



TECH **AUSTRALIA** life

WINDOWS, MAC, ANDROID & IPHONE HACKS

ISSUE 78 JULY 2018 f TECHLIFER t TECHLIFER v APPLE NEWSSTAND & GOOGLE PLAY



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ACTION-READY TVs REVIEWED IN-DEPTH

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GET MORE INCHES FOR YOUR BUCK



ACCESS ALL AREAS



THE NEW LEGO
HOW NINTENDO LABO IS CREATING THE FUTURE... WITH CARDBOARD!

EVASDE INTERNET BLOCKS & TRACKERS

EXPERT GUIDE TO BREAKING THROUGH GEOBARRIERS

* VPNs REVIEWED & COMPARED * NEVER BE RESTRICTED AGAIN



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FOCAL LENGTH: WHAT IT IS AND WHY IT MATTERS ON YOUR SMARTPHONE & DSLR

ESSENTIAL REVIEWS
FITBIT VERSA vs SUUNTO FITNESS 3 UE MEGABLAST GOPRO HERO



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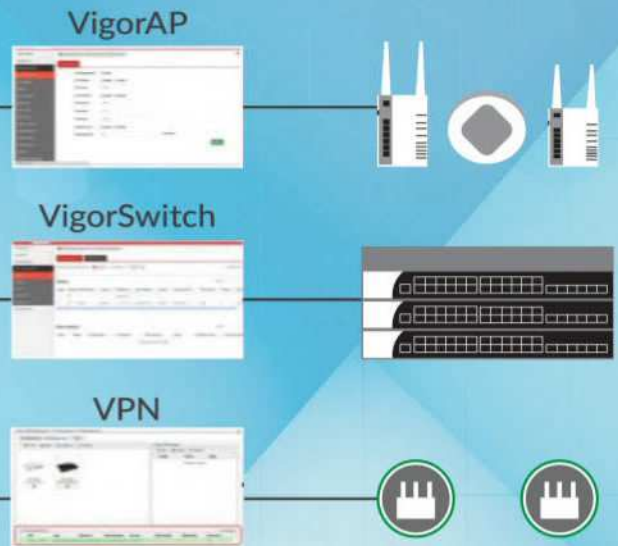
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Central
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i-LAN Technology Pty Ltd trading as DrayTek Aust & NZ

www.i-lan.com.au

(02) 9838 8899

sales@i-lan.com.au

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EDITORIAL

UNFETTERED SPECULATION



IF AN INTERNET PROVIDER WAS TO HAVE ITS OWN TV AND MOVIE STREAMING PLATFORM, WHY WOULD IT GIVE A COMPETITOR – LIKE NETFLIX – THE SAME BANDWIDTH UNLESS IT WANTS TO PAY FOR A ‘FAST LANE’?

[NOTHING BUT ‘NET’]

Net neutrality survives – for now

AMERICAN SENATORS VOTE TO PREVENT U.S. ISPs FROM DISCRIMINATING AGAINST INTERNET TRAFFIC. SO HOW DOES THIS AFFECT AUSTRALIA?

[PAUL TAYLOR]

HAVE YOU HEARD about net neutrality?

It’s the principle that all traffic on the internet is treated by your ISP equally, no matter where it comes from, or the device that’s accessing the internet. That Netflix show you’re watching on your TV gets the same priority as your Google search on your smartphone, as does your *Fortnite* gaming session on your Xbox, and Spotify stream through your smart speaker, if you’re trying to do all of these things at the same time.

It’s a term that was devised in 2003 and formally legislated as the Open Internet Order in the United States in 2015 by the Federal Communications Commission (FCC).

Previously, the internet had once been classified as an information service, but was reclassified as a public utility, like water, gas and electricity. However, in late 2017, FCC Chairman Ajit Pai voted to repeal the Open Internet Order.

His reasoning was that investment in high-speed internet infrastructure and services had severely declined, and that revoking the rules would open up internet access to more Americans.

Opponents who want to keep net neutrality point out that scrapping it can lead to companies favouring one service over another, and anyone with a vested interest in a service can instead cripple their opponents by slowing their traffic. For instance, if an internet provider was to have its own TV and movie streaming platform,

why would it give a competitor — like Netflix — the same bandwidth unless it wants to pay for a ‘fast lane’? Why would it let you view a competitor’s website quickly and easily? Deals and partnerships could quickly destroy any competition from springing up and disrupting their business model.

Unsurprisingly, the companies in favour of scrapping the rules include Comcast, AT&T and Verizon — either internet providers or companies who sell phones (or both). Comcast owns NBC Universal, a media conglomerate with its own TV show and a part ownership in Hulu, a video website.

So how does this affect Australia? Well, the argument goes that unless a new Australian company with a red-hot idea to provide some genuine competition has deep pockets (or wants to sell its idea to a larger company), they’re going to be out of luck expanding. Ideas and innovations will stifle. Australia does not have net neutrality laws, but we do enjoy consumer laws that prevent ISPs from charging more to access certain parts of the internet (this is different from your ISP offering different bandwidth speeds, as regardless of your plan all of your traffic will come through equally to the next).


Just before we went to print, the US Senate voted to prevent the dismantling of net neutrality by 52 votes to 47. It’s a narrow win, but it’s not the final say on the matter. Chairman Pai has a direct line to President Donald Trump, who holds the ultimate power on this. Watch this space. ■



WELCOME

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* VPNs REVIEWED & COMPARED * NEVER BE RESTRICTED AGAIN



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Download link: www.ashampoo.com/techlife



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Download link: www.techlife.net/exclusives

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TECHlife

Future Publishing Australia, PO Box 1077 Mount Street,
North Sydney, NSW 2059
Tel: 02 9955 2677 Fax: 02 9955 2688
Email: techlife@futurenet.com
Web: www.techlife.net

Subscription enquiries: Please call CRM on (02) 8227 6486

Editorial

Editor: **Paul Taylor**
Chief Sub-editor/Journalist: **Carmel Sealey**
Senior Journalist: **Shaun Prescott**
Journalist: **Joel Burgess**
Journalist: **Stephen Lambrechts**
Journalist: **Sharmishta Sarkar**
Journalist: **Harry Domanski**
Creative Director: **Troy Coleman**
Senior Designer: **Nyke Coleman**
Designer: **Sharne Swinerton**

Contributors

Matt Bolton, JR Bookwalter, Tim Bothwell, Marc Chacksfield,
Cat Ellis, Craig Grannell, Phil Hall, Charles Handmer,
Tim Hardwick, Kenny Hemphill, Howard Oakley, Nick Peers,
Christopher Phin, Nick Pino, Bennett Ring, Chris Rutter,
Chris Schilling, Mayank Sharma, Dave Stevenson,
Alan Stonebridge, Nathan Taylor

Photography

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Advertising

Advertising Manager: **Paul Marttila**
paul.marttila@futurenet.com
Business Development Manager: **Stan Geha**
stan.geha@futurenet.com

Management

Managing Director: **Neville Daniels**
Managing Editor: **Dan Gardiner**

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Chief executive **Zillah Byng-Thorne**
Non-executive chairman **Peter Allen**
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THE WALL

GUFF AND STUFF



I'M EAGERLY AWAITING THE DAY I DON'T HAVE TO DRIVE SOMEWHERE, DESPITE THE FACT I QUITE ENJOY THE ACT OF DRIVING. THINK OF THE CANBERRA-ADELAIDE DIRECT ROUTE DRIVE IF YOU COULD JUST FALL ASLEEP IN ONE STATE AND WAKE UP IN THE NEXT.

Source: en.wikipedia.org



Hands off the wheel?

I glanced at the highlights from the Google I/O conference this morning and one of the segments featured was about self-driving vehicles, namely the Waymo company and their fleet of cars. The presenter mentioned that all you needed to do was order a car and one would arrive at your door with nobody behind the driver's wheel.

While it might have been elaborated on in the full conference feed, it left me wondering about something... Would you, as the passenger, be obliged to sit in the driver's seat or could you sit wherever you wanted? As far as I'm aware, there are no countries with the necessary legals in place that state that passengers do *not* have to be able to control the car in case of emergencies — which would mean they would have to sit in the driver's seat, hands ready to take the wheel. While this is obviously a transitioning

state, the future of driverless cars is pointing in the direction of radically redesigning cars — complete with 'family social setting' interior and all forms of steering/dashboard/pedals removed.

Which takes us to another point... if, in these new Waymo cars, you don't have to sit in the driver's seat, what's the wheel for? It eerily turns by itself, so apart from bit of showmanship, it's not really necessary if nobody needs to sit there.

I'm eagerly awaiting the day I don't have to drive somewhere, despite the fact I quite enjoy the act of driving. Think of the Canberra-Adelaide direct route drive if you could just fall asleep in one state and wake up in the next. It would definitely make traversing this country of ours more bearable.

[JENNIFER KILLIĆ]

Ed replies: Quite the catch-22 there, Jennifer. You order a driverless car, don't have to drive

it, but it does look like you have to be behind the wheel, watching the road, and ready to take control in case your robot motor gets into trouble. Waymo's accomplishments so far are a glimpse at a future that requires new laws. Here in Australia, the state of Victoria (cruelly blanked out in your vision of interstate travel) has trialled driverless cars thanks to new legislation that allows them on the roads, though someone has to be in the car always watching and ready to take control. Even with this leap of faith, consulting group KPMG reckons it'll be another decade before we're ready for truly autonomous vehicles, based on people's acceptance of the technology and infrastructure. As for the steering wheel, we'd say its presence anchors the whole experience making this new technology familiar, and there'll still be times when you'll need to take manual control (like navigating a tricky driveway or alley). ■

[COME ON, HAVE YOUR SAY!]

We want to hear what you think. Add to these discussions or email your views (in fewer than 250 words) to techlife@futurenet.com. All correspondence becomes the property of *TechLife* and is subject to editing. Letters must include full name, street address, suburb, state and phone number to be considered for print publication. Address and phone details will not be published.

HOTSPOT

YOUR GUIDE TO HOT NEW TECH



THE TWIN OLED SCREENS DON'T JUST DELIVER A HIGHER-RESOLUTION EXPERIENCE OVERALL (THE ORIGINAL VIVE'S RESOLUTION WAS 2,160 x 1,200 TOTAL), IT ALSO MEANS THAT PIXEL DENSITY IS INCREASED BY 37%.

[REALITY UPGRADE]

HTC Vive Pro

NEXT-GEN VR BRINGS PERFECTLY CLEAR VISION AND A MORE COMFORTABLE HEADSET, SO NOW YOU CAN TRULY LOSE YOURSELF IN ANOTHER WORLD

[MATT BOLTON]

THE HTC VIVE has always been the leading virtual reality experience when it comes to room-scale immersion. Although rival headsets such as the Oculus Rift have since expanded to help you physically move around to navigate in a VR, and the PlayStation VR does it to a point, no other headset has quite been able to replicate what the Vive offers.

TECH ME ON

There's an increase in pixels, climbing to 2,880 x 1,600 (1,440 x 1,600 per eye), representing a 78% increase from the original Vive. There's also high-res audio headphones built into the headset this time round. But after you've forked out the staggering \$1,199 price,

you might be surprised as to what you actually get in the box: just the headset, the link box, a DisplayPort and USB cables for connecting the Vive Pro to your PC, a power adapter and the mounting pad for strapping down that link box. That's it. To actually use the Vive Pro, HTC is expecting you to already own the pair of controllers and the two base stations required for tracking all of your movements. To buy the full kit, you'll have to fork out for the 'Vive Enterprise Advantage' bundle at \$1,999 — a rather large investment.

ROOM WITH A VIEW

The good news is that the Vive Pro will work perfectly with any existing Vive kit. If you're

The Vive Pro design is improved when it comes to comfort, but it's still not the most beautiful bit of tech you'll ever own.

**HTC VIVE PRO**

\$1,199 (headset only)
\$1,999 (full kit)
vive.com/au

CRITICAL SPECS:

Dual AMOLED
3.5-inch screen;
2,880 x 1,600 resolution
(1,440 x 1,600 per eye);
90Hz refresh rate;
110° FOV; SteamVR
Tracking, G-sensor,
gyroscope, proximity,
IPD sensor; USB-C 3.0,
DisplayPort; Bluetooth

new to the VR game, you need to prepare for what a faff it is getting everything set up properly. You have to download the drivers from the HTC Vive website, run the setup software and get everything plugged in. Then you must position the sensor units up high enough by balancing them on bookcases, tripods or screwing them into your walls, map the space that you want to use, then finally run through the tutorial. That's before you factor in whether you'll need to clear extra space in your room to properly play. There's a standing-only option if you have a small space, but for the true Vive experience, you'll need a space at least 2 x 1.5m.

Tracking isn't always perfect, occasionally losing sight of one or both controllers mid-game. It's a little immersion-breaking, but regardless, the difference between the first Vive and the Pro is staggering.

EYE CANDY

The twin OLED screens don't just deliver a higher-resolution experience overall, it also means that pixel density is increased by 37%. Having many more pixels in the same space means you can't see individual dots anymore. The 'screen door effect', as it's known, was prevalent on the first Vive, the Oculus Rift and especially the PlayStation VR. But that's all gone with the Vive Pro and it seriously changes the overall VR experience.

The display refresh rate is 90Hz, the same as the original Vive. It's high enough to trick the eyes and avoid feeling artificial, though the 120Hz PlayStation VR is still the king here.

LIGHTENING THE LOAD

Technically, the Vive Pro is heavier than the original headset, and compared to the PSVR or Oculus Rift, it feels like a deadweight. But the weight is better distributed, applying less pressure to your face, thanks to a new rear headrest and a tightening mechanism on the back that's not dissimilar to the PSVR.

The area that comes into direct contact with your nose has also been tweaked, reducing the amount of light that gets in; before this tweak, that pesky light would have reminded you that you're still in the world.

The new integrated headphones reduces the wires hanging around your body as you play, and makes the most of the spacial audio provided by the Vive Pro. Everything sounds beefy and detailed, and with a good 3D effect, contributing to a higher sense of immersion.

Despite the fact that the HTC Vive Pro website shows a man leaping about all over the place, this is still a tethered experience. HTC is releasing a Vive Wireless Adapter later this

The HTC Vive Pro distributes its weight more evenly across your head, feeling lighter than other VR headsets thanks to a lack of pressure points.



HOTSPOT
HTC VIVE PRO



The Vive Pro's headphones are high-res audio compatible for high clarity sound, in luscious 3D, to avoid the experience sounding too flat.

year, but it'll be an additional cost. It's an exciting and potentially game-changing solution if it works as well as HTC promises, though.

POWERING UP

When it comes to a PC, you'll need to power a full Pro experience. HTC recommends using a rig packing at least 4GB of RAM, an Intel Core i5-4590/AMD FX 8350 processor or better, and an Nvidia GeForce GTX 1060/AMD Radeon RX 480 or better. You can buy a suitable setup from about \$1,000, though we'd recommend looking at around the \$1,800 mark for something that will last a while. That said, we tried the Vive Pro running off an Nvidia GeForce 980 Ti graphics card and it was fine.

With all of this in mind, the Vive Pro is an odd one for us to recommend at this stage. It's clear that it's the best immersive virtual experience you can buy; the clarity and detail is such a contrast to the original headset that it

feels less like a Vive 1.5 upgrade rather than a visual overhaul, particularly for the big-budget VR release. But the timing and pricing feels off. If HTC sold all of the accessories and the Wireless Adapter in one box, it could justify the premium price. Pre-orders around the world were selling out rapidly, so there's clearly a demand for better-quality VR. For us, though, such a premium price should also include the Vive Wireless Adapter.

The Pro might offer the best VR experience on the market, but having to buy all the extras to be able to use it properly makes it a very expensive proposition if you are coming to VR from scratch. Throw in the space and setup requirements and it's best to consider this an investment in the best VR experience. If you're happy to make that investment, we can recommend the Vive Pro. For an easier setup and lower cost, the PlayStation VR is still the best option. For a room-scale experience at a lower cost, the original Vive bundle is a good buy at half the price (\$879). ■



CHINA BANS PEPPA PIG FOR ITS 'GANGSTER' CONNOTATIONS
'I LOVE IT WHEN YOU CALL ME BIG PEPPA'

The Democratic Republic of China isn't afraid to ban things, and while the West might not agree with these decisions, it's at least often obvious why they occur. We can't say the same for the recent blacklisting of the children's TV series *Peppa Pig*, at least not without following the Notorious PIG down a Triad-shaped rabbit hole. See, *Peppa Pig* has been adopted as the unwitting mascot of an internet based anti-establishment group known as 'shehui ren' and was subsequently banned for promoting 'gangster' attitudes. [JB]

RESEARCHERS PUSH HIDDEN MESSAGES TO SMART SPEAKERS
'DO YOU SPEAK A MY LANGUAGE?'

While smart speakers may still struggle to understand your grandma when she says "Ohkei Googoo", researchers in China and the US have discovered that they're already adept at deciphering covert instructions that are inaudible to humans. The University of California, Berkeley, was able to dial phone numbers and go to websites using hidden audio-based commands and have stated that, in the wrong hands, the hidden smart speaker language could be used to unlock security doors or even make purchases without users being aware. [JB]

DIGITAL DRIVERS LICENCES COMING TO NSW
LEAVE YOUR WALLETS BEHIND.

Close to three years on from announcing its intention to introduce optional digital drivers licences, the NSW Government is finally introducing legislation into parliament that will see the app-hosted cards become legal on the state's roads. The decision was made after a 1,400 person trial in Dubbo reported an 83% customer satisfaction rating. Pretty convincing evidence that people are ready to ditch the wallet. [JB]



"THERE ARE 200 MILLION PEOPLE ON FACEBOOK THAT LIST THEMSELVES AS SINGLE, SO CLEARLY THERE'S SOMETHING TO DO HERE."

[THE BOOK OF LOVE]

Facebook to launch dating service

FACEBOOK WANTS TO GET OUT OF THE 'FRIEND ZONE' WITH NEW MATCHMAKING FEATURES.

IN ITS FIRST big announcement since appearing at a US congressional hearing for its involvement in the Cambridge Analytica privacy scandal, Facebook has unveiled its intention to get into the matchmaking game. While we generally wouldn't recommend asking billionaire Facebook CEO Mark Zuckerberg for dating advice, the world's largest social media network seems to be adept at pairing covert political manipulation advertisements with their perfect human counterparts. How much harder can connecting human soulmates be?

Naturally, the announcement by the multi-billion-user social media platform torched dating-app Tinder's stock price, which fell 22% on the day of the announcement.

In the evangelical tone that seems to emanate from large Silicon Valley companies, Zuckerberg highlighted the importance of this new company mission in a blog post, stating: "There are 200 million people on Facebook that list themselves as single, so clearly there's something to do here." While there might not be much Zuckerberg can do about people now referring to the service as 'Facebonk', he said the new dating feature is "not just for hook-ups", but is rather aiming to create "meaningful, long-term relationships".

The new optional dating-profile feature is expected to launch soon, although the company hasn't committed to an official date-night yet. [JOEL BURGESS]

[THE OLD SWITCHEROO]

Controversial data analysis firm Cambridge Analytica 'closes'

COMPANY RESPONSIBLE FOR 'MAKING AMERICA GREAT AGAIN' SHUTS DOWN IN WAKE OF SCANDAL.

AFTER WAFTING AN orange haired clown into America's highchair and successfully convincing swathes of Brits that it was a 'fit' idea to Brexit the EU, social media consultancy firm Cambridge Analytica is shutting up shop. Knowing intimately how much fake news propagates on the pages of Facebook, the company took to its website and Twitter to post the official announcement that it would be filing for bankruptcy following the widespread exposure of its pivotal role in the Facebook data abuse scandal — and, well, that blatant video footage capturing the company's commercialisation of political blackmail. Like all good dubious business ventures, the company then attempted to rebrand as Emerdata Limited, an entirely *different* business that dealt with "data processing, hosting and related activities", shared the same business address and featured an identical set of management staff as the cast from Cambridge Analytica. This delicate deception was, however, detected and the crafty new business has, subsequently, also been shuttered. [JOEL BURGESS]



[BOOKING BOT]

Google faces backlash over autonomous calls by new voice chatbot

DOES DUPLEX ENCOURAGE DOUBLE STANDARDS FOR COMPUTER CALLS?

IN WHAT WAS potentially the first public display of a computer passing the Turing Test, Google's reveal of its AI powered audio-chatbot (codenamed Duplex) at the company's annual I/O developer conference in May certainly garnered a lot of attention — from both early adopters and AI doomsdayers alike.

Duplex's uncanny ability to pass for a human in phone conversations had many conference attendees eager for the time-saving benefits it could provide — such as never having to personally book a haircut, doctor's appointment or restaurant reservation ever again [*Ugh, such a chore - Ed*] — others decided that the important take-home message was to ask whether or not it's ethical for robots to make phone calls without disclosing their AI nature. University of North Carolina tech sociologist Zeynep Tufekci called the AI-powered conversation “horrifying”, adding that “Silicon Valley is ethically lost, rudderless and has not learned a thing.” This opinion seems to be shared by UNSW AI professor Toby Walsh, who posted on social media that “Computers should not pretend to be humans.”

It's not immediately clear just how many people are concerned by the new chatbot's linguistic capabilities and default anonymity, but Google's CEO Sundar Pichai did footnote that they were still developing the software and wanted to “get the user experience and expectations [for Duplex] right”. So the addition of prior notification that you're speaking to an AI may already be in the pipeline. [JOEL BURGESS]

[WE NEED TO TALK]

Google takes on Apple and Facebook in the instant messenger game

IS GOOGLE'S NEW CHAT APP REGRESSIVE, OR A STEP IN THE RIGHT DIRECTION?

ANDROID USERS HAVE been calling for an iMessage equivalent for years now and though there have been a string of attempts by Google at a core chat app, none have really caught on. Google Allo was recently ditched in order to divert resources to a new Rich Communication Services (RCS)-based messaging app called Chat. RCS is the modern equivalent of SMS, using traditional telecom channels to transact messages with similar features to iMessages, Messenger and WhatsApp. By building Chat on RCS, users will get an in-built messaging app that works with phone numbers across various phone brands without needing to sign up for a specific service.

Google has garnered a lot of support for the RCS-based Chat from telcos. End-to-end encrypted services like iMessage turn telcos into dumb data pipes with no access to message contents and metadata, while RCS return these responsibilities to service providers. That said, the platform may face other hurdles, with outside groups like Amnesty International condemning the use of RCS's unencrypted protocol, labeling it as ‘dangerous’ and ‘regressive’. [JOEL BURGESS]



GOOGLE EMPLOYEES QUIT IN PROTEST OF MILITARY CONTRACT
EMPLOYEES FEEL PROJECT MAVEN CLASHES WITH 'DON'T BE EVIL' MOTTO.

While the company has long attempted to uphold the motto “Don't be evil”, in February, Google seemed to diverge from this by making public its acceptance of a controversial contract from the US Defence Department. The US Government's Project Maven will draw on Google's visual AI systems to automatically classify objects and people from drone surveillance, a critical task that the disgruntled employees believe should be performed by humans, and for which they stress that Google should take no part in. [JB]

THE ACCC TO INVESTIGATE GOOGLE'S DATA HARVESTING PRACTICES

CHECKING USER CONSENT FOR ALL ANDROID DATA COLLECTED.

The Australian Competition and Consumer Commission is looking into the data that Google collects from Android users, after software company Oracle suggested it harvests up to a gigabyte from Android devices every month. While Oracle's original report was sparked by concerns over Google and Facebook's dominance in the local advertising market, the watchdog is now reportedly exploring whether there is adequate user consent for all of the data Google currently collects. [JB]

BOSTON DYNAMICS WILL BEGIN SELLING ROBOTS IN 2019

THESE ROBOTS ARE MUCH BETTER AT FETCHING.

The dog-like SpotMini could be man's new best friend or our worst enemy depending on who you ask, but regardless of your point of view, MIT-spinoff Boston Dynamics will be delivering its first retail robots to customers in 2019. The announcement was made in conjunction with a presentation of the updated features for the robot range, which saw the company's humanoid robot Atlas jogging in a woodland setting, and the SpotMini navigating stairs and performing tasks in a factory area. [JB]

The news in numbers

THE KEY FIGURES DRIVING THE LATEST ISSUES AND TRENDS IN TECHNOLOGY.

[HARRY DOMANSKI]

HOTSPOT
NEWS IN NUMBERS



NETFLIX'S MARKET CAP HAS SURPASSED FOX, SONY AND WARNER BROS BY ALMOST DOUBLE

In mid-April, Netflix's market cap rose significantly to \$146 billion, leaving it only \$8 billion shy of media leaders Disney and Comcast, and placing it well and truly ahead of the likes of Warner Bros (\$76 billion), 21st Century Fox (\$70 billion) and Sony (\$64 billion). The rise came hot on the heels of Netflix's announcement that 7.41 million customers had signed up in the first quarter of 2018, which was over 1 million more than it anticipated.



HOME PHONES COULD BE HISTORY IN LESS THAN 20 YEARS

We could see the death of the home phone as early as the year 2037, according to research conducted by finder.com. The number of Australians reporting that they have a home phone has been steadily falling by more than 3% over the last few years, and currently sits just above 60%. The year 2037 has been reached by extrapolating this trend, but of course, factors like the competitive mobile network and infrastructure neglect could see this process accelerate.



802%

APPS FEATURED BY APPLE'S APP STORE SAW A SIGNIFICANT BUMP IN DOWNLOADS

For developers lucky enough to get their game or app into any of the featured slots of iOS's App Store, they'll find themselves with more than just an accolade. Analysis conducted by mobile insight company Sensor Tower has found that the average number of downloads for a game featured as an App Store Game of the Day rose more than 800% from the days prior. Similarly, an App of the Day title would reward apps with a 685% increase in downloads.

3 YEARS

HOW LONG MARK ZUCKERBERG SAYS IT WILL TAKE TO 'FIX' FACEBOOK

At Facebook's keynote event (F8) this year, Mark Zuckerberg replaced most of the typical fanfare for new products and technologies with damage control in the face of the particularly rough 2018 that the company has seen so far. In an interview with tech publication *Wired* before the keynote, Zuckerberg outlined a need to be more proactive in preventing any abuse of the platform, but this kind of transformation would take the social network three years to achieve.

300,000km

DISTANCE A TESLA CAN DRIVE BEFORE ITS BATTERY LOSES 10% OF ITS MAX CHARGING CAPACITY

A Tesla owners group in Belgium and the Netherlands has gathered data on the life expectancy of their cars' batteries, and the results are more positive than anticipated. Although there was a 5% drop in the maximum charging capacity of the battery after 80,000km of driving, it took much longer to drop to 90% (300,000km) and even longer to drop down to 80% (800,000km). While this is a user-based study, the results are quite promising considering the batteries are only guaranteed by Tesla to have a 70% maximum capacity after 200,000km. ■

THE ULTIMATE GAMING BUNDLE



The OriginPC and AOC **Neuron Esports PC Gaming Bundle** delivers everything you need to take on the world's best and come out on top. Now you can **customise your system** to game like the pro's.

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RAM: 8GB DDR4 / 16GB DDR4 / 32GB DDR4

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THERE'S NO GETTING AROUND THERE BEING A WHIFF OF AN IPHONE X TO THE LOOK, AS YOU GET A BIG 6.1-INCH SCREEN (WITH NOTCH) HERE. THAT SOUNDS HUGE, BUT HUAWEI HAS REALLY NAILED THE ERGONOMICS, SO WE FOUND IT COMFORTABLE TO USE.

[TRIPLE THREAT]

Huawei P20 Pro

HUAWEI'S LATEST HAS A SMART DESIGN WITH AN IPHONE-STYLE NOTCH, BUT IS THREE CAMERAS THE MAGIC NUMBER?

[MARC CHACKSFIELD]



HUAWEI P20 PRO

\$1,099
www.huawei.com/au


CRITICAL SPECS:

Android 8.1; 6.1-inch 1,080 x 2,244-pixel screen; Kirin 970 CPU; 6GB RAM; 128GB storage; 40MP wide-angle, 8MP telephoto, 20MP B&W + 24MP front cameras; 4,000mAh battery; 15.5 x 7.4 x 0.8cm; 180g

HAVING SHUNNED ITS budget image, Huawei is carving out a solid reputation for offering Apple-like hardware with Android software at a premium price. Of course, that price has to be justified with features, and the P20 Pro has quite the showpiece: a triple-sensor Leica camera system. Oh, and its beautiful gradient colour finishes that shift in the light.

FAMILIAR FACE

In the rest of the design, there's no getting around there being a whiff of an iPhone X to the look, as you get a big 6.1-inch screen (with notch) here. That sounds huge, but Huawei has really nailed the ergonomics, so we found it comfortable to use.



ON THE BACK, YOU'LL FIND THAT CAMERA SETUP, WHICH COMBINES TWO COLOUR CAMERAS (WIDE-ANGLE AND TELEPHOTO) WITH ONE MONOCHROME SENSOR.

HOTSPOT
HUAWEI P20 PRO

The glass back is smooth and solid, while the metal edges are pleasingly chamfered and tactile. It's definitely premium — we find it much more pleasant to hold than the Samsung Galaxy S9 — and it feels more durable. Unlike the iPhone, there's still a fingerprint sensor and home button on the front. It's a welcome extra, since the face unlocking works well but isn't as secure as Apple's Face ID.

On the back, you'll find that camera setup, which combines two colour cameras (wide-angle and telephoto) with one monochrome sensor. You get 10MP, even though the sensors are higher-res than that — Huawei combines multiple pixels into one for an extra-sharp image. It's very smart, and similar to what Nokia did with its legendary PureView camera.

The actual sensor of the wide-angle camera is huge as well (double the size of the iPhone or Galaxy S9's), and when combined with the tonal pixels of the monochrome sensor and 'Artificial Intelligence Stabilisation', you get a camera that's shockingly good in low light, capable of pulling out noise-free details we're unable to see with the naked eye.

Huawei has created a super-fast autofocus system, too, and it even has predictive focus to keep any moving objects pin sharp. It also uses AI for better results in each photo: it instantly recognises what you're shooting and adjusts the image processing accordingly. For example, it will know when you're taking a picture of a flower and boost the saturation. And if you're taking a portrait, it will automatically smooth the skin and blur the background.

We rate the Google Pixel 2 as the best phone camera on the market, and the difference between it and this one is down to taste. The Pixel 2 is more like a point-and-shoot camera, while the P20 Pro is more like a DSLR, where you need to play with the settings and modes to get the most out of it. It definitely bests the iPhone X and Galaxy S9, though.

Everything the P20 Pro camera is doing is quick as hell, powered by an octa-core processor and its special AI chip. In fact, anything we did on the phone, from opening apps to watching videos, is super responsive. The P20 Pro runs Android Oreo 8.1 with Huawei's EMUI 8.1 skin on top. The skin is improved greatly over previous versions, but still not quite as attractive as stock Android.

POPULARITY CONTEST

The OLED display is excellent, striking a good balance between natural and over-saturated. It is lower resolution than the Galaxy S9, but you'll only notice the lack of pixels when side-by-side. The display is sharp, bright and pleasing to look at.

The battery is a massive 4,000mAh unit, leading to huge longevity. We often find ourselves ending a day with 50% remaining and we are not light users. In fact, we're not sure how Huawei managed this trick in a phone that measures just 7.8mm thick.

The P20 Pro is outstanding in other more boring and often overlooked areas such as speaker quality and wireless performance. The phone also manages to get 4G signal where others usually fail to do so.



Premium phones with a fingerprint sensor on the front are rare these days, but the P20 Pro keeps the flag flying.

The Huawei P20 Pro is a very impressive smartphone. It's powerful, fast, refined, stylish and, perhaps most importantly of all, desirable. The biggest criticism that can be drawn against it is that the handset looks like an iPhone X, and people may dismiss it instantly as a knock-off because of that. We'd love to see Huawei carve more of its own look in the overall design, but the gorgeous pink and blue gradient finishes already give it a luxe identity of its own.

So don't dismiss the Huawei P20 Pro purely as an iPhone X also-ran. This is as good an Android phone as the best out there right now, a truly incredible camera, and an object of desire on its own merit. ■



[I F & % \$ # @ * LOVE SCIENCE!]

Pop science

THE LATEST DISCOVERIES, INVENTIONS & SCIENCE NEWS
HELPING TO SHAPE THE WORLD OF TOMORROW.

[SHARMISHTA SARKAR]

SCIENCE CAN HELP SUPPRESS UNWANTED THOUGHTS

FOR MEDICAL PURPOSES ONLY, NOT DYSTOPIAN MIND CONTROL.

People suffering from post traumatic stress disorder or schizophrenia tend to relive nightmares over and over, but new discoveries from Canada's McGill University may help with effective treatments. Until now, it was understood that patients suffering from mental disorders lacked a neurochemical in the prefrontal cortex called gamma-Aminobutyric acid (GABA), which our bodies produce to suppress any memories that trigger stress. But injecting patients with GABA didn't help suppress those memories. Studying healthy brains, however, has changed that school of thought. Researchers now understand that GABA is produced in the hippocampus (the part of the brain responsible for long-term memories), which then travels to the cortex as a "stop signal". In unhealthy brains, the hippocampus doesn't send that signal, allowing memories to seep through. This knowledge can help doctors recommend hippocampal GABA treatments, which would empower patients to selectively suppress their worst memories.

GROWING NUMBER OF HEALTHY EATERS COULD BE DAMAGING OUR PLANET

A study published in the journal *PLOS One* has found that healthy diets, while really good for humans, could be harming the planet. According to this study, buying healthy food often ends with food wastage. In the US, 39% of food waste comes from fruit and vegetables, 17% from dairy and 14% from meat. It is estimated that nearly 350 million kilos of pesticides, 800 million kilos of nitrogen fertiliser and 16 trillion litres of irrigation water per year goes into harvesting crops that go uneaten. It's not all bad, however; previous studies have found that growing more fruit and veg produce less greenhouse gases and use less land to grow. And while there are pros and cons of high-quality diets as far as the planet's health is concerned, the team behind this study does not suggest that people give up on eating healthily.



A photo a day keeps the doctor away

TAKING PICTURES AND POSTING ONLINE EACH DAY IS GOOD FOR YOUR WELLBEING.

Millions of photos are uploaded to social media each day but new research has found that taking one per day and posting online can boost one's wellbeing. A joint study between the University of Sheffield and Lancaster University in the UK took into consideration what types of images people post, the text included with the image and how users interact with one another on Blipfoto, a photo-a-day site. They found that taking at least one photo each day and uploading to social media improved not just community interactions, but people's self-care attitude and mindfulness. It also improves exercise by forcing people to go out, and extends a sense of purpose and achievement as well. The online interaction helps manage loneliness and grief, as well as helping to bring people with common interests together.



The Australian health guideline of two drinks a day has been trashed by science

CUT THE BOOZE IF YOU WANT TO LIVE LONGER.

Analysing data from over half a million drinkers from around the world has suggested that even the tiniest amount of alcohol consumption can lower life expectancy. If weekly alcohol consumption is over 100g — less than 10 standard Australian drinks — life expectancy at the age of 40 drops by six months to five years. The data published in *The Lancet* suggests that the more people drank, the higher the risk of related illnesses. In Australia, the health guidelines recommend two standard drinks a day; that's 14 a week. This new study debunks the country's norm, but is in keeping with the UK's guideline of six glasses of wine a week. While Australian health recommendations might exceed the new data's recommendation by four standard drinks a week, countries like Italy, Portugal and Spain have a recommended limit that's 50% higher. But no matter the recommendations, it's best to err on the side of caution when it comes to alcohol consumption.

Google search for 'syphilis' is helping public health officials find new cases

DR GOOGLE TO THE RESCUE.

A persistent itch, a strange bump; but instead of going to the GP, we look up the symptoms on the internet. If you thought those searches were private, think again. Public health officials are looking at Google's search trends and geotagged social media posts to track down new cases of syphilis. It has been found that search results for "STD" and "Find sex" is linked to cases of syphilis in an area reported in the weeks following the search. A similar link was found between geotagged tweets about syphilis (apparently people like to overshare) and unsafe sex. While this pattern helps public health officials find new cases of syphilis, it isn't a predictive tool to help track or prevent future outbreaks.



NEW STUDY FINDS THAT, CONTRARY TO POPULAR BELIEF, UGLY PEOPLE EARN A LOT

Beautiful people have it easy: there are plenty of studies that show being good-looking is good for one's health (mental and physical), makes it easier to find friends and secure great jobs. In short, they earn a lot more than the average citizen. A recent study published in the *Journal of Business and Psychology* has debunked that myth. Data collected from 20,000 Americans from the age of 16 until they were 29 has found that there is no "ugliness penalty" on wages. As long as the person is conscientious, extroverted and less neurotic, earning capacity is apparently significantly higher. According to the study, participants labelled as 'very unattractive' earned much more than those labelled just 'unattractive', or those considered average looking or even attractive. It has been suggested that attractive people are more open to experiences, resulting in distractions that could lead to lower pay.

DYED CONTACT LENSES COULD HELP CORRECT COLOUR BLINDNESS

While the use of contact lenses in correcting vision is common in correct vision, their use in correcting colour blindness has, so far, been less so. But researchers at the University in Birmingham have developed a contact lens that uses a safe low-cost dye to rectify the issue. The most common form of colour blindness is the inability to distinguish between red and green, meaning sufferers see a muddy yellow, causing issues with things like traffic lights. The newly developed contact lenses utilise a dye made out of rhodamine, which absorbs certain wavelengths of light between red and green. When those wavelengths are blocked, light is better absorbed by the red-sensitive and green-sensitive cones in the eye, allowing the sufferer to distinguish between the two colours. The next step is to develop a similar process to correct purple-blue blindness. ■



[SEEING IS BELIEVING]

Amazon Echo Spot

THIS ADDITION TO THE ECHO FAMILY IS A FUN, VERSATILE VIDEO DEVICE.

[MARC CHACKSFIELD]



AMAZON ECHO SPOT
\$199
www.amazon.com.au

CRITICAL SPECS:
2.5-inch 480 x 480-pixel screen; Bluetooth; 3 x buttons; 3.5mm audio jack; compatible with Spotify, Deezer, TunesIn and iHeartRadio; supports multi-room functionality; supports Amazon Alexa

AMAZON'S LATEST ECHO refresh has brought with it a design flourish that was sorely missing from its original line-up. We'll get straight to it: the Amazon Echo Spot is the best-designed Alexa device Amazon has ever created. The new form factor makes Alexa feel fresh again, giving the voice AI some much-needed purpose.

The Amazon Echo Spot is versatile — it doesn't have a chameleon-like ability to adapt to the room you put it in but this is certainly not just a smart alarm clock, something Amazon has been very clear about.

DESIGN

The issue is, it looks like a smart alarm clock which means that this may become its default use for many, but its use stretches beyond that. The Amazon Echo Spot is unlike any other Echo device and that is a good thing. Its curved shell does more than enough to make up for its sibling's design failings.

Where the big, bulky and brash Amazon Echo Show took over any area you put it in, no thanks to its brutish black slab look,

the Echo Spot is much more refined in its design. Surprisingly, it turns out the best way to do a desk-based video device is to forgo the TV-lite look and just go with something that is compact and looks good.

The Echo Spot is a cross between an Echo Dot and a smaller version of the Amazon Show. This is no Echo Dot replacement, though. It's a pretty compact device with a curved back and screen that's angled up, which makes it easy to view. It's a great-looking device, certainly something you won't mind having on show in your home unlike the, uh, Show.

WHAT CAN IT DO?

The screen is small, at 2.5 inches (480 x 480 pixels). On the top of the screen, there is space for a camera, and on the top of the device as a whole, there are three buttons: volume up, down and mute for the mic — this will also disable the camera. There are also four small pin-prick holes that house the four-array mics that listen out for the wake word. On the back, you have a nice bit of Amazon branding and a slot for power and a 3.5mm jack.



bigger screen size, we actually preferred it on the Spot.

The round screen is also perfect for room-to-room calling. This is functionality that Alexa has been able to do for a while and it works really well, turning the Spot into an intercom of sorts. Ask Alexa to drop into another Spot speaker and a face will pop up on the screen and you can have a chat, much like FaceTime. You can also 'drop-in' on people in your phone book (if you and they allow it). This works really well — there's a blurred image for 10 seconds or so, just in case you need to make yourself decent, then the screen will appear clear.

Like the Echo Dot there's an integrated speaker and we were surprised with how good it sounds. Unlike the Echo Dot, which is only really passable for things like voice, the Echo Spot had a nice sound to it. You will probably want to hook it up to a better speaker system, but if it is on your bedside table, then you won't complain about the sound. If you listen to something with Amazon Music, then you also get the added bonus of having lyrics come up on the screen.

Another way Amazon wants you to use the Spot is as smart cam monitor. We saw a demo where you could get a smart cam video link up on the screen — from a compatible smart cam — where it was streaming from a nursery. The stream on the demo was clear and bright. Unfortunately, our current setup at home is Hive and, at the time of the review, the Hive View isn't yet compatible (but should be soon), but the idea of this is great. It will also work with smart doorbells such as Ring.

When it came to using the Spot in the kitchen, we found it great to watch something on Amazon Prime while cooking our food. Having the ability to call up recipes and times and actually see them on the screen was a real boon, too. The ability to have multiple timers running at once really helped when cooking a roast dinner.

Again, this is functionality you can have on other Echo devices but having it 'at a glance' on the screen is great and means you don't have to whip your phone out for these things.

IN THE END

The Amazon Echo Spot does everything the Echo Show does but it all feels better in this smaller form factor — and we can easily see the Spot being used in the bedroom, kitchen or even on a desk. We're just hoping that Amazon's Skills become much more video friendly — once this happens, the Amazon Echo Spot will become an absolute must-have. ■



The speaker grill for the Spot is right at the base of the device, which makes it invisible when viewing the Spot face-on. Bluetooth functionality is also available.

Setup is similar to other Echo devices, except for this one, you can type in your Wi-Fi details straight on the screen, instead of going through the Alexa app. It is a little bit fiddly putting in your details that way (it will ask for your Amazon account password, too) but the whole process will take less than five minutes.

Once up and running, you have the option to watch Amazon's promo video which tells you what you can do with the device. Then you get that warm chime sound, which means Alexa is up and running. Once this appears, follow the prompts that come up on the screen. Or you can swipe right on the screen and that will bring up a whole load of Alexa commands you can use. It's a really nice way to learn what to do with Alexa. It's in the settings where you can toggle home cards on an off also. The home cards are information that comes up on the home screen.

You can have the home screen include your messages, weather, notifications, upcoming events, reminders, drop in and trending topics.

DOES IT WORK?

Performance depends on what you actually use it for. If you did use it as an alarm clock, then it's got everything you need. There are myriad clock faces to choose from — both analogue and digital. There's a night mode, too, which is really handy and worked well. Put this on and it will dim the screen for the hours that you choose.

Amazon has also made it so that you can have a song or radio station wake you up as the alarm. You can also read your messages on the screen and make calls.

When we used the Spot on our desk, it made us veer more towards the video functionality of the device. It looks a little strange when it first comes up as you are trying to watch a 16:9 video on a small round screen. Amazon has given the option to 'zoom' the picture to fit the round shape, though. While this would be hideous on a



[CROWDFUNDED]

Kickstarted!

FROM THE PRACTICAL TO THE QUIRKY TO THE DOWNRIGHT STRANGE, CROWDFUNDING WEBSITES HAVE ALLOWED THE CREATION OF AN AMAZING RANGE OF PRODUCTS. HERE'S A SELECTION OF LATEST PROJECTS THAT PIQUED OUR INTEREST.

[CARMEL SEALEY]

Nemo

ULTRA HIGH-DEFINITION 4K UNDERWATER DRONE

aquarobotman.com | Goal: \$40,133 | Raised: \$78,918 from 55 backers | RRP: US\$999, plus shipping

There's a certain fascination amongst humans for the great deep, being the least explored place on our planet. So it's no wonder that inventors are trying to come up with the best underwater drone. The Nemo is an "ultra-stable" model that also comes with UHD 4K video quality, meaning whatever it sees will be seen by you later crystal clearly! Did someone say VR? Strap on some goggles and you can pretend to be a fish, and share your experience with all your friends. But back to the real pros: the Nemo is equipped with four thrusters to give it that stability, it connects easily to its companion controller app and is simple to set up. It's not wireless, though; but before you complain, this cable means all of the video it records is immediately transferred back and means it will never get lost in the blue. The battery also lasts an astounding three hours and takes just half that to recharge! Take that, quadcopters! If you're interested in what's under the sea, Nemo looks like a good companion for your next adventure.



[CONFUSED TRUMPET]

The 'This should have been taken down by now' project of the month

SOME PROJECTS ARE SO BLATANTLY NOT ABOUT CREATING REAL PRODUCTS THAT IT'S EMBARRASSING.

Ultra Password Cube

A MECHANICAL PASSWORD GENERATOR OR A PHOTO GALLERY...?

tinyurl.com/tla78-ultra | Goal: \$60,000 | Raised: \$1,738 from 19 backers | RRP: \$80

According to the creator of the Ultra Password Cube, the best way to try to get people's attention on a crowdfunding site is to offer numerous wildlife-photos as rewards for funding in the form of calendars, wall prints and mugs. Seems as though the project is as much a publicity stunt for some guy called Anthony Weston as it is to promote an actual product. Needless to say, we think it's a bit of a dud, but the idea they were floating is almost as ridiculous as the campaign. Passwords are hard to remember, especially since we're encouraged to create randomised ones. Well, this invention is basically a Rubik's cube, but instead of colours, each square has a selection of three symbols on it. Now, we should stress that this is only 'useful' for creating passwords, not for remembering them, and you're absolutely better off investing in a password manager to do both the creating and remembering for you. Basically, give this project a wide berth.



SOMEWEAR GLOBAL HOTSPOT

SATELLITE COVERAGE IN YOUR POCKET

www.somewearlabs.com | Goal: US\$50,000

Raised: US\$156,575 from 523 backers

RRP: US\$450, plus shipping

Getting lost on a hike sucks. Well, Somewear Global Hotspot is here to save the day with a powerful device that's designed to link your smartphone with satellite networks with, apparently, zero black spots! "As long as you have a clear view of the sky, you're covered." Not only can you keep track of your location, you can also make sure your friends and family back at home know where you are, giving them some much-needed peace of mind before bed. Of course, this isn't just a device for people trekking around the countryside. It also works as an emergency SOS. Yes, to take advantage of this service, you do need to pay an additional price for the data plan, but they're apparently very flexible. Besides, what's a bit of money for safety guaranteed, eh?



LUFT QI

A SMALL, FILTERLESS AIR PURIFIER.

luftqi.com | Goal: US\$25,000 | Raised: US\$149,567 from 1,099 backers | RRP: US\$169

If you suffer from allergies, smell mildew somewhere or have recently painted, there's a better way to clear the air than to dance around the room with a spray can. Luft Qi is a tiny air purifier that pulls in the surrounding air and flushes it through its body. A chemical reaction is created inside with the nano-reactor and UV LED lights, whereby pollutants are broken down into "harmless molecules". The treated, clean air is then pumped back out to your eager nostrils. But this isn't just a device for people who are afraid of getting a bit of hay fever. If you turn to page 34, you'll see we've reviewed an app this month that detects how polluted your environment is. Having a Luft Qi might be a must for you! It's portable, fits into your average car cup holder, attractive, quiet and not that expensive! We're thinking of asking the boss for a few. Hey, Nev...! ■

[TIMEY-WIMEY]

Get Psyched: How do we sense time?

THE SCIENCE BEHIND WHY TIME FLIES WHEN WE'RE HAVING FUN.

[TECHLIFE TEAM]

WHEN YOU'RE WAITING for a bus, you can usually estimate how long you've been standing there. Our ability to keep track of time is important in almost every aspect of day-to-day life, from playing a musical instrument to holding a conversation.

That little internal alarm that says you've been standing in the shower for too long comes from a type of temporal processing supported by two neural clocks. Researchers previously thought that our intuitive timekeeping ability came from a part of the brain called the striatum. Studies have shown that this region is activated when people pay attention to time, and patients with Parkinson's disease — which disrupts the

striatum — can have difficulty telling the time. Scientists predict that the striatum consistently pulses with activity, a little bit like the ticking of a clock. However, recent studies suggest that, in order to be conscious of the passage of time, your brain also relies on the hippocampus to remember how many pulses from the striatum have occurred. This concept is known as the interval timer theory, and it explains how we unconsciously judge time spans on the scale of seconds to hours.

You will notice that time spent with your friends seems to pass much faster than when you're writing an assignment [*Unless you're running late with your deadline!* — Sub-Ed]. Neuroscientists have found that this is

because your brain stops recording these pulses of activity when you stop paying attention to time, such as when you're engrossed in an activity. When this happens, the brain puts fewer 'ticks' of its internal clock in storage, making it feel like less time has passed.

On the other hand, in situations where you are more actively aware of the time — like when you're waiting for a delayed appointment — your mind will be counting every tick because you have little else to distract yourself with, making the passage of time feel much slower. So the next time you find that the day is dragging on, try to take your mind off the time to distract your internal clock. ■

YOUR BRAIN'S INTERNAL CLOCK

THE INTERVAL TIMER THEORY EXPLAINS HOW YOUR BRAIN KEEPS TIME LIKE A NEUROLOGICAL METRONOME.

01 START THE CLOCK

A 'start' signal is activated by the onset of an event that lasts a familiar amount of time, such as the three minutes it takes to boil some water in a kettle.

02 SYNCHRONISATION

This triggers specific cortical nerve cells (which usually fire at different speeds, shown in A) to briefly fire together at the same time (B). They then return to their original firing rates, but because they all started simultaneously their activity follows a particular pattern.

03 DOPAMINE

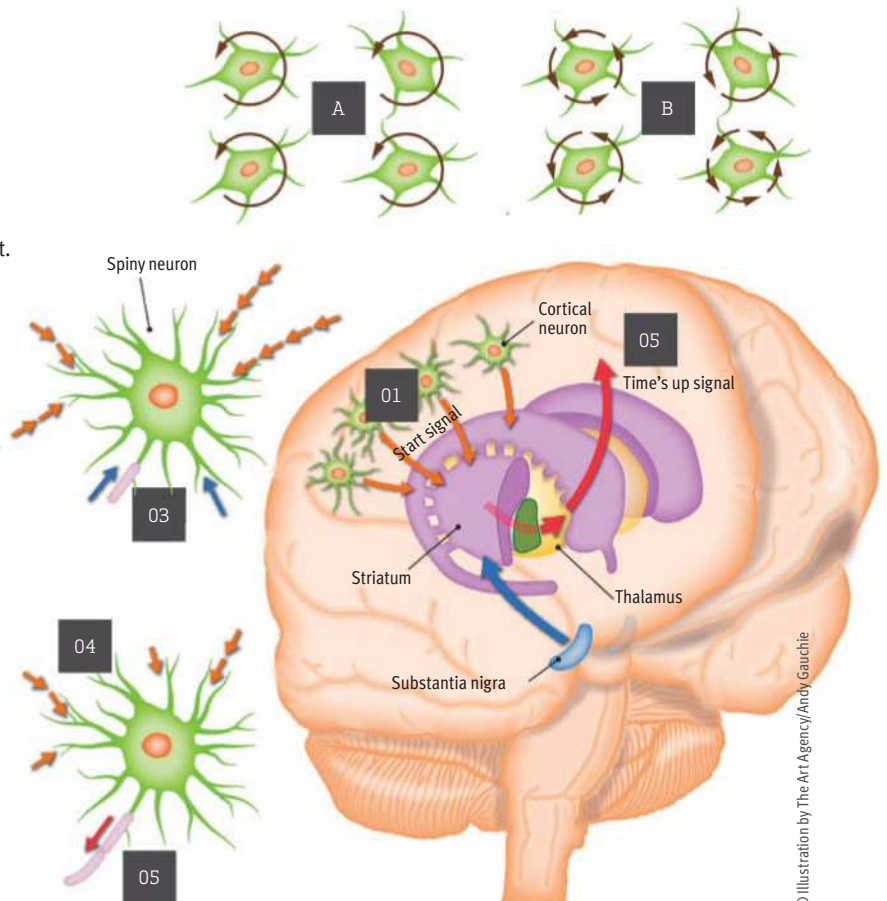
A subtype of brain cells called spiny neurons monitor the cortical neurons' activity, keeping track of how many times their firing patterns repeat. When the event finishes — in this case, once the kettle has boiled — bursts of dopamine are sent towards the striatum.

04 MEMORY

The release of dopamine causes the spiny neurons to commit the firing pattern of the cortical neurons at that particular instant to memory. This creates a kind of 'time stamp' for the given event. Research suggests that there are unique memories for a whole range of different intervals.

04 TIME'S UP

Now the spiny neurons have 'learned' these intervals they will monitor cortical firing rates until they match the memory for the time stamp that signals that particular event is over. Once this occurs the striatum sends signals to other areas of the brain involved in memory and decision making, giving you an internal 'time's up!' alert.



[FULLY INKED]

Cheap printers put on test

WHETHER YOU'RE LOOKING TO PRINT OFF A FEW NOTES, THE KIDS' ASSIGNMENTS OR FREE SOME HAPPY SNAPS FROM YOUR SMARTPHONE, THERE'S A PRINTER THAT'LL FIT YOUR NEEDS FOR SURPRISINGLY LITTLE OUTLAY.

[PAUL TAYLOR]

SCAN THE SHELVES at your local retailer or browse online and you'll see a lot of big box-shaped printers that profess to be ideal for both home offices and small businesses. If you haven't updated your printer in a while, you'll be surprised by how evolved they've become. In fact, these days, you'll have to try hard to find one that's simply just a printer.

The vast majority can scan and print directly to and from your smartphone now, and even accept printing tasks remotely over the internet so your document is ready for you by the time you get home. (This does mean you will have to leave the printer in a stand-by power mode.) Traditionally, you might (rightly) wonder why you'd need a scanner since the inevitable dimensions of the plate glass requires a far bigger footprint on your desk, but the simple fact is: if a printer doesn't have a scanner attached to it now, then it feels like you're getting half a product.

For this roundup, we collected six inkjet printers, some with multiple colour ink tanks, some with just one. All but one of them includes a scanner — that one instead has a Bluetooth speaker... All will connect to your Windows or Mac computer and Android smartphone or iOS device wirelessly.

We've picked out printers that (with a bit of shopping around) cost less than \$200. One even costs about \$50! If you're looking for a device that will knock a bit off your tax bill and can also print documents and photos, keep reading. We invited Brother to submit models for this roundup, but the company was unable to supply before our deadline.

6

BUDGET PRINTERS
ON TEST

A five-page document was printed in black and white to assess print speed, and a single colour photo for colour accuracy. Both were completed at normal quality. Scanning tests (where possible) was two A4 pages. All print documents were tested with an Android smartphone, and then checked to see if the printer was available in the linked Google service. Per-page print costs are based on the cost of XL tanks divided by the number of pages they produce.



HP Envy Photo 7120

LARGE, LUMPY AND LOVELY.

THERE'S A CLUE in the name here. The Envy produces excellent images that you'd be proud to frame, and does so with a tri-colour tank, remarkably outperforming other printers with tanks for separate colours. It's also one of the fastest black-and-white printers we have on test, making it very, well... enviable, despite its caveats.

Like the other HP printers, the setup app takes you by the hand and gets you connected wirelessly, though there is a disc (how quaint) and a USB cord included. It's one of the few with a touchscreen that offers shortcuts to print your Google calendar (you'll have to connect your account online). The touchscreen is responsive though a little on the small side, and the text can be a bit of a strain to read. Expect to do a lot of scrolling up and down, and side to side.

Setup is a cinch, and the printer auto aligns the cartridges without you needing to put the test doc back into the scanner. The SD card reader can be used to print photos directly from the card, or you can save scans to it. That's a boon, as you also have the app, laptop or cloud services making this very flexible. The scanner does a good job, though struggles with representing shiny paper.

Our biggest complaint is the size of the printer, as it takes up a lot of desk space, and is tall for an all-in-one. While the paper tray offers good dust protection, it permanently juts out.

Our black-and-white print test ran at a fast 8.3 pages per minute (ppm). Scanning test came back at 37 seconds, and the cost for black ink is \$0.10 per page (pp), while colour is \$0.17pp. Be aware, that if one colour runs out, you'll need to replace the whole tank.



HP ENVY PHOTO 7120

\$131
hp.com.au

CRITICAL SPECS

USB, Wi-Fi, Bluetooth; up to 4,800 x 1,200dpi printing; 1,200 x 1,200 dpi scan; 8.3ppm (max speed 14ppm); B&W refill cost: \$62; B&W cost per page: \$0.10; colour refill cost: \$69; colour cost per page: \$0.17; 45.4 x 16.1 x 41cm





Canon TS8160

BIG BOX OF TRICKS.

CANON'S PRINTER IS a slick setup. A USB cable outlet is a backup to Direct Wi-Fi, an SD card slot for photos or a clutch of cloud printing solutions like Canon's own 'SELPHY' app, Apple AirPrint and Google Cloud Print.

Print quality for both black and white and colour was admirable. Text looked crisp, and photos came out with no banding and good colour representation, printing at a resolution of 4,800 x 1,200dpi. You'd expect a good result like this, as the TS8160 uses six ink tanks for more tonal variation.

Our black-and-white print test completed at 4.2ppm, and our scan test took 45 seconds, though there's no option to send the JPG or PDF image to the SD card, only to email or a cloud service such as Google Drive, Dropbox and Evernote.

However, it's a smart-looking device, and our white test unit was a great contrast to many other black boxes. The touchscreen is large and comfortable to use. It also has the capability to print out a Sudoku puzzle, and characters from the *Hungry Caterpillar* book for little 'uns, all built into the printer (as long as you have an internet connection).

One dedicated print tray can stash A4 paper, with the ability to print to a disc label, and a rear tray can also accommodate other paper types, such as T-shirt transfers. The paper tray will extend and retract when powering on and off, though you'll have to manually close the touchscreen panel.

A black XL tank will cost \$0.07 per page, and the colour tanks sit at a wincing \$0.28 per page.



CANON TS8160
\$185
canon.com.au

CRITICAL SPECS

USB, Wi-Fi, Bluetooth; 4.3-inch touchscreen; up to 4,800 x 1,200dpi printing; 2,400 x 4,800dpi scan; 4.2ppm (max speed 15ppm); B&W refill cost: \$28; B&W cost per page: \$0.07; colour refill cost: \$140 (\$28/tank); colour cost per page: \$0.28 (\$0.06/tank); 37.2 x 32.4 X 13.9cm



BUDGET PRINTER BUYER'S GUIDE

WHAT TO LOOK FOR WHEN BUYING A BUDGET PRINTER.

CLOUD PRINTING

Linking a printer to either Google Cloud Print or Apple's AirPrint is an easy way to then use that printer with other devices linked to your corresponding account — including your laptop. Simply log in with that account, and you will see the printer under your account. Very handy if you use multiple devices.

SCANNER DPI

The page you're reading right now is printed at 300dpi. The higher the dpi (dots per inch) the better quality your scan and print will be, but it will also make the file size larger.

INK CARTRIDGES

Some printers use a tri-colour tank in conjunction with the black to produce colour prints, while others have separate tanks for colours. The latter is the better way to monitor costs, as you can replace the tanks that are needed.

CLOUD SCANNING

If you want to scan and save documents remotely, see if your printer offers access to Google Drive, OneDrive, Dropbox or other services. That way, you can scan and have the document wherever and whenever you need it.

CONNECTION OPTIONS

Do you want to print directly from your DSLR? An SD card reader

is a must. NFC connections are a nicety, but the really useful one is Wi-Fi connectivity. All the printers here offer that, and also offer a USB cable connection.

USB CABLE IN THE BOX

While the printers here can connect to your computer via USB, only one of them included the required cable in the box. Expect to add another \$10 or so to the cost if you don't have access to a router and need to print from your computer. All of the printers here use a USB-A to USB-B cable.

SPEED

The listed print speeds on the back of the box are usually at 'draft' quality, which is quicker than at 'normal' or 'best' quality spec, and thus faster than you might use it in real-world conditions. Our test measures the speed of the first page out, which is usually the slowest one to print, and the following four pages.

SIZE

Modern printers can be quite large with the A4 scanner bed needing a few centimetres either side to allow for bleed and uncommon paper types. Check the footprint of these printers to see if they fit on your desk.



HP DeskJet 2621

SLOW BUT STEADY.

IS THIS AUSTRALIA'S best budget printer? For less than \$50 (if you shop around), you get a printer that can handle the basics more than competently, being able to print, copy and scan. If you use this with a mobile, then you have a cheap and easy way to turn your documents into hard copies. Setup is easy too, as the scanner self-aligns the cartridges after spitting out a test document.

The 2621 will connect to your laptop via USB, and even at this price, HP has bundled in the appropriate A to B cord in the box. Wi-Fi Direct and wireless connection via a router are more flexible, though. Whether you pair the 2621 with your phone or laptop, you will need that device to send scanned documents as emails, or save them to cloud storage — there's no way to do it from the printer alone. The only concession to device-less printing is being able to press one button on the top of the unit to instantly create a colour or black-and-white copy. Colour vibrancy is almost identical to the more expensive AMP, which makes sense as they use the same cartridges (one black, one tri-colour), but the 2621 produced a more consistent image with no banding on the colour test. Black-and-white text suffers the same slight blurriness, though, giving away its budget appeal, and it's slow to print.

Our B&W test produced a sloth-like 2.3ppm, though the two-page scanner test was reasonable at 42 seconds. The cruel thing, too, is that the cost of the lower yield ink is only marginally less expensive than replacing the unit wholesale when it's empty. A small screen under the power button shows off the ink levels left in the cartridges. Replacement B&W XL tanks costs \$0.15pp and colour is \$0.18pp.



HP DESKJET 2621
\$54
hp.com.au



CRITICAL SPECS
USB, Wi-Fi; up to 4,800 x 1,200dpi printing;
2.3ppm (max speed 7.5ppm); B&W refill cost: \$44; B&W cost per page:
\$0.15; colour refill cost: \$54; colour cost per page: \$0.18;
42.5 x 54.8 x 24.9cm



Epson Premium XP-6000

SET ME UP BEFORE YOU PRINT-O.

ONCE YOU'VE PEELED away a dozen pieces of packing tape keeping the XP6000's various trays in order, the printer needs about 10 minutes initial setup followed by another 10 minutes of alignment checks — and this is before you've connected it to Wi-Fi to actually start printing. It's not a device for the impatient, but if you want professional quality documents, it's the best in class here.

Five ink tanks nestle under the scanner bed, four for colour images and a dedicated black for docs. The black text results are faultless, producing crisp documents that are ideal for anything from recipes to forms, and does so at 5.5ppm in our test. However, photo results are a bit off, as we saw blue streaks on our test image, and the contrast could be better. There is an option to tweak the photos within the menu system and this does improve results, but it's a disappointing that this doesn't happen automatically.

Where it does win out is with the scanner, which can save to cloud services and external USB and SD memory cards — something that all printers should aspire to.

A single page scan takes 20 seconds, and a double takes 40 seconds, though you will have to manually set this up. The matte-black chassis repels fingerprints, which is great, as you'll have to have your hands all over this pulling the paper input and output trays in and out.

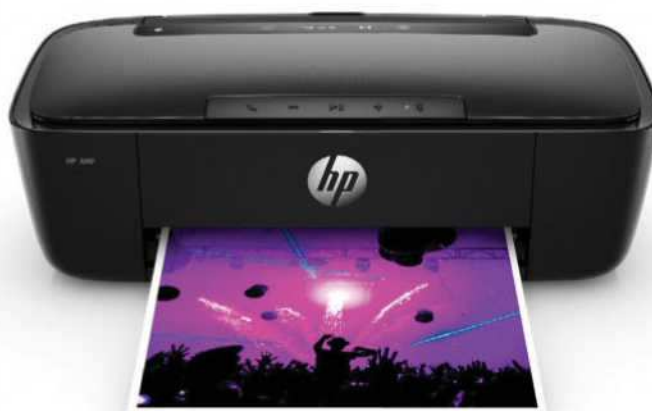
If you prefer the definite click of a physical button when going through menus, this is the printer for you. Be warned, though, the screen is tiny, and the app is best described as only 'functional'.



EPSON PREMIUM XP-6000
\$179
Epson.com.au



CRITICAL SPECS
USB, Wi-Fi; up to 5,760 x 1,400dpi printing; 1,200 x 2,400dpi scan;
5.5ppm (max speed 7.8ppm); B&W refill cost: \$35.99; B&W cost per page:
\$0.07; colour refill cost: \$139.96 (\$34.99 per tank); colour cost per page: \$0.22 (\$0.05 per tank);
34.9 x 34 x 14.2cm



Canon TS6160

RIGHT IN THE MIDDLE GROUND.

ACTING AS THE little brother to the TS8160 (back over the page), the TS6160 shares a lot of its characteristics, but comes in approximately \$50 cheaper. The overall look and feel of the printer is largely the same — they're the same dimensions with a very similar aesthetic — but it's easy to see in action how these two differ.

Setting it up takes the same brief amount of time, and the process is easy. The ink tanks are accessible, with the printhead under the scanner, and obligingly shuffles to the middle of the guide rail so you can plug in the five ink tanks. Four are dedicated to colour images, and one separate blank tank handles documents. The scanner uses a printed test sheet to help align the nozzles, and from there, you're away.

Surprisingly, the TS6160 printed our test document faster than the more expensive model, at 6ppm. Print quality here is on-par with the TS8160, though the Epson still takes the crown for best black-and-white documents. Colour prints are also OK, though look closely and you'll see where the paper has been fed through the rollers, and it's also lacking the contrast of the 8160. For the price range, though, the HP Envy has it well and truly bested.

Scan speed for a single page is just over 50 seconds, which is slow, but the image result is reliable. The Canon offers the same cloud printing services as its stablemate, though you'll have to make do with a smaller 3-inch touch screen and physical buttons, and also have to manually pull out and retract the paper output tray. A mild inconvenience, but one that's common.



HP AMP 120

A NEW TYPE OF ALL-IN-ONE.

BY FAR THE most unique printer in this round up — and probably on the shelves — as HP's AMP 120 includes a built-in Bluetooth speaker that plays music and accepts calls from your smartphone. It'll even recharge your handset thanks to the included USB port. The big trade off for this device is that it doesn't come with a scanner, but the Bluetooth speaker is surprisingly powerful and clear.

Setup is painless, the app superb for getting a cloud service up and running, though you'll need a separate plugin to get images from your photo roll or gallery printed. This process is well explained in the app. All of your print jobs will have to be sent from your laptop or mobile, as there is no SD card input.

Black-and-white text has a very minor amount of blurring, and produced pages at just over 2ppm during our print test. The tri-colour tank puts up a fair fight for photos, but images suffer from a barcode effect where you can see the lines across the image. They're also a bit flat — fine for the occasional happy snap but not something you'd want to hang on your walls. There's just the one paper inlet, and a slightly fiddly guide to move around if you want to change paper types. You'll also have to manually extend the paper outlet, and the printer does give pages a good shove once it's done with them, so that guide is there to avoid pages ending up on the floor. Automatic double sided printing is not an option.

The speaker and the USB charging point are the big drawbacks here, and if space on your desktop and at the powerpoint are limited, it's worth considering. ■



CANON TS6160
\$139
canon.com.au



CRITICAL SPECS
USB, Wi-Fi; up to 4,800 x 1,200dpi printing; 2,400 x 4,800dpi scan;
6ppm (max speed 15ppm); B&W refill cost: \$28; B&W cost per page: \$0.07;
colour refill cost: \$112 (\$28/tank); colour cost per page: \$0.22 (\$0.06/tank);
37.2 x 32.4 x 13.9cm



HP AMP 120
\$196.90
hp.com.au



CRITICAL SPECS
USB, Wi-Fi, Bluetooth (speaker only); Bluetooth speaker drivers not provided;
up to 4,800 x 1,200dpi printing; 2ppm (max speed 78ppm);
B&W cost per page: \$0.15; colour cost per page: \$0.18;
B&W refill cost: \$44; colour refill cost: \$54; 40.5 x 17.7 x 14.5cm

DISCOVER

ESSENTIAL APPS, TOOLS AND ENTERTAINMENT

[PINNING THE WEB, ONE PAGE AT A TIME]

Social media pro: Pinterest

GET INSPIRED WITH THIS IMAGE-DEPENDENT SOCIAL NETWORK.

[TIM BOTHWELL]

WHETHER IT'S PHOTOS, status updates or resumes, social networks these days seem intent on helping you stay up to date on the latest and greatest happenings with friends. However, this isn't the case for all social platforms, with Pinterest in fact taking quite a different approach. Placing an emphasis on the visual image, Pinterest takes you into a world of inspiration and creativity, allowing you to find and save photos from all over the web. Whether it's food porn, potential holiday destinations, even just an endless stream of Kmart furniture, Pinterest allows you to save all this and more in a single place. Think of it as the digital equivalent of a vision board but without the hassle of physically cutting and sticking several images together. So put on your creativity hat and follow us as we guide you through the many features of this inspirational social network.

THE BASICS

SIGNING UP: Before you begin pinning to your heart's content, you'll need to sign up to Pinterest using either an email address, Facebook or Google account. The app will ask for your full name, age and gender (which you can skip), as well as country. Once done, select

a minimum of five topics that interest you — some of the options include health and fitness, architecture and custom motorcycles. Doing this will help Pinterest fine-tune its results specifically to your needs.

PINS: One of the first things to understand is what a pin actually is. While most web browsers have some kind of bookmarking tool, Pinterest takes quite a different approach, focusing on images rather than web links. For example, you could pin a dress you found online, a recipe for a cheesecake, even a fancy lamp that you've taken a liking to. The easiest way to add a pin is through the home tab — once you find a pin you like, tap the red save button to add it to your collection. You can also add pins using your smartphone's web browser, or a third-party app. In addition to saving, tap the share button to send a pin to someone not yet signed up for Pinterest.

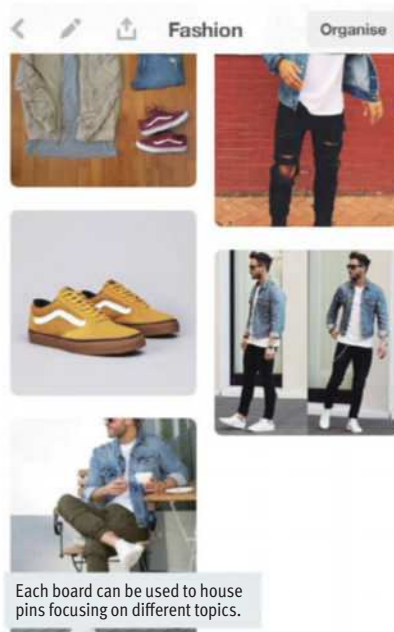
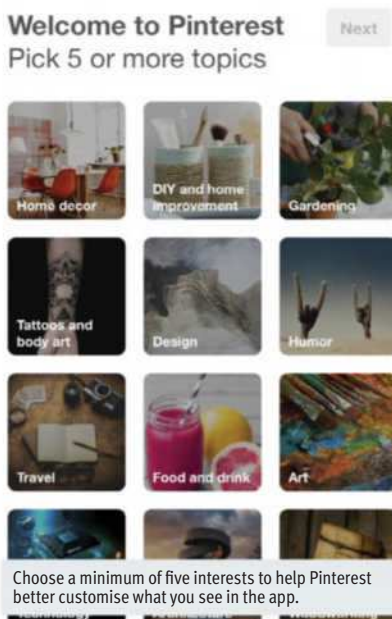
BOARDS: When you go to add a pin, the app will ask where you'd like to put it. Rather than have all your pins on one page, Pinterest allows you to create different boards to house your images. Accessed from the saved tab, you can create as many as you like. Think of each

board as a blank canvas. For example, you might want to have one for gift ideas, another for home DIY inspiration and one for ingenious storage hacks. To create a new board, tap the plus button at the top of your saved tab and give it a name. Press the pencil icon on a board to add a cover photo, description and to assign it a topic (so other people can find it more easily).

HOME FEED: Once you're feeling comfortable with the above, it's time to visit the home tab. Here, you'll find a never-ending collection of content tailored to your interests and past activity, along with pins from any people, topics or boards that you follow. Tap on a pin to see its source, along with comments made by other users. You can also post a photo response demonstrating your attempts to replicate what's shown in a pin.

STEP IT UP A LEVEL

FRIENDS: We all have our strengths, and I am proud to say visual creativity isn't one of mine. But there are some people on Pinterest who always seem to have an eye for the visual prize. If you enjoy the look of another person's pins, you can add them as a friend to stay up to date

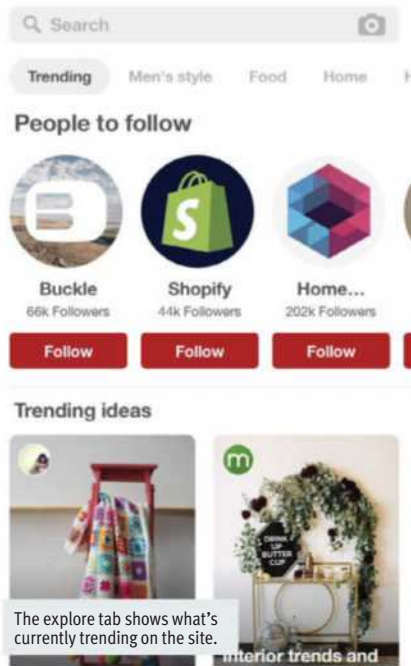




with anything they post. Simply navigate to a person's profile and tap the follow button.

SEARCH: One of the easiest ways to find inspiration is through the app's search tool. Start by typing a few words — for example, 'winter fashion', 'fish tacos' or 'last minute gift ideas'. As pins begin to populate, you can further refine your search by tapping on one of the suggested keywords displayed below the search bar. Press the funnel icon to filter results to show only pins, people or boards.

EXPLORE: In addition to your home tab, the explore page shows ideas and pins currently trending on the site, along with recommended people to follow. You can also swipe left to move through different pages devoted to each one of your pre-chosen interests.



RELATED PINS: A simple yet extremely useful feature on Pinterest is the ability to quickly see related images for a pin. Once you've found a photo that you like, simply swipe up to see similar images.

MESSAGING: A feature present on the majority of other social networks, for Pinterest it's no different, with the app allowing you to send and receive messages with other users. To do so, visit the notifications tab and tap the inbox button to see a list of recent messages, along with the option to start new conversations.

IMAGE SEARCH: Unsure how best to describe exactly what you're looking for using mere words? In addition to text, Pinterest lets you search for pins using your camera. Just tap the camera icon in the search bar tab and snap a photo, or choose one from your camera roll.

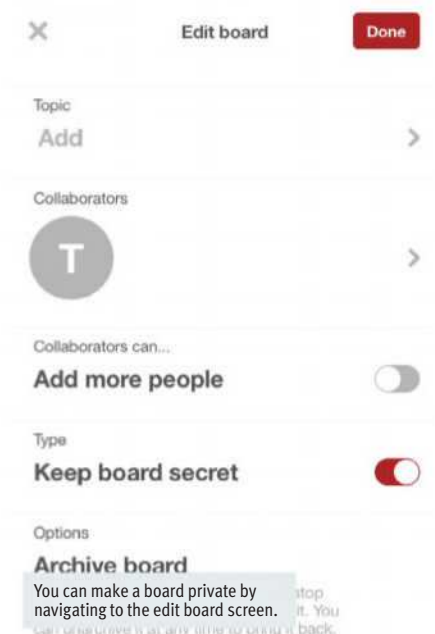


The app will then analyse the contents (and colours) of that image to come up with a list of similar pins.

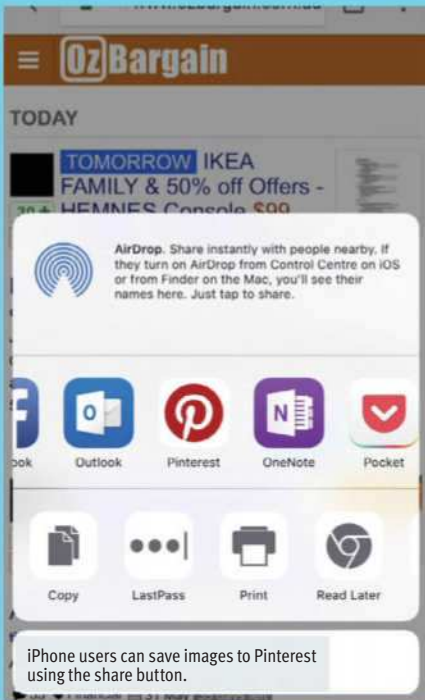
GOING PRO

SECRET BOARDS: There are some boards you mightn't want other users to see. For example, a board devoted to '90s-themed costume ideas might be great inspiration for you, but others... not so much. For these scenarios, you can make pins private by navigating to a board and tapping the pencil icon.

COLLABORATORS: If you're struggling for inspiration on a board, why not ask for help. You can allow other users to add pins to a board by pressing the pencil icon and tapping the collaborator button.



COMPANION APPS



APP EXTENSION

Free

Regardless of where you find an image, it's extremely easy to add it to Pinterest. iPhone users can pin an image from any app that supports the share function. For example, in Safari tap the share button and scroll until you see the Pinterest icon. If it's not there, you may need to enable it by scrolling left and tapping the more icon. For Android users, tap the three-dot icon located next to the address bar in Chrome and press share.



DESKTOP

Free

about.pinterest.com/browser-button

You can easily pin items from the web by installing the Pinterest browser extension on your Mac or PC. Using your browser of choice, visit about.pinterest.com/browser-button and install the relevant button. Once done, you can hover over an image on a web page to see a red icon appear ready for you to pin.

1 collaborator

Tim Bothwell
You created this board

Allow other users to contribute pins to one of your boards by adding them as a collaborator.

In addition to photos from the web, you can also upload images from your camera roll.

Add a board or Pin

Board
Create board

Pin
Photo
Website

PHOTO UPLOADS: While Pinterest promotes itself as a social network for saving things from the web, you can also upload your own photos. Tap the plus button on your profile to see the option to pin a photo from your camera roll.

ARCHIVE: No longer inspired by your board made up entirely of unicorn cake pins? You can archive a board to remove it from your profile. You'll also no longer receive recommendations for pins to add to it. Alternatively, deleting a board will remove it and its pins permanently. You'll find these options on the edit board screen.

LENS YOUR LOOK: An expansion on the previously mentioned visual search, Pinterest makes it easy to search for outfit ideas based on items already in your wardrobe. For example, if you're searching for a winter outfit that'll go perfectly with that denim jacket, simply type in "winter fashion" and then tap the camera icon to take a photo of said jacket.

ORGANISATION: While inspiration is rarely a bad thing, add too many pins and a board can quickly become quite overwhelming. Fear not, because Pinterest allows you to create different sections within a board. For example, for cooking, you could create sections devoted to breakfast, lunch and dinner ideas. To do this, visit a board, tap the organise button and select which images you'd like to assign a section. You can also arrange images by tapping and holding on a pin within your board. ■

Sending boards to the archive removes them from your profile.

Archive this board?

If you archive **Fashion**, we'll hide it from your profile and you won't be able to save new Pins to it. If you change your mind, you can unarchive it from your account settings.

Archive

Cancel

Find outfit inspiration by snapping a photo of a clothing item alongside your search term.



Add section

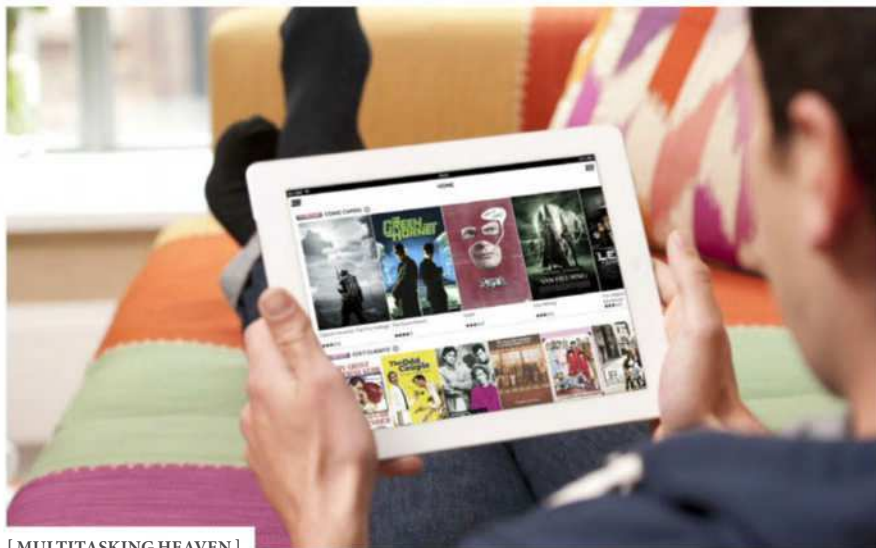


Section name
Shoes

Or pick one of these:

Mens jeans Slim fit jeans Stuff to buy Pl

You can organise each by board by creating different sections where pins can reside.



[MULTITASKING HEAVEN]

Companion podcasts for your night of bingeing

THE PRODUCTIONS THAT PICK APART THE DETAILS, SPRINKLE IN THE TRIVIA AND MAKE ALL THE PREDICTIONS.

[CARMEL SEALEY]

SOMETIMES, JUST WATCHING the TV shows you love isn't enough to sate your appetite for content. Sometimes, you want to know the juicy details of how the producers, directors, actors and writers wrestled against time and obstacles to bring the show together. Sometimes, you want to hear all the fan theories and all the predictions, all the clues and all the red herrings. Good news for you, for this where we enter the realm of the companion podcast — as wide a range of podcasts as the TV shows and movies about which their hosts eagerly talk. Needless to say, you need to be careful tuning in to any of the following productions. Check the names and descriptions of each episode before hitting play, for here be spoilers (and potentially dragons). We will have to revisit this subject a number of times to give you as broad a snapshot as possible of what's on offer, but in the meantime, lap up the following...



THE X-FILES FILES

www.feralaudio.com/show/x-files-files

In his spare time, standup comedian Kumail Nanjani (from *Silicon Valley* — yeah, that guy!) puts together his *X-Files* podcast and invites a guest to join him. While most episodes focus on the TV show itself (plot, characters and so on), some episodes are dedicated to *X-Files*-related news and special interviews featuring members of the show's production cast! The truth is out there, Filers! (That's what fans of the show call themselves, right? Please, don't write in.)

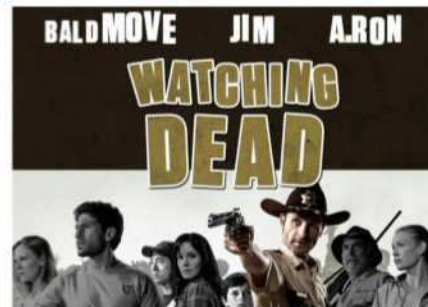
[WWW.TECHLIFE.NET]



GOT THRONES?

soundcloud.com/gotthronespodcast

There are almost as many podcasts about this show as there are beloved, dead main characters... While during the offseason of *GoT*, the hosts are busy delving into *Star Trek Discovery*, there are dozens of episodes for everyone's favourite fantasy epic. Alexandra August and Johnny Kolasinski, along with their guests, thoroughly enjoy analysing each aired episode of HBO's adaptation of GRRM's ongoing series of novels, and eagerly let you in on all their theories.



WATCHING DEAD

baldmove.com/category/watching-dead-podcast

If you've invested eight series' worth of your time (soon to be nine) watching this post-apocalyptic zombie epic, then you've probably got enough time to listen to this companion 'cast. The hosts Jim and A. Ron delight in picking apart the best episodes, but equally don't shy away from laying down the criticism where it's due.



LEGENDS OF GOTHAM

www.legendsofgotham.com

This production got going in April 2014, and it's clear that hosts Bill Meeks and Anne Marie DeSimone are not just fans of *Gotham* but of the Batman universe in general. (How could you not be?!) Each episode is discussed, key scenes dissected and necessary parallels between canons are drawn. Having watched the show, we rather enjoyed listening in to their predictions, too. Nice theory about Jerome's face, guys... Nice.



SUNNYDALE STUDY GROUP

www.facebook.com/SunnydaleStudyGroup

'But *Buffy* isn't even on anymore!' we hear you cry. Well, for true *Buffy* fans, it's always on TV, right? Starting back in 2015, Chris Bramante and Omar Najam have gone through every single episode from Season 1 and are currently in the midst of Season 4, so they'll be at it for a while. With bonus episodes dedicated to listener contributions, it's a nice way to get involved in your favourite TV show, even though it's not being made anymore. *Tear* ■

[MAKE TRAINING PERSONAL]

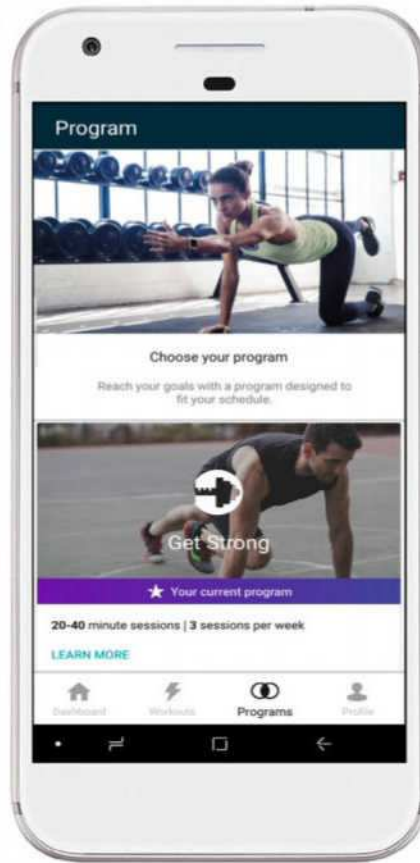
App showdown: The best personal training app

THESE EXERCISE APPS WILL GIVE YOU THE ROUTINES AND GUIDANCE TO MANAGE YOUR OWN FITNESS REGIME.

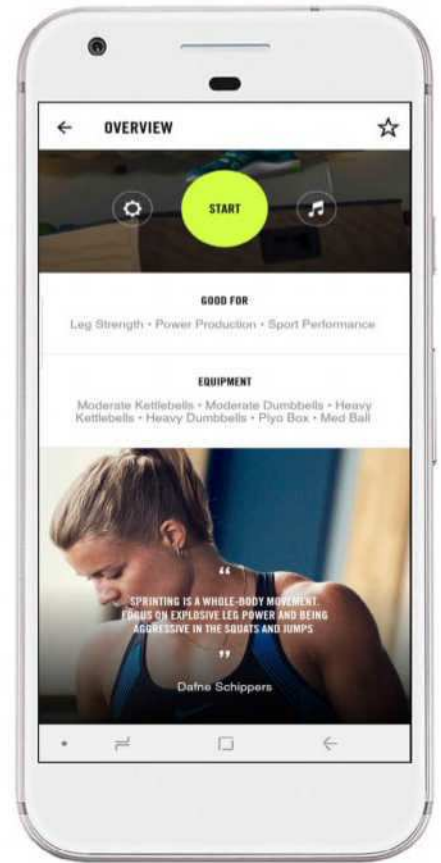
[JOEL BURGESS]

ANYONE WHO'S ATTEMPTED to be a little bit healthier has at least looked into a gym membership or personal training program to pick up their fitness, but when these services start at around the \$60 and \$240 mark, respectively per-month, the barrier to entry won't just be the physical hardship involved in shedding the dad-bod or extra curves. Yet most of us don't have the skills (or the motivation) to design our own workouts and stick to them long enough to see any health benefits. If you are one of the few that feels as though you don't need the pop-music-charged social atmosphere of group training to keep motivated, then personal training fitness apps are an avenue worth looking into. For a fraction of the price, fitness coach apps will give you curated workouts that you can do in your backyard, local park or indoor gym by simply watching your phone screen and listening to instructions through your headset.

+
FITNESS COACH APPS WILL GIVE YOU CURATED WORKOUTS THAT YOU CAN DO IN YOUR BACKYARD, LOCAL PARK OR INDOOR GYM BY SIMPLY WATCHING YOUR PHONE SCREEN



There are a couple of camps in the fitness tech space: those who are happy to carry their phones while exercising and those who would prefer not to. If you sit in the latter, then one of the few ways you'll be able to access the routines of a fitness coaching app will be if you have a Fitbit Ionic or Versa smartwatch. These devices pair with Fitbit Coach to give you up to seven bodyweight workout regimes (sometimes called 'functional training' workouts) that put the visual instructions for exercises on your wrist and use the device's inbuilt haptic sensor to let you know when to start or stop an exercise. In addition to this wrist-based convenience, the main drawcard of Fitbit Coach is the synchronised biometric information that'll be recorded as you work out. Having your heartrate alongside each exercise will allow you to track your progression and see if you are getting fitter or not over time. While you might be fine to go without the tracking if you're being overseen by a professional trainer, if you are attempting to manage your own regime, you'll need some indication of how you're going.



If you just want training tips and you're happy to get a set of dumbbells and a yoga mat, then the Nike Training app is your best bet. There are hundreds of body-weight and minimal-equipment workouts available, tailored to all levels of trainee. Not only is the quality of these routines arguably better than what you can get from any other app we've looked at, all routines are available without a subscription cost and can be downloaded using the free app. With full video instructions including warm ups, exercises and rest timings that can be chromecast to your TV, the Nike Training app has everything you could want from a home training setup. If you want to take it outdoors, the app features an integrated local music playback interface that'll sync to your workout, but you can also simply play music over your headphones using other streaming or playback applications. For anyone wanting to keep up a schedule, the app offers tailored routines that can be slotted into a broader schedule that accounts for recovery time and will get you to form better habits.

POWER USER TIPS

STEPPING IT UP A NOTCH

Some useful pointers on how to get the most out of your home bodyweight training.

CHROMECAST

The living room is one of the easiest places to set up a temporary workout space, and some apps will let you tap into your TV and home entertainment system to make it easier to follow the workouts you need to do.

EQUIPMENT

While there are a heap of exercises you can do using nothing but your body, adding a set of dumbbells, a yoga ball, medicine ball, resistance band or bench to your workout can dramatically increase the amount of muscle building exercises you can do.

MUSIC

Listening to music during workout is known to help you push yourself further, especially when you are responsible for your own pacing, so tap into a streaming service or one of the training app's onboard local music feedback app.

SCHEDULES

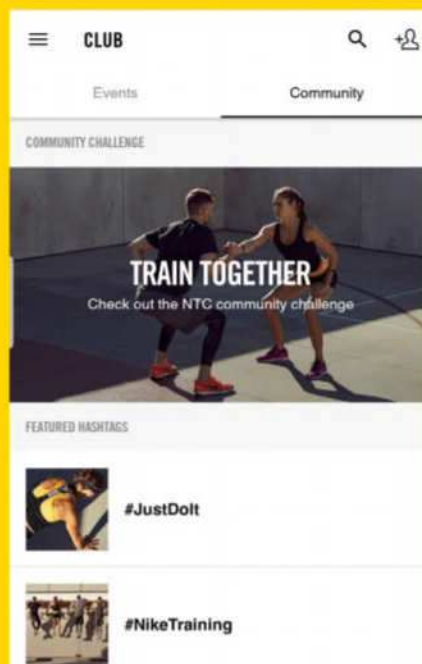
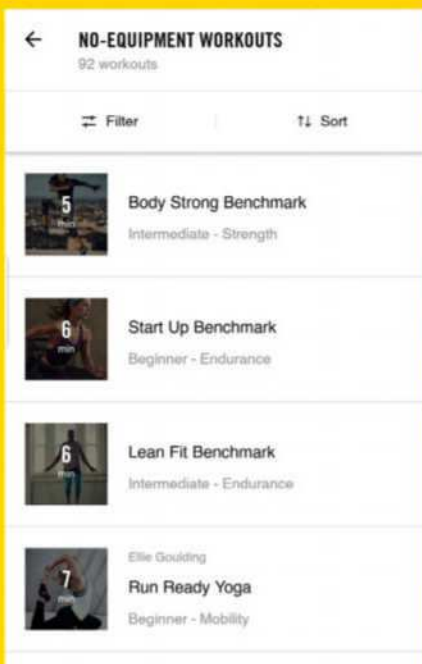
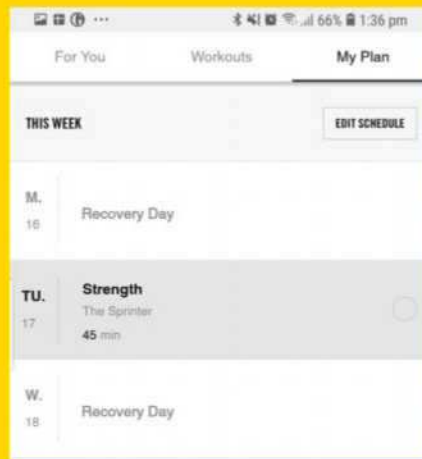
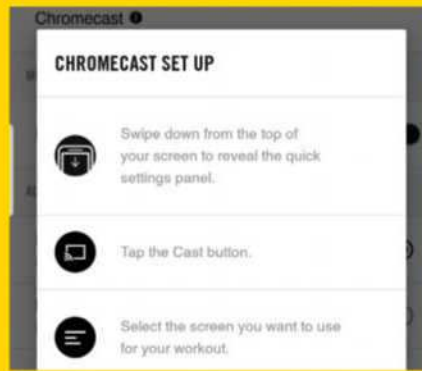
It's one thing to have particular routines that you do, but some of the better apps will allow you to create a personalised schedule with differing routines to allow parts of your body to recover while you work on other areas to maximise the amount of training you can do in a week.

COMMUNITY

Join friends or groups that are doing a similar training schedule to add some competition back into your 'personal' training sessions.

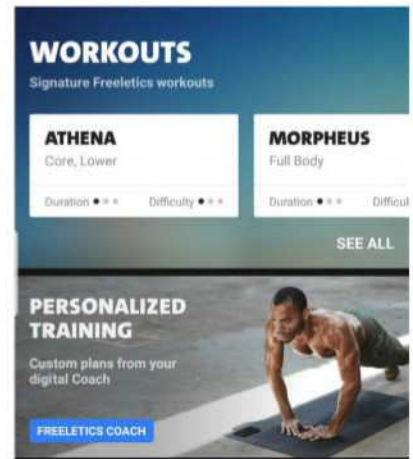
GOALS

Use complementary applications like My Fitness Pal or the Fitbit app to track your weight and body fat percentage to let you track how your fitness sessions are impacting your body.



ALSO CONSIDER...

CLOSE RUNNERS UP AND OTHER USEFUL APPS FOR HELPING YOU MEET YOUR FITNESS GOALS.



FREELETICS

A FREE-WEIGHT PERSONAL TRAINING APP THAT'S NOT FREE.
\$4.22 per week | freeletics.com

If you want some investment to keep you motivated, Freeletics is a fully tailored coaching plan that costs \$55 per quarter for a unique training regime or \$82.49 for a three-month training and diet plan. In addition to the ongoing coaching, Freeletics also offers a community space where you can post your progress to a forum that keeps you motivated by inspiring you using the progress of others.



JEFIT

A MORE INTENSE SESSION.
Free; Elite, US\$6.99 p/m
www.jefit.com

If you want to bulk-up and put on muscle rather than just slim down and be healthier, then something like Jefit will be more your speed. Adding full gym workout alternatives to the extensive range of bodyweight exercises means you can use the extensive 1,300-plus exercises to take your training to the next level. In addition to providing exercises, Jefit also lets you set weight and body fat goals and helps you track your progress with strength and endurance test benchmarks.



STREAKS

GET YOURSELF ONTO A FITNESS STREAK.
\$5.99 | streaksworkout.com

If you're a part of the Apple ecosystem and you like the idea of doing little bits of exercise every day rather than a few intense sessions per week, then you'll want to take a look at Streaks. Letting you choose a custom workout of between 6 and 30 minutes from a range of available exercises, Streaks encourages you to do these bite-sized sessions every day to get you into healthier everyday training habits. ■

[YOUR TECH CRYSTAL BALL]

Bleeding edge: the best of emerging tech

TECHLIFE'S PRACTICAL MONTHLY ROUNDUP OF EMERGING TECH EXPERIENCES, INCLUDING ALL THE LATEST VIRTUAL AND AUGMENTED REALITY APPS, ALONGSIDE AI-DRIVEN BOTS AND OTHER USEFUL TOOLS.

[JOEL BURGESS]

WITH GOOGLE REVEALING a mass market AI chat bot that can breeze past the Turing Test at its I/O developer conference in May, this month's Emerging Tech has some serious breakthroughs in the AI space. Apart from raising widespread concern around whether the Google Duplex AI should disclose its identity on the phone, Google also married AR and AI in a big way by using Google Lens and Maps to offer visual navigation and line-of-sight location information. While Google undoubtedly stole the show, the People's Republic of China also managed a few mentions for the first staffless bank branch and an AI-optimised cockroach breeding factory (which scares us far more than any chatbot ever could). Honorable mentions go to the lightsaber beatboxing game *Beat Sabre* which is cutting up Steam's most recommended list and a coal power plant that is set to be reopened as a blockchain innovation hub for a particularly futuristic installment of Emerging Tech.

VIRTUAL-REALITY APPS, GAMES & VIDEOS



[CARDBOARD, DAYDREAM]
Open Heritage VR museum
PHOTOREALISTIC VR MODELS OF WORLD HERITAGE SITES.
Free | artsandculture.google.com

After hearing that conflict in the Middle East had led to the destruction of the Buddhas of Bamiyan rock face carvings in Afghanistan, CyArk founder Ben Kacyra began using lidar scanners to build 3D models of precious historical artifacts. CyArk's attempt to preserve historic sites from various environmental and geopolitical threats began in 2001, but Google recently added its full body of work to the Arts and Culture portal that can be accessed through Google's Daydream smartphone VR portal.



[GEAR VR, OCULUS GO]
Oculus Venues
TURN YOUR LIVING ROOM INTO A LIVE MUSIC AND SPORTS VENUE.
Free | www.oculus.com/go

One of the joys of VR is that it immerses you in an environment, and there's nothing quite like the atmosphere of a sporting event to make you enjoy a game even more. Oculus Venue is one of the first apps we've seen to be released exclusively on the Oculus Go platform and it uses this new headset to make you feel as though you're in the crowd at your favourite live sporting event or music gig.



[RIFT]
Go Guess
A GUESSING GAME FOR GLOBETROTTERS.
Free | www.oblixvr.com/go-guess

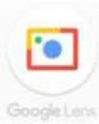
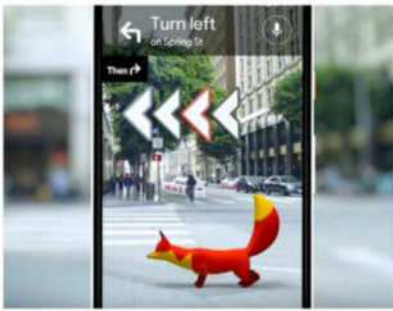
If you were dumped at a random point on the planet, how long would it take you to work out where you were? Whether you're a geography whiz or you worry it could take you all day to get your bearings, you'll have the opportunity to test your response thanks to a new VR game called Go Guess. Drawing on the environments of Google's 360° Street View, this Oculus Rift-based game gets you to pinpoint on a world map where you think you are, using nothing more than the visual cues around you.



[RIFT, VIVE, WINDOWSMR]
Beat Sabre
CUT A MAD BEAT.
Free | hyperbolicmagnetism.com

While the rhythm game *Beat Sabre* might not be the first to marry the musically-timed genre with the VR platform, it certainly seems to be the most highly regarded. Receiving a 99% positive score after just a few days on Steam, this Early Access title briefly managed to pip *Portal 2* as the most well regarded title on Steam. Considering you get to swing Oculus Touch-controlled lightsabers to the beats of 10 popular songs on one of four difficulty levels, we're not overly surprised that it ended up a cut above the rest.

AUGMENTED REALITY



[ANDROID, iOS]
Google Maps AR navigation
SEE THE WORLD THROUGH A NEW LENS.

One of the highlights of Google's I/O developer conference in May was an update of Google Lens that allows it to be used with Maps to provide AR navigation. While the orientationally challenged will be excited by the prospect of simply following a furry fox guide or giant floating arrows for directions via your smartphone camera, the update also brings the possibility for Google Maps venue information on whatever your smartphone camera happens to be pointing at using the new 'VPS' (visual positioning system).



[iOS]
Forensic Detective
BE A SHERLOCK IN YOUR HOME.
\$TBC | tinyurl.com/tla78-inside

There's no shortage of detective-based entertainment available in the living room, but all of it is very different to actually being the detective responsible for solving a murder set in your living room. *Forensic Detective: Inside the Crime Scene* is a new AR game on iOS that uses your smartphone camera and phone screen to project visual clues onto the world. Your task is to identify the murderer from a list of suspects by examining visual evidence and matching it to the story given by witnesses.

ARTIFICIAL INTELLIGENCE



ALEXA COD SKILL
GET YOUR KILL/DEATH RATIO BACK ON TRACK, NOOB.
Free | www.callofduty.com/wwii/alexa

Despite only being available locally since February, Amazon's Alexa already has a number of skills, but the newly added ability to be a *Call of Duty* coach is one of the more unique hats worn by this digital assistant. In addition to providing match debriefs, Alexa can also draw on its machine learning algorithms to diagnose some of your weak points and offer advice on loadouts, strategy, maps, modes and your optimum soldier division to improve your performance.



GOOGLE DUPLEX
YOU HAD ME AT HELLO.
Free | assistant.google.com

We need a new Turing test, as Google Assistant on your smartphone will soon be able to book appointments, check business opening hours and make dinner reservations by talking on the phone to real humans, without them being any the wiser. Two recorded calls between the company's new vocal chatbot, Google Duplex, and employees of a hair salon and a restaurant were played at the company's I/O developer conference in May. The selected clips show just how well the machine-learning powered chatbot was able to navigate genuine conversational complications to book reservations. The backlash for this one was expected from the get-go...

EMERGING TECH NEWS



THE FIRST AI-RUN BANK BRANCH
HUMAN, GIVE ME YOUR MONEY.

A state-owned bank in China has opened a new branch that is entirely autonomous, relying on robot tellers and virtual reality software for all exchanges. The China Construction Bank's experimental Shanghai branch has attracted considerable attention for its face scanning software and novel VR room, but there is opposition from analysts claiming that the high-tech branch offers no more customer features than a traditional ATM.



AI USED TO BREED AN ARMY OF ROACHES
FOR HUMAN CONSUMPTION.

One Chinese pharmaceutical company is enlisting the help of AI to efficiently breed them for a medicinal tonic. You might think it's easy to breed the only species believed to be capable of surviving nuclear armageddon, but the facility relies on a 'smart manufacturing' system to rapidly grow the 6 billion-strong colony in order to satiate the 40 million-person customer-base for the crushed cockroach cleanse.



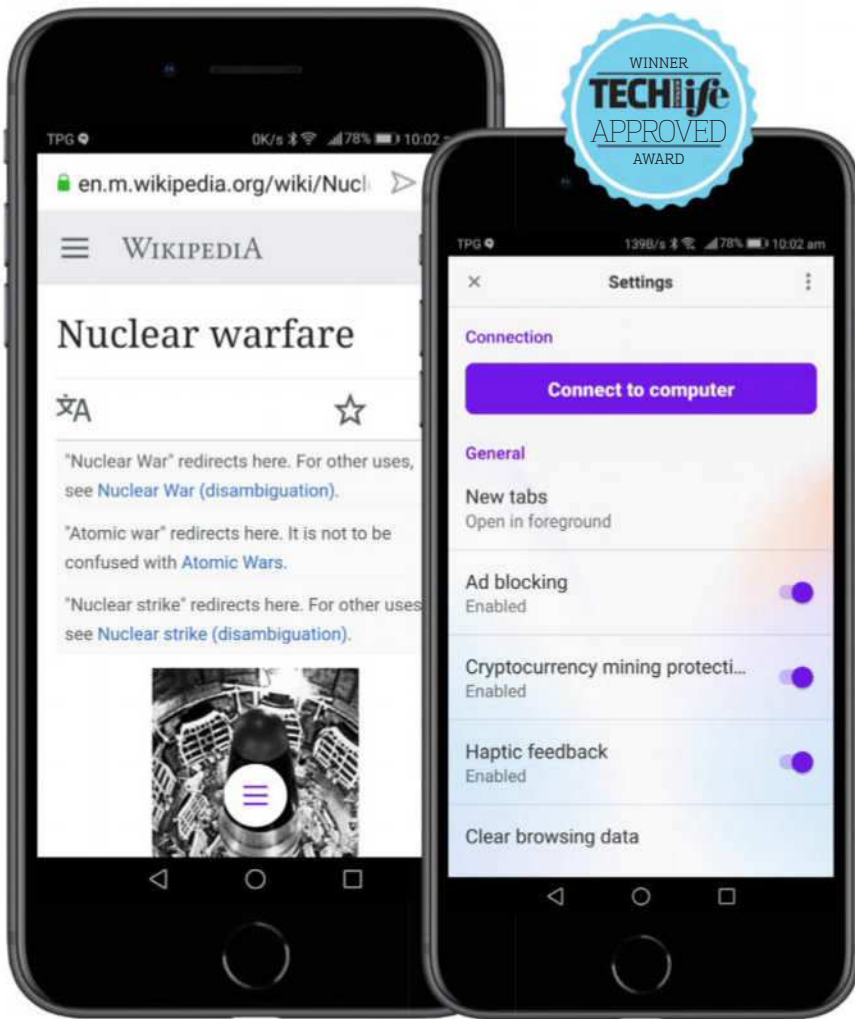
COAL POWER PLANT REOPENED FOR CRYPTO MINING
THE FUTURE TURNS TO THE PAST FOR POWER.

The taxing computational algorithms that keep cryptos secure and valuable require exorbitant amounts of power. One Aussie startup is about to reopen a coal plant to provide power to a new Blockchain Application Centre that can satisfy the heavy energy needs of companies that mine or use blockchain. Sadly, the growth of cryptos has outpaced renewable energy, so the forward thinking businesses have to rely on dated methods of competitively priced energy creation.



LG TVs ADOPT GOOGLE ASSISTANT
MAKING YOUR SMART TV EVEN SMARTER.

LG has taken its Google integration a step further by bringing out a stand-alone smart speaker and embedding the Google Assistant directly into the new range of TVs. Both the new OLEDs and Super UHD TVs will come with smart remotes that have built-in ThinQ AI to allow users to change the channel, modify settings or search using only their voice. The ambitious integration plans to go further by allowing users to interact directly with the show they're watching by asking the TV to turn off once a program has finished. ■



[LATEST APPS]

Best new apps

THE **TECHLIFE** TEAM REVIEWS THE MOST INTERESTING NEW APPS FOR iOS AND ANDROID.



Opera Touch
AN ANDROID WEB BROWSER WHICH PRIZES SIMPLICITY IN DESIGN.
Free | opera.com/mobile/touch

CAN GOOGLE CHROME be dethroned as the most popular web browser in the world? Given its dominance (it hosts nearly 58% of all web traffic counted in April 2018 by StatCounter), one would assume not. It doesn't hurt to have alternatives, though, and veteran web browser company Opera Software has just issued a pretty decent one for Android and desktop called Opera Touch. Given the Opera browser pioneered features we now take for granted, such as pop-up blocking, private browsing and tabbed browsing, it's a typically pleasant user experience. The novelty here is that using a one-time QR code set-up between a phone and a computer, you can easily push webpages between devices with a

single button press. Not only that, but you can add images, videos and text to your 'Flow', which is a kind of personal cloud service available between desktop and phone versions of Touch — it's a genuinely useful function. Aside from that, there's a fixed menu button at the bottom centre of the screen which brings up functionality supporting text, image and voice search.

It's hard to imagine Opera re-taking the browser market in any mainstream sense, but that doesn't mean you shouldn't start using it.

[SHAUN PRESCOTT]



GOART
TURN YOUR AMATEUR PHOTOS INTO HIGH ART.
Free | goart.fotor.com

If you think your selfies would benefit from being works of Expressionist art to rival Munch, then GoArt might appeal. It's basically a series of filters that apply various art styles including the aforementioned Expressionism, Dadaism, Surrealism, Pointillism and many more. It's easy to apply these filters: you can either select a photo or image already stored on your device, or else you can take a new photo from within the app. There's a generous amount of free filters that come with the app, though all require payment if you wish to remove the "GoArt" watermark. The app uses an over-complicated coin payment system: 60 coins cost \$2.79, 150 coins cost \$4.19 and 400 coins cost \$13.99. Of course, most transactions aren't priced similarly (removing a watermark costs 50 coins, some filters cost 30), so you'll always have not quite enough coins, or a useless surplus. A more straightforward approach would make GoArt easier to recommend. [SHAUN PRESCOTT]

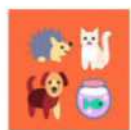
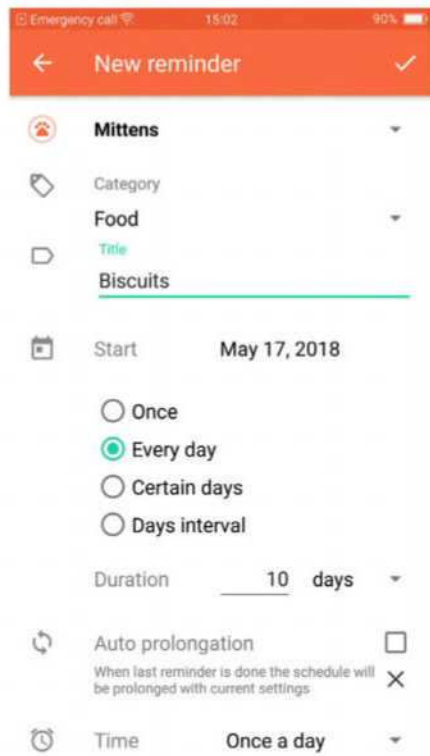


SUMMARIZE
GETTING TO THE POINT
Free | tinyurl.com/tla78-summ

Apps that can summarise the news have been around for a long time, though their elegance and beauty is sometimes overshadowed by the amount of stuff they throw at you. Flipboard looks great, but if you really want to laser in on an article, there may be a better way. Summarize makes a decent go of this and is singular in its approach. It's still in early access, but the results are promising. The interface is clean, as it strips out images and provides text alone, distilling the essence of the piece you're reading into a few paragraphs. Summarize copies some of the source wholesale, other paragraphs are stitched together with neighbouring copy, while some are small fragments of the original. Summarize's interface is clean, and for the most part, it gets the guts of the story. However, you lose almost all of the colour and background, and the app only works after you've shared a link to it from your web browser.

[PAUL TAYLOR]





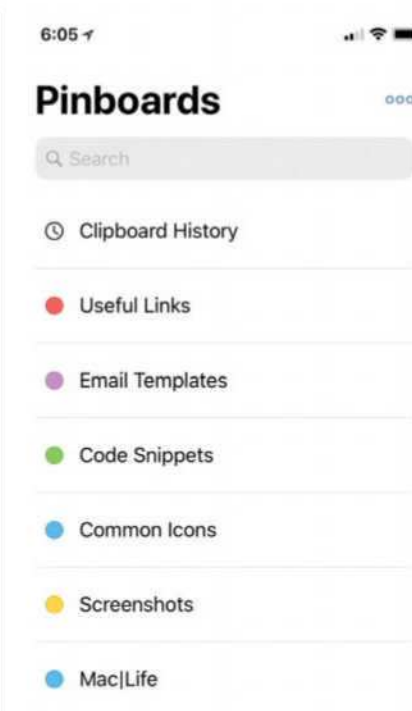
Pet's Diary
ARE YOU FELINE THE LOVE?
Free | play.google.com

Got pets? Great stuff. So far you've probably managed to not kill them by sheer virtue of feeding them. It's a good start. But do you know when you last had them vaccinated, or when they had their litter of pups, or even their menstrual cycle? Although your smartphone probably already has a calendar built into it to record such events, Pet's Diary is a more bespoke and less cluttered way to note 'feed Mittens dry food' than jamming that reminder next to 'buy milk' on your Google Calendar. From the menu, it's easy to set an upcoming and repeating reminder, items to buy in different categories like food, toys or life events and so on. You can then search for these in the history tab in case you get the stink eye from the vet asking you when you last gave Mittens her worming tablets. It's simple stuff, but it's easy to read, and while it's a shame that you can't share your schedule with someone else (for the lucky ones who have both pet *and* partner), it's pretty handy nonetheless. An ad-free version costs \$4.02.

[PAUL TAYLOR]

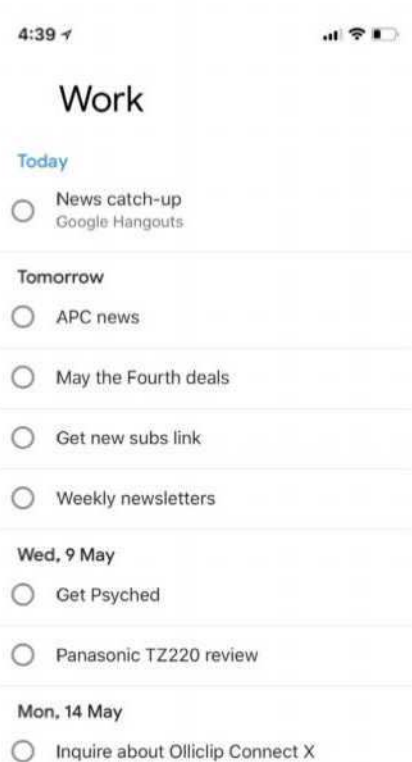


[WWW.TECHLIFE.NET]



Paste 2
SIMPLE CLIPPINGS MANAGEMENT.
pasteapp.me | Free with IAP

Apple's Clipboard seamlessly copies and pastes between Mac and iOS, but the current implementation falls short. Instead of simple one-time data transfer, a true clipboard manager would enable saving and organising frequently used clippings. This free mobile app uses iCloud to sync text, images, links, files or other content saved with Paste for Mac 2.3 or later, organising clippings into folders called Pinboards. You can rearrange, delete, rename or share snippets, but there's no way to directly add new content into the Paste iOS app — this must be done from other apps like Safari or Mail via the sharing extension. The process is as straightforward as it sounds, and a share sheet prompts you to give the clipping a unique name and file it in an existing Pinboard. Like the desktop version, Paste 2 for iOS features a similarly sparse, clean user interface. Clipboard History consolidates everything into a single searchable Pinboard, and the developer includes a second Pinboard for Useful Links with website and support contact information and it's a snap to add new Pinboards. Of note: iPad users must pay \$7.99 to unlock all features. [JR BOOKWALTER]



Google Tasks
A BAREBONES ATTEMPT AT YET ANOTHER TO-DO LIST.
Free | google.com

Alongside a redesigned Gmail, Google's launched a standalone to-do app called Tasks. It's available on iOS, Android and on desktop and, more importantly, is accessible via the new-look Gmail and on Google Calendar. While there are plenty of to-do apps out there, Google has stripped Tasks down to the bare bones, giving it a clean, crisp user interface that lists all your tasks in one place. And that's it. There really isn't much more to the app. You can set up sub-tasks for each item — like adding a shopping list to 'buy groceries' — and can create multiple task lists and switch users if you have multiple Google accounts, but you can't set up alerts or share the lists with others. While you can add a date for a task, you can't specify a time. Perhaps Google decided less is more, but this time less is definitely less, especially when there are more sophisticated to-do apps available for free. That said, there may be scope for improvement, if Google is willing to add more features to Tasks.

[SHARMISHTA SARKAR]





There's nothing more irritating to your humble reviewer (today, at least) than having a plume of cigarette smoke waft in her face at 8am in the morning while walking to work. For someone who has never smoked, this app is a disturbing reminder of the effects of passive smoking and general bad air quality. Its premise is as simple as it comes — boot up the app and give it permission to know your location and it will then load the local air quality data and translate that into number of cigarettes smoked in a day. Why do it this way? It's more potent than giving a general 'high', 'moderate' or 'low' reading on air pollution, isn't it? While some places won't have as precise a reading as others, due to the distance from the nearest air quality metering station, the locations we tested were all within 10km, so fairly accurate. (Some user reviews made online, however, suggest that accuracy could be an issue with some locations being as far away as 200km from the nearest meter.) Apparently, our office at *TechLife* Towers is situated in a two-cigarette-per-day average area, which is a bit worrisome, especially for one particularly pregnant colleague. We'd have liked the app to have included some sort of map and graph to visualise the data, though, and to perhaps link that to weather conditions (wind, especially) to give predictions of pollution levels across the day and week. The app was inspired by Berkeley Earth's research (berkeleyearth.org/air-pollution-and-cigarette-equivalence) and uses their rough equivalent of 1 cigarette = 22µg/m³ PM_{2.5} (22 micrograms per cubic metre of particles of pollution, both solid and liquid). Scary. Let's all move to the country, yeah?

[CARMEL SEALEY]

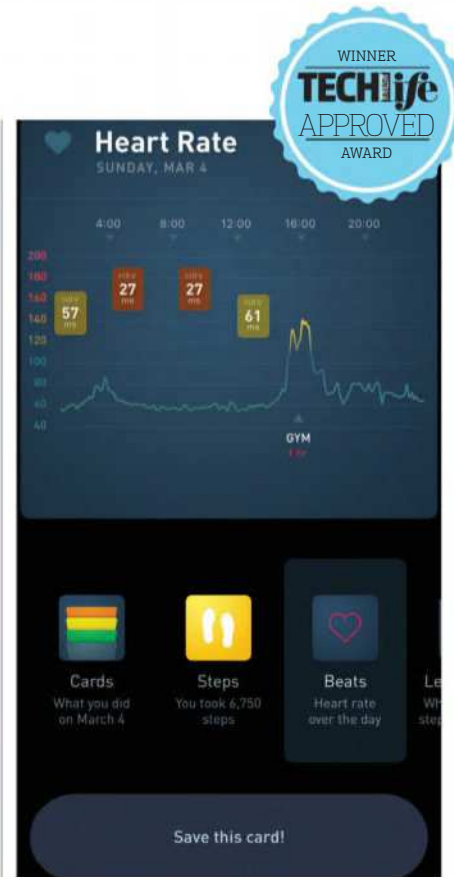
3½



Most of the plentiful self-care apps out there focus on meditation and calming techniques, rather than the little everyday things like drinking water and taking your medication on time. And although you could set reminders on your phone for that, the alerts can be more a distraction than a solution. That's where Aloe Bud comes in. Created by former Hillary Clinton staffer Amber Discko, this app makes push notifications more pleasing. The notifications are gentle reminders, with beautiful messages, to look after yourself and your basic needs by encouraging you to eat healthy, move around, drink water, breathe, take a break and much more. You can build your daily routine around your lifestyle, so you aren't forced into making any drastic changes. The app's retro pixel icons and soft colours make it very pleasing to use, and all you need do, after you've created your routine, is 'check in'. There's no sign-up process, neither is there a social angle. It's simple yet very effective. If you'd like to customise the reminder texts, however, you'll need to go for the \$7.99 expansion pack.

[SHARMISHTA SARKAR]

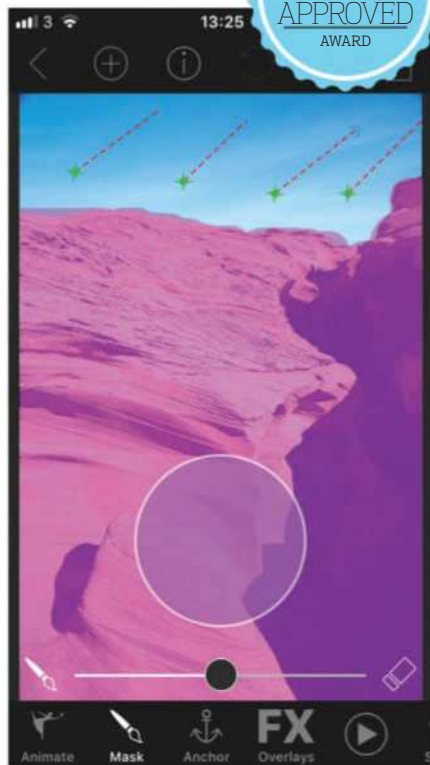
4



The rise of smartphones has led to an exponential increase in the number of apps to track your lifestyle and daily habits. On iOS, much of the data from these apps now finds its way into Apple's HealthKit, which provides a convenient, if uninspiring, summary of overall wellbeing in the stock Health app. Third-party app Gyroscope tries to go one better, however, by integrating all these data points and more into a unified personal profile that offers users a detail-rich story about themselves via visually impressive daily or weekly report cards. Gyroscope's can pull from a huge number of sources, from Strava and Apple Health, to productivity tracking service RescueTime and even movement-mapping via Foursquare and Moves. The more of these sources you allow Gyroscope to grab, the more complete and accurate a picture you'll get. The plethora of customisable report cards (some of which require a Pro subscription) is impressive, and all can be shared with fellow Gyroscope users and via any social media integrations. All this is very handy... provided you don't harbour privacy concerns, of course.

[TIM HARDWICK]

4



Plotaverse
POWERFUL CINEMAGRAPH APP.
Free with IAP | plotaverseapps.com

Cinemagraphs, done right, are spectacular. For the uninitiated, a cinemagraph is a partially animated photograph — think a portrait of a person with clouds whizzing overhead, for example. They're hard to make, so yay for Plotaverse, an amazingly powerful iOS app that allows you to mask the areas of an image you want to stay still, choose the areas you would like to move, as well as the direction and speed you want them to go, and create Live Photos, GIFs, stickers for iMessage, or images ready for social media. The app is split into two pieces — Plotaverse is a social network in which users post their animated images, while Plotagraph is the part of the app you use to create new work. Plotaverse has plenty of inspirational images, but Plotagraph is where the magic happens. Masking and animating images can be awkward — masking off someone's face (or worse, hair) on a touchscreen is challenging, and pro-quality cinemagraphs do require work to get right. With the free version, the small Plotaverse watermark is overlaid on all exported images, but a subscription removes this.

[DAVE STEVENSON]

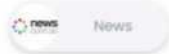


New rule helping NSW cyclists

5D AGO | NEW SOUTH WALES, AUSTRALIA

NSW motorists will have to leave minimum gaps when passing cyclists or face fines and loss of demerit points following a successful two-year trial.

Tap on the **News Source** to read more



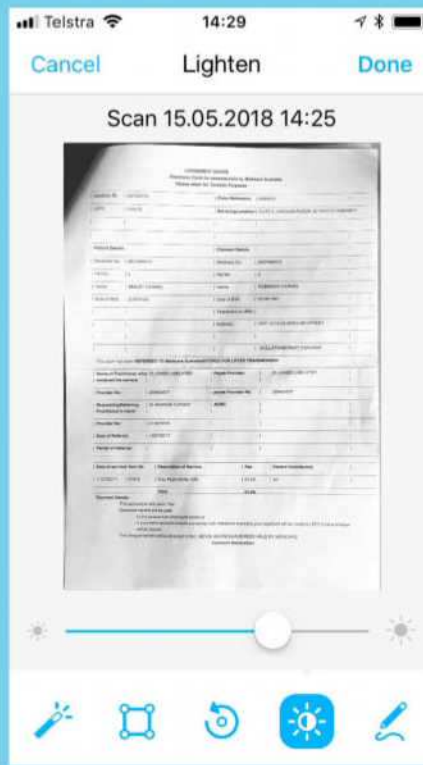
Reactions

Tap to reveal other **Reactions**



Ground
FIND AND VERIFY YOUR NEWS.
Free | ground.news

After signing up to news app Ground, you're asked to customise news to your tastes from a selection of categories (Politics, Sports, Media & Arts, Business and Science & Tech) and whether you'd like to know when something major happens in one of them. Ground's key feature is highlighting local news, so allowing the app to know your location is fairly crucial. Once you've found some news, you can tap on the story which will then open a blurb, with a link to the original source, plus the opportunity to react (thumbs up, thumbs down, fist bump or mark as suspicious) and add comments. The app is fairly clean, but we did find it strange how devoid of news the map actually was — it's clearly not well tuned for Australian sources yet. We can see how this "patent-pending technology" could come in useful, such as during demonstrations, war zones, breaking news incidents and more — just as long as it actually works. User-submitted content has to be verified by other users or official sources, otherwise it is labelled as 'unverified'. Pretty neat, especially in this day and age of fake news... it's a pity it's so devoid of Aussie stories.



SCANNER & FAX PRO
A MOBILE SCANNER AND FAXER.
Free 3-day trial; \$140 yearly subscription | bigfishapps.me

iOS scanning apps are now common, with Apple's native Notes app now even offering it built-in. So why would you dip your toes into this app? Unfortunately, there are still some services out there (cough, the Australian public health system) that insists on being sent faxes. Yes, *faxes*. So there's definitely a need for a service such as this to offer that antiquated method of delivery. Scanning the document is simple, although the 'auto capture' feature is a bit eager, meaning you'll take several auto images before you actually steady your phone above the document in question. After discarding the blurred ones, you can edit the image by brightening it up, rotating, making it black and white, and cropping before saving. It can also digitise the text on the document for you and convert it into a simple text file, should you prefer to scan a doc and rip the text. Once you're happy with the image, you can select to share it with someone via email, save to Drive, fax it and other useful options. Faxing is a simple matter of selecting the country, entering a fax number and the names of both recipient and sender, then hitting 'send fax'. The only downside is the monumental cost. You'll have to cough up \$13.99 for a single month after the three-day trial is up, or \$139.99 for a full year. Ouch.

[CARMEL SEALEY]



[EXTENSIONS TO ENHANCE YOUR WEB EXPERIENCE]

Browse better

THE **TECHLIFE** TEAM DIGS UP THE BEST NEW BROWSER EXTENSIONS FOR CHROME, FIREFOX AND MICROSOFT EDGE.

[SHARMISHTA SARKAR]

[GIDDY-UP]

Video Speed Controller

WATCH VIDEOS THE WAY YOU LIKE IT.

Free | github.com/igrigorik/videospeed

THE APTLY NAMED Video Speed Controller, a plugin available for Chrome and Firefox, offers shortcuts to speed up, decelerate, fast forward or rewind any HTML5 video on sites like YouTube. Once installed on the browser of your choice, click on the plugin icon and navigate to the Settings page. This opens in a new tab where you can customise the keyboard shortcuts and the speed for video playback. By default, S slows down a video, D speeds it up, R will reset the playback settings and so on. The next time you open an HTML5 video, the current speed will be displayed on the top left corner, with buttons to fast forward and rewind also presented when hovering over the speed display. This display can also be removed in the settings page. While some sites allow you play videos at varying speeds (YouTube, for example), the controls are hidden within the preferences for each video and aren't customisable. And that's where Video Speed Controller shines — customised video controls without reaching for your mouse or trackpad. The plugin has a blacklist of sites for which it doesn't work properly, and users can add to that if needed.

+

THAT'S WHERE VIDEO SPEED CONTROLLER SHINES – CUSTOMISED VIDEO CONTROLS.



Celebrities Read Mean Tweets #11
38,970,866 views



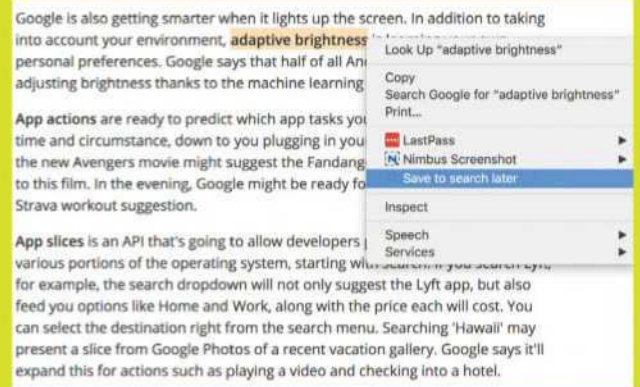
[ENOUGH IS ENOUGH]

xTAB

CAP THOSE TABS.

Free | tinyurl.com/tla78-xtab

Are your browser tabs getting away from you? xTab gives you an easy way to make sure you don't open too many tabs in a single Chrome window. This plugin allows you to set the maximum number of tabs you can have open simultaneously. On installation, clicking on xTab's little red icon opens a box where you can set your preferences; by default, the number of opened tabs is set to 20. There are three options for closing tabs: you can choose to close the tab you least used recently, the one least accessed or the oldest tab currently open. xTab, however, will not close any pinned tabs, and doesn't add them to the count either. It also won't close tabs that haven't been used yet. While most tab addicts will shudder at the thought of giving up controls over what they've got open, xTab might well be the cure that brings the addiction under control.



[SAY WHAT?]

SEARCH LATER

KEYWORD LIST FOR LOOKING UP LATER.

Free | tinyurl.com/tla78-keywords

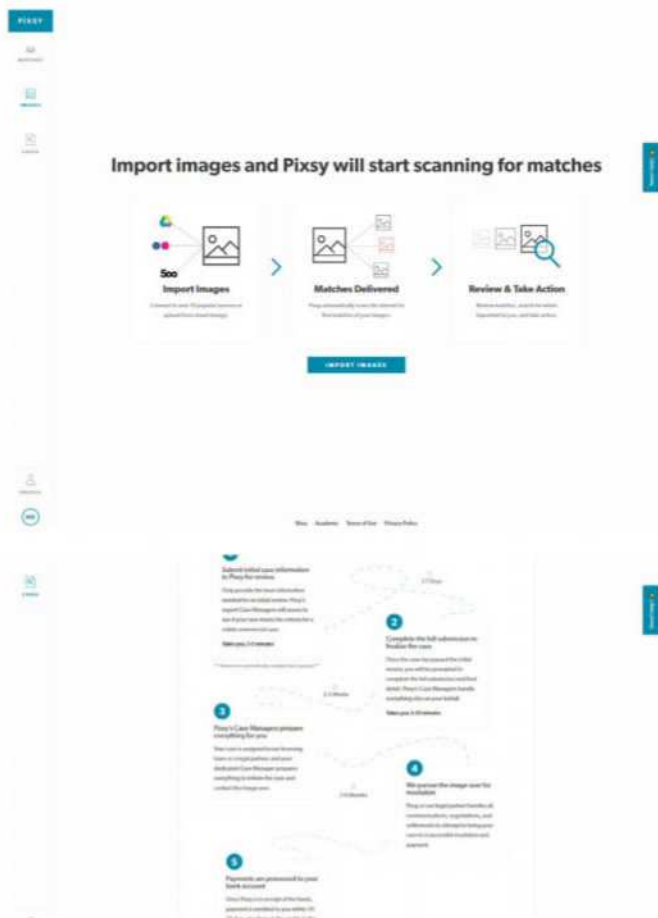
It happens often enough — you're reading a long article online and there are terms and keywords you'd like to look up but can't be bothered to navigate away from the current webpage or break the flow of the read. But once you've finished reading, you find that you can't remember the terms you wanted to look up. A simple Chrome extension like Search Later can help with that by building a list as you read, available to you when you have the time to do a Google search. Using Search Later is easy: install the plugin, then the next time you read something and spot a keyword you'd like to research later, highlight it, right click and select 'Save to Search Later' from the menu options. Clicking on the plugin's icon in the toolbar will show you the list you've created. Individual keywords can be deleted, but the option to select a bunch and remove together is sadly not available. While it might seem a tad tedious to keep right clicking each time, the developer has indicated that he's working on a keyboard shortcut to make the process simpler. ■

[SPIFFY STUFF FROM AROUND THE WEB]

Site insight

OUR MONTHLY ROUND-UP OF THE WEB'S MOST ILLUMINATING, USEFUL OR JUST-PLAIN-COOL WEBSITES.

[HARRY DOMANSKI]

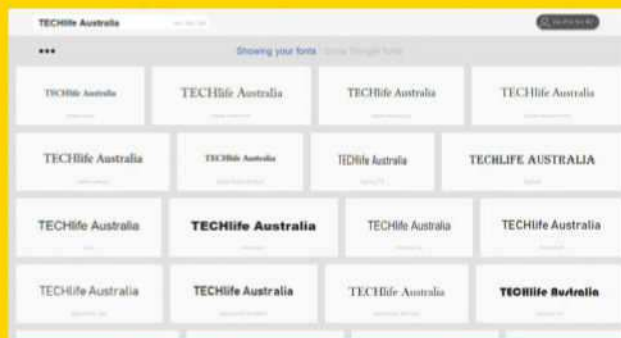


Pixsy

AUTOMATICALLY PURSUE COPYRIGHT CLAIMS ON YOUR PHOTOS.
pixsy.com

As a photographer in the digital age, it's near-impossible to keep on top of where your images are cropping up online. Abuse of copyright and intellectual property is rife and often difficult to track down and deal with, but Pixsy aims to help you out on this front. Once you've signed up for a free account and imported your images to Pixsy (as either a photographer, artist/designer, online shop or agency) the service will scan the web and return any matches it finds. From here, you can review the legitimacy of these matches, and in the case of theft or other breaches in terms, choose to take action. This takes the shape of either submitting a case, sending an automated (and legally-binding) takedown notice if you want the image removed, or pursuing action yourself. Submitting the case itself is free and relatively simple, and if the Pixsy team and their army of 26 law firm partners don't win the case, you pay nothing. If they do win, then you're entitled to 50% of the overall compensation and the rest goes to funding the service and covering legal fees.

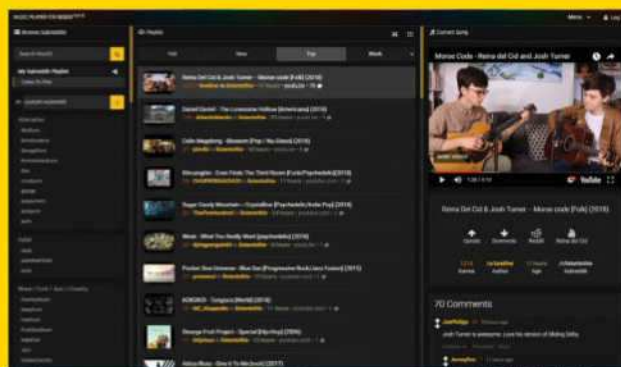
[WWW.TECHLIFE.NET]



Wordmark

EYEBALL ALL OF YOUR FONTS AT ONCE.
wordmark.it

Wordmark offers a solution to a problem you didn't even know you had — displaying all of your computer's fonts at once. While this may not be an issue you run into very often, knowing that there's a website dedicated to addressing it is handy information to have nonetheless. Simply type in a word or phrase, stylise it how you'd like, and hit enter. Presuming you have Adobe Flash player enabled in your browser, Wordmark will then display the entered text in every available font on your computer so you can quickly compare them and make your choice. Click on a font tile to select it and, once you've made a few selections, filter out everything but these tiles in order to further refine your choice. There's also a minimal array of settings, including zooming the fonts in and out, displaying them in inverted colours (white on black), and quickly printing or saving your selection as an image. For \$2 a month, you can 'go pro' and remove ads (which we barely saw) and allow your selected fonts to be filtered by category as well, but the free version is plenty useful as is.



Reddit Music Player

A TIDY PLAYER THAT MANAGES THE MUSIC FLOWING THROUGH REDDIT.
reddit.musicplayer.io

As a result of its community-driven nature, Reddit can be the source of some of the freshest and most interesting music available today, whether it's from a well-known artist or emerging bedroom producer. Unfortunately, the process of trawling through the array of subreddits and their individual links can be tedious, especially if you'd like to take a backseat in the discovery process. The Reddit Music Player allows you to browse any combination of subreddits you please, automatically playing through the YouTube or Soundcloud links in each. You can sort these via the characteristic 'hot', 'new' or 'top' categories that make up standard subreddits, or shuffle your way through the playlists. If you're not sure what to search for, the site has an extensive list of genre-specific subreddits, ranging from deep funk to folk punk, and hovering your cursor over them provides a neat little description of what to expect. Whether you're curious about discovering new music or simply keen to listen to a few select genres, this is ever-changing music player is a tidy tool for the job. ■

DISCOVER
SITE INSIGHT



[PC AND CONSOLE GAMES]

Weapons are easy to come across but think before you shoot: noise will attract the hordes.



Stayin' alive

THE **TECHLIFE** TEAM REVIEWS THE LATEST GAMES FOR PC AND CONSOLES, BEGINNING WITH THIS ZOMBIE-KILLING SURVIVAL SIM.

State of Decay 2

A COMPLEX AND UNIQUE SURVIVAL SIM WITH A HARD EDGE.

\$49.95 | PC, X0 | www.stateofdecay.com

WITH NEWS OF the arrival of yet another zombie game, you'd be forgiven for immediately turning away. But wait: *State of Decay 2* is probably the best zombie game this generation (and, in my opinion, of all time). Few major console titles dare ask as much from the player as this sequel, both on an emotional and cerebral level, and what results is a survival simulation that feels less like a grindhouse reread and more like a meditative, tense, existential journey.

The format is barely changed from the first *State of Decay*: choosing from a few survivor archetypes, you're set loose in a collapsed society, where you're forced to gather resources and build a pathetic semblance of normality amid the ruins. Early game, you'll have a small handful of survivors you can take control of in order to bolster your settlement (via some light, but surprisingly detailed, management elements), clear out zombie hordes, and make contact with other survivor communities.

Survival is key here: each of your characters can die, permanently. Within the first four days of my first playthrough, the two chief characters in my settlement had been brutally murdered by an aggressive survivor community, leaving just three. The writing in *State of Decay 2* is hardly worth writing home



It's not just zombies that are the threat in *State of Decay 2*: other humans are arguably more dangerous.

about, rather it's the emergent elements that matter, and this is a game where each player will inevitably have their own stories to tell.

It's a survival game in the purest sense: you won't be punching trees, you won't be grinding resources to build an axe: you're keeping people alive in a harsh, aggressive world. Each time you take a character from the settlement into the wastes, there's a strong sense that anything can happen. But it's not because the game will kill you at random: careful play, careful consideration and careful planning will hold you in good stead.

You can have real-life friends come along for the ride via online cooperative play, though the functionality is limited and you can't team

up for settlement building. Meanwhile, the graphics are improved over its predecessor but *State of Decay 2* is by no means a pretty game. But what it lacks in triple-A presentation it more than makes up for in depth. This is a sandbox in the purest sense. Player agency is the priority, and across three massive maps and a large cast of avatars, there's a startling abundance of stories and experiences to be had in *State of Decay 2*. Turn away from this at your peril.

[SHAUN PRESCOTT]



Conan Exiles

A SURVIVAL GAME THAT SHEDS SOME OF THE GENRE'S ANNOYANCES.

\$79.95 | PC, PS4, X0 | www.conanexiles.com

THE SURVIVAL GENRE is a tough one, both for developers and players. The likes of *DayZ*, *Rust*, *The Forest* and until recently *Ark: Survival Evolved* seem stuck permanently in Early Access, a Steam program which allows developers to sell games mid-development. For players, this means coming to grips with any given game's quirks and bugs. *Conan Exiles* is a bit of an anomaly: it stayed in Early Access for a single year (*DayZ* is approaching its fifth!), and now that it's launched into version 1.0 across all platforms, it actually plays pretty seamlessly.

As is customary, you'll start *Conan Exiles* (as either a scantily clad — or not clad at all — man or woman) with nothing. You'll need to gather resources like plants, branches and stones in order to build tools in order to harvest better goods, which will let you build bigger stuff, which will lead to even more resource-demanding goods. You get the picture. It's a perpetual grind to achieve the next milestone, but that's not a criticism: it's part and parcel with the genre. In many ways, survival games like *Conan Exiles* are meditative affairs. You can play them while

listening to a podcast or watching television, or else you can buddy up with a friend and chew the fat while building your enemy thwarting fortifications.

Conan Exiles allows you to play offline, meaning any survival game's biggest threat — other players — can be avoided. It's actually a great way to play, as interactions with real players in games like these hardly contribute to their sense of realism. Even better, the combat system here is much more fleshed out than the competition, with the ability to dodge and hold up a shield. There's a fair bit of stamina management at play, lending the combat a ropey *Dark Souls* feel.

But it's still a survival game. If you're averse to the genre, you still won't get much out of this, but if you're curious, it's much easier to recommend *Conan Exiles* than *Ark: Survival Evolved*. At times, this feels more like an action RPG than a resource grind, and that alone should hook you. If you can be hooked.

[SHAUN PRESCOTT]

3



FINAL FANTASY XV WINDOWS EDITION

REQUIRES BOTTOMLESS HARD DRIVE.

\$60 | PC | www.finalfantasyxv.com

"A *Final Fantasy* for fans and first timers" is a heartening statement to see when approaching a series that has had a troubled relationship with the PC in the past, with some pretty terrible ports. But this is a game that can look stunning, and which can bring even the beefiest rig to its knees with a few tweaks to the settings.

First of all, though, there's the small matter of storage. You might need a new SSD, because with the optional high-res texture pack installed, *FFXV* takes up 152GB. That's twice what *Shadow of War* — a ridiculous amount of space, but also a hint of things to come.

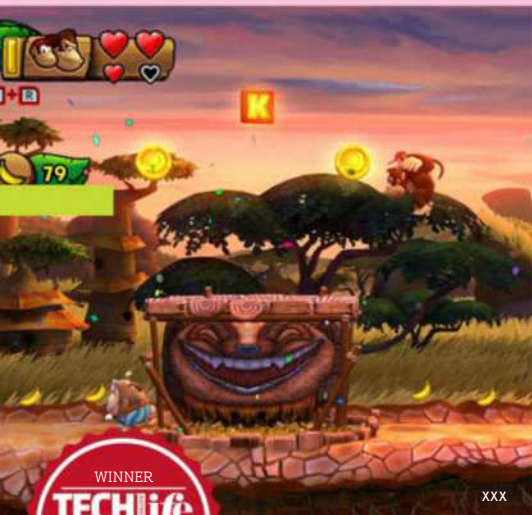
The game is simplified from the convoluted RPGs that came before in the series. There's more focus on action here, and despite the bewildering number of sub-menus, selection screens and choices, it really is a streamlined game, framed as a road trip taken by four friends — all muscular young men, with fashionable haircuts and a liking for wearing black — one of whom is a prince on his way to his wedding. Of course, it doesn't work out that way; there's an invasion, people die and you're soon thrust into a quest to retrieve ancient weapons, and kill a lot of demons and robots.

Being a road trip, there's a car, and the world is built for vehicles. Near the end of the game, you can upgrade the car so it flies, but for most of the game, you're confined to the roads. It's a shame that the second half of the game becomes a more linear experience. It's hard to get too upset, however, when the whole thing is backed by such a magnificent score, and the highly tweakable graphics look so good. *FFXV* is a console port done right, and despite being a more streamlined game than we're used to from the series, it still deals with subject matter that could rightly be described as 'epic'.

It's a journey worth taking, as long as you've got the storage space.

[IAN EVENDEN]

4



DONKEY KONG COUNTRY: TROPICAL FREEZE

BEST PLAYED WITH FRIENDS.

\$79.95 | Nintendo Switch | www.nintendo.co

As one of the crowning jewels in the Wii U catalogue, *Donkey Kong Country: Tropical Freeze* risked turning into a buried cult phenomenon with the demise of that console. Thankfully, it's been re-released on Switch, mostly untouched aside from the addition of Funky Mode. This is a blessing, since it adds a much more forgiving approach to this rather difficult platformer (and that's even if you opt to ignore all the challenges and hidden collectibles). Donkey Kong is accompanied by a cast of familiar friends who all modify his moveset in subtle ways. The game also supports local cooperative play, showcasing the versatility of the Switch's detachable Joycons in such a way that it doesn't feel like you're at a disadvantage playing on such a small input device. The Switch is bulging with top quality platformers (*Celeste*, *Super Meat Boy*, *Kirby*) but this should join your personal catalogue. [SHAUN PRESCOTT]



Sorry, I must have taken a wrong turn... we were just looking for the bathroom.



Pillars of Eternity II: Deadfire

THE CLASSIC ISOMETRIC RPG FINALLY GETS THE SPIT-SHINE IT DESERVES.

From US\$59.95 | PC | eternity.obsidian.net

NOSTALGIA IS A powerful force in today's entertainment landscape, but even given the sheer abundance of throwback media products on offer, it's rare to see a revival that can truly match the source material. *Pillars of Eternity II* is, to its enormous credit, one of those "exceptions that make the rule". A follow-up to the 2015 original, it's a game built largely in homage to *Baldur's Gate* and the isometric PC RPGs that were popular throughout the 1990s. *Pillars II*, however, outdoes its predecessor in several key areas.

It still gets the basics right. This is a game that's as much about negotiating your way through conversational conflicts with myriad multicultural fantasy denizens as it is about killing monsters in dungeons. Critically, though, *Pillars II* rethinks the original's handful of weaknesses — all in-game dialogue is now fully voice-acted, for one. It's hard to overstate how much of a difference this seemingly small change makes to the experience as a whole — it dials up the immersion and engagement, and really makes the world come alive. Developer Obsidian has also made some smart snips, like limiting your

party to a slightly more manageable five characters, rather than six, and they've combined that with a customisable and reasonably flexible party AI system that means less stop-starting (and micromanagement) while in combat.

The world map has also been overhauled to give players much more freedom — with the setting having moved to the Deadfire Isles (which resembles a sort of colonial-era Caribbean), your home base is now a ship, which you can freely use to sail and explore wherever you like... although there's no guarantee you'll be able to handle what you'll find. All those new ingredients add up to a reformulated recipe that, while keeping the core flavours largely unchanged, makes *Pillars II* friendlier, more consistently pacy and — for those who like this kind of isometric-RPG dish — an absolutely scrumptious affair. This is a delicious masterwork that equals the best the genre has to offer.

[DAN GARDINER]



Even the ogres are drop-dead gorgeous in *Deadfire*.



A Way Out

BAD DIALOGUE AND SIMPLISTIC SYSTEMS HALT A CLEAN GETAWAY.

\$40 | PC, XO | www.ea.com/games/a-way-out

FIVE YEARS AGO, *Brothers: A Tale of Two Sons* seemed to have established Lebanese filmmaker Josef Fares as a bold new voice in games, expertly interweaving story and systems to moving effect. As such, *A Way Out*, Fares' new game, is something of a comedown. Essentially a boneheaded B-movie you play with a friend, it's not a good game by most standards. Yet between its charm and a handful of creative flourishes, it's a hard one to dislike. This isn't a game that can be played alone. You can go through the whole thing with an online pal, but it's best with someone sitting next to you.

Immediately, we're introduced to Vincent, who's about to start a 14-year sentence for embezzlement and fraud, and Leo, who's six months into an eight-year stretch for armed robbery. Placed in adjacent cells, the two form an alliance over a couple of skirmishes in the yard and the prison canteen, before they discover a shared objective that convinces them to make their escape. It's no spoiler to say they get out. But as with any thriller, there's some pleasure in watching the inevitable unfold while playing cliché bingo — and in this instance, you're taking an active role in the chases, shootouts and narrow escapes that follow.

Split into bite-sized chapters, it maintains a brisk pace, though in its early scenes, you're asked to take things slowly. Here, it feels a bit like a simplistic co-op *Hitman*, as you use conveniently placed objects and environmental features to cause distractions or avoid detection. Elsewhere, it's more like a poor man's *Uncharted*, with clumsy brawls, and setpiece pursuits with you running, riding or driving away from danger, often down fairly

straight routes. At least the action is well staged. One standout sequence, set in a hospital, moves seamlessly between characters, the camera never cutting as it darts through windows and vents while you take it in turns to fight or hide.

One of *A Way Out*'s biggest problems is that its forced co-op setup doesn't bear creative fruit often enough. You'll give your partner leg-ups or catch them when they're falling: all things we've done in numerous other games. In fact, some of its best co-operative moments are either frivolous (splashing in a pond to guide fish so your partner can spear one) or incidental (a banjo-strumming rhythm-action interlude). There is, however, something satisfying about coordinating your timing. And it occasionally prompts healthy debate by forcing both players to agree on a route forward. But any investment in the story is scuppered by a script that appears to have been written by a bot fed exclusively on dialogue from straight-to-DVD action films. You can almost guess the lines before they're spoken.

There's plenty to admire in its ambition — if not in mechanical terms, then at least in the way it strains to compete with blockbuster games with a fraction of the budget. Accept that this is the work of a team whose reach has exceeded its grasp, and, with a partner in tow, you'll probably have fun as this unlikely pair on the run. Even when you're laughing *at* rather than *with* it.

[CHRIS SCHILLING]

3



THE SWORDS OF DITTO

A COMPACT ACTION RPG.

\$25 | PC, PS4 | www.theswordsofditto.com

This cheerful, cartoonish dungeon-crawler doesn't want for ideas — even if most of them aren't really its own. Developer Onebitbeyond hasn't just picked its targets well, though, as *Ditto* emerges from its influences as very much its own game. Each randomly generated hero accepts their destiny with heartwarming enthusiasm. Fate has decreed that they must prepare for the imminent arrival of a malevolent sorceress, who at least has the good grace to give notice of her hostile takeover. Two artefacts, lying within nearby dungeons, can weaken her grip if destroyed; first, however, you'll need to find two legendary toys — a remote-controlled drone, perhaps, or a laser-shooting eye-ring — to complete these labyrinths. That is, of course, assuming you've passed the entry restrictions, which demand you get your hands dirty. Every kill accrues points to level up your sword and increase your health bar, so roll-dodging attacks will only get you so far.

Though *Ditto* isn't as ruthless as some of its peers, death still stings, especially since the delightfully hand-scribbled map that steadily fills out as you explore is wiped clean and rearranged for each new dungeoneer. Challenge is a welcome constant in an ever-changing world, which, with its fast-travel kazoos, vinyl frisbees and *Vietnifful Joe*-style jumpsuits, has plenty of charming eccentricities. It's not going to change your life, but for a dozen or so hours, this genial adventure might just make it a few shades brighter. ■

3½

Live. Die. Rewind. Try again.

TECHLIFE'S TEAM REVIEWS THE LATEST GAMES FOR ANDROID & iOS SMARTPHONES & TABLETS.



Bring You Home
AN IMAGINATIVE PUZZLE GAME.
\$4.49 | bringyouhomegame.com

WHILE MANY iOS games are available on both iPhone and iPad, the latter's large display can often enable immersive, tactile experiences that don't work on smaller devices or traditional gaming systems. *Bring You Home* is a good case in point, rethinking platform puzzling by having you directly manipulate the environment rather than the protagonist. Said protagonist is Polo, a blue alien who's just seen his pet kidnapped by villains who then disappear via a portal. Polo sets off in pursuit, falls from a second-floor window, and face-plants on the ground.

Fortunately for Polo, time then rewinds, and you are invited to save his dignity and face. Tap the play button and Polo's fall is broken. He then leaps through the portal to find himself in a jungle. Clambering up a vine, it snaps, and Polo is in trouble again. This time, there are four options — giant mushrooms, pink beasts with dangly tails to grab, and a spiky plant that might work as a ladder...

At this point, you might think it's going to be a cinch to get that pet back, but *Bring You Home* quickly ramps up the difficulty. Scenes introduce multiple panels, some that move, and multi-step solutions. Single-screen scenes become complex webs, where setting Polo off in a particular direction may result in a decidedly unexpected outcome. Sometimes, the logic is a touch suspect, and you might wonder, on seeing Polo killed several times in a row, if *Bring You Home* is too reliant on trial and error.

Really, though, what you're doing is testing a system. You try something, note how this affects the outcome, and figure out how tweaks might change things. Only a couple of times during the game does this become trying. Mostly, it's a joy, and much of that is down to superb animation, and a lot of imagination.

Even failure is rewarding, since Polo's demise is often entertaining in itself. Sorry, buddy. At the end of the day, this is a wonderful, tactile, inventive puzzle game that is a joy to play.

[CRAIG GRANNELL]



Samsara Game
AN INTERDIMENSIONAL PLATFORMING PUZZLER.
Free with IAP | www.samsara-game.com

THERE'S SOMETHING IN the water in New Zealand, where the devs of this challenging puzzler reside. Zee, the hooded squirrel-chasing protagonist with teddy bear backpack, has fallen through an evil-looking portal into another dimension and it's your job to guide this gender-neutral child from level to level without perishing.

[Do I sense a theme here? — Ed]

The setup is quite clever. Each level consists of two 'dimensions' — for want of better terms, we're calling them right-way-up-land and the upside-down. (Cue *Stranger Things* theme tune. You're welcome.) You guide Zee across a series of platforms using a predetermined selection of blocks that you drag across to attempt to create a safe path from start to finish. Some blocks are just blocks, others include stairs, and as the levels increase in difficulty, the blocks also take on different properties and act differently depending on whether they're in right-way-up-land or the upside-down. The two worlds act in a mirrored fashion, meaning objects placed below the sizzling line of death will sometimes be reflected above it and vice versa. There's an element of *Portal* here, too, as some solutions will require passing through coloured-coded gateways, often transferring you from the upside-down to right-way-up-land.

We played this game on our tiny iPhone SE, which is probably not the best device to use, in hindsight. We found dragging the objects from the top right corner to be problematic, as our finger entirely obscured them when we were trying to lay them in place, meaning we'd often drop them in the wrong spot and have to try again. Luckily, there are no punishments for trying levels over and over, so this is more an annoyance than a deal-breaker, and one that's no doubt less of an issue on larger devices.

In all, it's a clever little game that gets progressively harder with each level as it introduces new ways of thinking and new props. Well worth trying out. [CARMEL SEALEY]



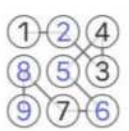
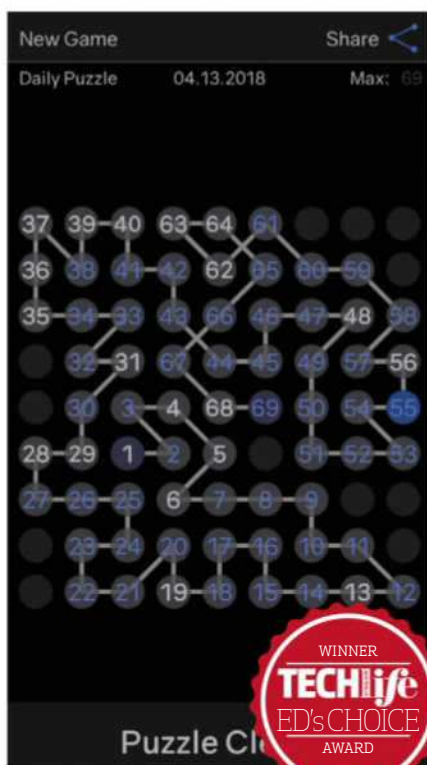


Part Time UFO
 ADORABLE ALIEN IS EAGER TO PLEASE.
 \$5.99 | halegg.jp/eng

THE PROTAGONIST HERE is a sentient spacecraft that's eager to help humans with odd jobs. Equipped with only an arcade game-style claw crane, you're tasked with picking up objects and transporting or assembling them. The genuinely odd tasks you're asked to do include lifting a cheerleader squad into formation, rebuilding a toppled museum exhibit that's broken into pieces, and carefully balancing assorted animals on a pole held by an elephant that's balancing on a ball.

The game is fairly flexible with how you accomplish each stage's objective. You can arrange the cheerleaders in all sorts of implausible ways, for example. They and other objects you move are rigid shapes, though they react to bumps and gravity. Each level has three bonus objectives, for which you're awarded medals. These include assembling the cheerleaders in a way that exceeds a minimum height, putting the exhibit's pieces back together in the correct order, and ensuring no animals fall off the elephant's pole. The game is soon finished if you concentrate mostly on core objectives. However, it's satisfying going back to try your hand at the rewards you previously missed, which extends the fun and value.

A short but sweet physics-based arcade game, *Part Time UFO* is charming, accessible and rewarding. [ALAN STONEBRIDGE]



Number Chain
 TRAIN YOUR BRAIN TO THINK LOGICALLY.
 Free | www.ecapyc.com

IF YOU ENJOY solving logic puzzles, you'll spend hours trying to solve the conundrums that *Number Chain* has to offer. The objective is simple: join consecutive numbers from 1 to a maximum number in a chain without skipping a circle. Sounds easy, and it is at first, but try one of the Daily Puzzles or choose the Hard or Challenging levels and you could well spend hours scratching your head. Once you have the answer, you'll curse yourself for not realising it sooner. The object of the game is to help your brain think logically, firing every synapse it can spare.

The number of puzzles here seem endless, with the ability to play on- or offline, all within an app with a very minimalistic design — the moment you see the first puzzle, you intuitively know exactly what needs to be done. (However, you will need to sit through the tutorial as there's no way to skip it.) The only thing that spoils the clean design is a banner ad at the bottom, but the option to choose a light or dark theme is welcome.

Alongside the daily puzzles you can choose levels that go up to "Hardcore". You can also erase a single mistake or remove multiple numbers in case a part of the chain's gone awry. Or you can start from scratch if you've messed up. Whether you consider yourself a fan of puzzlers, genius or not, expect to get addicted here. [SHARMISHTA SARKAR]



Florence
 A LOVE LETTER TO GAMING.
 \$4.49 | florencegame.com

FLORENCE IS DIFFICULT to review. First, because in saying too much, it'd be easy to ruin the experience for those yet to play. Secondly, it's hard to say whether this really is a game in a conventional sense. There are certainly game-like elements, but *Florence* is perhaps best thought of as an interactive storybook, charting a young woman's first love. Regardless, the title was created by the lead designer of *Monument Valley*, so it's peppered with clever touches, and full of heart. There's no architecture to manipulate here; instead, you get interactions that cleverly evoke the feel of everyday life. Florence's existence starts out mundane — you help brush her teeth, for instance — but later, you encounter a conversation between young lovers, and complete speech balloon jigsaw puzzles that have fewer pieces as the pair become more comfortable.

The main snag with *Florence* is it's very short, and broadly devoid of replay value. There's not enough 'game' to make you want to go back to the puzzles, and the story's brevity means it lacks the return power of a great book or movie. Still, as an experiment at the fringes of gaming and interactive stories, it's worth a look — not least if you like the idea of delving into an intimate, sweet-natured story on your device — especially one delivered in a unique way. [CRAIG GRANNELL]



TEST BENCH

THE HOTTEST GEAR PRESSURE-TESTED



Fitbit Versa

FITBIT'S MOST VERSATILE SMARTWATCH TO DATE.

THE RIGHT PRICE and great fitness tracking, but is it well versed enough in added features to make a great smartwatch?

It might seem a little weird for Fitbit to release another smartwatch less than six months after revealing the Ionic, but the company has a history of offering a choice between two largely similar devices. If you take the Charge 2 and Alta HR as an example, the strategy has worked well in the past. Fitbit's new Versa smartwatch takes a softer, more rounded form factor and attaches a traditional watch band to be notably more approachable and stylistically versatile than the Ionic. Rather than compete, these two smartwatches were designed to sit alongside one another in the market. In some ways, the two options cater to differing design preferences (the Versa is lighter, smaller, has softer edges and is more style conscious), but the devices simply offer a slight variation on the most divisive elements for consumers in order to appeal to the broadest possible market.

Fitbit created the Versa to be a smartwatch that could appeal to a large new market of people that find current smartwatch offerings prohibitively expensive. The Versa's main selling point is that it costs \$100 less than the Ionic (and many other competing smartwatches), but despite slashing close

to a quarter of the price off, there are very few concessions.

The Versa's fundamental drawback is the omission of an on-board GPS. This means the Versa relies on the presence of your smartphone to do any geographically pegged fitness tracking — an important factor in exercise maps and your Cardio Fitness score. For those who like to run without a smartphone, this is obviously an inconvenience, but for anyone wanting to step into the smartwatch realm for the first time, it's really just a minor concession.

Apart from connected GPS, however, there's really not much the Versa misses out on. You can still load up to 300 songs onto it using the 2.5GB of storage space for MP3s or saved music from the Deezer streaming service. Then listen to that music directly

through Bluetooth headphones if you want to ditch your smartphone. There's also no compromise on the waterproofing, with the Versa maintaining the swim-proof 50m/5ATM water resistance rating. Fifteen of the biggest banks across Australia and New Zealand are on board, so you can upload your credit card details and pay for things using your wrist so you don't have to carry your wallet either.

The Versa is also excellent as a fitness tracker, building on Fitbit's established

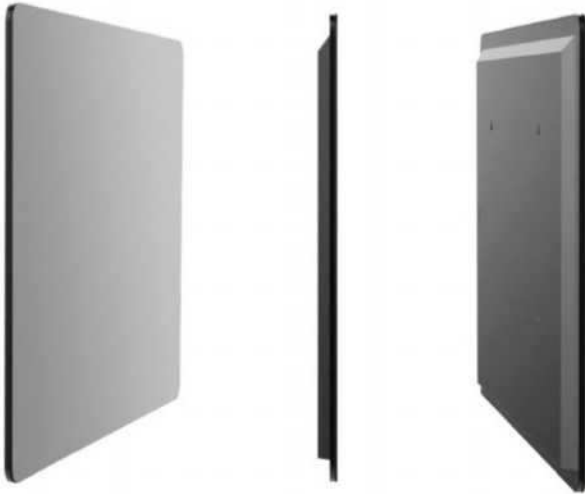
ecosystem of sports, nutrition, weight, stress and sleep tracking software to give you advanced insights into your overall health. The device's Purepulse heart rate tracker maintains continuous all-day heart rate tracking for advanced health insights like sleep quality and Cardio Fitness scores, on top of full training diagnostics to give you unfettered access to everything Fitbit has on offer.

While the Versa misses out on the independent GPS and smart assistant capabilities of Apple's Series 3 smartwatch, it does offer close to double the battery life for comparable usage situations and is between \$150 and \$250 less than Apple's entry-level models. This might seem small, but charging every four days is much easier than having to take it off every other day in the long run — especially if you value ongoing sleep tracking data and don't want to take it off at night. ■ [JOEL BURGESS]

FITBIT CREATED THE VERSA TO BE A SMARTWATCH THAT COULD APPEAL TO A LARGE NEW MARKET OF PEOPLE THAT FIND CURRENT SMARTWATCH OFFERINGS PROHIBITIVELY EXPENSIVE.

FITBIT VERSA
\$299.95; Special Edition, \$349.95
www.fitbit.com

CRITICAL SPECS
1.3-inch display, optical heart rate monitor, altimeter, accelerometer, gyroscope, SpO2 sensors, smartphone connected GPS; NFC, Wi-Fi 802.11 b/g/n, Bluetooth 4.0; 4-day battery; 50m water resistance; 4GB storage capacity, 3.8 x 3.8 x 1.2cm (2.2cm-wide strap); 33g



Embrace Smart Mirror

NOT QUITE THE FAIREST — OR SMARTEST — OF THEM ALL.

WITH AMAZON, APPLE and Google all giving considerable attention to smart assistants, there's been a lot of firsts in the smart home space of late, but as with anything that breaks new ground, there are going to be successful devices and things that need to take a long, hard look in the mirror. At a glance, the classic rounded-corner Smart Mirror from local start-up Embrace has a generous 80 x 60cm reflective surface and comes with an ample 23-inch touchscreen display. Marrying the voice controlled Google Assistant with the familiar Android OS (and all its compatible apps), the Embrace Smart Mirror offers a hybrid control interface that seems perfectly suited for the modern smarthome.

Unfortunately, many of these features end up better in theory than they are in practice. The Smart Mirror's touchscreen opts for a floating toolbar for your 'back', 'home' and 'settings' buttons which manage to get in the way of almost every interaction by covering text, video or keyboard keys. While Google Assistant is present, it's running on an older Android 6.0 OS, so it won't integrate in the latest ways with your Google Home speakers and can't control smart devices unless the apps are installed directly on the device. This dated OS and the underpowered 1.8GHz CPU and paltry 2GB RAM also means the voice recognition is generations behind the latest Google Assistant devices, so be prepared to repeat yourself when talking to it. To round out this pretty severe list of limitations, the Embrace Smart Mirror is running an Android security patch from December 2015, opening it up to numerous vulnerabilities that will leave the microphone and camera far more exposed than anyone should be comfortable with.

If the security is updated, then the device does everything it says on the box, but for a \$1,699 piece of tech, it's a long way from futuristic.

■ [JOEL BURGESS]



Razer Nommo Chroma

AN UNCONVENTIONAL PAIR OF COMPUTER SPEAKERS.

IF YOU'RE IN the market for a new pair of computer speakers, there's a slim chance you'll find anything as cool as the Nommo Chromas. The result is a good-sounding pair of speakers that don't break the bank. The Chromas are dripping with Razer's distinctive aesthetic. They have a matte-black plastic finish, and that's not even mentioning the RGB lighting that pulses underneath the speakers' stands — a fun, quirky addition that will be hated and loved in equal measure. The lightshow can be controlled via the Synapse app, and helps set the speakers apart from the dull competition, plus you also get a digital-to-analogue converter (DAC) that boosts the sound from your PC media player.

Above the glowing bases on the right speaker are two knobs — one that controls the volume and another that raises and lowers the amount of bass response. Around the back, you'll find a 3.5mm auxiliary input that enables you to connect your phone, tablet or MP3 player, as well as a headphone jack. You also get a cable that runs from the right speaker to the USB port on your computer — yes, sadly, it requires both power from the wall and the PC. The biggest compromise of the design is that it doesn't feature Bluetooth, which would have made it easier to connect to some devices and reduce the clutter of cables.

If you can get over the fact that there's some very clear catering to the bass-loving crowd here, the Nommo Chroma speakers actually sound great — good clarity in the mids and highs, and a powerful (if somewhat muddy) bass response that can cater to your tastes. Sure, there are some issues with voices not coming through as clear as they should, but the speakers are more than capable of holding their own.

If traditional speakers aren't your style, then the Nommo Chromas are a set of well-designed alternatives. ■

[NICK PINO]



EMBRACE SMART MIRROR
\$1,699
www.embracesmartmirror.com

CRITICAL SPECS
23.6-inch 1080p IPS touchscreen display; Android 6.0.1 Marshmallow; 1.8GHz Octa-core CPU; 2GB RAM; 16GB storage; 8MP camera, microphone, motion sensor; 802.11n WiFi, Bluetooth 4.0; 80 x 60 x 2.7cm; 14kg



RAZER NOMMO CHROMA
\$249
www.razer.com

CRITICAL SPECS
50–20kHz frequency response; D/A converter built-in; 3.5mm auxiliary input, headphone jack, USB audio input, 14 x 17 x 22cm; 2kg





LG WK7 ThinQ

GIVING GOOGLE THE FULL BEANS.

CYLINDRICAL IS THE de facto form for a number of smart speakers, and the WK7 continues this trend. It has Google Assistant built into its chunky and tallish frame, making it bigger than the Amazon Echo 2 but not quite as rotund as the Apple HomePod.

Like most speakers in this class, the WK7 boasts a clean, uncluttered appearance. Through the metal grille, you can make out a forward-firing dome tweeter sitting above a mid/bass driver. The top features touch-sensitive controls for volume and playback, and that tiny splash of colour is a dedicated, touch-sensitive Google Assistant button.

The WK7 works over your Wi-Fi network, or you can hook up sources via Bluetooth. Unlike Sonos, LG doesn't offer you the option of running two WK7s as a stereo pair. It's not a deal-breaker, but worth noting all the same. The speaker also has Chromecast built in, so you can stream between and interact with compatible sources and displays.

Within the app, there is scope to enable and disable what LG calls Clear Vocal and Enhanced Bass. It's often worth experimenting with such settings, but on this occasion, we'd steer clear. Both modes sacrifice cohesiveness and quality of sound to such a degree, the negatives outweigh any positives. Turn these modes off, position the speaker in the corner of a room — on a bookshelf or close to a rear wall — and you'll hear the WK7 performing at its best. And its best is rather good by smart speaker standards.

While we couldn't call the WK7 class-leading, it's a welcome alternative to the current pace-setters from Apple and Sonos, and well worth auditioning. ■

[PAUL TAYLOR]



UE Megablast

ALEXA ON THE MOVE.

COMBINING THE VERSATILITY of a Bluetooth speaker with the brains of a smart home speaker is a very sensible move. UE, the team behind the marvelous Megaboom and Boom 2, has made something quite magical.

With the Ultimate Ears Megablast, you get the portability, durability and 360° sound of these excellent speakers, as well as their playful aesthetic and wide array of colours. The audio is clear and punchy across the spectrum, and the Megablast can get 40% louder than its Megaboom predecessor. This is really quite loud. The overly large buttons make for simple operation, and the voice control is as good, if not better, than the Amazon Echo itself. While a 16-hour battery life is a slight step down from the Megaboom, it's still an impressive feat considering the unit is running its own operating system for the Wi-Fi and Alexa functionality. At the time of writing, you can play any music streaming service via Megablast's Bluetooth, but you can't yet control Apple Music or Spotify via Alexa's voice control. The official word is that the latter is "coming soon". One of the real boons of the Megablast, unfortunately, comes from a sold-separately charging dock dubbed the Power Up (\$49). With this set up in your home, you can instantly transform this portable powerhouse into a smart home hub, all while juicing it up for its next outing.

If the Power Up was bundled with the device, the UE Megablast would corner both markets comfortably, but even sans-dock, it presents a powerful amalgamation of two burgeoning fields. ■

[HARRY DOMANSKI]



LG WK7 THINQ

\$299
www.lg.com.au

CRITICAL SPECS

Bluetooth, Wi-Fi; Google Assistant;
500W of power; Clear Vocal and Enhanced Bass modes;
13.5 x 13.5 x 21cm; 1.9kg



UE MEGABLAST

\$379
ultimateears.com/en-au

CRITICAL SPECS

60–20,000Hz; 2x 25mm tweeters, 2x 55m drivers,
2x 85mm passive radiators; Alexa-enabled; IP67 waterproof; 16-hour battery life;
Wi-Fi 802.11 a/b/g/n (dual-band); 23.7 x 8.8 x 8.8cm; 1,190g





WHEN WE TOOK THIS ON A LONG (21KM) RUN WITHOUT A PHONE, THE SUUNTO MEASURED THE PACE AND DISTANCE COMPARED TO OUR CONTROL DEVICE TO WITHIN ABOUT 3%, ALL THANKS TO ITS INBUILT STEP COUNTER.



Suunto Fitness 3

LIGHTWEIGHT TRAINING COMPANION.

SUUNTO'S SLIM SPORTSWATCH is doing something very bold. It's not only ditched the onboard GPS, offloading the hard work of physical tracking to your smartphone (thus bucking the trend of nearly all sportswatches currently available), it's also giving you permission to not feel bad about a missed workout. If you blow off that run you swore you would do, the Fitness 3 adapts your upcoming plans to compensate.

For Suunto's adaptable regimen to properly work, though, you'll need to have the watch on your wrist nearly 24/7. The Fitness 3 measures your heart rate and (after granting it permission) your sleep patterns, building a profile of who you are. As you run, swim, cycle, paddleboard (or do one of the other dozens and dozens of other sports on the menu), the Fitness 3 creates a recommended plan that covers the length and intensity of your workout — smart stuff. Thankfully, it's comfortable to wear. Suunto has made this lightweight, slim and far more restrained than their previous watches, largely because it omits the bulk of the GPS. Our all-black test unit got a lot of admiring glances, as the display is understated, and the overall design well rounded. A white and gold option is also attractive, though the variants with the pink and green straps betray that aesthetic.

Battery life is good, depending on your schedule. If you like to push yourself every other day in your chosen sport, and do a spot of walking, you should get about four days of use between charges. That's helped by your smartphone taking the duties of the GPS, so if you don't have the two paired, you'll be left without a map of your adventure. That's disappointing at first, but when we took this on a long (21km) run without a phone, the Suunto measured the pace and distance compared to our control device to within about 3%, all thanks to its inbuilt step counter. That is a remarkable feat. While the Fitness 3 has somewhere in the region of 70 activities to choose from, it's not a 'true' multisport watch that can stitch together multiple sports, like a triathlon — you'll need the Spartan for that sort of day, or be prepared to rapidly switch between activities.

The optical heart rate (OHR) sensor and is a boon here, furthering making the watch an attractive option for the price. The OHR sensor made a good contact point to read this tester's pulse, and the soft strap coupled with the diminutive bezel makes it's unobtrusive for on-land sports — you won't get it snagged on a jersey or jumper. Get that contact point under the OHR too wet and those results will suffer. For better accuracy, Suunto offers an optional

heart rate strap and bicycle sensor for more detailed metrics, but if you're happy to have your phone with you, then you're already reasonably equipped to check your pace, splits and other vital info. With your phone paired, you also have the option to receive notifications, but this isn't a smartwatch.

Suunto has created a fantastic watch for anyone who wants something that will do more than simply track steps. It offers tangible, easy-to-read results and on-the-go metrics on a clear screen, guidance on how hard to push yourself and when. If you're just starting to get into something beyond a walk around the block, the Fitness 3 is a brilliant companion.

■ [PAUL TAYLOR]

SUUNTO FITNESS 3
From \$279
www.suunto.com/en-AU

CRITICAL SPECS
218 x 218 resolution screen; 30m water resistance; battery life up to 5 days; Bluetooth; no GPS; optical heart rate sensor, sleep and activity tracking; white and gold option, plus alternative strap colours; 4.3cm diameter; 36g



Audio-Technica ANC700BT

COMPACT AND CLEAN CANS FOR CASUAL CRUISIN'.

THE TREND TOWARDS minimalist design in wireless headphones has clearly impacted the ANC700BT — their matte grey tidiness is more striking than most of the competition, and the near-complete lack of visible buttons and ports works to enhance this. The only physical button is an innocuous power button next to the micro-USB charging port, and all other controls are handled by three touch zones on the left cup.

While it generally takes us a while to adapt to the behaviour and sensitivity of particular touch controls, the subtly-delineated zones on the ANC700BT made the process even trickier. The swiping gestures that skip or rewind tracks were easy to master, as was holding all three buttons to engage or switch-off Active Noise-Cancelling (ANC), but it was often difficult to accurately tap a single button for volume or play/pause. We found the ANC to be fairly decent, but not top-of-the-line, and it would occasionally glitch out when sitting on bumpy buses or walking at pace.

Audio-Technica brings its well-balanced audio signature to this pair of cans, with a decent sense of space and crystal clear definition. While this frankly flat frequency flavour might be underwhelming for people used to the excited bass and compression of the likes of Beats, it performs admirably and consistently across all genres of music as a result.

If you're after a pair of cans with a significant bump in the bass department, the Plantronics Backbeat Pro 2 will cost you \$50 less, although at the expense of some portability. Otherwise, the ANC700BT present a neat and tidy travelling solution with a price at the lower end of the wireless ANC bracket. ■ [HARRY DOMANSKI]



Ryze Robotics Tello

A GREAT START FOR GRADUATE PILOTS.

SAY HELLO TO the most affordable drone going, and one that threatens to be educational. The Tello has been made in conjunction with master drone manufacturer DJI, the company responsible for the mighty Phantom, the diminutive Spark and winning Mavic Air. Ryze Robotics has handled the software and design, while DJI provides hardware components.

It's a modest setup compared to DJI's work. A 720p camera on the front shoots reasonable video and takes OK pictures, all controlled via your smartphone (or an optional handset for an additional \$49). Flips, rotating shots and a long, rising shot are standard in the app. You'll see a lot of blockiness in the footage, but it's colourful and lively. One small, single flashing light on the front of the Tello gives you an idea of which way the thing is pointing, but keeping track of that can be rather hairy. Fly it outside on a bright day and it's easy to lose orientation and stack it into a shrub. The Tello will cut power if it senses you've lost control, and the lightweight nature combined with a 10m flight ceiling and propeller guards means you won't do too much damage, indoors or in the backyard.

What's unique is that the Tello is primed for teaching people — kids, teens and adults — how to code with Scratch or an SDK. Both are free to download. That's a terrific initiative, and one big reason to buy a Tello. The camera's passable, and while the smartphone controls are functional, you're far better off with something grippy to inspire confidence. Sadly, the Tello misses out on gesture controls, but get to grips with Scratch and you can fly it using your laptop instead. ■ [PAUL TAYLOR]



AUDIO TECHNICA ANC700BT WIRELESS HEADPHONES

\$349
audio-technica.com.au



CRITICAL SPECS

40mm drivers; 5–40,000Hz frequency range; active noise-cancelling; 25 hour battery life for Bluetooth + ANC; touch controls; integrated microphone; Micro-USB charging port; Bluetooth 4.1; Soft carry pouch; 250g



RYZE ROBOTICS TELLO

\$169
www.dji.com



CRITICAL SPECS

Requires Android 4.4 or iOS 9.0 or later device; 13 minutes fly time; 720p video; 10m height restriction; flight distance from source 100m; companion app; 80g



Electrolux PUREi9 robot vacuum

A SLOW LEARNER THAT SHOWS EXCELLENT RESULTS.

ELECTROLUX HAS HIT gold with the design of the PUREi9: not only does the triangular droid get at the hard-to-vacuum corners, a brush that automatically gets oriented towards walls and obstacles picks up the dirt from along room edges. The suspended wheels and proprietary technology 'ClimbForceDrive' lets the little android climb up to 2.2cm, allowing it to cross thresholds easily and, unlike most robot vacuums, the PUREi9 has plenty of suction power to scoop up dust, crumbs, fluff and even bits of gravel in a single pass. And while app control is excellent, albeit limited, its mapping technology is left wanting, especially consider the PUREi9's undeniably hefty price tag.

Although Electrolux has installed 3D Vision (the bot's obstacle avoidance system) which works really well we might add, the PUREi9 doesn't seem to have any logical pattern to its movements, especially when used on carpet floors. Our test unit moved about rooms randomly, often cleaning the same strip of room multiple times before moving on, and it's wont to miss large sections of a home if it's a "complicated multi-room space". Moreover, it has a hard time returning to its charging station to top up its batteries, which it will need to do at least once if you have a large home.

So while we can't fault the hardware, Electrolux has seemingly struggled with the software side of things. Excellent physical cleaning performance and perfect app control is all for naught if a robot vacuum can't drive itself logically, which, in the PUREi9's case, means it can miss large sections of a space or clean some spots repeatedly. We get the feeling the PUREi9 would operate more effectively in small, simple spaces — like a sparsely furnished studio or small home (specifically, one with hard floors). But for a unit that comes with a price tag this high, we'd argue it should do well in multi-room dwellings with wall-to-wall carpets, too. ■

[SHARMISHTA SARKAR]



Dyson Cyclone V10

SAY GOODBYE TO CORDED VACUUMS FOREVER.

IT'S NO SECRET that Dyson's vacuums are 'the business' when it comes to design, portability and performance. With the new Dyson Cyclone V10 cord-free vacuum, the company has taken its flagship product back to the drawing board, and in its wake, has abandoned corded vacuums for good. You can thank Dyson's new V10 digital motor for that — a truly impressive feat of engineering that's capable of 125,000rpm (that's over 2,000 revolutions per second), up from 108,000rpm on the V8. Along with its technological advancements, the Dyson Cyclone V10 sports a number of other improvements — its various sections are positioned in completely different manner to previous V-series models, with a front-facing barrel which now leads directly into the device's expanded cyclone array (with 14 chambers in total), followed by the aforementioned V10 digital motor, which is the smallest and smartest the company has ever engineered.

At the very back end, you'll find the V10's filter, which you can now remove with one simple counter-clockwise twisting motion, making it easier to clean. Once again, Dyson's filter is said to be capable of capturing 99.97% of allergens in the air. With all of the various elements of the vacuum now arranged in an in-line format, the V10 is able to achieve a more direct air-flow path than any of its predecessors, leading to greater suction. Based on our time with the V10, we can say that it's as powerful as any corded vacuum Dyson has released so far. ■

[STEPHEN LAMBRECHTS]



ELECTROLUX PUREi9 ROBOT VACUUM

\$1,699
www.electrolux.com.au

CRITICAL SPECS

21cm-wide brush; 0.7L dustbin; washable filter;
Wi-Fi enabled; 40-minute battery life;
28 x 32.5 x 8.5cm; 2.7kg



DYSON CYCLONE V10

Dyson Cyclone V10 Animal: \$899
Dyson Cyclone V10 Absolute+: \$999
dyson.com.au

CRITICAL SPECS

60 mins battery life (low setting), 40 mins (medium setting),
5 minutes (max setting); bin volume: 0.77L;
LED battery/filter indicator; 25 x 124.9 x 25.9cm; 2.68kg





THE HERO COMES BUNDLED WITH A STURDY PLASTIC FRAME WHICH IS A WORLD AWAY FROM SOME OF THE CHEAP CHINESE RIVALS OUT THERE IN TERMS OF QUALITY.

GoPro Hero

BACK TO BASICS, AND ALL THE BETTER FOR IT.

AS THIS IS GoPro's budget-focused action cam there's no 4K video capture. You get the option to shoot at either Full HD 1080p, or at 1440p, although this does force the camera to shoot in a not very video-friendly 4:3 aspect ratio. While GoPro's pricier models, and some rival cameras from other manufacturers, offer a wide range of frame rates and resolutions, the Hero keeps things simple, with only 30fps or 60fps on offer, and it can't shoot higher frame rates at lower resolutions.

The Hero doesn't get the Hero6 Black's GP1 processor, but there is image stabilisation on board to help keep footage steady. It can capture 10MP JPEG images as well as video, though unlike on the premium GoPro models, there's no RAW file support. The Hero can shoot a burst of 10 files in succession — more than enough for most people — and there's also a timelapse mode, although you're restricted to 0.5-second intervals where you get multiple options on the higher-end models.

Just like the Hero5 and Hero6 Black, the Hero gets a 2.0-inch touchscreen, along with GoPro's handy voice control feature. There are 12 simple voice commands, covering pretty much everything you're likely to want to do with the camera, but you don't get the Wake On Voice function that we saw with the Hero6 Black. Finally, the Hero uses the same 1220mAh battery with USB-C charging that we've seen before.

GoPro has opted to stick with the same design for the Hero as for the Hero5 Black and Hero6 Black, which is great to see as the two high-end models are perhaps the best designed and finished action cameras on the market. The Hero has an understated smooth dark grey finish and feels extremely well made. The Hero is also waterproof (down to 10m) without the need for a housing, which means there's nothing to get in the way of the built-in

microphone, making audio quality that bit better. Should you want to take your Hero deeper underwater, there's an optional Super Suit housing that offers protection down to 60m. The Hero comes bundled with a sturdy plastic frame which is a world away from some of the cheap Chinese rivals out there in terms of quality; the fit is nice and snug, and it's compatible with a huge range of GoPro-compatible camera mounts.

You could be forgiven for thinking that the small 2-inch touchscreen would be awkward to use, but it really isn't that bad. The screen is responsive, with only light swipes and taps required, while the interface is fairly straightforward.

You can transfer images from the microSD card to a computer, while GoPro's QuikStories app enables you to upload images when you're on the move. As well as transferring videos and images via Wi-Fi, the app can be used to adjust all the Hero's settings and hosts an almost-instant live feed, allowing you to position the GoPro Hero remotely and hit record should you wish. You can choose to share shots without editing, but QuikStories can automatically turn footage into a video collage, adding transitions and even music, and the videos are fully editable if you want to make changes.

Shoot in Full HD 1080p and you should get about two hours of battery life from the GoPro Hero at 60fps, while this can be stretched to 2.5 hours if you reduce the frame rate to 30fps — good going for an action camera. While the absence of 4K might seem to put the Hero at a disadvantage compared to some rivals, the quality of its Full HD 1080p footage is very good. We reckon you'd be hard-pushed to notice the difference between it and 4K on a smartphone or tablet screen, with footage appearing nice and smooth when replayed,

although if you're going to be regularly replaying footage on a larger monitor or TV screen, you may want to look for a 4K action camera that offers greater clarity and sharpness.

Colours look good, the built-in image stabilisation works well (within reason) and the exposure seems pretty dependable. That said, GoPro has dropped its ProTune options from the Hero, so you don't get the advanced control over exposure, colour, white balance and sharpness that you do on other GoPros.

The Hero shoots 10MP JPEG stills, although it probably isn't going to trouble your smartphone or compact camera for image quality. The ultra-wide angle of the lens means it's not suited to a lot of subjects (although it's perfect for selfies), while a little too much noise-reduction processing is applied to images, which means detail is compromised.

There are better-specified action cameras out there for a similar price, including ones that offer 4K video, but they don't have the refined design and polished controls of the GoPro Hero. This is a great action camera for the budget-conscious or novice user. ■

[PHIL HALL]

GOPRO HERO
\$299.95
www.gopro.com

CRITICAL SPECS
2-inch touchscreen; 1440p video @ 60fps, 1080p @ 60fps; 10MP images; 32GB SD card; image stabilisation, voice control; USB-C charging port; waterproof to 10m



ASUS ZenBook Flip UX461UA

DOES THIS NEW 2-IN-1 OFFER THE BEST OF BOTH THE TABLET AND LAPTOP WORLDS?

CAST YOUR EYES over today's PC market and you'll largely see a tale of woe, but there's one bright spot among the carnage in the form of 2-in-1s — the only PC category that's still seeing substantial growth, with detachables and convertibles continuing to steal a lot of customers from the shrinking tablet market. From a consumer perspective, we guess it makes some sense to put a bit of extra money into a laptop to gain the ability to also use it as a tablet — and in some cases, that extra spend will also net you a faster SSD, a more powerful CPU or even, in some cases, a dedicated GPU for better gaming chops..

ASUS's latest 2-in-1 convertible, the 1.4kg ZenBook Flip UX461UA, is perhaps not quite as comfortable to use in tablet mode as a detachable or a straight-up slate, but for people who will only use the tablet form occasionally, it does perform adequately enough as a tablet to serve comfortably in both modes. There are caveats, with that 14-inch size meaning it's a little too big to easily hold with one hand (even though it's light for a laptop, it's about double the weight of your average high-powered tablet) and, as with all 2-in-1s that use this folded form factor, it's a little jarring that your supporting-hand has to cling to keyboard keys. The included 1,024 pressure-point stylus and the fully foldable design do make it good as a desktop slate or drawing display, however, which does somewhat help make up for the less-than-ideal handheld tablet experience.

As a laptop, however, the UX461UA looks and feels great, sharing the premium

concentric brushed-metal casing of the broader ZenBook line and keeping its compact form factor at an impressively-slim 1.39cm thickness. There's some clever engineering in the hinge design which folds to give the keyboard face a comfortable typing incline without thickening the overall body design, and although it lacks a built-in Ethernet port (they're just too chunky to fit), just about every other interface you'd want is there, including: a HDMI-out, one Type-C and two Type-A USB 3.1 ports, a microSD Card slot and a 3.5mm headphone socket.

Despite this compact chassis, that foldable facade conceals a proper mobile series Core i7-8550U CPU (or in its cheaper iteration, a Core i5-8250U) from Intel that is thermally serviced by a single, edge-mounted vent at the left of the keyboard. The speedy CPU was accompanied by 16GB of RAM and a 256GB SanDisk M.2 SSD (connected via the SATA 6Gbps interface) on the model we tested. This is a powerful configuration for a nearly tablet-sized setup, and the new 8th-generation Intel CPU showed a 10% performance boost on last year's Toshiba Portégé X20W-D (which runs on a Core i7-7600 CPU with the same amount of RAM) in PCMark 8's Home general-productivity benchmark. Despite those powerful components, the UX461UA manages to last a full 7 hours during video playback tests on balanced power settings, making it a good out-and-about device, too.

While the UX461UA's CPU is a top bit of kit, a growing selection of premium ultrabooks are

beginning to offer dedicated GPUs, so you'll want to be sure that you prefer the tablet features to being able to lightly game, mine cryptocurrency or 3D model anything. There's just an integrated Intel UHD Graphics 620 chip here, which is outperformed by entry-level dedicated GPUs like Nvidia's GTX 1050 by anywhere between 100% and 600% across the suite of 3DMark graphics benchmarks.

Thankfully, the price of the UX461UA is competitive against other current 2-in-1s. It undercuts the similarly-specced HP Spectre x360 convertible by about \$500 on average, and a comparable fully detachable Surface Pro slate will likewise have an RRP of at least \$500 more — and that's for a machine with only 8GB of RAM. If you're looking for a laptop that you'll need to use as a tablet on occasion, then the ZenBook Flip UX461UA is the best value 2-in-1 we've come across. ■

[JOEL BURGESS]

ASUS ZENBOOK FLIP UX461UA
From \$1,698; as tested, \$1,998
www.asus.com/au

CRITICAL SPECS
Windows 10 Home (64-bit); 14-inch LED 10-point touchscreen @ 1,920 x 1,080p resolution; Intel Core i7-8550U; 16GB DDR3 RAM; Intel UHD Graphics 620; 256GB SATA3 M.2 SanDisk SSD; 54Wh LiIon Battery (7 hour video playback); 32.7 x 22.6 x 1.39cm; 1.4kg



THERE'S NO OTHER SNAPPER IN THE SAME CLASS THAT OFFERS A 15X OPTICAL ZOOM AND A 1.0-INCH SENSOR IN A COMPACT BODY.

Panasonic Lumix TZ220

THE MOST ADVANCED TRAVEL ZOOM YOU CAN BUY RIGHT NOW.

PANASONIC IS NO stranger to using a large 1-inch sensor in small travel compacts, but where the TZ110 sports a 10x zoom, the company has squeezed a 15x zoom into the new similarly sized TZ220. This versatile 24–360mm Leica lens gives you the ability to capture anything from sweeping landscapes to close-up portraits. With a larger zoom, however, comes the risk of camera shake, but Panasonic's five-axis Hybrid optical image stabilisation is on hand to reduce unnecessary blur from videos and Power OIS is available for your stills.

The TZ220 boasts Panasonic's Light Speed AF technology, and we found focus speeds to be pretty snappy throughout the zoom range in good light; the AF system will struggle when light levels are really poor, but this isn't unique to the TZ220. The camera isn't really suited to fast-paced action, but its focus tracking will do a solid job for general subjects.

If you're shooting JPEGs, be prepared for images to display signs of detail smoothing as the camera tries to reduce the effects of noise. RAW files are more pleasing at higher sensitivities — while image noise is present, more detail is retained, and you'll ultimately get a better result if you're prepared to process your images.

While the older TZ110 and the new TZ220 are similar in size, Panasonic has made some minor tweaks that go a long way in making

the latter camera a better one. A textured strip in the front along with a thumb rest at the back offers a stronger grip on an otherwise aluminium body.

The controls on the TZ220 are straightforward and are grouped in such a way that you can use the camera one-handed if you wish. There is no control wheel at the back, but each button is clearly marked. The Fn3 button provides access the camera's quick menu, enabling you to adjust common settings such as ISO, metering and white balance without the need to dive into the main menu. The speed of adjustment is helped by the touchscreen interface, as you can tap your desired setting on-screen rather than having to physically select it.

The control ring around the lens facilitates quick adjustments to a variety of settings, depending on the mode you're in. For instance, if you're in aperture priority mode, its default setting is to control the lens aperture. If you prefer, though, you can set it to control other settings, including zoom, exposure compensation and white balance.

Our only gripe is the electronic viewfinder on the TZ220. Compared to the TZ110's 1.17m dot EVF, the TZ220 gets a boost to 2.3m and it's a little larger at 0.21 inches (compared to the older model's 0.2 inches). It also offers better magnification at 0.53x, but using the EVF is tight. It sits flush against the back

of the camera and is still rather small, although the same can be said about any other travel zoom's EVF. You'll find yourself using Live View more, which is good as it boosts the camera's battery life.

The battery in the TZ220 is rated for 350 shots, or 300 if you use the EVF. The camera also features a new eco30fps mode, which reduces the Live View refresh rate and should see the camera good for around 370 shots (if you're using the rear LCD) per charge.

And while it's the most expensive travel camera out there right now, there's no other snapper in the same class that offers a 15x optical zoom and a 1.0-inch sensor in a compact body. ■

[PHIL HALL & SHARMISHTA SARKAR]

PANASONIC LUMIX TZ220
\$1,199
www.panasonic.com/au

CRITICAL SPECS
20.1MP 1-inch MOS sensor; 15x optical zoom; 24–360mm, f/3.3–6.4 lens; 4K video and photo; 3.0-inch 1,240K dot touch display; 10fps continuous shooting; 5-axis Hybrid optical image stabilisation; built-in flash and EVF; Wi-Fi and Bluetooth enabled; 340g with battery and SD card



Cygnett ChargeUp Pro USB-C

ALL THE ON-THE-GO JUICE YOUR GEAR COULD POSSIBLY NEED.

THIS BEEFY 20,000MAh power bank from Cygnett is pitched at tech enthusiasts who need lots of juice while out and about. While it'll technically fit in a small shoulder- or handbag, its biggish footprint and 450g carry weight means it'll make its presence known wherever it goes.

Still, it does deliver when it comes to performance. With Qualcomm Quick Charge 3.0 support, it can juice-up most Android smartphones at top speed — with our Samsung Galaxy S9+, it matched our wall-charger's speed, going from 10% battery to full in around 90 minutes. We squeezed five full recharges (plus around 15%) of our S9+ test unit (which has a 3,500mAh battery) out of the Cygnett before it was drained, and it also managed 4.5 refills on a Nintendo Switch console.

Design-wise, there's not much to it — a matte-rubber finish on the outside makes it feel good in the hand and it's not as 'sticky' as most silicon cases, so it's easy to slip in and out of a bag. There's a discrete bank of five LEDs (four blue, one green) in that black band that wraps around the top — which indicate remaining charge — and three upward facing USB ports, two of which are USB-As (one for up to 12V/1.5A fast-charging and the other for up to 5V/3A regular-speed), plus a USB-C, which is used for recharging the bank itself or providing up to 20V/2.25A (45W) of power for more demanding devices like portable laptops. All three of those ports can be used simultaneously.

Using that latter USB-C port to power a 13-inch MacBook Pro at full screen brightness, we managed to get an impressive 4:30hr runtime — a great result that's around 60% of the 6–7 hour running time we get from the internal battery. It's worth noting that you need to use that USB-C port to power laptops — using USB-A, our MacBook refused to draw further power from the ChargeUp at about 40%. At that battery level, the Cygnett doesn't seem to be able to output the higher voltage needed to keep a running laptop happy.

The only thing we don't like about the ChargeUp is how much time it takes to recharge that 20,000mAh battery. Using the S9+ charger, that took just under 10 hours — although that was cut to just under 4 hours with a higher-powered MacBook charger. ■ [DAN GARDINER]

4½

CYGNETT CHARGEUP PRO USB-C
\$170
www.cygnett.com

CRITICAL SPECS
20,000mAh/74Wh internal li-po battery; QualComm Quick Charge 3.0 compliant; 1 x USB-C input (max 20V/1.5A - 30W) and output (max 20V/2.25A - 45W) port; 2 x USB-A output ports (max 5V/2.1A - 10.5W and 12V/1.5A - 18W); surge protection; 17.1 x 10.2 x 1.5cm; 450g



Sony WF-1000X

DO THESE EARBUDS LIVE UP TO THEIR OVER-EAR COUNTERPARTS?

WHEN IT COMES to over-ear headphones, Sony's WH-1000X cans are one of the best wireless sets on offer, rivalling even Bose's crowd-pleasing QuietComfort QC35s when it comes to audio quality and noise-cancelling. So it's fair to say we had high hopes for these smaller WF-1000Xs, the former set's in-ear counterparts — especially given their sky-high Aussie RRP of \$399.95, which puts them a good \$100 or more above most competitors.

Like many other 'true wireless' sets, they consist of two lightweight buds that come with their own combo charger/storage-case, which helps keep them clean and charged. The buds last around 3 hours per charge, and you can juice-up the case (which holds another two recharges) while you're using the buds.

In the box, Sony has thrown in a generous seven sets of fit tips (four rubber and three foam) alongside three rubber 'supporter' attachments to help keep them in place, which all but ensure you'll be able to get a tight fit. You might not even need those supporters either, as the WF-1000X's are some of the lightest true wireless buds we've tried, weighing just 6.8g a pop. They're not quite the most discrete, visually — they stick out a little more than some others — but their sleek design means their appearance isn't too 'loud' either.

Sonically, they sound good, too — audio's reasonably balanced but definitely tuned from a stronger midrange and bottom-end, although there's still a pleasing amount of apparent detail — and each bud's powered by a 6mm Neodymium dome driver. The noise-cancelling isn't the strongest, however. It'll cut out background aircon droning, but introduces its own constant quiet hiss.

Also disappointing is that there's a half a second delay in transmission between playback device and buds — if you're watching a video or playing a game on your phone or PC, that's enough to get annoying quickly.

Given that price, we'd expect perfection, so with those shortcomings, the WF-1000Xs are hard to justify — especially considering you can find impressive alternatives for under \$250. ■ [DAN GARDINER]

3½

SONY WF-1000X
\$399.95
www.sony.com.au

CRITICAL SPECS
Bluetooth 4.1 and NFC pairing; 6mm Neodymium closed dynamic dome drivers; 7 sets of fit tips + 3 sets of supporters; 20–20,000Hz frequency response; active noise cancelling; 3 hours battery life for buds per charge; carry/charge case with two additional charges with 2 hour charge time; 103 x 42.6 x 24.5mm; 70g (6.8g per bud)

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2018's best TVs

LOOKING FOR THE BEST PICTURE BUT CONFUSED BY THE HDR OLED 4K QLED JARGON? WE'RE HERE TO HELP WITH THIS ROUNDUP OF THE BEST SETS GOING.

[BENNETT RING]

IT'S BEEN EXACTLY 12 months since *TechLife* last sat back on the couch to gaze at the latest and greatest in TVs, so now is the perfect time to zap some microwave popcorn, grab the remote and do it all again. With most of the major manufacturers recently releasing their latest ranges, we've grabbed six of the best TVs from these brands, as well as taking a look at their overall range for the year.

If you're expecting a revolution like the introduction of 3D, we're sorry to disappoint, because 2018's TV tech is more of an evolution than a huge leap forward. Two panel technologies in particular are now fighting it out to be the king of the hill — OLED versus QLED. While OLED is better at pitch-perfect blacks, as each pixel can be totally deactivated,

QLED offers greater brightness, at up to twice the level of OLED in some cases.

The real news is the rapid adoption of High Dynamic Range, or HDR, panels. These offer a much more appreciable improvement in quality than 4K resolution, as they can duplicate a much vaster range of colours than non-HDR TVs. Colours are now true to life, with images that pop.

There's just one problem — a massive lack of content. But as with all new TV technologies, we need the tech to become ubiquitous before content creators start making the most of it.

And slowly but surely, the catalogue of 4K HDR content is starting to trickle out, both in the streaming world and on Ultra HD Blu-ray disks. Unfortunately, HDR is starting to get

rather confusing, initially starting with two variants (HDR10 and Dolby Vision) but now encompassing five different types. Along with the original two, we now have HDR10+, HLG and Advanced HDR by Technicolor, all of which have slightly different requirements. And some manufacturers are using the term 'HDR' when their sets aren't actually HDR approved, as you'll see in our run-down (and we'll tackle that when it arises).

In the meantime, sit back and relax as we reveal our couch potato's guide to 2018.



Hisense 55P7

THREE NEW SCREENS TO CATER FOR THE WHOLE MARKET.

FORMERLY KNOWN AS a maker of models focused at the entry-level, Hisense continues to go from strength to strength in 2018, and is now offering screens for the premium market. In April the company unveiled its new range TVs, with three different tiers of TVs targeted at different price brackets.

At the top of the chain is the Series 9, which differs from the other sets thanks to the inclusion of its 'Prime Array Backlight' system. This range starts at \$4,499 for the 65-inch screen. All of the TVs across the ranges are based on ULED technology, which is similar to LED TVs in that it requires a backlight. However, this causes issues with dark colours, as there is light bleed between the backlight panels. The solution to this is to make these light panels smaller, and the Series 9 has over 1,000 dimming zones that do so.

The more affordable Series 8 starts at \$3,699 for the 65-inch screen, while the Series 7 starts at just \$1,499. Both of these ranges cut back on the number of light panels, making them more affordable, but decreasing their ability to pump out rich blacks.

The Series 9 is also the only one in the range to be Ultra HD Premium certified, which means that each of these TVs is fully 4K resolution, supports 10-bit colour depth, meets the BT.2020 colour space representation,

and is also HDR certified. Finally, they must be able to produce blacks that are less than 0.05 nits and whites that are greater than 1,000 nits. In fact, Hisense claims the Series 9 can pump out an astonishing 2,500 nits of brightness, which it calls HDR Supreme, making it one of the brightest panels available.

Dropping down to the Series 8, and we see that, instead of having HDR Supreme, this range uses the more commonly available HDR Plus technology. This still means it's amazing at colour reproduction, but it's not as bright.

Finally, there's the Series 7, which doesn't appear to have the Quantum dot technology used by the other two series, again lowering the colour accuracy. We tested out the Series 7 55-inch, also more formerly known as the 55P7, and were very impressed at the image quality considering the price point, at just \$1,999. It's not in the same league as the likes of the OLED and QLED sets, but it's also half the price.

Like all of the Hisense ranges, the 55P7 is very thin, at just 52mm at its deepest point. With support for HDR Plus, our demo disk displayed images that popped, though it didn't have black levels as rich as OLED TVs.

Like all of Hisense's new TVs, it uses the VIDAAU 2.5 Smart TV OS, which is custom designed for Hisense TVs. It can be controlled

via your smartphone, and you can cast video and pictures directly from your phone without the need for a Chromecast. Support for every major streaming app is included, though we did find that the linear scrolling layout of the menu is more time consuming than a layered menu approach. It's also one of the few ranges that doesn't support voice recognition, though this doesn't always work with other TVs.

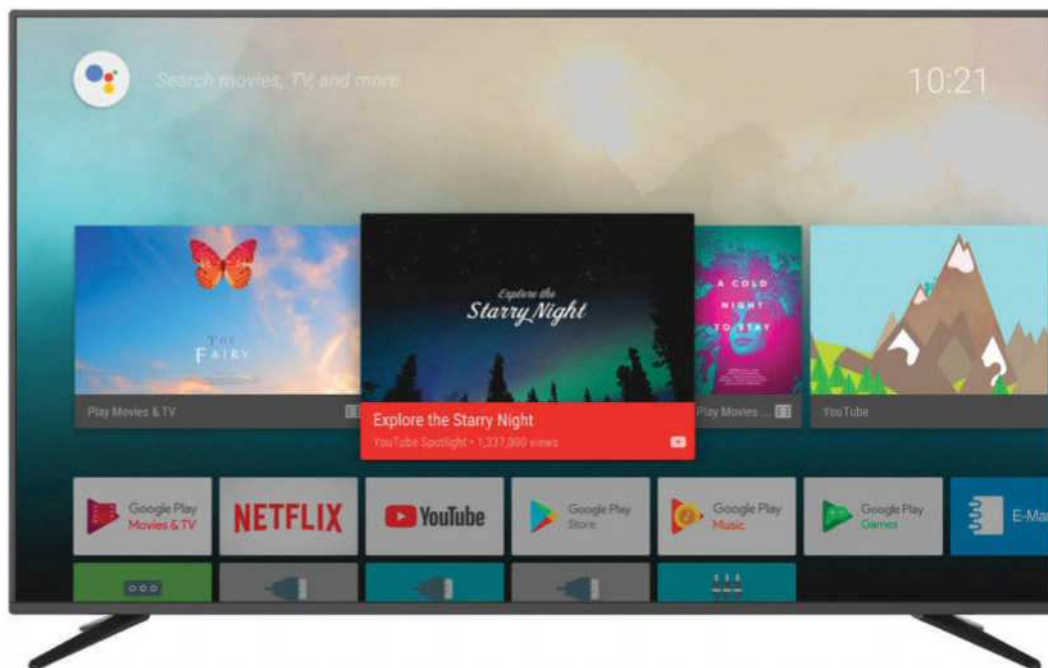
Overall, we were very impressed with the 55P7 considering its excellent price. In the past, we'd expect to pay double for this level of colour accuracy and brightness, and we can't wait to see how Hisense's upcoming OLED range will improve their quality even more.

4

IMAGE QUALITY VALUE FOR MONEY

HISENSE 55P7
\$1,999
hisense.com.au

CRITICAL SPECS
55-inch UHD
3,840 x 2,160 screen;
VIDAAU 2.5 Smart TV OS; 4x HDMI outputs, USB 3.0,
USB 2.0, Ethernet port, Wi-Fi 2.4/5GHz; 123 x 79 x 22.3cm



Kogan 58" SmarterTV

FOCUSING ON BANG FOR BUCK RATHER THAN DAZZLING VISUALS.

RATHER THAN FOCUS on improving image quality, it seems that Kogan's approach to TVs in 2018 is delving back to its roots of delivering big-screen TVs at an exceptionally low price. That's not to say it's not making improvements elsewhere, with the company recently unveiling its new SmarterTV range.

Available in both 50-inch and 58-inch sizes, these affordable sets focus on their inclusion of Google software and Android TV operating system. From the moment we turned on our 58-inch Kogan Series 9, which retails for a mere \$949, it was as if we were setting up an Android phone. In fact, it synced to our Android phone during the setup process; all you have to do is ensure they're both on the same home network, and you can seamlessly integrate your Google account onto the TV.

This means that it has built-in support for the Google Play application, which in turn gives it arguably the widest range of applications available for any TV in this price range. You can even control Google via your voice with the microphone built into the remote, though we found the accuracy to be flaky at best.

According to the CEO of Kogan, Ruslan Kogan, it's possible to simply say, "OK Google, play *Stranger Things* through Netflix on the TV" and it will do its thing. Unfortunately,

we couldn't get this to work most of the time, with the microphone often confusing what we were saying, or not registering anything at all.

Both of the new SmarterTVs are 4K resolution, and Kogan claims they have HDR support. However, during our image quality tests, we found the image to be very washed out, as it's based on older LED technology. Kogan says it's HDR10 compliant, but it certainly didn't meet the minimum required specifications for HDR compliance when measured with our colorimeter.

Compared to OLED TVs, which have basically infinite contrast ratios, the measured contrast ratio of 1,335:1 is very low-fi, and we could see obvious banding in colours. It's also not very bright, measuring just 290 nits. One nice touch though is the inclusion of Chromecast technology, so you don't need to buy one to stream to the TV, and it's included in both versions of the set.

The catch-up TV feature is also excellent, as each major channel's catch-up service is integrated into the Electronic Program Guide. With so many of today's TVs now adopting an ultra-thin chassis, the Kogan's chunky depth also betrays its budget pricing. However, from the front, it looks very slick thanks to the extremely thin bezel.

While we love the new Smarter TV Android operating system and Google integration, the image quality of this range leaves something to be desired. But you pay for what you get, and at less than one thousand dollars for a 58-inch 4K screen, there's no denying that this is solid value as an entry level big-screen TV.

IMAGE QUALITY
VALUE FOR MONEY

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KOGAN 58" SMARTERTV

\$949
www.kogan.com/au

CRITICAL SPECS

4K 3,840 x 2,160 screen;
Wi-Fi, Ethernet, Bluetooth;
Android TV OS, feat Google Assistant; inbuilt Chromecast,
streaming and catch-up TV apps; 3 x HDMI, 2 x USB



LG OLED65C8PTA

THE MASTERS OF OLED ARE STILL AHEAD OF THE PACK.

IT'S WELL KNOWN that LG is the king of OLED technology, the panel type of choice for many AV enthusiasts, as they've been supported longer than every other TV company on the market. In fact, most OLED TVs under other brands, such as the Sony reviewed later, actually use LG OLED panels, though the hardware powering the panels is different. This year is no different for LG, with its aim to deliver ever thinner OLED panels with class-leading image quality at the top of their range, with more affordable technologies further down the stack.

LG has broken its 2018 range into three categories — OLED, SUPER UHD and 4K UHD. Obviously, the first in the range is based on superior OLED panel technology, and this year's sees an upgrade to the processor used to power the screen. The Alpha 9 intelligent processor is a significant improvement on prior chips, delivering some of the finest images we've ever witnessed. Fully Dolby Vision compliant, the contrast ratio on the 65-inch LG C8 OLED that we tested was simply too high for our colorimeter to accurately measure, while blacks registered as exactly 0 nits. Detail in dark areas was much improved on prior OLEDs we've tested as well.

There is now support for high framerate video up to 120fps, as well as being one of the

very few sets to support the new Hybrid Log Gamma (HLG) standard. Setting the frame interpolation too high still resulted in the soap-opera effect, but at lower values, it definitely improved the smoothness of panning shots and motion. Thanks to the way OLED screens are built, it's also impossibly thin, though the base does blow out to 4.7cm.

The SUPER UHD range is based on LG's Nano Cell technology, which is based on IPS technology but uses an improved backlight technology called Full Array Dimming. It's similar in concept to the Hisense backlight array, in that there are more lighting zones, helping to stop light bleed, as well as improving contrast performance. The use of IPS technology allows for wider viewing angles, as seen on most of today's high-end laptop displays.

TVs in the SUPER UHD range use the Alpha 7 chip, which also supports full Dolby Vision HDR and is also 4K. Finally, there is the entry-level 4K UHD range, which also supports HDR and HLG, and starts at just \$1,549 for the 43-inch model. These use an LED/LCD screen to keep costs low, so there is obviously going to be a trade-off in image quality here.

Voice control is included across the range thanks to the AI ThinQ controls, while the C8

we tested had the same gesture-controlled remote as seen previously. It's not the easiest remote to use, but support for every streaming service is included or downloadable, thanks to the LG Smart TV webOS. Strangely our set wouldn't connect to our network via Ethernet, but worked perfectly over Wi-Fi.

If you're serious about your viewing addiction, LG's premium range is hard to beat, but you're going to have to pay for the privilege. And while they're still the masters of OLED, the rest of the field is slowly catching up, so LG is will have to continue to improve wherever possible to maintain its lead.

4 1/2

IMAGE QUALITY
VALUE FOR MONEY

LG OLED65C8PTA
\$6,399
www.lg.com/au

CRITICAL SPECS
65-inch OLED @ 3,840 x 2,160-pixels; LG Smart TV webOS and ThinQ AI; 4 x HDMI; 3 x USB; 144.9 x 83.1 x 4.7cm



Samsung QA65Q9FAMWXXY

STUBBORNLY HANGING ON TO THE Q, BUT WITH BRIGHT RESULTS.

ONCE AGAIN SAMSUNG is flying in the face of convention, sticking with its proprietary QLED technology to offer stiff competition to OLED, while other manufacturers slowly make the move to OLED. Like LG, Samsung has broken its 2018 range into three main lines — the top-end QLED, mid-range Premium UHD and finally its UHD range.

We sourced the stunning Samsung 65-inch QLED Q9F for our tests, and it's easy to see why Samsung doesn't feel threatened by OLED. For starters, QLED delivers much brighter images than OLED (up to 2,000 nits), but in the past it suffered from having edge-mounted backlights. This year sees the introduction of Full Array Local Dimming, allowing for much more precise control of the backlighting. We've seen similar technology to this across most of the LED based TVs released in 2018, but it seems Samsung really has mastered it, with almost perfect screen uniformity and intense blacks, if not quite as dark as OLED. However, the benefit is arguably the best HDR viewing we've seen on our demo disk, with the additional brightness really allowing the full colour gamut to shine. It has full certification for HDR10+ and HLG, though doesn't have Dolby Vision certification (yet). The quantum used in the panel will not age over time, unlike OLED's organic-based

pixels, and this probably explains why Samsung has slapped a huge 10-year 'No Burn' warranty on this set. Later in the year, Samsung is going to roll out an update that will allow for variable framerates tied to the source, allowing gamers to tinker.

Like the LG set, this screen is incredibly thin, and now includes a unique ambient mode, which turns the set into a giant digital picture frame, yet uses a fraction of the power of the TV when it's turned on. It's even possible to upload an image of the wall behind the TV, so that it blends into the background when not in use, with only the thin bezel giving it away. Samsung's invisible 'one clear connection' cable has returned, which connects to another box you can hide away that has all of the TV's inputs, removing cable clutter entirely despite the thin stand.

The Premium UHD range includes the NU8500 and NU8000 models, and both retain the HDR10+ certification. Unlike other LCD-based TVs in this price range, both are based on edge-lit backlighting, a surprising decision given the move to array-based lighting elsewhere. We haven't seen these sets in action, though it's likely they'll suffer from more light-bleeding as a result.

At the entry level, Samsung's UHD range is a relatively basic 4K LED TV, as it does not

support any of the official HDR standards, instead using Samsung's 'PurColor' tech (like Kogan, though, Samsung does say it is an HDR set in the specs). Given the huge volume of official HDR TVs on the market, this is quite surprising, though it's priced accordingly.

When it comes to smart features, the higher range is compatible with Samsung's Smart Things platform, allowing you to control and monitor SmartThing-enabled devices via the TV. We're not huge fans of the Tizen OS, though it does offer all of the major streaming and catch-up services.

OLED finally has a real challenger on its hands, especially with HDR's benefit of increased brightness.

4 1/2

IMAGE QUALITY VALUE FOR MONEY

SAMSUNG QA65Q9FAMWXXY
\$5,899
www.samsung.com/au

CRITICAL SPECS
64.5-inch 4K Ultra HD QLED, 3,840 x 2,160 screen
Tizen OS; Wi-Fi, Bluetooth, Ethernet;
4 x HDMI, 3 x USB; 145 x 82.8 x 2.5cm



Sony KD-65A1

NOT NEW ON SHELF, BUT STILL STANDING OUT.

IN THE PAST, it may have been a trepid passenger, but in 2018, Sony is all aboard the OLED train. Its top-of-the-line models will all feature OLED panels, reputedly supplied by LG, but with different electronics powering the panels. At the top of the food chain is the A8F OLED series, which has some extremely interesting technologies.

Sony is using the 4K HDR picture processor-X1 Extreme to push all those OLED pixels, and it features object-based recognition to tailor the colours for each item on the screen. It also uses features Super Bit Mapping 4K HDR and Dual database processing, two other technologies both developed to deliver even better HDR performance. We should point out that this chip isn't exactly new, with it being released back in 2016. They do have a new processor in the works, in the form of the Sony X1 Ultimate, which is apparently twice as powerful as the current chip.

More interesting is the continued use of Sony's brilliant 'Acoustic Surface' technology, which basically turns the entire screen into one giant speaker. We haven't mentioned audio quality on the other sets as we believe you're going to buy a soundbar or dedicated sound system if you're buying one of these screens, but you may not need to with the Sony. The audio quality is far better than

expected considering it's pumping audio through the screen itself, though bass is handled by a standalone subwoofer.

We weren't able to get hold of this year's TVs, but were able to take the 65-inch A1 OLED (KD-65A1) for a test spin, which is very similar to this year's model. To say we were impressed is an understatement. It matched the LG panel in our image quality tests, so we're sure that this year's updated range will be even better. Especially noticeable was the detail in darker areas, where OLED sometimes suffers due to the fact that it's so damned dark. The incredible design is a sight to behold, looking more like a picture frame than a TV.

The new range is obviously fully HDR-compliant, with support for HDR10, HLG and Dolby Vision. Like the KD-65A1, the new range is based on the Android TV OS, which means it has support for every major streaming service in Australia. We did find the remote to be a bit cumbersome and cluttered, though. Thankfully, this year's range will be updated with Voice Search and Google Play; here's hoping it works better than the Kogan we tried.

If you don't have almost six grand to blow on a TV, the company is also releasing two new ranges of 4K HDR LED TVs in the

X9000F Series and X85F. Both feature the same Android TV OS, voice search and Google Play functionality, but have been downgraded to LED screens using Sony's Triluminos Display technology to extract the maximum performance.

One thing to note here, though, is that, should you choose to stand this TV up on a media unit rather than wall-mount it, you will have to account for a full 34cm of depth.

We can't wait to see what Sony delivers with the A8F series; if it can out-do last year's A1 series, then Sony will be the company to beat in 2018 when it comes to premium TVs.

4 1/2

IMAGE QUALITY ●●●●●
VALUE FOR MONEY ●●●●●

SONY KD-65A1 OLED
\$5,698
www.sony.com.au

CRITICAL SPECS
65-inch OLED @
3,840 x 2,160-pixels; Android TV OS;
4 x HDMI, 3 x USB; 83.4 x 145.1 x 33.9cm (width with stand)



TCL 55C6US

A BUDGET TV COMPANY SHOOTS FOR THE PREMIUM TIER.

LAST BUT NOT least, we have TCL, a company that is much like Hisense in that it first came to our attention as a more economical brand, but that now offers extremely high-end sets in the Australian market. 2018 sees a huge range of new sets from the company, ranging in price from a stratospheric \$19,999 all the way down to \$269 for their tiniest sets.

The king of the range is the new flagship X range, with the 85-inch X6 retailing for 20 grand. It's based on Quantum Dot technology that Samsung and Hisense use, and initial reports are that this is a breathtaking wall-stretcher. Helping a little to take the sting out of the price is the fact it comes with a 12-channel Harman Kardon sound system. With a slightly less eye watering price, the X4 set comes in both 65- and 55-inch sizes, and uses the same QLED tech. All of the X Series have support for HDR Premium 800, which is a new term for HDR we haven't heard before. They all run on Android TV, which is rapidly becoming the OS of choice for Smart TVs, which means they'll run all of the streaming services on the market.

Next in the range is the mid-market C6 QUHD series, and we reviewed the TCL C6 55-incher. Though the tech specs are rather light on detail, it appears to use an IPS-style

LED display, as it has the same 178° viewing angle of all IPS screens. At \$1,699, we were very impressed with the image quality. While it obviously didn't have the rich blacks and incredible contrast of OLED, or the blinding brightness of QLED, the colour accuracy is excellent. This is largely thanks to its official support for HDR10, and we were amazed at how thin this screen is, measuring a mere 7mm at its thinnest point. That's astonishing for an LED-based technology.

Surprise, surprise: this is another TV using Android TV in combination with Google's Play store, offering access to a massive amount of applications, including every streaming and catch-up service commonly used by Australians. Finally, it appears that the entire market now offers support for every app available Down Under. Voice search is included, and we had much better luck using it on the C6 than Kogan's offering.

There are several more ranges featured this year, with the P6 being the next rung down the ladder after the C6 range. It has HDR Premium, which appears to be a custom version of HDR created by TCL, and not an official standard approved by industry groups.

Those on the tightest of budgets will be most interested in the S6500 Full HD Smart TV series, which drop 4K support for 1080p,

and will be priced at \$999. Considering Kogan is offering 4K TVs at this price, we're not sure how well TCL's lowest tier offerings will go.

We're itching to see the X series in action to see how it compares to Samsung's fantastic revamp of the tech this year, thanks to improved backlighting, but until then we'll have to settle for the C6. And we're quite happy to, as this range offers excellent image quality considering the price, making them a great option for those who want a quality experience without blowing the bank.

4

IMAGE QUALITY
VALUE FOR MONEY

TCL 55C6US
\$1,699
www.tclelectronics.com.au

CRITICAL SPECS
55-inch LED @ 3,840 x 2,160;
HDR Premium; Android TV OS;
built-in Chromecast; Wi-Fi; Bluetooth;
3 x HDMI; 1 x USB 3.0; 125.4 x 80.6 x 31.9cm



[POP THAT CORN]

Best in class TVs

WHETHER YOUR BUDGET IS NEAR LIMITLESS OR REQUIRES A MORE MODEST APPROACH, WE FIND THE BEST SET FOR YOUR MONEY.

BUDGET TV

SAMSUNG UA43NU7100WXXY
Price: \$1,199

At only a couple of hundred dollars more than Kogan's 55-incher, the leap in image quality on Samsung's new NU7100 series is hard to miss. While both claim to have HDR10 support, the colour quality on Samsung's budget range is measurably superior, to both the trained eye and expert measurement devices. Sure, you're sacrificing quite a bit of size to get this additional image quality, but it's worth it once you've seen just how nice video looks on such an affordable set. Despite the low price, it's actually fully 4K, and uses UHD Dimming to carve up the backlight into smaller areas. Connectivity and Smart features are also top-notch, making this our budget-bargain for the year.



MAINSTREAM TV

HISENSE 55P7
Price: \$1,999

It might rely on LCD technology, but that hasn't stopped this value-packed screen from delivering some of the best image quality you'll find below three grand. It appears Hisense has pushed LCD technology to its limits, using its proprietary 'Elite Backlight' system to break the backlight up into hundreds of discrete zones. It's fully HDR10-compliant, and while it couldn't keep up with the likes of QLED or OLED, we were still incredibly impressed with the colour accuracy. We were especially surprised by the black performance, an area where this panel technology usually lags, with rich blacks that didn't lose detail. The fact that it's got built-in support for streaming from your smartphone means there is no need for a Chromecast or other streaming device, though the VIDAAU 2.5 Smart TV OS isn't quite the best on the market. Still, at this price, we can happily live with a few small compromises when the image quality is this good.

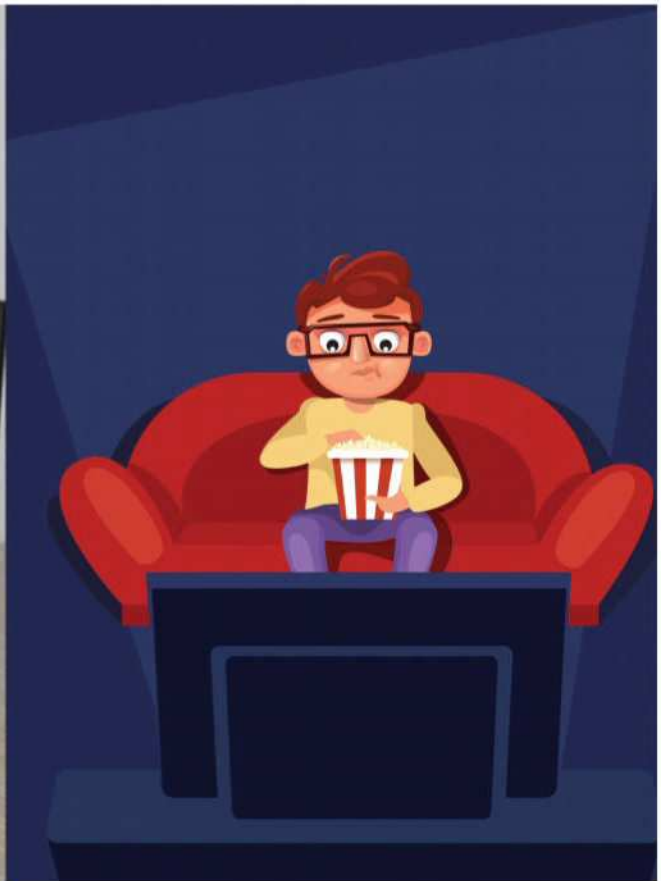


PREMIUM TVs

LG C8 OLED family
Price: 77-inch: \$14,999; 65-inch: \$6,399; 55-inch: \$4,099

It was a close call between LG's new C8 range and Samsung's Q9F for this one, but LG's added years of expertise with the OLED tech compared to Samsung's relatively new QLED panels gives it the slight edge in image quality. There is a caveat, though; if you're going to use this in a very brightly lit room, we'd suggest the Samsung instead, as it's much brighter than the OLED panel used in the C8. However, most movie-lovers who are spending this kind of money may have dedicated, darkened theatre rooms, where OLED's one weakness isn't really apparent. One thing we found to our disliking, though, was the huge leap in price between a 65- and 77-inch screen, at more than double the price. It simply doesn't make sense given the relatively slight increase in size. As expected for a premium screen, it supports all of the most advanced image technologies, and the interface is a delight to use, once you get used to the slightly wobbly gesture-controlled remote.





ULTRA HIGH-END TV

TCL 85X6US
Price: \$19,999

Based on the same technology that powers Samsung's beautiful Q9F (QLED), the X6 takes big-screen viewing to the next level. At a whopping 85 inches across the diagonal, this rivals the screen size of a projector. The Quantum Dot technology means it's able to produce incredibly precise colours, while the array backlighting means it's much brighter than competing OLED technology, yet doesn't suffer from the light bleed of edge-lit displays. TCL calls the HDR support HDR Premium 1200, which is apparently the highest colour depth available on HDR TVs today. It also comes with HLG support, and Dolby Atmos. A 12-channel Harman Kardon sound system comes with the set, helping to lessen the blow on your wallet. Like most of today's Smart TVs, TCL has smartly used the Android TV operating system. It's also fully FreeView Plus-certified, integrating Australia's catch-up TV services into the electronic programme guide. If you've got the money to spare and want the absolute best and biggest in class, the X6 is the beast for you.



BUT AT WHAT COST?

WHAT TO KEEP IN MIND WHILE WEIGHING UP THE SIZE OF A SCREEN VS THE HIT TO YOUR WALLET.

It's easy to find a 50-inch screen for around \$1,000 these days, but the compromise in image quality is hard to miss once you've looked at other TVs. Surprisingly, features such as Android TV and Smart TV application support doesn't really suffer when you're at the budget end of town, as these are mainly software driven, and thus cheap to implement. However, using these smart features will generally be more sluggish, as the chips inside these TVs are nowhere near as powerful as more expensive sets.

You'll also find that HDR support is very confusing in budget price ranges. While most manufacturers claim their sets support HDR, they often use their own terminology rather than the industry standards, suggesting it's more of a marketing ploy than an actual specification. And even when they do claim support for one of the five official HDR standards, actual real-world performance shows that they don't live up to the claims.

One final thing you'll notice with budget boxes is their appetite for electricity. Because they tend to rely on older panel technology, they'll guzzle the joules like a marathon runner chugging a Gatorade at the end of a race. It's easy to see this when you're in store, as most TVs have an Energy Star sticker on one of the corners. You'll notice that budget sets over 50 inches in size tend to score around the two to three star range, while newer, more advanced TVs get four or more, even if they're considerably larger. ■



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**ACCESS
ALL
AREAS**

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EVASDE INTERNET BLOCKS & TRACKERS

THE EXPERT GUIDE TO BREAKING GEOBARRIERS

*** VPNs REVIEWED & COMPARED * NEVER BE RESTRICTED AGAIN**

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THIS FREE WINDOWS VPN STOPS PEOPLE TRACKING YOU ONLINE AND STEALING LOGIN DETAILS.

[SUPERGUIDE]

Breaking through internet barriers

THE COMPREHENSIVE GUIDE TO BUSTING INTERNET BLOCKS, INCLUDING SITE RESTRICTIONS AND GEOBLOCKING.

[NATHAN TAYLOR]

SO YOU LIKE your internet unfiltered, with access to the full array of services and sites without any censors or geoblocks getting in the way. You'd like to be able to watch the BBC online, access Hulu or Netflix US and visit sites that would otherwise be restricted. This is the guide for you.

We're going to be looking at various ways you can get around different types of restrictions on all your devices. In particular, we'll walk through the four most common ways you can access an unrestricted internet.

FOUR WAYS TO GET AROUND BLOCKS

Before we get into specific techniques,

we should talk at a high level about these different solutions, and what they're good (and not so good) for.

DNS

The domain name service (DNS) is like the White Pages of the internet. It takes human-readable URLs like **techlife.net** and translates them into IP addresses.

As noted in the sidebar 'How Australian ISPs block websites' (opposite), ISPs have begun using the trick of modifying their DNS servers so that certain sites can't be looked up — kind of like ripping their entries out of the White Pages. The sites are still there, and still

accessible, but your computer won't be able to look up their IP address.

Well, it won't be able to unless you make a single, simple modification to your internet settings. If your ISP's directory has been modified, then just use somebody else's. For most people, that somebody else is Google, which runs its own (very fast) DNS servers. The address of that server is 8.8.8.8 (8.8.4.4 for the secondary) and you just need to modify your DNS server address to that to get unrestricted access.

In lieu of Google, some people prefer to use OpenDNS (opendns.com) at 208.67.222.222/208.67.220.220.

WHAT EACH SOLUTION IS GOOD FOR (AT A GLANCE)

	CAN IT DEFEAT ISP SITE BLOCKS?	CAN IT DEFEAT GEOBLOCKS?	CAN IT DEFEAT LOCAL BLOCKS (SCHOOLS, WORKPLACES, ETC)?
Using a public DNS service such as Google DNS	Yes	No	Not likely.
Using a VPN	Yes	Yes	Yes
Using Tor	Yes	Yes (but probably too slow for streaming media)	Yes
Using a web-based proxy	Yes	Yes (but most public free ones will be too slow for streaming media)	Yes
Using an HTTP/SOCKS proxy	Yes	Yes (but most public free ones will be too slow for streaming media)	Yes

IF YOUR ISP'S DIRECTORY HAS BEEN MODIFIED, THEN JUST USE SOMEBODY ELSE'S. FOR MOST PEOPLE, THAT SOMEBODY ELSE IS GOOGLE, WHICH RUNS ITS OWN (VERY FAST) DNS SERVERS.

ACCESS TO WEBSITE DISABLED

You have attempted to obtain access to a particular website. This page notifies you that access to that website has been disabled because the Federal Court of Australia has determined that the website infringes, or facilitates the infringement of, copyright.



Internode's blocked splash page.

HOW AUSTRALIAN ISPs BLOCK WEBSITES

WHEN THE COPYRIGHT AMENDMENT (ONLINE INFRINGEMENT) BILL WAS PASSED IN 2015, IT OPENED THE DOOR FOR COPYRIGHT HOLDERS TO PETITION THE FEDERAL GOVERNMENT TO HAVE INFRINGING WEBSITES BLOCKED.

And that has happened: a parcel of sites including The Pirate Bay, Torrentz, TorrentHound, IsoHunt, SolarMovie, Putlocker, Watch TV Series, Vumoo and a number of others have been added to the ban list, with ISPs now being required by law to block them.

The bill, however, did not specify how the ISPs were to implement the blocks. Right now, most (including Telstra, Optus and TPG) are using DNS poisoning, modifying their DNS servers so that, when your browser requests the IP address of one of those sites, it is instead given the IP address of a "site blocked" splash page. That means, to defeat the blocks, you only need to change your DNS server address — one of the easiest fixes available.



VPN

VPN services are a catch-all solution for hiding your activity from snooping ISPs and for hiding your country of origin from media services.

When you connect to a VPN, an encrypted tunnel is created between you and a server run by the VPN provider. All your data is sent along that tunnel, and the VPN provider then relays it to its destination. This has two effects: your ISP can only see that you're communicating with the VPN provider and no-one else; and all your traffic appears to come from the VPN server, so that sites you visit will think you're visiting from the same country that the VPN server is in. If the VPN server is in the US, your traffic appears to come from the US, bypassing geoblocks.

For most people, VPNs serve as the all-in-one solution for getting around site restrictions.

Tor

Tor, formerly known as The Onion Router, is an anonymising network that sits on top of the regular internet. Like a VPN, it allows you

to route through other parties, obscuring both your source IP address from sites you visit and your destination IP address from your ISP.

Unlike a VPN, however, you're not routing through a fixed server. You're routing through other Tor users. Your traffic will bounce between at least three other Tor users on its way to its destination (the traffic is encrypted, so they can't read it) completely obscuring its origin.

Tor represents pretty much the ultimate in internet freedom. It works around every restriction and can unlock any site, and there's nobody that can monitor your activity online. There are even Tor-specific sites called Tor hidden services, accessible only to Tor users.

Although it's great at working around content blocks, it's not great for media. All that data bouncing around results in lowest-common-denominator speeds, so you're not going to be able to stream Netflix with it, for example.

Proxy

A proxy server works much like a VPN above, allowing you to route through an intermediary (the proxy), which obscures your destination from your ISP/network provider (they can only see you connecting with the proxy server), as well as your country of origin from the destination website. They're most commonly used as a simple and easy way to get around work and school website restrictions, but can also be used to fool ISP blocks.

In general, there are two types of proxies that you might use. The most common type of proxy is the web-based one. These are simply web pages that you visit, give them a URL, and they will relay the page to you (usually in a browser frame). People often use Google Translate as a web-based proxy, but if you want a dedicated proxy page you can try www.filterbypass.me, newipnow.com and proxy.org, the last of which has a list of web proxy services.

Alternatively, there are the true HTTP/SOCKS proxies. This is where you go into your internet settings and modify the proxy settings, so that all your browser traffic flows through the proxy. You can find a list of some of the available free and open servers at www.xroxy.com/proxylist.htm, though these tend to be very, very slow. There are also commercial anonymous proxy services available, sometimes in conjunction with VPN services and sometime standalone (such as TorGuard's Anonymous Proxy). Only the commercial ones really stand a chance at being fast enough for media streaming.

[SUPERGUIDE]

How to bypass geoblocks on your PC

PCS AND MACS NATURALLY GIVE YOU THE MOST FLEXIBILITY WHEN IT COMES TO BYPASSING BLOCKADES. ALL THE OPTIONS ARE AVAILABLE TO YOU.

CHANGING YOUR PC'S DNS

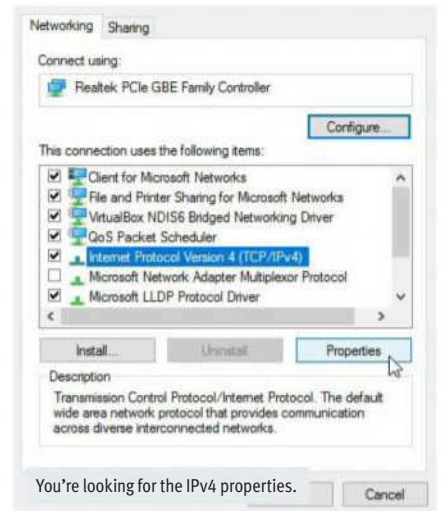
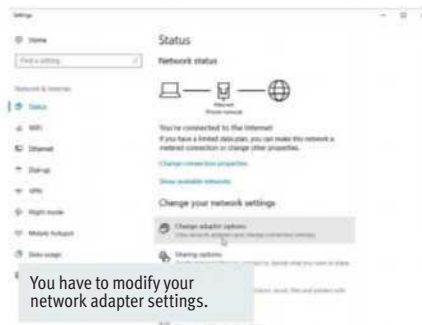
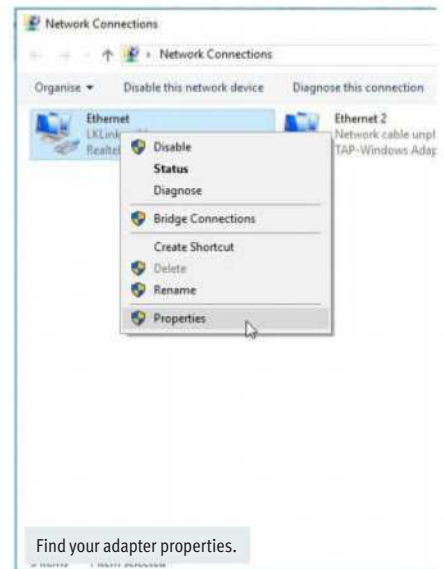
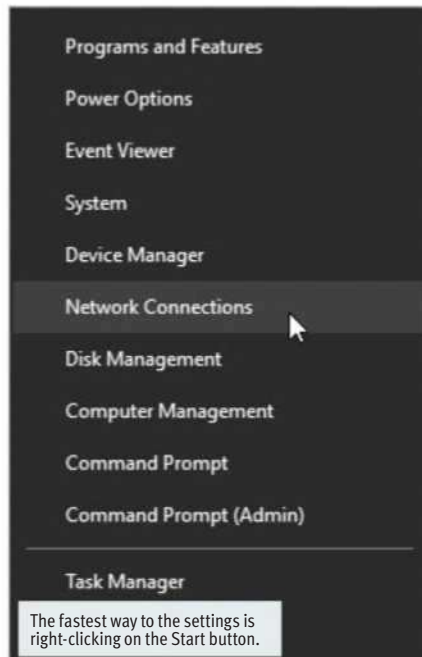
If you'd just like to be able to access the sites that might be restricted by your ISP, the simplest thing to do is change your PC's DNS server. All you need to do is find your computer's DNS settings and enter a new DNS number.

ON WINDOWS, JUST FOLLOW THESE STEPS:

- * Right click on the Start button and select Network Connections.
- * Click on 'Change Adapter Options'.
- * Right click on your network adapter (whichever one you're currently using, Ethernet or wireless) and select properties.
- * Find 'Internet Protocol Version 4' (TCP/IPv4) in the list and left click on it to select it. Then click Properties.
- * Switch the radio button to 'Use the following DNS server addresses:' and enter 8.8.8.8 in the preferred DNS server field and 8.8.4.4 in the alternative DNS server field. Click OK and you're done.

ON MAC OSX, THE PROCESS IS THUS:

- * In System Preferences, click on Network.
- * Click on the first item on the list (which is the network you're currently connect to) to select it, then click on Advanced.
- * Click on the DNS tab. Then click on the + button under DNS servers to add a server.
- * Add 8.8.8.8 and then add 8.8.4.4. Click OK.



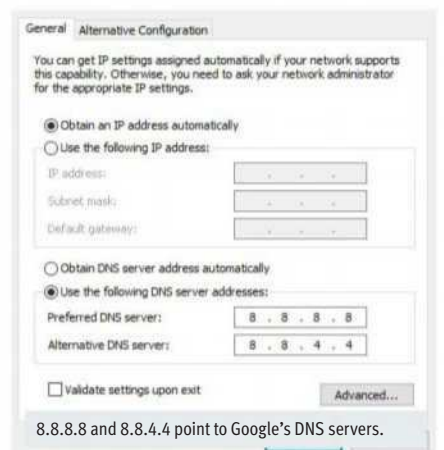
USING A VPN ON A PC

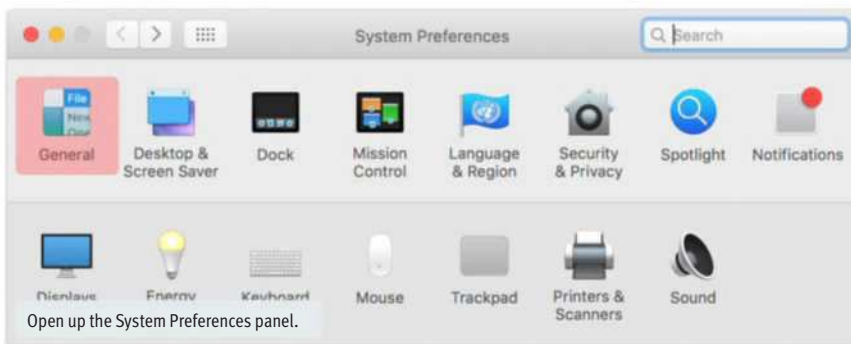
Although Windows and Mac both have VPN services built in, as a rule, it's far, far easier just to download the app supplied by your VPN service provider. Just head to its website and look for the downloads page.

Each app is a little different, but in general, you have to enter your VPN account username and password and select a server. The location of the server will determine where you will appear to be coming from when you visit a site. To access the BBC, for example, you would select a UK server. If all you want is to bypass your ISP's block or maybe just general BitTorrenting, you can choose an Australian server for maximum speed.

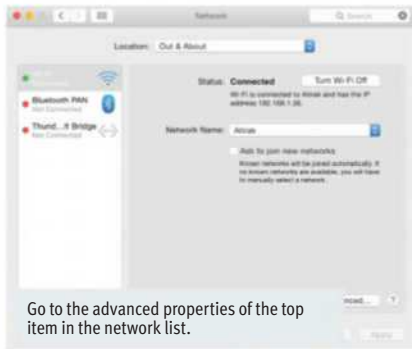


Use the app provided with the VPN service. Just enter your username and select a country.

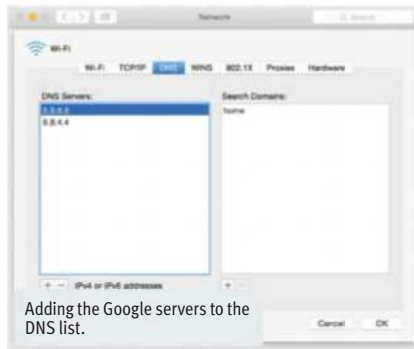




Open up the System Preferences panel.



Go to the advanced properties of the top item in the network list.



Adding the Google servers to the DNS list.

Once applied, you should now have access to any sites blocked by your ISP.

USING TOR ON YOUR PC

Lots of people use Tor as an all-round privacy shield. Even a VPN doesn't provide complete anonymity, since the VPN provider still knows what you're up to. But Tor provides complete privacy, bypassing nearly any kind of block.

These days it's remarkably easy to use, as well. You just download the Tor browser and most of the technical stuff happens in the background.

Head to www.torproject.org. Click on the link to Tor Browser. Then download it for your language and platform.

The Tor browser is simply a modified version of Mozilla, tuned for maximum security and using the Tor network in the background. When you've downloaded and installed it, start it up.

You'll see an initial connection box.

It shouldn't take long to connect.

Once you've connected, the Tor main page will appear. You can now just browse the internet as if you were using any other browser.

As a check, you can head to www.iplocation.net, which will tell you your current apparent IP address and geolocation. It should be different from your normal address, and the geolocation will show the location of whichever Tor exit node you're using (which could be anywhere — it's more or less random).

If you want to use Tor to appear to be from a specific country, then you'll have to edit the torrc file, a configuration file that's kept in the directory where your Tor browser

application is installed. In Windows, you can generally find the file in 'This PC/Desktop/Tor Browser/Browser/TorBrowser/Data/Tor'.

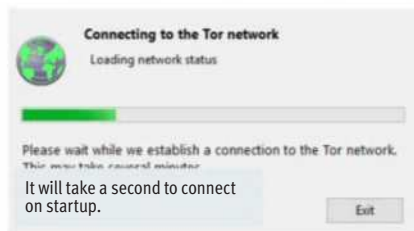
Open the torcc file up in Notepad.

Then add two lines to the end of it:

```
ExitNodes {countrycode}
StrictNodes 1
```

Where countrycode is the two-letter code representing the country you wish to appear to be from. You would use {us} for the United States; {uk} for Britain and {au} for Australia, for example. A full list of country codes can be found on the Tor Project site.

Save the file (remember it does not have a .txt extension) and next time you start the Tor browser, you should appear to be from that country to sites you visit.



The Tor browser is just a modified version of Mozilla. Browse as you normally would.



Web proxies are the super-simple way to access a blocked site. Just enter the blocked URL, and they'll relay a copy of it to you.

USING A PROXY ON YOUR PC

Using a web-based proxy to bypass site blocks is extremely easy. Just go to the website of your preferred web-based proxy and type or paste the URL of the site you'd like to see in the URL field. For example, if you wanted to visit The Pirate Bay, but your ISP is blocking it, you can go to filterbypass.me and type "thepiratebay.org" into the URL field. The Pirate Bay site will then load into a frame below the web proxy's header box.

Setting up an HTTP or SOCKS proxy is a little more complicated. If you set one of these up, all your web traffic will be routed through the proxy, not just one site. You'll need the proxy server IP address and port number to make it work. In Windows 10, follow these steps:

Click on 'Settings > Network & Internet'. On the left hand panel, the bottom entry is Proxy. Click on it.

Under 'Manual Proxy setup', change the switch to 'Use a proxy server'. (Automatic proxy setup is typically used when you're supplied with an automatic setup script, which happens mostly in corporate environments).

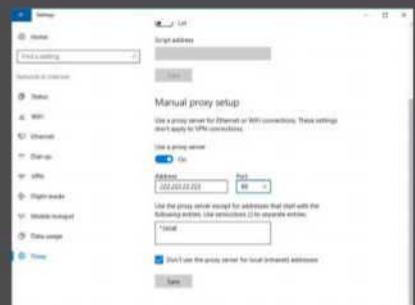
Enter the proxy IP address and port number in the fields.

Check the box for 'Don't use the proxy server for local (intranet) addresses'.

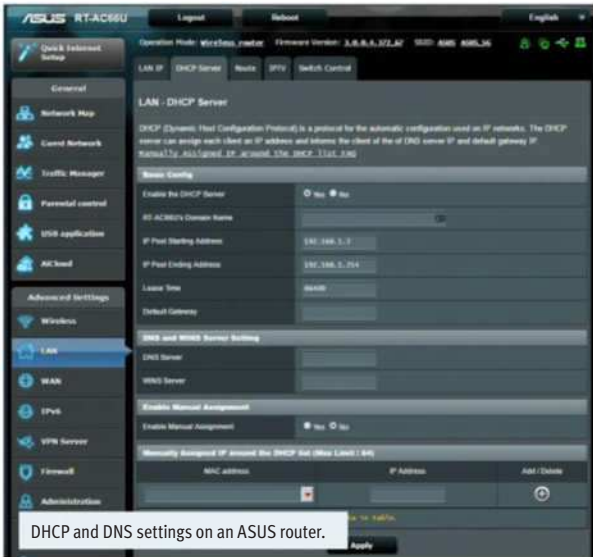
Click Save.



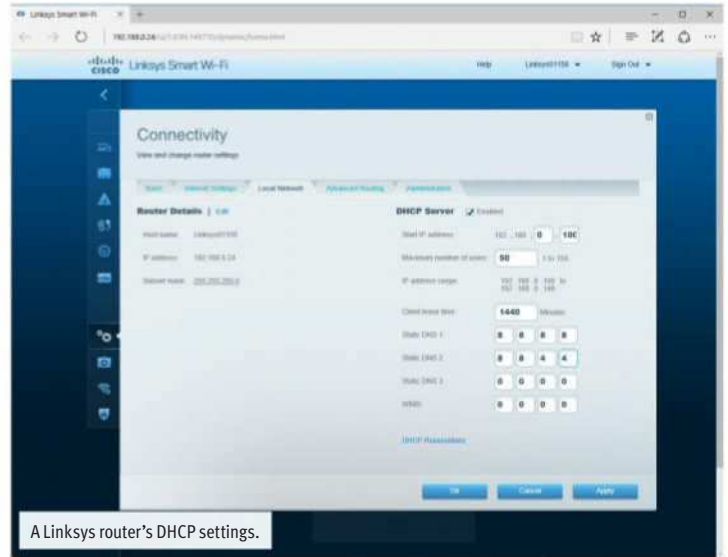
You can find the Proxy settings in Network & Internet.



Make sure local traffic doesn't use it.



DHCP and DNS settings on an ASUS router.



A Linksys router's DHCP settings.

[SUPERGUIDE]

Bypassing blocks on other devices

WHILE IT'S EASIEST TO BYPASS BLOCKS ON A PC, YOU ALSO HAVE OPTIONS ON OTHER DEVICES AS WELL.

ON MOBILES, YOU actually have access to all the same tools as on PC. You can modify your network DNS settings just like on a PC. You can download your VPN provider's app. You can use proxies in your browser as well. On Android, you even can install and app called Orfox to access the Tor network.

Other devices like smart TVs and consoles can be trickier. Your best option may be to not to try to modify the device at all — the best tool you have in this case is your router. With a few simple modifications, you can make it so that every device on your network will use Google DNS automatically. That way, a single modification covers every device.

CHANGING YOUR ROUTER'S DNS

Configuring DNS services on your router has a major advantage — it instantly covers all your devices. Any device that connects to your router with auto-configuration (aka, DHCP) switched on will have the benefit of using your router's DNS configuration.

Now, normally your router will use the DNS server address provided to it by your ISP when you connect to the internet. But this doesn't have to be the case. You can change your router's DNS so that the DNS server address it uses and hands out to your devices is one you specify.

Unfortunately, the exact way of doing this varies from router to router. Generally, you're looking for the DHCP settings or DNS settings.

- * On most ASUS routers, click on 'LAN > DHCP Server' and look for the DNS server field.
- * On D-Link, click on 'Setup > Manual Internet Connection Setup' and change only the DNS server fields under Dynamic IP.
- * On DrayTek, you'll find it under 'LAN > General Setup'.
- * On Linksys routers, they're usually found under 'Connectivity > Local Network', under the DHCP server field.
- * On Netgear, click on Basic Settings on the left, then 'Use these DNS servers'.
- * On TP-Link, click on DHCP in the left hand panel, then on DHCP Settings. In the DNS fields enter the numbers 8.8.8.8 (primary) and 8.8.4.4 (secondary) if you're

going to be using Google's DNS servers. Then save the settings.

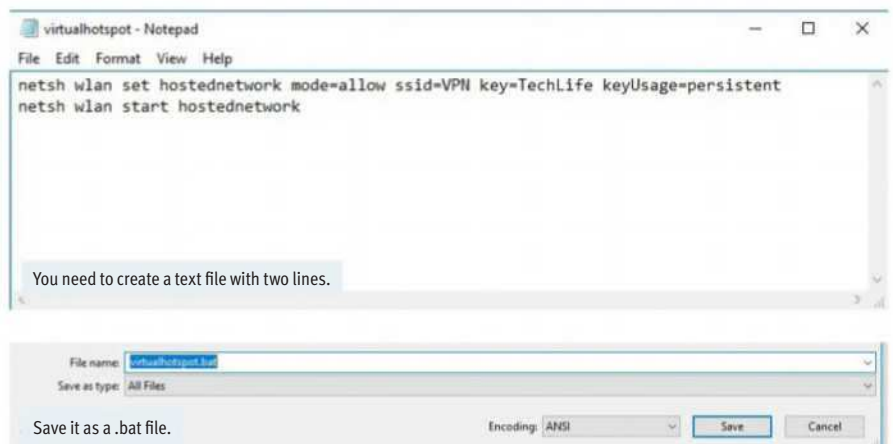
Now when a device connects to the network, it will be assigned those DNS server addresses, bypassing your ISP's DNS and its site blocks.

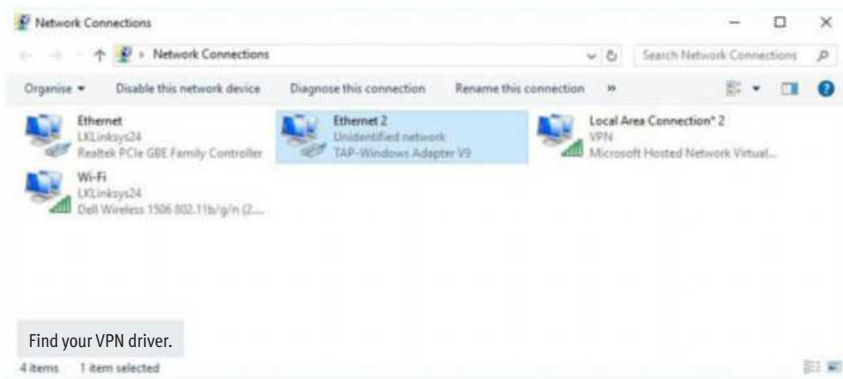
SHARING YOUR PC'S VPN

There's also another way to extend a VPN service to devices that might not have VPN clients, such as smart TVs and consoles. If you have a VPN set up on your PC, it's possible to share it with those devices.

You will need a Windows PC that supports Wi-Fi. If that's the case, you can actually create a hotspot on your PC that the device can connect to. Then you share the VPN connection with them.

Follow these steps:





wired connections. You should also see the new hotspot you've created. And finally, there should be a TAP driver, created by the VPN application. Find that, right-click on it and select Properties.

In the Properties window, click on the Sharing tab. Check the box to 'Allow other users to connect through this computer's internet connection'.

Under 'Home networking connection', select the network device that corresponds to the virtual Wi-Fi device you've just created. Most likely, it will be 'Wireless Network Connection 2' or 'Local Area Connection 2'. Click OK.

You've now shared your VPN connection with all devices that connect to the Wi-Fi hotspot you created. All that's left to do now is connect to it.

On your smart device, go to the Wi-Fi settings. Find the network name that you gave your Wi-Fi hotspot and connect to it. Now, any data sent to and from the device should go through the VPN, bypassing geoblocks just like your PC

does. If your device has a browser, you can check that it's working just by going to www.iplocation.net and seeing where it says you are.

That should be it: you've now shared your PC's

VPN connection, and its ability to work around censorship and geoblocks, with any device that connects to the virtual hotspot. Note that when your PC reboots, this virtual hotspot will disappear, but you can start it up again by right clicking on the virtualhotspot.bat file and selecting 'Run as administrator' as before.

And that should be everything — every device in your home should now be able to dodge geoblocks, avoid site censorship and generally access all that the internet has to offer. Enjoy!

First we turn your PC into a Wi-Fi hotspot. On your Windows PC, open Notepad.

Type the following two lines into Notepad, replacing <SSID> with the name you want your virtual hotspot to have (such as VPN) and <Password> with the password you want to use:

```
netsh wlan set hostednetwork mode=
allow ssid=<SSID>
key=<Password>
keyUsage=persistent
netsh wlan start
hostednetwork
```

Save the file as 'virtualhotspot.bat' Make sure it has the .bat extension, rather than .txt (you'll have to change the file type to All files).

Now, in File Explorer, right click on virtualhotspot.bat, and select 'Run as administrator'. You may get a prompt asking if you want to allow it (say yes). Once you've done that you should be good — you've created a virtual hotspot on your PC.

Now to share your VPN connection. When you installed the VPN app from your provider, it should have created a new networking adapter driver on your PC. We're going to share that. Right-click on the Start button and select 'Network connections'. Then select 'Change Adapter Options'. You should see your regular wireless and

WITH A FEW SIMPLE MODIFICATIONS, YOU CAN MAKE IT SO THAT EVERY DEVICE ON YOUR NETWORK WILL USE GOOGLE DNS AUTOMATICALLY. THAT WAY, A SINGLE MODIFICATION COVERS EVERY DEVICE.

UNFORTUNATELY, THERE'S NO UNIVERSAL GUIDE WE CAN PROVIDE FOR SETTING UP A VPN ON A ROUTER. EVERY VPN SERVICE PROVIDER HAS A DIFFERENT CONFIGURATION. YOUR BEST BET IS TO VISIT THE WEBSITE OF YOUR VPN SERVICE PROVIDER AND LOOK FOR THE GUIDE FOR SETTING IT UP ON YOUR ROUTER.



DD-WRT is a third-party router firmware that supports VPNs.

USING A VPN ON YOUR ROUTER

It's also possible to set up a router so that all traffic from your network is routed over a VPN. That means even your smart devices like television sets can use the VPN service to bypass geoblocks.

This is not for the faint of heart, however, and you need a special kind of router to do it. Your router must support VPN services. Most ASUS routers do, as do most DrayTeks, but the majority of other consumer routers do not. On many such routers, however, you can install a third-party firmware like DD-WRT (dd-wrt.com). If you want to install DD-WRT, visit their website and see if your router model is supported, and then follow the installation instructions for that router model very carefully. Unfortunately, there's no universal guide we can provide for setting up a VPN on a router. Every VPN service provider has a different configuration. Your best bet is to visit the website of your VPN service provider and look for the guide for setting it up on your router. Most of the major providers have guides for DD-WRT and Tomato and maybe ASUS.

Even then, you do have limitations. It's not easy to switch between VPN locations, for example — you have to manually log into your router and change the VPN server address. On the other hand, it does allow devices that normally couldn't use the VPN to use it. ■

[SUPERGUIDE]TM

The best VPNs for Aussies compared

HOW DO THE MAJOR VPN SERVICES CURRENTLY STACK UP AND WHICH ARE WORTH YOUR MONEY?

[NATHAN TAYLOR]

WHETHER YOU WANT to work around online censorship and geoblocks, or just want to maximise your security and privacy, a VPN service can get the job done. The right service can give you access to media you can't get here, including the international libraries of Netflix, as well as protect your online activity from hackers and government snoops.

Below, we've looked at some of the top VPN services available today. We've tried to focus on the largest and those that support Netflix in some fashion, though there are a number that we felt were noteworthy enough to include even though they can't access Netflix. We set up and tested them all, but we should make the very important

note that we're only talking about our personal experience with the VPN. Speeds, for example, will vary from server to server and time to time — so you may find that, in some cases, you get notably better or worse performance than we did.

TESTING VPNS

The easiest and most common way to test a VPN service is to head to [speedtest.net](https://www.speedtest.net) and run the default test when you're connected. Where we referenced speeds in the reviews, this is exactly what we've done — though, as noted in the introduction to this article, speeds can vary wildly from time to time and server to server.

NETFLIXING AND HULUING

ONE OF THE THINGS THAT MANY USERS WANT OUT OF A VPN IS THE ABILITY TO WATCH CONTENT THAT'S NORMALLY RESTRICTED BY GEOGRAPHY.

Services like Netflix, Hulu and the BBC use geolocation to restrict content based on country, and a VPN can potentially trick those services into thinking you're in a different country and are thus authorised to access that country's library. With Netflix, you don't even need a separate account for the US — one Netflix account is good the world over.

However, both Netflix and Hulu now block VPNs and proxies from accessing their service. This has turned into a game of cat and mouse with VPN providers. Netflix blocks some VPN IP addresses, so the VPN provider switches them up. Many VPN providers have given up the game, but some still play it, including most of the providers here.

Even if a VPN provider does still give you access to Netflix and Hulu, you probably won't just be able to connect to any server and have it 'just work'. Typically, what you have to do is contact customer support and ask which servers still support Netflix.



Buffered

BROUGHT DOWN BY HUBRIS.

BUFFERED ONCE MARKETED itself as a perfect VPN for accessing Netflix's international library, and even went so far as brazenly putting a Netflix logo on its web page. That got Netflix's attention, and at the time of writing this article, Netflix is blocked on Buffered, although the VPN provider claimed to be working on a solution. Still, it's a fast VPN for other services. Running the Speedtest.net benchmark indicated a speed of 18.3Mbps from that server, and impressive speed nearly rivaling that of ExpressVPN and NordVPN. The Windows client is very simple — there's not much to it other than a basic country selector. We do like that it gives you a live speed and data indicator, as well as a ping indicator for the different servers (though it would have been nice to see current load, as well). Unfortunately, there are no mobile clients, which is a major issue. You have to configure mobile clients manually using the OpenVPN app, which means no easy server switching. It's also expensive. For a service that's not currently capable of accessing Netflix, that's way too much, and there are cheaper and better options available.



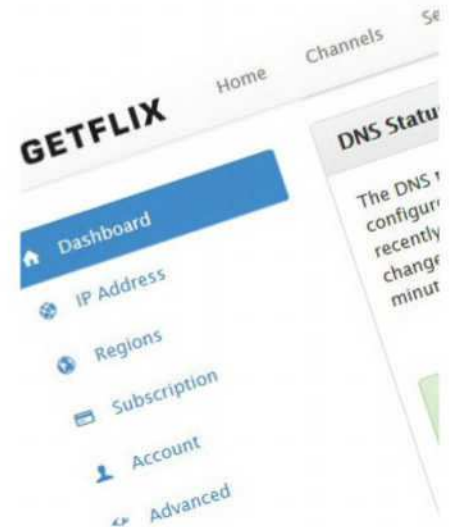
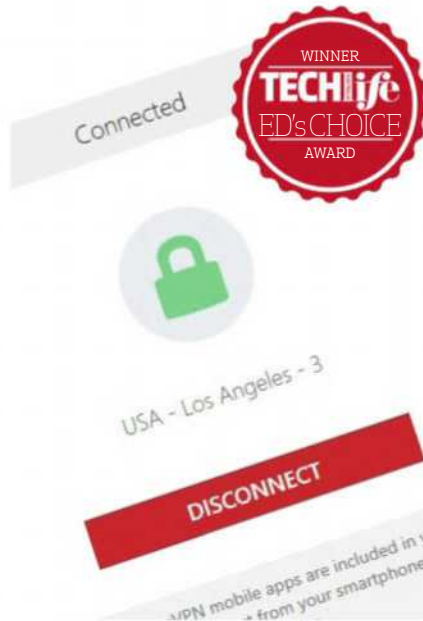
BUFFERED

US\$13 per month, US\$100 for a full year
buffered.com

CRITICAL SPECS

Countries served: 37; Netflix support: no;
clients: Windows, MacOS; simultaneous connections: 5





CyberGhost

A NEW CONTENDER.

ONCE JUST AN OK service with limited support for Netflix, CyberGhost now has support for the streaming network baked right in — and it works really well. You don't have to contact support to find the 'secret' Netflix capable server, either. There's an option right in the VPN app itself in the Unblock Streaming menu to choose a server that supports Netflix US (there are also specific options for the BBC and other streaming services, as well). Select it, and it will connect you to the right server. It worked perfectly for us on the first try, and with fast enough speeds to support smooth streaming in HD.

It has other features to recommend it, as well. It has ad-blocking built in. It also has a kill switch and app protection, plus SOCKS proxy support, so you can effectively choose which apps use the VPN and which do not.

With really solid speeds to top it all off (13.4Mbps to the US when we tested it), and servers listed by load and speed, we can away really impressed with CyberGhost. It's a great choice right now and highly recommended.



CYBERGHOST
www.cyberghostvpn.com
US\$12 per month, US\$66 for a full year

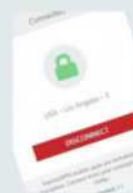
CRITICAL SPECS
Countries served: 51; Netflix support: yes; clients: Windows, MacOS, Android, iOS, Linux; simultaneous connections: 5

ExpressVPN

THERE'S NOBODY FASTER.

ONE OF THE world's largest VPN providers, ExpressVPN justifies its cost with both unrivalled reach and (at least in our testing) unbeatable speeds. It has servers in 94 countries and in our testing essentially maxed out our 30Mbps connection when using the recommended server in both Australia and the US. The application is as simple as they get. There are almost no options apart from choosing your server, and the service doesn't have fancy features like kill switches and ad blockers. It does, thankfully, offer server recommendations based on current load, which makes the server lottery much easier to win. You can connect up to three devices at once on a single account. It also offers 24/7 support — which we found both responsive and helpful — and the ability to pay anonymously through Bitcoin and Bitpay.

ExpressVPN is also one of the services that still supports Netflix in the US, the UK and several other countries. You will have to chat to a customer service operator and ask which server to connect to, but we found it worked perfectly, capable of high-def Netflix US and Hulu.



EXPRESSVPN
US\$13 per month, US\$100 for a full year
www.expressvpn.com

CRITICAL SPECS
Countries served: 94; Netflix support: yes; clients: Windows, MacOS, Android, iOS, Linux; simultaneous connections: 3

Getflix

SMART DNS PROVIDER TURNED VPN PROVIDER.

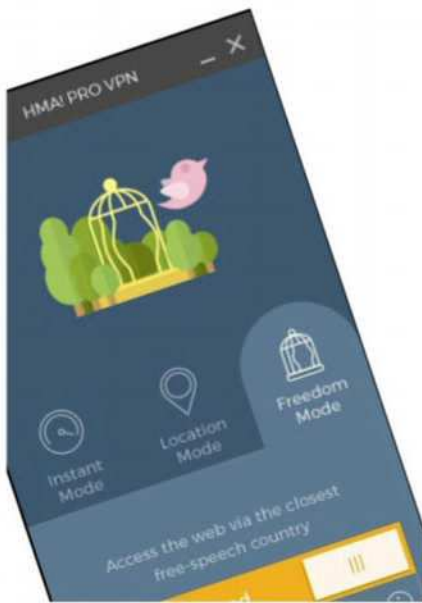
GETFLIX BEGAN LIFE as a Smart DNS service, and while that remains its primary offering, it now also offers VPN services to all subscribers. As a Smart DNS service, it remains a premier option. The Smart DNS service allows you to access most of the world's leading streaming services just by changing the DNS server address on your home devices. However, Netflix — once a staple of the service (and its namesake) — is no longer listed as supported and did not work when we tested it.

While its Smart DNS services are up to scratch, however, its VPN services are not. They are fast enough — 9.3Mbps to Los Angeles when we tested it — but there is no client for it at all. You have to use the VPN services built into Windows/Android/iOS or use the third-party OpenVPN client. If you even want to change location you have to go to Getflix's website to look up server addresses, then manually change it in the VPN configuration. It's not good, and is probably best seen as a free bonus to the Smart DNS service rather than a viable VPN service in its own right.



GETFLIX
US\$5 per month, US\$40 for a full year
www.getflix.com.au

CRITICAL SPECS
Countries served: 38; Netflix support: no; clients: none; simultaneous connections: unknown



Hide My Ass!

THE COMEBACK KID?

ONE OF THE oldest VPN providers around, some poor performances in previous reviews and lack of support for Netflix had dropped Hide My Ass! off our radar and out of our reviews. Last year, however, Hide My Ass reversed course on Netflix and started offering a server specifically for people that wanted to watch Netflix. So we thought we'd give it another shot, for old time's sake.

The good news is that the Netflix and Hulu support was legitimate. We had no problems accessing the services in either a browser or the dedicated apps. The bad news is that the server was so congested that the streams were almost unwatchable.

It wasn't just the Netflix server that had trouble. Performance across the board was spotty at best, and we couldn't find a US server that would connect at more than 5Mbps — and many operated at well under 1Mbps when we tested it.

It has a neat, well-designed PC client, as well as mobile clients, but those weren't enough to make up for its shortcomings. For now, Hide My Ass! remains on our Nope list.



HIDE MY ASS!

AU\$17 per month, AU\$111 for a full year
www.hidemyass.com



CRITICAL SPECS

Countries served: 190; Netflix support: yes;
clients: Windows, MacOS, Android, iOS, Linux;
simultaneous connections: 5

IPVanish

TOP PERFORMER.

ONE OF THE oldest hands in the business, IPVanish comes with an attractive and well-designed application for both Windows and mobile and a full feature set. However, it has decided to give up the fight against Netflix. If Netflix is not your primary concern, then there's an awful lot to recommend about IPVanish. The app is just great — we particularly like its ability to sort servers by use, which will arrange servers by ping or bandwidth. That makes it much easier to select a fast server for you without having to go through the usual server hopscotch.

Picking the fastest server in both Australia and the US produced some very impressive speedtest.net results when we tested it. Our 30Mbps connection was essentially maxed by the VPN on both servers, which is very impressive. IPVanish doesn't throttle BitTorrent, either — and a quick test on a fast torrent had us downloading at over 2.2MB/s.

IPVanish ticks many of our other boxes as well: no logging, PPTP and OpenVPN support, 24/7 customer support, money-back guarantee. Indeed, except for its lack of Netflix support, IPVanish is great pick.



IPVANISH

US\$10 per month, US\$78 for a full year
www.ipvanish.com



CRITICAL SPECS

Countries served: 60; Netflix support: no;
clients: Windows, MacOS, Android, iOS, Chrome;
simultaneous connections: 5

NordVPN

THE ALL-ROUNDER.

NORDVPN IS A service that ticks all our boxes: Netflix support, no logging, global reach, kill switch, proxy servers, unthrottled peer-to-peer and high speeds. Connecting to servers in the US and Australia, we consistently hit speeds over 23Mbps, which is more than enough for HD Netflix streaming. NordVPN also offers the ultimate in anonymity: not just anonymous sign-ups with Bitcoin but also a unique Tor-over-VPN service that hides your online activity even from NordVPN.

As with most VPN providers, you will likely have to contact support to find a Netflix server — although heading to nordvpn.com/servers and looking for 'Ultra Fast TV' can get you started as well. Netflix-capable servers are available not in not just the US, either: US, UK, Canada, Netherlands, France, Italy and Norway are supported. The client itself is fantastic. Our favourite part is that it lists servers by current load, as well as the useful map selector for the location. That makes choosing a server so much easier than the usual lottery. You can also let it auto-choose, which will connect you to the closest server with the lowest load in your country of choice.



NORDVPN

US\$12 per month, US\$69 for a full year
www.nordvpn.com



CRITICAL SPECS

Countries served: 58; Netflix support: yes;
clients: Windows, MacOS, Android, iOS;
simultaneous connections: 6



SUPERGUIDE
THE BEST VPNS FOR AUSSIES COMPARED

Private Internet Access

NOT WHAT IT ONCE WAS.

ONCE A DARLING among VPN subscribers for its low-cost and broad service offering, PIA has had its ups and downs. Even now, server selection is something of a lottery. Connecting to 'California' delivered speeds of just 1.04Mbps, while connecting to Silicon Valley netted 6.8Mbps. If we went with Auto, it connected us to Sydney (9.4Mbps) and the generic 'US West' hit 8.1Mbps. Some of those are good for streaming, some are not, and there's no indication in the client about server loads or recommendations that might help you choose.

Not that it's all that great for streaming in any case. PIA is one the ISPs that has given up trying to work around Netflix and Hulu's VPN bans — you simply cannot access these services while connected. Other sites, like the BBC and Amazon still work just fine, however, and PIA is also BitTorrent-friendly.

There are elements to like in the basic client. It has a kill switch and leak protection, and the service will also block most ads if you switch on the PIA Mace protection option. PIA also provides SOCKS5 proxies if you just want uncensored web browsing.

2½

PRIVATE INTERNET ACCESS
US\$7 per month, US\$40 for a full year
privateinternetaccess.com

CRITICAL SPECS
Countries served: 25; Netflix support: no;
clients: Windows, MacOS, Android, iOS, Linux, Chrome;
simultaneous connections: 5

SlickVPN

AN AFFORDABLE NETFLIX SOLUTION.

WITH A VERY affordable annual charge and continued support for Netflix, SlickVPN offers excellent value for money. It also offered some pretty good speeds when we tested it. Connecting to the Sydney server, we hit 15.3Mbps on speedtest.net; connecting to Los Angeles, we hit 11.3Mbps. According to SlickVPN, there's no throttling on P2P traffic, either. Up to five devices at once can connect to the service on a single account, and SlickVPN does offer anonymous sign-up with Bitcoin.

It's also one of the services that still offers support for Netflix and Hulu. As with most providers, you'll have to ask which servers to use, but support is available on SlickVPN's website 24/7. After getting the information from support, we had it up and streaming Netflix US in HD with no problems at all.

The client itself is relatively basic: you log in and select your country. There is no kill switch or ad-filtering. In preferences, you can turn on DNS leak protection, as well as the Balancing option, which will let the client automatically choose a server based on current load (which is useful if you just want the best speed).

4

SLICKVPN
US\$10 per month, US\$48 for a full year
www.slickvpn.com

CRITICAL SPECS
Countries served: 35; Netflix support: yes;
clients: Windows, MacOS;
simultaneous connections: 5

TorGuard

MORE PRIVACY FEATURES THAN MOST.

ALTHOUGH IT HAS 'Tor' right there in the name, there is actually no association with the anonymising network; TorGuard is a largely conventional VPN service (the 'Tor' is apparently a reference to 'Torrents'). It does offer a few features not available from other providers, which can make it a compelling choice for the security-conscious, however.

For people looking for anonymous web browsing, it offers a comprehensive SOCKS5 proxy service with servers available worldwide. You can even subscribe just to those services. The service also comes with an encrypted web mail service with full PGP support and 10MB of mail storage if you're looking for a secure email service. TorGuard also offers a 'stealth' mode that strips out potentially identifying header information from the data from its networks, so that nobody can know the data came through a VPN. It claims that this can defeat things like China's packet inspection. With some help from support, we found you can also access Netflix on TorGuard — quite smoothly, in fact. The speeds across the board were very good — we connected with Los Angeles at just over 12Mbps. ■

4

TORGUARD
US\$10 per month, US\$60 for a full year (US\$6/US\$47 for just anonymous proxy)
torguard.net

CRITICAL SPECS
Countries served: 50; Netflix support: yes; clients: Windows, MacOS, Android, iOS, Linux; simultaneous connections: 5

[SUPERGUIDE]

Get set up with the free TunnelBear VPN

WHY NOT GET THIS FREE WINDOWS VPN, WHICH STOPS PEOPLE TRACKING YOU ONLINE AND STEALING LOGIN DETAILS?

[CAT ELLIS]

WHEN YOU USE the internet, there are many potential weak points where the information you send could be intercepted by would-be thieves. This is even more of an issue if you're using a public Wi-Fi network in a café or hotel where you can't secure the router yourself.

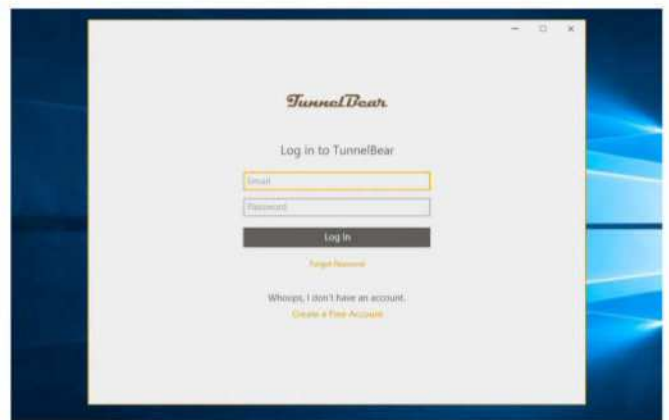
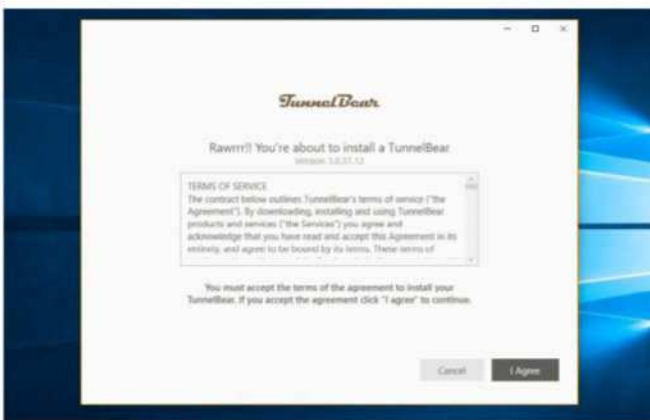
Protecting your IP address is also a concern. This is a number assigned to the device you're using to access the internet, which can be used to determine your physical location and, together with small pieces of data called cookies, to track which websites you're visiting.

You can avoid these security risks by using a virtual private network (VPN), such as TunnelBear, which redirects data from your computer via another location to hide your identity. A VPN also encrypts all the data it transfers, and works with your regular web browser.



[STEP BY STEP]

DIG YOUR FIRST TUNNEL



01 THE BEAR NECESSITIES
First, download TunnelBear from our sister site TechRadar at downloads.techradar.com/downloads/tunnelbear and run the installer (you'll need 63MB free space on your storage drive). This free version of TunnelBear gives 500MB of data per month, which is enough for regular browsing, but not for downloading large files or streaming video, so it's best to save it for online shopping and banking.

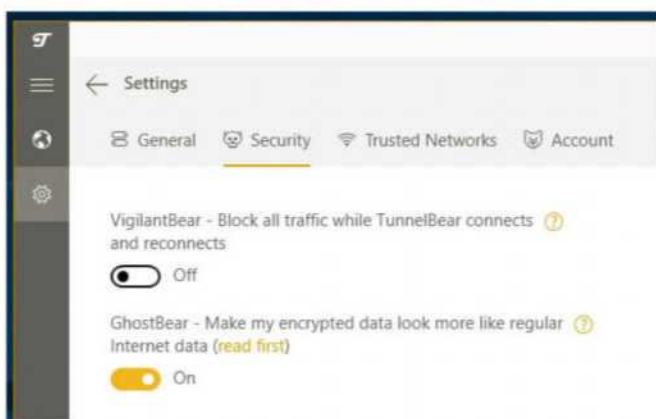
02 REGISTER AND CONFIRM
Once you've installed TunnelBear, you'll be prompted to create an account by entering your first name, email address and a password. You can also optionally add a Twitter username; if you tweet about TunnelBear, you'll receive an extra 1GB of free data. Go to your email account and you'll see a confirmation email containing an activation link. Click this, reopen TunnelBear and click Done.



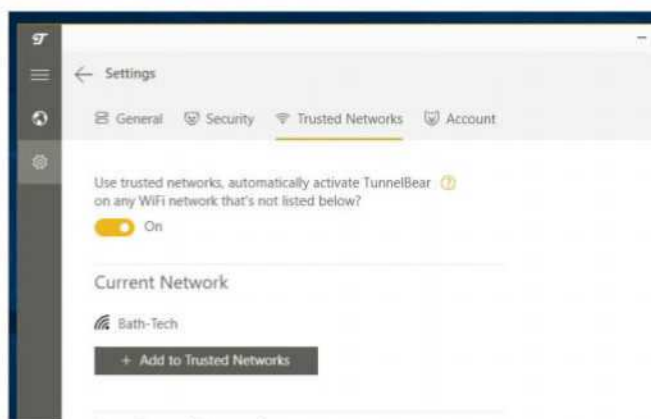
03 START TUNNELLING
Some VPN tools need a lot of configuration, not TunnelBear! To activate it, click the On/Off toggle (or set it to Auto), and it will connect to your nearest ‘tunnel’. This is the location your web browsing will appear to come from. When a confirmation notice appears in the bottom right, you can start using your regular web browser and TunnelBear will redirect everything.



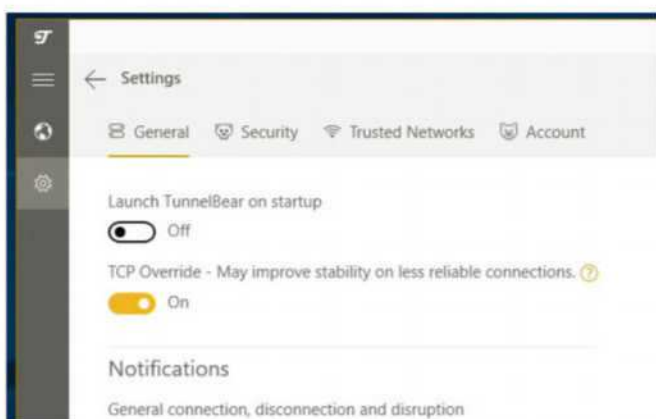
04 MOVE OVERSEAS
Your nearest tunnel is probably in your home country, but you might want to appear further afield. Click ‘Auto’ to see a list of countries. Select one, then wait a moment and TunnelBear will start re-routing your browsing via the new location. This can also be handy if you’re on holiday abroad and want to access a website that’s only available in your country.



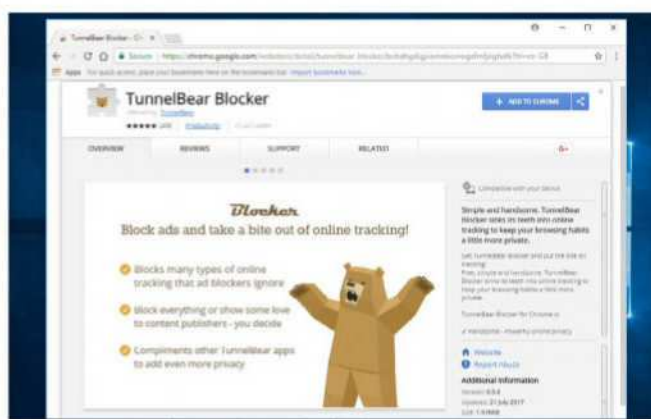
05 GO GHOST
TunnelBear now includes a GhostBear option, which makes it harder for businesses, ISPs and even governments to tell that you’re using VPN encryption. To use it, click the Settings icon in the left-hand sidebar and then set the GhostBear toggle to On. The slight drawback is that this will slow your connection speed. You only need this on sites and in locations that block VPNs.



06 CONNECTION OPTIONS
Still in Settings, select the ‘Trusted Networks’ tab and toggle the ‘Use trusted networks, automatically activate TunnelBear on any WiFi network that is not listed below’ to On. This ensures that, when you connect to a public Wi-Fi network, TunnelBear will activate automatically. Click ‘+ Add to Trusted Networks’ to add any Wi-Fi connections you do trust — such as your home network.



07 SMOOTH CHOPPY CONNECTIONS
Another option under ‘Settings > General’ is ‘TCP Override’, which helps to compensate if your internet connection keeps dropping. The overall performance is slower, but the signal should be steadier, so give it a try if your connection is choppy. If you’re still having problems, switch TunnelBear off and on again — sometimes it helps to reset the connection.



08 A BEAR FOR YOUR BROWSER
If you like using TunnelBear, it’s also available as an extension for Google Chrome and Opera (search for it in their add-on stores). This has the advantage of only tunnelling your browser activity — it won’t divert things such as software updates that Windows performs in the background, helping to conserve your monthly TunnelBear data allocation. ■

15

THINGS YOU SHOULD KNOW ABOUT

NINTENDO LABO™

WE BREAK DOWN SOME OF THE INCREDIBLE FACTS AROUND THE SWITCH'S REVOLUTIONARY NEW ACCESSORY KITS.

GIVEN THE SUCCESS of the Switch and the impressive library of first-party games we've received in the past 12 months, you'd think that Nintendo would be all out of great ideas. But here we are, barely into 2018, and the company has turned the industry on its head all over again — come on already, give somebody else a chance! Nintendo Labo launched on 27 April, and it's already shaking up the way our imaginations coalesce with the wonderful world of videogames. It could be the evolution of play as we know it and, once again, it all starts here on the Nintendo Switch.

It's funny how things work out sometimes. Back in 2012, notorious industry analyst Michael Pachter joked that should Nintendo

ever make a cardboard box and slap its logo on the side of it, fans of the company would still buy it. Well, what do you know; it's taken a decade, but one of Pachter's predictions has finally come (mostly) true!

To put it simply, Nintendo Labo is a set of interactive build-and-play experiences. It's a toy and software line that asks players to build intricate constructions from sheets of cardboard, later combining them with the Switch and Joy-Cons to unlock new and innovative avenues of play.

Each project — known internally as a Toy-Con — comes with branded sheets of cardboard, rubber bands, string and other assorted craftwork items. It will also be

bundled in with software that features detailed interactive instructions and a relevant mini-game designed to showcase your new construction.

Nintendo has so far shown off just six of the projects that make up the first wave, and they effortlessly capture a sense of childlike imagination — the do-it-yourself spirit that any of you who spent childhoods playing with cardboard boxes will immediately recognise. These projects span everything from larger pieces, such as a fully functional piano and a kit that transforms into an autonomous robot, alongside smaller constructs that let you fashion items like steering wheels, fishing rods, RC Cars, controllable creatures and even a camera. While Labo is predominantly designed for kids, it's clear that an adult will need to be present and accounted for in the construction stage. Is this fun for all the family, or the sort of headache parents could do without? That much isn't clear just yet, but we're banking on it likely being the former.

The Robot Kit, one of two kits that was available at launch (and the most expensive revealed so far) will, for example, take a number of hours to piece together. It has foot straps, a visor and a big bloody backpack that will not only need to be built from the templates, but then connected together with an intricate system of strings and bands — necessary so that the game registers your arm and foot movements as you control a robot hell-bent on levelling a city that's being displayed in the Switch-holding visor.

It's such a wild idea. All of the projects demonstrated thus far have an exciting, almost magical quality about them. They capture the imagination and a childlike sense of wonder, joining with the excellent force-feedback found in the Joy-Cons to create some truly impressive experiences.

We will always lament the death of the plastic peripheral. The extension of play and the newfound sense of immersion they introduced to gaming will never be forgotten — though the amount of space they consumed in our homestead certainly will be. Nintendo has taken all of this in its stride and delivered a product that not only delivers new avenues for play, but something that can exist as a learning tool; as a way of bringing people and families together, and as a conduit for unlocking creativity. And when it's all said and done, it can be easily flatpacked and stored away for another day without consuming the entirety of your living room. Nintendo Labo is unlike anything we've seen before on console, and it has the potential to be huge.



01 INHERITOR OF THE WII SPIRIT

The Wii U may have been the follow-up to Nintendo's monumental and revolutionary system, but the Switch is the true successor to the motion control icon, and Labo is the most succinct expression of this. By this we mean that the Wii's lasting legacy was not motion controls in themselves, but breaking down the barrier to entry to playing games and making them something families could enjoy together, and these cardboard kits do something very similar. Labo is something to be experienced together, built together and played together. That's pretty much been a part of the Nintendo mission statement for the last couple of decades, and it remains true with the Nintendo Switch.

02

IT MAKES MORE USE OF THE SWITCH

The Nintendo Switch has so much more

functionality and adaptability than any game released so far has really taken advantage of. And that's not a knock of any games that have been released so far, as if any single game attempted using all the features the sum total would be a complete mess. From motion control to the IR camera and from the touchscreen to the HD rumble in the Joy-Cons, there's a lot there to dig into, and Nintendo Labo is fully capable of making the most of all of it. Every facet of the console has been utilised to make the various minigames currently available with the Labo kits as varied and enjoyable as possible.



03

IT'S ABOUT THE BUILD AS MUCH AS THE PLAY

Not unlike working on a new Lego kit, Labo

is going to be as much about making the Toy-Con as it will be about playing the games they associate with. This is very much aimed at families, and most especially at young children working with supervision to make a Toy-Con and then sharing the gaming experience together. Some of the builds are thought to take a fair amount of time as well, so the experience of making the controllers and setting up the game has to be a fun one. Thankfully, the simple layouts of the cardboard kits should make finding the right pieces and making it all fit together far easier than hunting around for the correct length of brick, as with other toys.



THE APP MAKES IT EASY

One of the great advantages the Switch has as a tool for construction kits is that the app can walk you through as your instruction manual, and it offers a lot more interactivity than a piece of paper ever could. Every stage of the construction of the various kits is there for you, and in 3D, so you can touch the screen to rotate your view and see how the Toy-Con goes together from every angle. The instruction guides are meticulously put together so that you don't miss a single step in the build, although that also means they can be a little slow to get through. Bottom line is that, while it may take patience, it is built to avoid frustration and answer any questions you may have as you go.

04



THE STICKERS ARE THE SECRET

If you've been wondering how exactly all of the mechanical magic of Labo is pulled off, from how it registers the playing of keys on a piano to how it reads the yanking of cords in the Robot kits to create movement, it's all in the stickers. All of the Labo kits come with special reflective stickers, and they're not just there for decoration. Thanks to the IR camera, these reflective stickers can be picked up even in complete darkness by the Joy-Con, and it is these points of reference that the games then use to read movements and translate them into action. So the piano keys use stickers to translate movement to sound and the Robot uses stickers to translate cords going up and down into attacks.



05

06

SO MUCH CREATIVITY IN THE MINIGAMES

One of the things we've been most impressed with from the Labo kits is the breadth of content they actually offer. As we've mentioned, they make full use of every facet of the console, but more than that, they've actually applied those functions to fun in-game mechanics that make the games feel as interactive and tactile as possible. They manage to blur the lines between digital reality and the real world very nicely. This might best be displayed in the House build as part of the Variety kit, where the motion tracking, tilting and touch of the Switch can all come into play, as well as the IR functionality for reading inputs inside the box.



07

IT'S SO MUCH DEEPER THAN YOU THINK

While a common criticism we've seen of the games attached to the Robot kit and Variety kit is that they are rather shallow, if anything... we were rather impressed with their depth. For instance, if we were to compare them to the games that came with *Wii Sports*, the Nintendo Labo titles compare quite favourably. While the House and Fishing Rod are relatively simple, their core gameplay loop is a lot of fun to explore and play with. Meanwhile, the Bike and Piano offer a lot more gameplay potential than the base playing experience might first let on. There's a lot of extra stuff you can do in these games.

08

MAKE YOUR OWN TRACK

With the Bike game as part of the Variety kit, you can make your own tracks from scratch. This includes being able to scan the shapes of objects with the IR camera to have them form the base topographic layout of a course. And then, using a Joy-Con placed in a small bike-shaped folder, you can trace out the shape of a track in the air by tilting the Joy-Con, and the game will translate that into a raceway for you. That the game can then be enjoyed in multiplayer and shared with others only makes it more compelling. So while the base game may be limited in gameplay and track selections, the potential to be creative yourself is there to dig into.

09

DESIGN AND CUT YOUR OWN CHARACTERS

Building on the ability to scan objects with the IR camera, the fishing minigame actually makes use of that ability too, as you can design, cut out and scan in your own fish shapes for the game and then attempt to catch them, adding them to your aquarium. While this is a relatively simple application of the technique, it opens up some exciting opportunities for the future, as it could allow you to design your own Labo kits, scan them and have them made. Or just create more complex characters or items for future games. This tech could just as easily be applied to non-Labo products in the future too. Frankly, this little reveal has got our minds racing.



THERE'S EVEN A MUSIC STUDIO

The Piano is probably the Toy-Con from the Variety kit that has the greatest potential longevity, thanks to the fact that it features a full music creation tool. While plugging in different knobs to the top of the piano can change the sound of your keys, going into the music creation mode means you can customise the keyboard entirely, record tunes, create sound waves by cutting out pieces of paper, create rhythms with punch cards and a lot more. You can also place a Joy-Con on top of any empty vessel (a cardboard box, for instance) and playing the keys will cause vibrations to play sounds from it, like a makeshift speaker. It's a stunning addition to the kit that means that anyone with a taste for music-making can come back again and again to the game and keep finding new things.



11 THE TOY-CON GARAGE IS NEXT LEVEL

All of the building and tinkering with cardboard is interesting and has lots of potential for the future, but it's the toolset hiding in the Labo app that has us as excited as anything else. The Toy-Con Garage offers a full suite of tools to make your own experience with the Switch with a simple input/output command system. This means that you can do things like tell the Switch screen to light up when you move the analogue stick up or have the right Joy-Con vibrate when the left Joy-Con is shaken. There are lots of little command variations that can be matched with dozens of output reactions to create interesting new relationships between the various pieces of the Switch.

12 MAKE ENTIRELY NEW GAMES

What having the Toy-Con Garage means in real terms is that you can create your own games. What do we mean by that? Well, for a start, you can remix the Toy-Con games you already have, such as using the Fishing Rod to control a RC Tank or using the House design to control a music box. But more than that, you can make entirely new ideas with the cardboard and commands at your disposal. Set up the right inputs and outputs and you can create simple AI responses and combinations of movement that make brand-new games to play. Break away from the templates and the potential to make things of your own is massive.



13

THE NODE CONTROL CAN GET COMPLEX

As you might expect, if you want to make an entirely new type of game, then the input and output combinations might begin to get a little more complex, but Labo can handle that. One example we've seen involves remixing a targeting system already available through the IR camera that causes a cardboard figure to vibrate and fall when it's spotted by another Joy-Con in a RC Tank model. By adding additional instructions the vibration can be controlled by a button press rather than just being spotted, spotting the figure can cause an alarm to sound instead and additional sound effects can be added for 'firing' and falling. Combine it all together and you have a complete experience.



NINTENDO LABO

14

YOU MAY WANT MORE JOY-CONS

One thing to pick up on is that, with all of the different input and output options available and the way they can be paired with various Toy-Cons already available, you may want to get some additional Joy-Cons to sync with your Switch. Having at least another pair should open up a lot more options, as it gives you another IR camera and can potentially open up multiplayer game ideas for you. And with the extra Joy-Cons you can definitely create more complex and involved command structures to deliver even more engaging and exciting game ideas for everyone to enjoy.



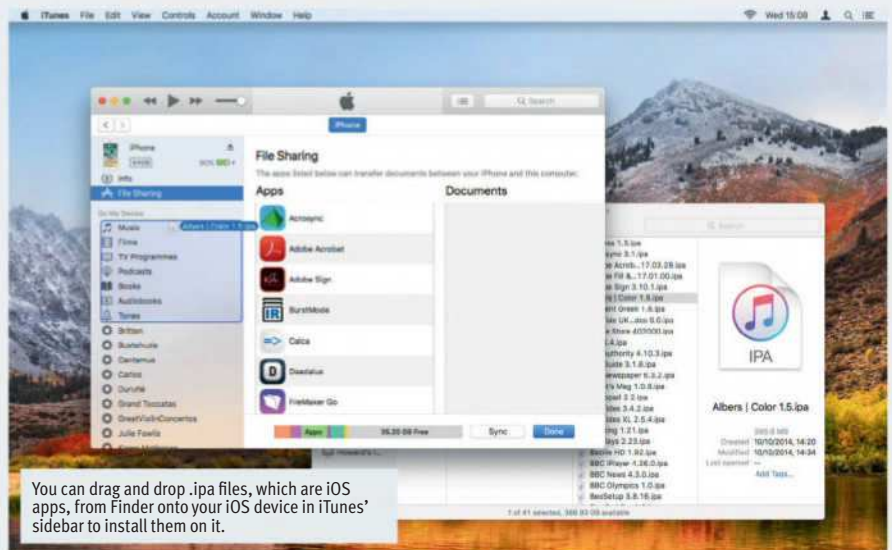
THE POTENTIAL APPEARS LIMITLESS

Nintendo Labo has an incredibly low barrier to entry, which is great because it's intended to be appealing to craft-loving kids who care about building things as much as playing with things. But what's really exciting to us is how much further it can go. Of course, Nintendo will be launching additional kits over time. The Variety and Robot kits are just the opening offer, but more will be on the way, with even more complex and exciting ideas attached. But between those releases, a Labo community is bound to rise up and begin sharing fun new ideas that can make even more from the tools made available. Expect cardboard templates for new devices to spread quickly and command lists for fun new games to appear on message boards. We're convinced this is going to be huge. ■

HELP STATION

GET THE MOST FROM YOUR TECH

[IN THIS MONTH IN HELP STATION]

86 Q&A
YOUR QUESTIONS ANSWERED89 Windows
FREE WAYS TO SPEED UP WINDOWS 1092 Mac
EASILY SIGN INTO EVERYTHING
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HOW LENS FOCAL LENGTH AFFECTS
YOUR PHOTOS[iOS]
Reinstalling old apps

Now that iTunes on the Mac no longer stores and manages iOS apps, how can I downgrade to an older version of an iOS app?

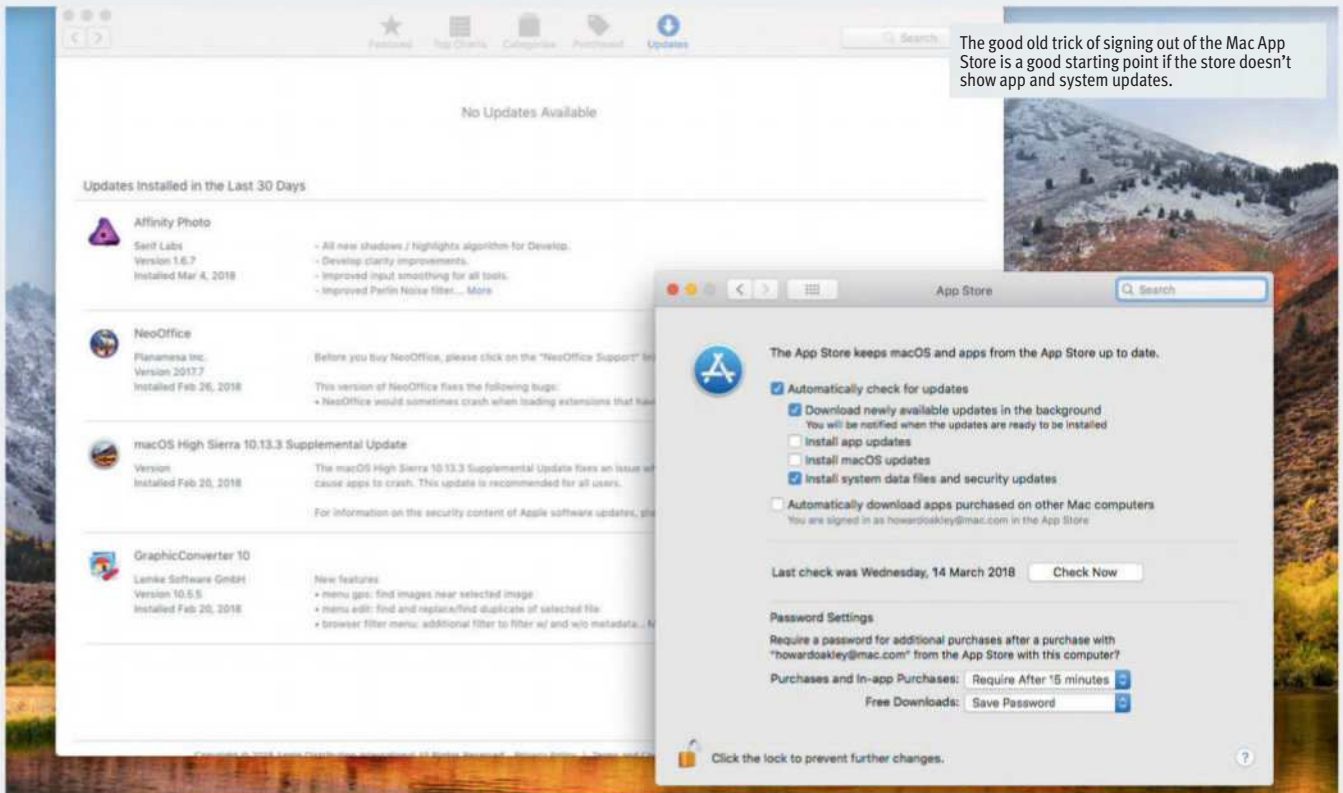
[TIM FUSSELL]

Howard Oakley replies: iTunes 12.7 and later can't download iOS apps or manage those that are installed on iOS devices. Further complicating matters, for a while, iTunes has not synced apps downloaded on iOS devices back to the Mac; with iOS 9, Apple introduced a set of

techniques called 'app thinning' to save bandwidth and storage by downloading only what's necessary for the device you're using, which would prevent you transferring it, say, from an iPad to a Mac and then an iPhone.

However, you may still have copies of much older versions of iOS apps available on your Mac from before that time, when you were using an older version of iTunes.

Previous versions of iTunes stored copies of iOS apps under Mobile Applications within iTunes' library folder. If you can't find any there, have a browse through your Time Machine

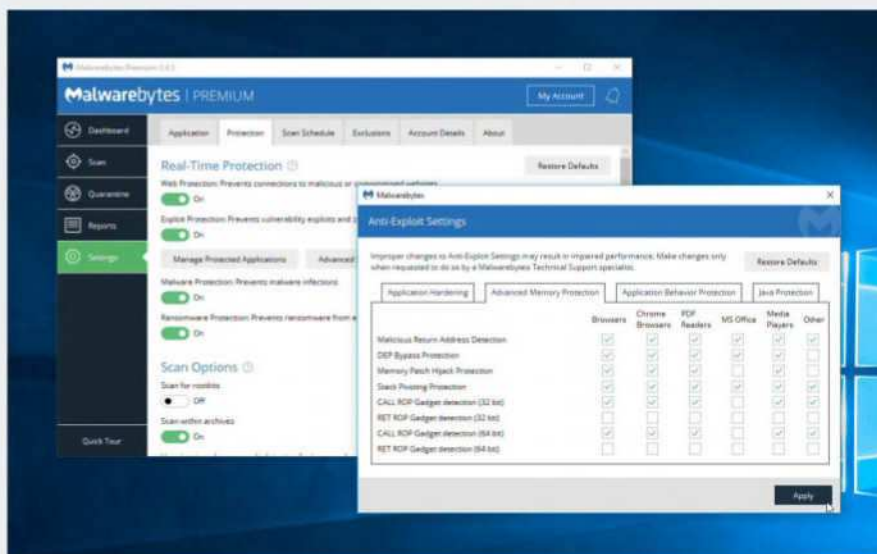


backups and you might find some. These will have the .ipa file extension.

Installing those apps from your Mac onto an iOS device may seem impossible now that your iTunes library has no Apps category. However, even the latest iTunes can install an .ipa file on a connected iOS device.

In Finder, drag and drop the .ipa file for the app you want to reinstall onto your device's icon in iTunes' left pane. The biggest snag with this is that the only apps you can do this with are those downloaded directly to your Mac before iOS 11 was released last September. However, some won't be 64-bit and so will be incompatible with iOS 11, or they may have other compatibility issues with it.

Apple still provides iTunes 12.6.3, which can manage iOS apps, at bit.ly/itunes1263



[WINDOWS] Mouse stopped working

My husband's HP computer from October 2015 is causing a great deal of trouble — the mouse doesn't work. I've tried both wired and wireless types, and can't get either to work. I shut down and restarted several times with no change. I imagine it's a driver issue, but can't imagine how to fix it with only a keyboard.

[MARSHA THALIN]

Mayank Sharma replies: By the time we contacted Marsha, she'd managed to fix her problem by resetting the PC and finally getting a warning about missing drivers from HP, which then resolved the problem. We suspect this was linked to a recent Windows 10 update that stopped certain USB devices from working (see support.microsoft.com/en-gb/help/4091240) — in which case, either of the two recommended solutions (downloading and installing the subsequent update or entering the Windows 10 Recovery Environment to remove the offending update via the Command Prompt) would resolve the problem without the hassle of going through a full Windows reset.

[MACOS] Mac apps stuck

Since upgrading to High Sierra, I can't download or update apps from the Mac App Store, and I don't receive any system updates either. How can I get these to work again?

[DENNIS OATES]

Howard Oakley replies: Check in System Preferences' iCloud and App Store panes that you're signed in using your correct Apple ID. Also confirm in the latter that your Mac is at

least set to automatically check for updates. If those are correct but the Store still isn't working, try signing out of it and iCloud and signing in again. The underlying cause is most likely that your upgrade to High Sierra didn't work correctly and needs to be repeated. Before doing so, ensure you have a good recent backup of the internal drive, in case you need to restore files from there.

If you kept a copy of the 'Install macOS High Sierra' app, open it to install High Sierra again over the top of itself. There's no need to erase the disk, and your current data will be retained. The installer will fix problems with system files that may be your trouble's cause.

If you no longer have the installer, because the only way to obtain it is from the Mac App Store, your current installation can't download a fresh copy while the problem persists. In this case, hold 'Command-R' at startup to enter Recovery, then choose the 'Reinstall macOS' option.

If that doesn't fix the problem, you can hold 'Command-Option-R' at startup; the option to install macOS then installs the latest version, even if it's newer than what you're using.

[HARDWARE] PC keeps locking up

I hope you can help me — at random intervals, sometimes after a few minutes but other times after an hour or more, my Windows PC just suddenly locks up. No error message or automatic reboot, the screen simply freezes, and I must power off and back on to recover from it. Can you help?

[AMELIA HORTON]

Nick Peers replies: This could be down to any number of reasons, but the culprit quickly revealed itself. We instructed Amelia to run a full disk check — right-click Start, select

'Command Prompt (Admin)', type `chkdsk c: /f/r` and press Enter, then restart — and the scan locked up at 16%. She ran the check twice more and it froze at the same spot each time.

The solid-state drive (SSD) was clearly the culprit — reinforced when an attempt to take a drive image also froze at the 16% mark — leaving Amelia with the prospect of having to replace her boot drive and reinstall Windows from scratch. If she has no recent backups to call on, Amelia will need to copy off what files she can — hopefully no critical files reside on the damaged part of the drive.

[SECURITY] Malwarebytes false positive

I'm unable to use the OfficeTab add-in with Microsoft Office — after installation, OfficeTab keeps locking up Office and I'm forced to remove it. I can't find any obvious solution online — do you know what's going on?

[JAKE PROSSER]

Cat Ellis replies: Jake was running the Premium version of Malwarebytes Anti-Malware, which is known to falsely flag OfficeTab as a threat. Sadly, despite numerous reports to the Malwarebytes forums, a permanent fix hasn't (yet) been forthcoming.

If you're happy to reduce your Office security level slightly, you can tweak Malwarebytes to ignore the kind of specific threat that it mistakenly thinks OfficeTab represents: open Malwarebytes and click 'Settings > Protection' tab. Click 'Advanced Settings' under 'Exploit Protection', then select the 'Advanced Memory Protection' tab and untick both 'CALL ROP Gadget detection' boxes under MS Office. Click 'Apply' and you should find Office now loads and OfficeTab works correctly. ■



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Free ways to speed up Windows 10

KEEP YOUR WINDOWS 10 MACHINE PERFORMING AT ITS BEST, ALL THE TIME, WITH THESE HANDY TIPS, TRICKS AND TECHNIQUES.

[NICK PEERS]

WINDOWS 10 IS the fastest, most efficient operating system Microsoft has yet created, but it's not infallible, and even the most expensive, most powerful of PCs can get a little sluggish after a few months of continuous use, especially if you don't keep on top of your PC's maintenance.

Some people might spot that their computer is starting to slow down and unnecessarily spend money upgrading hardware under the bonnet, or going out and buying a new system altogether.

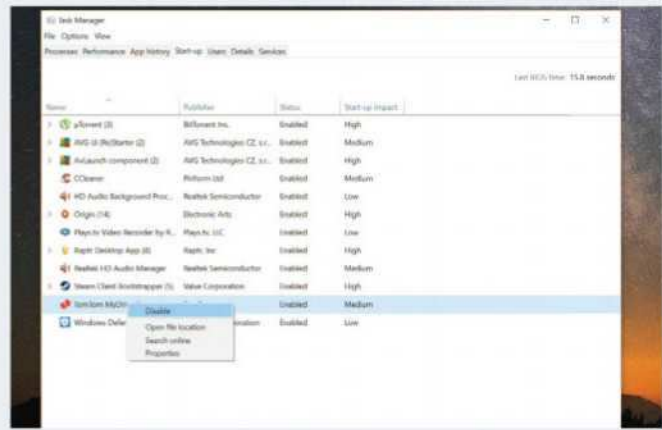
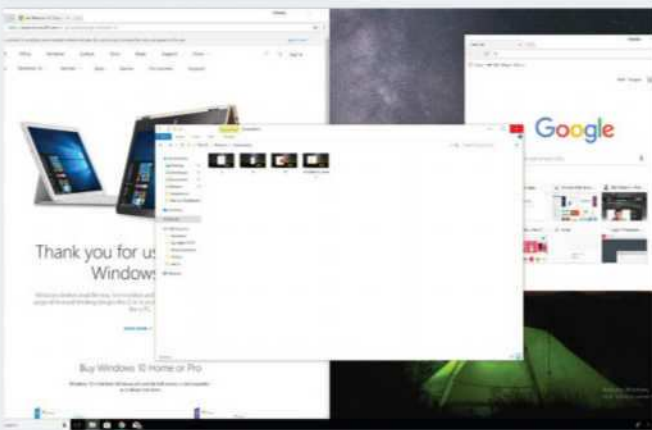
We think that's pretty extreme when all you really need to do if your Windows 10 machine

starts to slow is to follow this guide to give your laptop or desktop an instant boost of speed. What's more, none of this costs any money to do!

And if you're diligent with your PC's upkeep, you needn't ever suffer from lower performance ever again.

[STEP BY STEP]

GIVE YOUR PC AN INSTANT SPEED BOOST



01

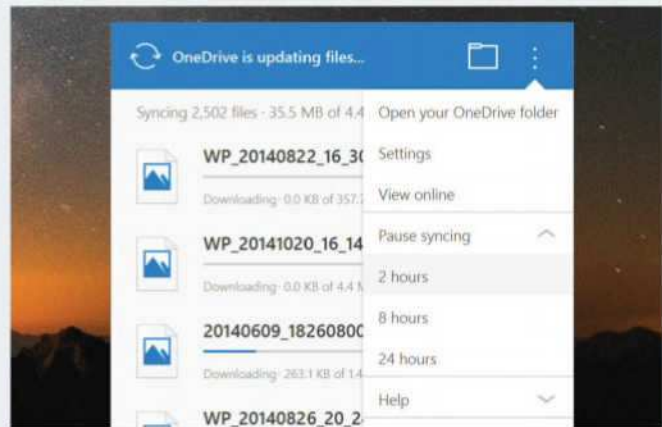
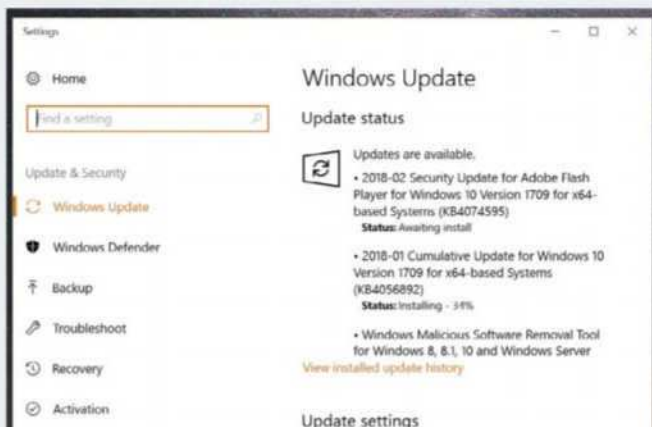
CLOSE APPS YOU'RE NOT USING

This first step might seem really obvious, but if you're not using something within Windows, you should probably close it. This could take the form of apps, web browser tabs or even basic file windows. If you'd like to be more accurate, you can check the Task Manager (see over the page) to see which of these are causing the biggest effect on your PC's performance, and close only those.

02

STOP THE START-UP

Whenever you start your PC from fresh, it automatically loads a number of applications. These can have an effect on your performance, making your PC seem slow to use and start up. To prevent apps from loading, type "Task Manager" into the search box and press Enter. Under the Start-up tab, right-click those you want to prevent from opening and select Disable.



03

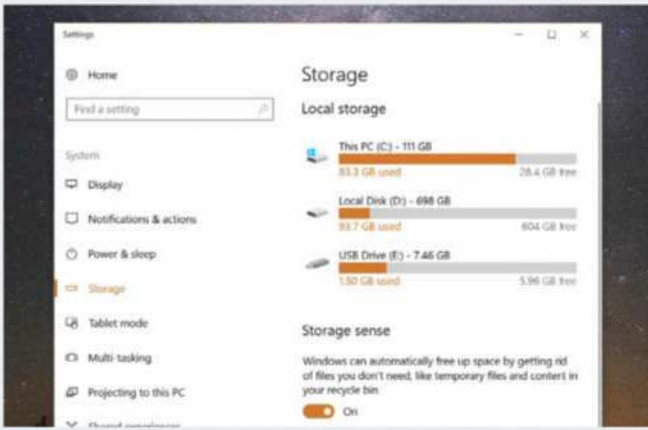
GET THE LATEST UPDATES

To ensure your PC is running at its best, always get the latest updates — it'll help with performance, and keep your computer virus-free. To check for updates, type "update" into the search box and click 'Check for updates' when it appears. If it says your PC is already up to date, then you're good to go. If there are updates waiting, click 'Install now' and restart your PC when it's done.

04

STOP SYNCING TO ONEDRIVE

If you have files on your PC that are automatically synced with Microsoft's OneDrive, it could be slowing you down. Every time OneDrive syncs in the background, it impacts performance. To stop it from syncing, open the OneDrive icon on the Taskbar — if you can't see it, click the up-facing arrow on the right-hand side. Right-click it and choose 'Pause syncing' and specify a time.

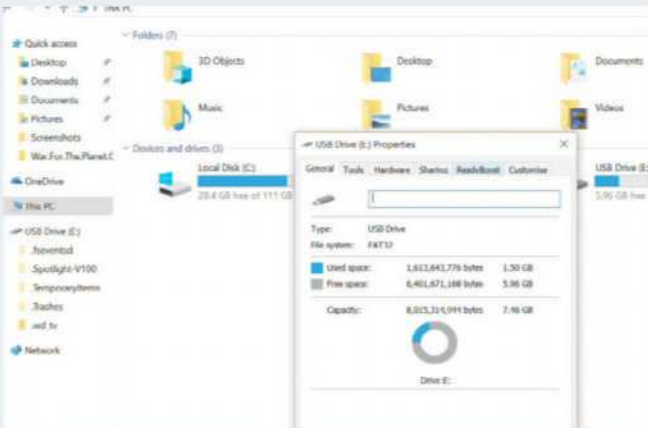


05

FREE UP DISK SPACE

A bloated drive can make your PC chug along at a seriously slow speed. To make sure it never gets full, turn on 'Storage sense'.

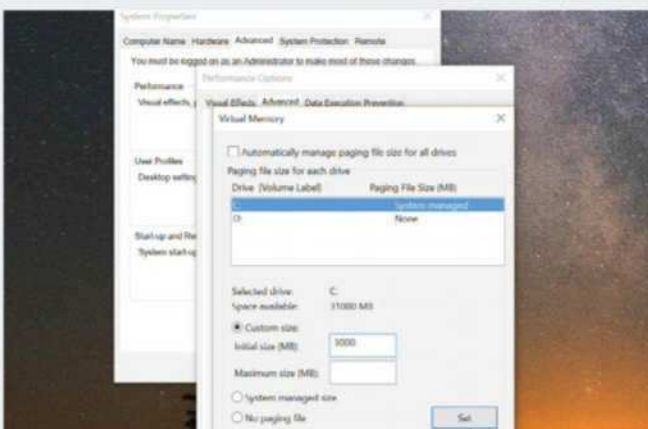
Type "storage" into the search box and click Storage when it appears. If it has not already been checked, click the toggle below 'Storage sense' to turn it on. Now your PC will automatically remove any unnecessary files when the drive is nearing capacity.



06

USE READYBOOST

ReadyBoost is a great way of improving your machine's performance — provided you have a spare USB flash drive to hand with at least 500MB of free space on it. To activate ReadyBoost, plug in your USB drive and once File Explorer opens, right-click the name of the drive, select Properties and choose the ReadyBoost tab. Select 'Use this device' to enable ReadyBoost.



07

INCREASE PAGING FILE SIZE

Windows uses an area of your drive called the paging file. If you increase its size, you can boost your PC's speed. To do so, type "advanced system" into the search box, and click 'View advanced system settings'. Click Settings next to Performance. Under the Advanced tab, click Change, then uncheck 'Automatically manage paging file size', select 'Custom size' and enter the value you'd like.



01

02

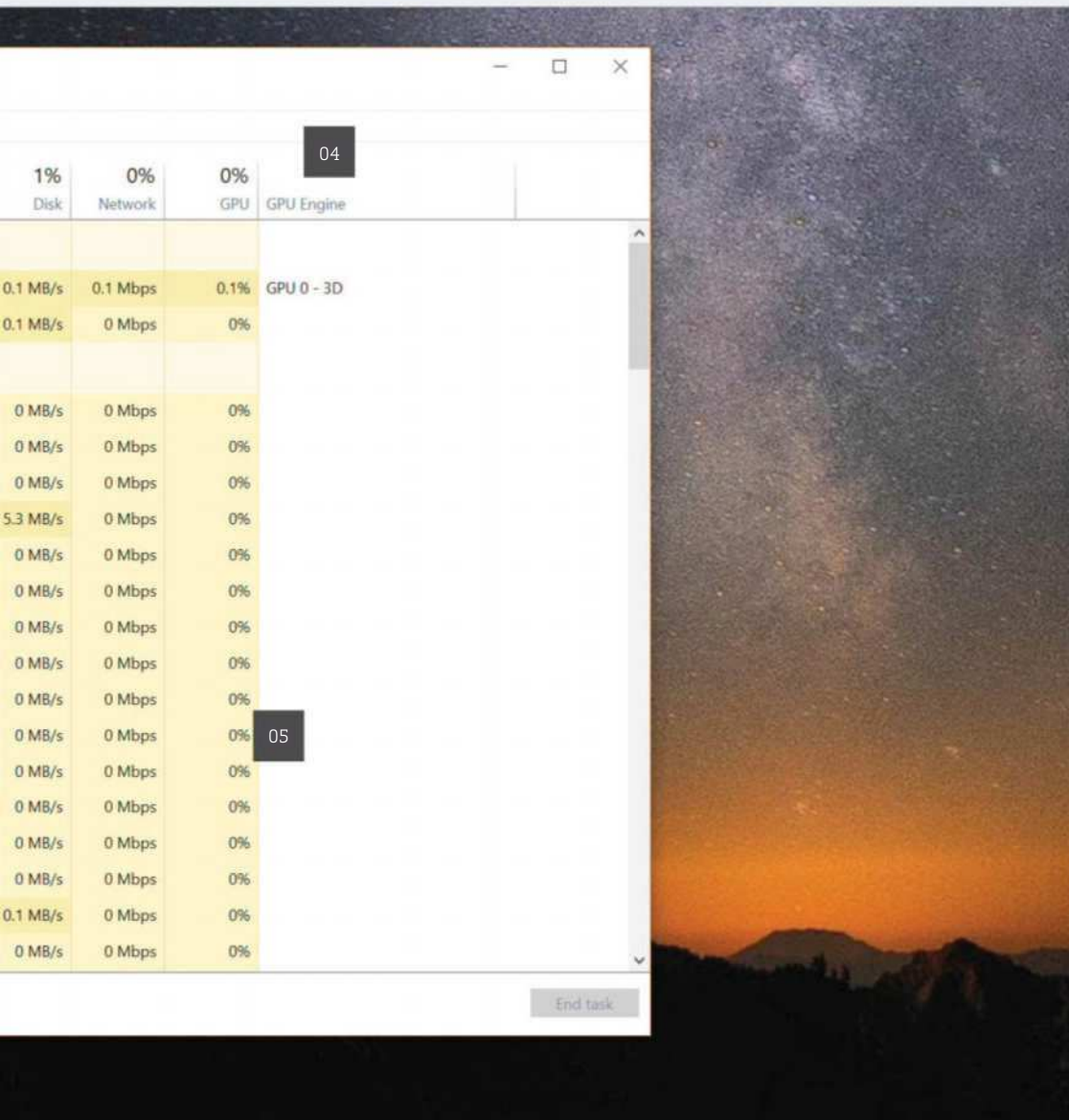
03



08

KILL VIRUSES OR MALWARE

A virus or piece of malware can slow down your PC. To keep it free of nasties, type "windows defender" into the search box and then click the Windows Defender Security Centre. Make sure you're up-to-date by selecting "Virus & threat protection", then "Protection updates > Check for updates". Now scan for viruses by selecting 'Quick scan'.



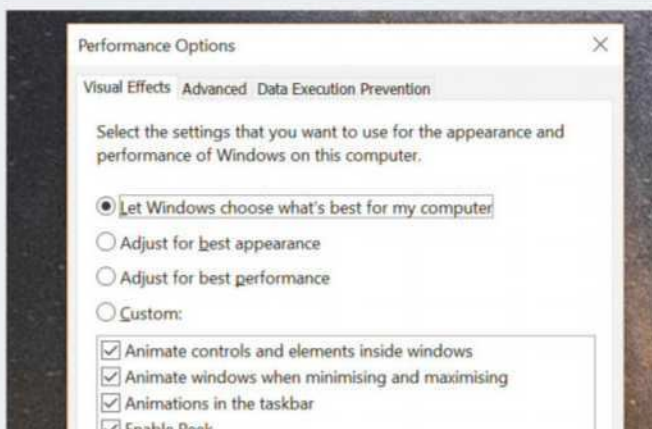
01 DIFFERENT VIEWS
Switch between tabs in the Task Manager windows to show performance, start-up programs and more.

02 WHAT'S GOING ON
On the left, you'll find all the current active processes. Use the drop-down next to each one to find out more.

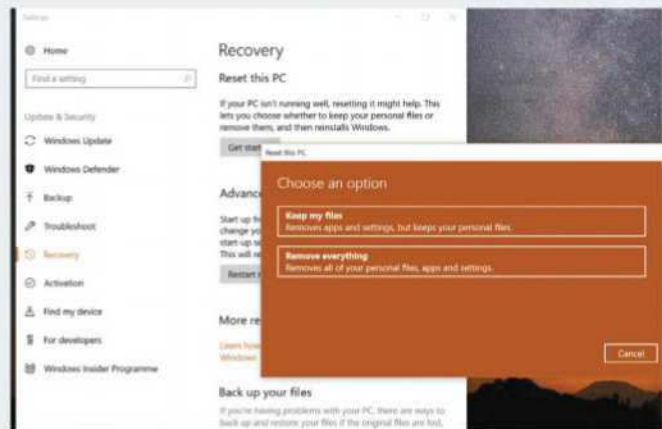
03 SHUT THEM DOWN
When you want to stop a process from eating up your PC's performance, right-click its name and select 'End task'.

04 YOUR PC
Here, you'll see what effect each of the open processes is having on your PC, revealing how much is being utilised.

05 COLOUR CODING
Processes that are unduly affecting your PC's performance are highlighted by colour; a darker shade reveals a resource hog.



09 ADJUST APPEARANCE
Windows 10's whizzy visual effects can put the brakes on your PC's speed. You can turn off many of these enhancements — type "performance" into the search box and, when it appears, click 'Adjust the appearance and performance of Windows'. In the window that appears, check the box next to 'Adjust for best performance', then click OK to put it into action.



10 RESET YOUR PC
Your PC should now be much faster than before. If it's still slow, you may have to resort to resetting your machine. Type "reset" into the search box and click 'Reset this PC'. Click 'Get started', and in the window that appears, choose the setting you'd prefer. For a complete reinstall, click 'Remove everything'. If you want to keep your personal files, select 'Keep my files'.



[MAC]

Easily sign into everything on Mac with keychains

LEARN TO USE iCloud KEYCHAIN TO STORE AND QUICKLY ACCESS ONLINE ACCOUNTS.

[KENNY HEMPHILL]

YOU MAY WELL have dozens of usernames and passwords for websites. Remembering them all is a tall order, but it's vital that you don't start using the same details for multiple sites; if one website suffers a security breach, your details may end up leaking out online, which could potentially give other people access to your email, social networks, online retail sites... all in one go.

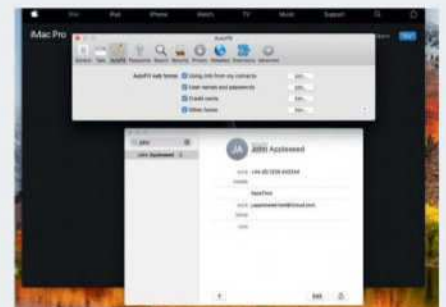
Instead, iCloud Keychain can help you out; it enables you to keep usernames, passwords and bank card details in an encrypted vault

on Apple's servers. Data stored in your keychain is available on any Mac or iOS device signed in to your iCloud account, which saves you having to remember every last password.

The keychain even works in conjunction with Safari's AutoFill feature to save you time filling out forms. You don't even have to come up with complex passwords in the first place because Safari can suggest strong ones when you create an account on a website.

[STEP BY STEP]

WORK WITH iCloud KEYCHAIN



01

GET STARTED

On your Mac, go to **Apple > System Prefs > iCloud**. On the right, check Keychain's box. If you haven't enabled two-factor authentication to protect your Apple ID, then you'll need to set a security code — don't lose it!

02

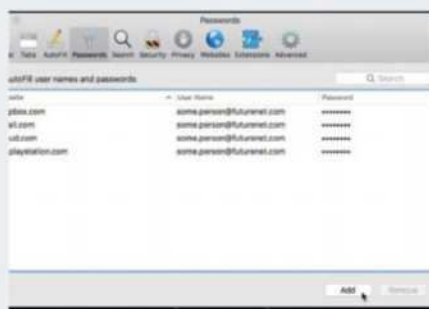
CONNECT A DEVICE

On a Mac that's signed in to your iCloud account, tick the same Keychain box. On iOS, look in **'Settings > [your name] > iCloud'**. You may be asked to enter the passwords/codes for devices on which you're already using keychain.

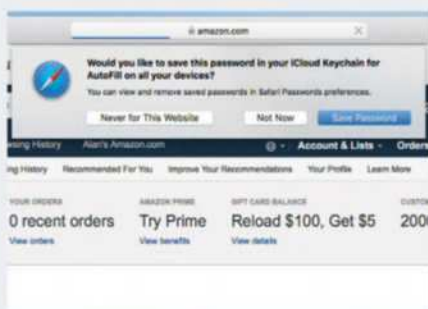
03

AUTOFILL IN SAFARI

In Safari, go to **'Safari > Preferences'** and click the AutoFill tab. Here, you can choose which information will automatically be filled out in forms. The first item pulls details from your card in Contacts, rather than using keychain.



04 ADD PASSWORDS
The quick way to add usernames and passwords to your keychain is 'Safari > Preferences > Passwords', by entering them manually — be careful when typing! Click Add, enter a site address and your username and password for it.



05 SAVE AT SIGN IN
Instead of (or as well as) the previous step's method, take advantage of Safari's offer to save details when you first sign in to a site. Also, when creating a password for a new account, Safari suggests one; click it to accept it.



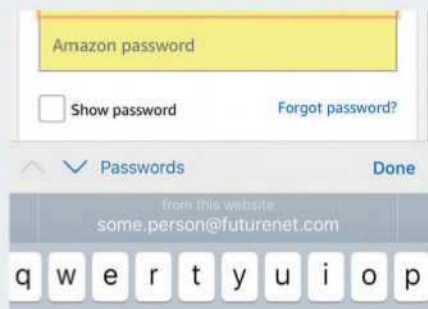
06 SAVE AT SETUP
Alternatively, click the icon at the right of the field for another suggestion. Your credentials are saved to iCloud Keychain and are available on all devices you connect to it. Some sites — banks, for instance — can request for details not to be saved.



07 EDIT KEYCHAIN
To change a password on your Mac, follow the site's reset steps, then sign in; Safari asks to update your keychain. Or preemptively click the password in Safari's Passwords preferences to edit it directly.



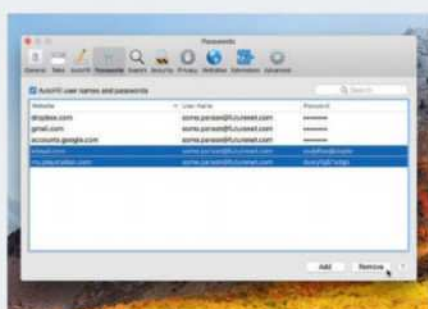
08 VIEW PASSWORDS
When you visit the Passwords tab on a Mac, you'll need to enter your password (or use Touch ID) to view items. Each is only readable when its row is selected; make sure you don't leave this tab open and unlocked for all to read!



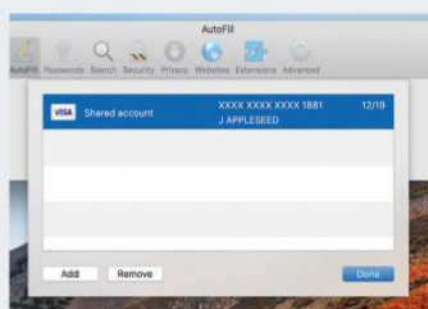
09 AUTOFILL ON iOS
If 'Settings > Safari > AutoFill > Names and Passwords' is on and you visit a sign-in page, saved credentials for the site are shown as pictured; tap one to fill out the form, or tap Passwords to choose from other saved account details.



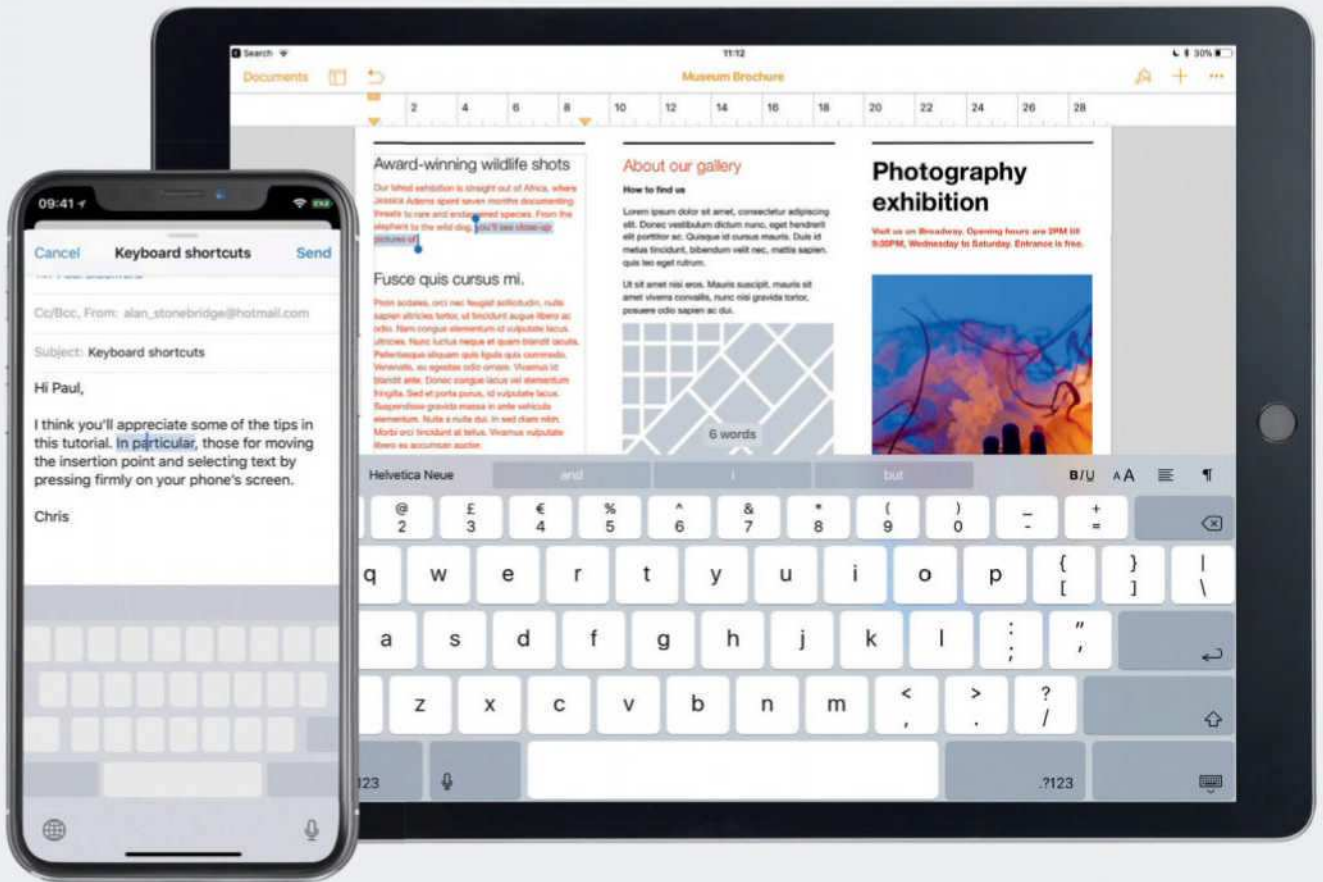
10 KEYCHAIN ON iOS
In iOS 11, apps can use keychain. If an app hasn't been updated for this, go to 'Settings > Accounts & Passwords > App & Website Passwords', hold a finger on an item, pick 'Copy User Name' or 'Copy Password', switch to the app, then paste.



11 REMOVE PASSWORD
If you delete an account, remove its details from your keychain on one device and they'll go from others, too. On a Mac, select it in Safari's Passwords list and click Remove. On iOS, swipe left on it in the passwords list and tap Delete.



12 ADD CARD DETAILS
In 'Safari > AutoFill', click Edit next to Credit Cards. Click Add and fill out the details. For security reasons, CVV codes aren't stored; they must be memorised. To edit a detail, click it; altering the long card number requires your password. ■



[iOS]

Discover iOS's hidden speed typing tools

THE PRODUCTIVITY-BOOSTING TRICKS CONCEALED UNDER YOUR KEYBOARD.

[CHRISTOPHER PHIN]

YOU MIGHT THINK that you need to use an external keyboard to get any serious typing done on an iPhone or iPad. While it's true that you can do that — over Bluetooth, using a Smart Keyboard or using Apple's Lightning to USB adapter — if you learn the little tips and tricks Apple has baked into the on-screen keyboard, everything from a tweet to the next great novel is well within the reach of your fingertips. Let's get typing!

We'll start with something fundamental. Most people will only really use one keyboard for typing, but you can set up several. One main use for this is for typing in different languages; adding other keyboards in 'Settings > General > Keyboard > Keyboards' doesn't just change the layout of the keys to match conventions in that country (AZERTY rather than QWERTY in France, for example), or even the input method entirely, but it changes the autocorrect dictionary, too.

(Here's a really hidden feature: you can override the keyboard layout change — to retain the benefits of the autocorrect change without the confusion of letters moving around — by tapping the name of the keyboard you've added in this list.)

If you do type in more than one language, therefore, and have been cursing autocorrect for mangling your words, here's the solution, and it even works for different versions of English; handy if you sometimes need to 'humor' our 'neighbors' in America without causing 'offense'.

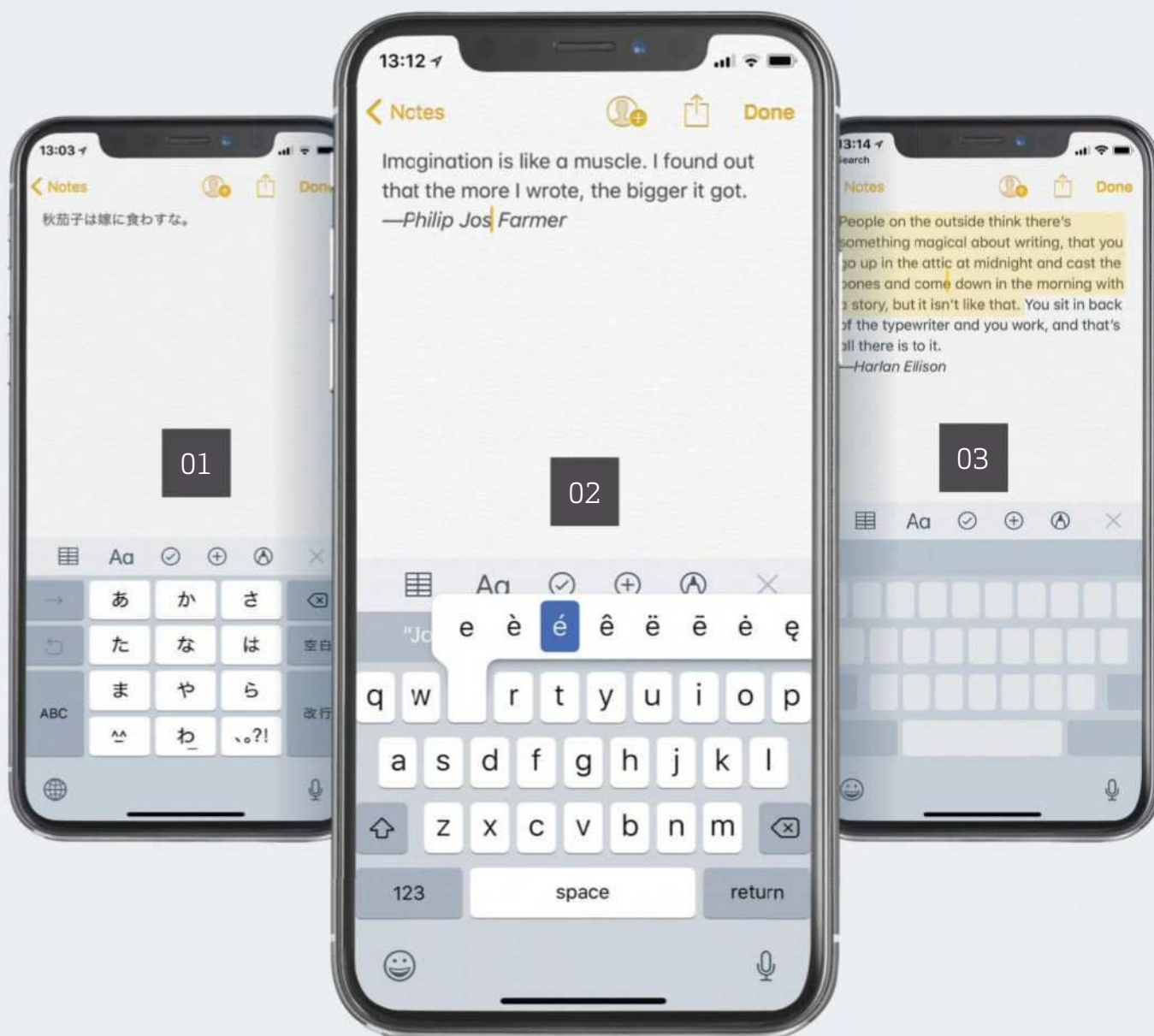
01 To switch between the keyboards you add (in the order you set them in 'Settings > General > Keyboard > Keyboards'), tap the globe icon at the bottom left of the keyboard. If you only have one main keyboard installed, this will instead be a smiley face, as it toggles to the emoji keyboard.

EMOJI AND SPECIAL CHARACTERS

So long as you have the Predictive bar turned on, though, it can act like emoji search, and you don't even have to switch to that keyboard; type "chips", say, and the option in the predictive bar is the French fries emoji. Tap it to replace the word with the emoji. (This will work for the UK keyboard, too, although not the US English version, since 'chips' are crisps in over there! Watch out when ordering takeaway, from personal experience...)

You might be used to tapping '123' to switch to the numbers, but if you only need to type a single character from this keyboard, it can be more efficient just to drag your finger from the '123' to the desired number key — the keyboard will temporarily switch layout in between — then release to get back to the usual keyboard.

If you're on any iPad except the 12.9-inch (and only then when using optimised apps),



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MOST PEOPLE WILL ONLY REALLY USE ONE KEYBOARD FOR TYPING, BUT YOU CAN SET UP SEVERAL.

you also see secondary characters on the keys; just flick down on the key to type them.

02 Hold a finger on a key to see alternate characters, and *voilà* — you can type “voilà”! It works for less well-known things, too; hold on the \$ sign, for example, and you get other currency symbols, or on the fullstop when entering a web address in Safari to see other domains, such as .com.au, .com and more.

MOVE THE INSERTION POINT

The traditional way to move the insertion point, or caret, around on iOS is to hold a finger on the text you were writing, and then use the magnifying glass pop-up to get it into the right place. That’s a little fiddly and prone to error around the edges of the screen, and there is a better way on iPad, and iPhones with 3D Touch — the pressure-sensitive display technology that was introduced on the iPhone 6s.

On an iPad, you can just slide two fingers around the keyboard to move the caret, and on an iPhone with 3D Touch, just press firmly on the keyboard with one finger to switch to this mode, then slide your finger around. Once you’ve moved the caret to where you want it on iPad, lift your two fingers, set them down again, wait a beat, then move; you’ll then be selecting text.

On iPhones equipped with 3D Touch, you have extra options for text selection, though they take some trial and error to learn. Once you’ve pressed firmly on the screen to move the caret, you can reposition the caret over a word and then press even harder to select just that word. That bit’s easy enough, but with practice, you can also double-press to select the whole sentence at once, or triple-press to select the whole paragraph.

QUICK TIPS

Made a mistake? You needn’t reach for the Undo button to roll back your text; just shake your device, provided ‘Settings > General > Accessibility > Shake to Undo’ is switched on.

03 You can combine the two-finger and 3D Touch shortcuts with dragging. Let's say you have a three-sentence paragraph and want to copy only the first two sentences; press firmly to start moving the caret, position it anywhere over the first sentence, double-press to select that sentence, then drag to the second, which will be selected in its entirety — though the paragraph's final sentence will be left out.

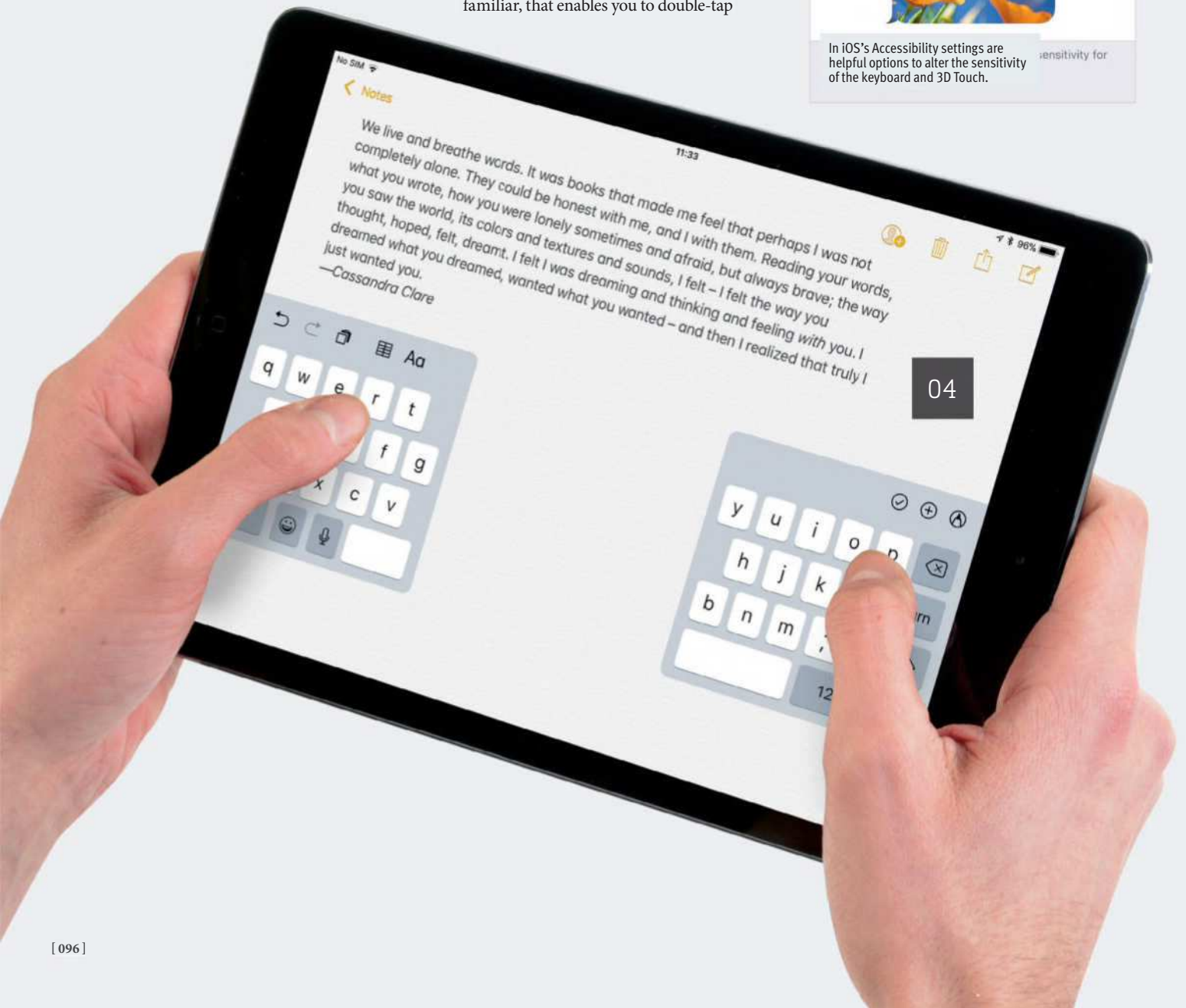
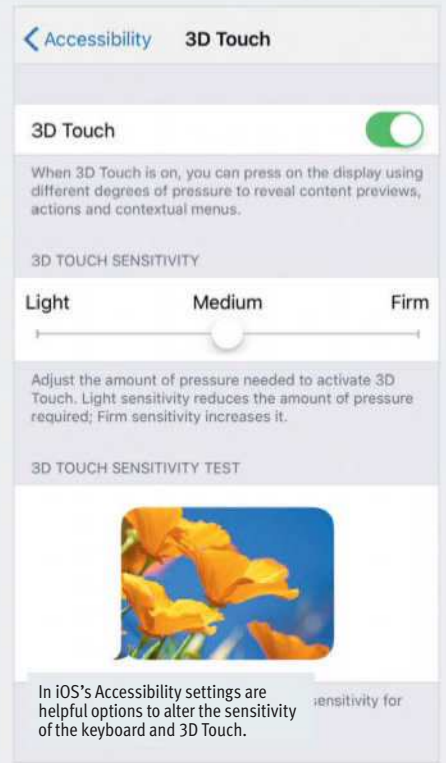
In either scenario, you can grab the little handles that appear at each end of your selected text to fine-tune what you're picking up, if necessary, and you can also tap either

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YOU CAN COMBINE THE TWO-FINGER AND 3D TOUCH SHORTCUTS WITH DRAGGING.

of these handles to bring up the options bar, with cut, copy, paste and other options, if they aren't already visible.

CAPITALS AND SPECIAL CHARACTERS

Let's go back to something easier: switching to capital letters. This can be as simple as tapping the Shift key to switch only the very next character you type to uppercase, or double-tapping it to turn on Caps Lock. Note that you can use the same slide technique we mentioned for the '123' keyboard switch; slide from the Shift key to a letter and it will be capitalised without the need to dismiss the caps keyboard afterwards. iOS will try to be helpful in capitalising new sentences, but if you don't like this, you can turn off Auto-Capitalisation in 'Settings > General > Keyboard'. Here, you'll also see a toggle for the fullstop shortcut; in case you aren't familiar, that enables you to double-tap



QUICK TIPS

If you use multiple email addresses, text replacements can work out quicker for typing them than relying on the keyboard's QuickType suggestions bar. For example, you might use @i c l to type your iCloud address, @g m a for Gmail and @l s t for an alias you use for newsletters and other mailing lists.

the space bar to get a full stop, a space and the next letter capitalised.

We mentioned holding a finger on some keys to get accented forms and alternative characters. On some iPads running iOS 11, keys may display a second character. Rather than using Shift or holding the key, flick upwards from the key to type the second character more quickly. ('Settings > General > Keyboards > Enable Key Flicks' must be switched on.)

KEYBOARD SIZE & POSITION

There are a couple of things you can do to change the size and position of the keyboard.

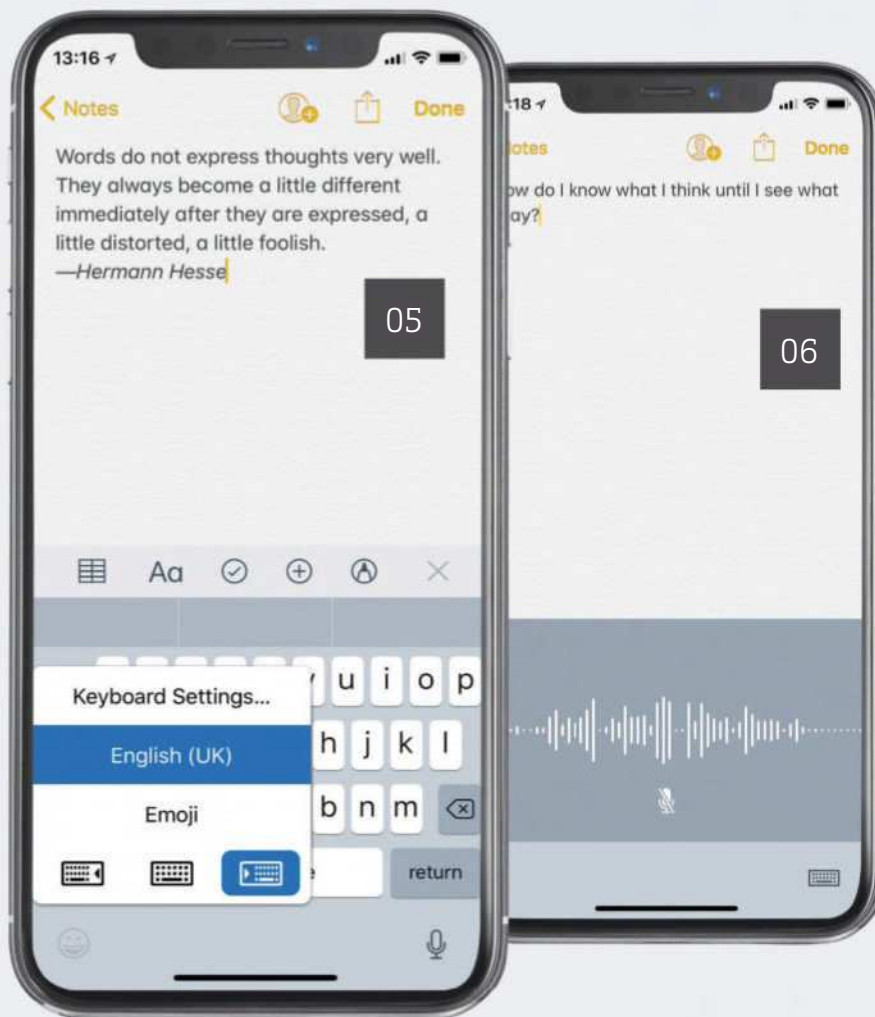
04 On an iPad, either drag the left and right of the keyboard apart with your fingers, or hold a finger on the keyboard icon (bottom right) and tap Split in the menu that appears; this separates the keyboard at the sides of the screen so it's easier to type with your thumbs when holding your iPad. Adjust their vertical position by dragging the icon at its bottom right. Drag all the way to the bottom to return to a single, large keyboard.

05 On an iPhone running iOS 11, except for the 5s and SE, you can make the keyboard easier to use one-handed by holding on the emoji/globe icon (bottom left) and choosing to shunt the keyboard over to the left or right side of the screen. The keys become narrower, like on pre-iPhone 6 devices, but are easier to reach with your thumb.

Don't feel this has to be a permanent decision; it makes sense to toggle it when you're trying to type while walking, say, even moving from right to left as you swap hands, but then switching back to the full-width keyboard once you get where you're going; tap the large arrow next to the keyboard.

SPEED UP YOUR TYPING

As well as all this, iOS provides some very helpful ways to actually speed up what you



type. Text replacement is a great one, with three common applications. First, to replace clusters of characters with short phrases (such as typing "omw" being replaced with 'On my way!'), and even 'correcting' weird iOS auto-corrections. Second, to type characters that would otherwise require laborious searching/copying/pasting — to have "cprt" become ©, say.

The third major use is to type phrases or longer passages of text that you write often. For example, you might type "reply7" and have iOS replace that with a couple of paragraphs of text that are your standard response to a question you're frequently asked by email. Or if you often search Apple Support articles in Safari, set up a shortcut to replace "#spt" with 'site:support.apple.com' so that you only get Google search results from that part of Apple's site. Set up text replacements in 'Settings > General > Keyboard > Text Replacement' on iOS, or in 'Apple > System Preferences Keyboard > Text' on a Mac. Whichever device you do this on, your text replacements will sync to your other Macs

and iOS devices signed in to the same iCloud account.

USE YOUR WORDS

06 Finally, don't forget about dictation, which you'll find at the bottom of 'Settings > General > Keyboards'. It works for English even when your device is offline, and though you might feel weird doing it in a shared office or classroom, these days, it's highly accurate — and usually much faster than typing, if you can think and talk in complete sentences. You can even dictate punctuation and issue 'commands', such as "fullstop" and "new line". ■

QUICK TIPS

If you find 3D Touch's sensitivity a little 'off', adjust it to require a lighter or firmer press in 'Settings > General > Accessibility > 3D Touch'.

[ANDROID]

An Android Oreo overview

DIVE IN WITH US TO SEE IF THE LATEST UPDATE REALLY TAKES THE BISCUIT.

[CHARLES HANDMER]

MOST NEW AND high-end Android phones are now shipping with, or being upgraded to, Android 8, aka 'Oreo'. In fact, most Android phones sold in the last year or two are likely to receive an Oreo update this year. The Samsung Galaxy Note 8 used in our recent Android Superguide just received its update to 8.0, so it's an ideal time to do an overview.

OVERALL CHANGES

Oreo does not look radically different, but has many refinements. A wider range of colours are supported, although you are more likely to notice the new adaptive app icons that let you choose what style they take. Android default emojis have been updated, too.

The Settings menu now has items grouped under broader categories. This means some items take more clicks to get to, but overall, the menu system is logical and easy to navigate. And you can still use the Search

option at any time to find the setting you want. Under-the-hood refinements include tweaks that let devices boot up twice as fast, and increase battery life by reducing power drain from background processes and apps.

PICTURE IN PICTURE — PIP

Can't get enough cat videos? Start your favourite video feed going and just tap the Home button to keep it running in a small window while most of your screen is dedicated to what you're supposed to be doing.

This Oreo feature has so many uses, including the ability to run a video call, monitor a live feed or other app without interruption while you text, browse the web or navigate maps on the majority of your screen. Say you're on a Duo video call and need to look up a text, website, contact or map. Just tap the Home button to shrink the video and open your other app/s. Your call continues uninterrupted, and you can drag the video window to reposition, or swipe it off the screen to close.

Note that PiP is only available on limited apps at present, including Chrome, Duo, Maps, VLC, WhatsApp and YouTube Red.

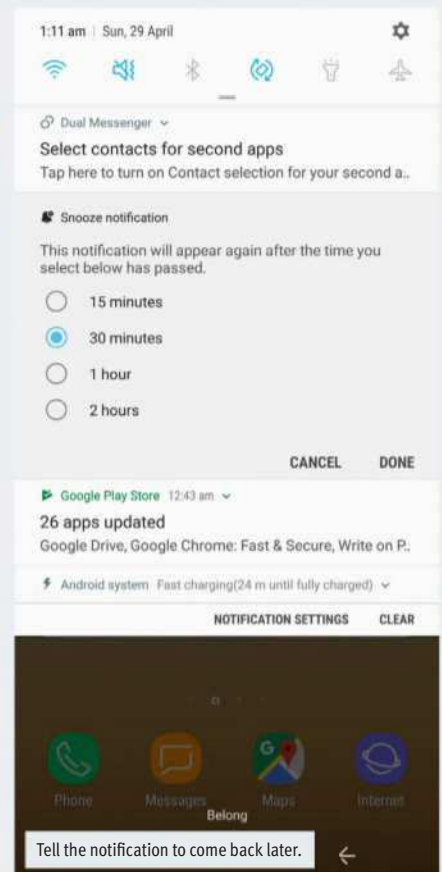
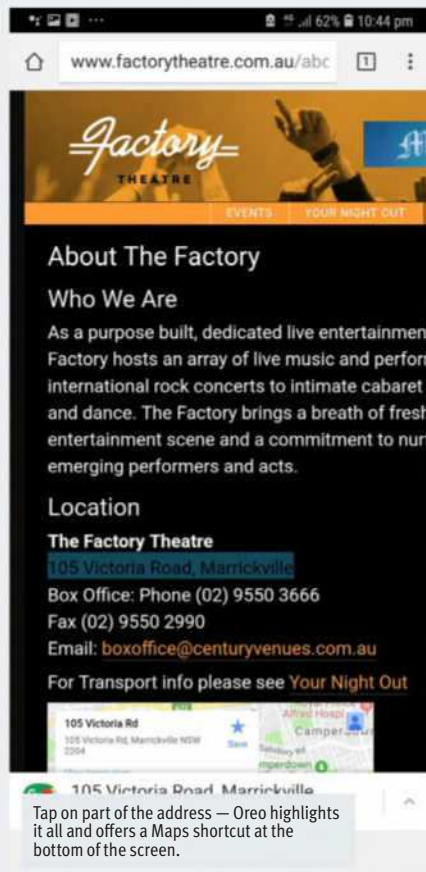
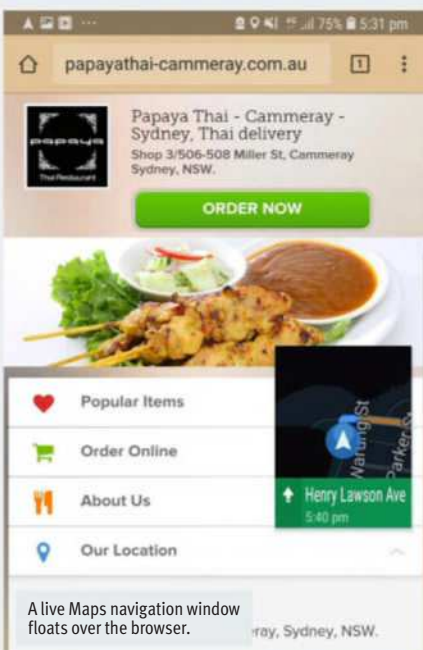
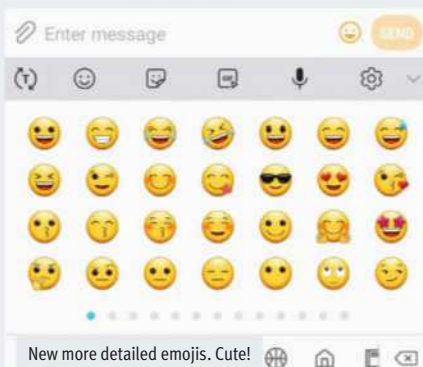
Samsung phones, which have had their own multi-screen capabilities for some time, allow Maps navigation to go PiP, but not the video sources that we tried.

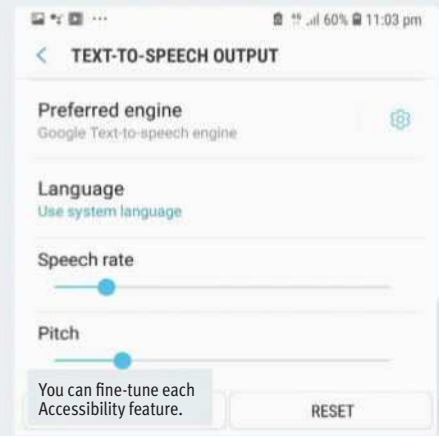
GET SMARTER

Oreo has Smarter Text Selection, which aims to anticipate the words you want to highlight — such as recognising an address or business name, which can save a lot of tapping and dragging. It will also anticipate what app you might use the highlighted text in, such as Maps, and offer it as the first option for copy and paste.

Beyond this, Android Oreo can learn how you use items, so over time, it will anticipate what you want to do with that photo, video or text, and offer to open the app you will typically use next.

If you use a password manager, Oreo supports autofilling your personal details, passwords, credit cards — everything you need for fast access to your web accounts. Just be very sure of your phone security if you go down this path.



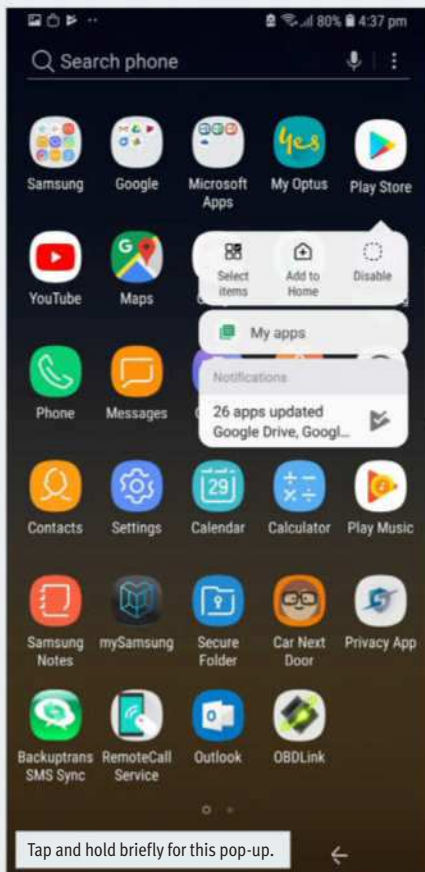


SWIPE RIGHT TO SNOOZE

In Android Oreo, you have the option of snoozing notifications on the home screen — just swipe right (a little) on a notification and tap the clock icon that appears, then choose your snooze. Default time is 15 minutes but you can set up to 2 hours.

APP NOTIFICATION BUBBLES AND SHORTCUTS

When you view the apps screens on recent phones, there may be small dots displayed on the app icons to indicate that there is a notification waiting to be viewed. In Oreo, you can view a pop-up to access these directly. A long press on an app icon also shows you shortcut buttons that you can drag onto your home screen, letting you launch directly into your preferred activity in the app.



TURN OFF YOUR WI-FI FOR GOOD

A great power saving option in Oreo is to set your Wi-Fi to stay off except when in range of a network you've used and saved details for, like your home network. The phone recognises locations with such networks, and switches Wi-Fi on automatically. To activate, find 'Turn on Wi-Fi automatically' in 'Settings > Network & Internet > Wi-Fi > Wi-Fi preferences'.

AUGMENT YOUR REALITY

AR stickers have so far mainly been used to add funny ears or hats to people in your

ANDROID OREO CAN LEARN HOW YOU USE ITEMS, SO OVER TIME, IT WILL ANTICIPATE WHAT YOU WANT TO DO WITH THAT PHOTO, VIDEO OR TEXT, AND OFFER TO OPEN THE APP YOU WILL TYPICALLY USE NEXT.

photos, but there's some serious processing power behind this tech. Once it becomes mainstream, expect to see, for example,

furniture suppliers providing AR stickers that let you position their items in your rooms virtually and share photographs of the results.

The possibilities are endless. Phones running Oreo 8.1 can access animated

Star Wars characters and objects that you can add to your live camera images and videos, then position, rotate and resize on the screen. Expect a glut of selfies with Storm Troopers.

Just tap on the Stickers tab on your camera screen to see what's available.

BLUETOOTH UPGRADE

Sony donated its high-quality audio codec LDAC for inclusion in Oreo, which also supports Bluetooth 5 for higher data transfer rates and longer range. There's still only a trickle of devices that support Bluetooth 5, but it's expected to grow.

Oreo is designed for higher performance audio all round, and LDAC promises to provide exceptionally high quality audio in compatible devices — such as Sony headphones and speakers.

ACCESSIBILITY ZOOM AND SPEECH

Android has long had Accessibility features, and with Oreo, a new button in the navigation bar provides quick access to them. Features such as magnification and Select to Speak are just a tap away.

Magnification lets you tap on a portion of the screen to instantly expand it, a great boon when you're finding that tiny text hard to read, or wondering what that obscure emoji means. Go to 'Settings > Accessibility > Magnification > Magnification Gestures' to activate.

To hear text information rather than see it, go to 'Settings > Accessibility' and turn on the 'Text-to-Speech Output' option. You can adjust speed, pitch and volume, too. ■



[SECURITY AND PRIVACY]

How to stop your phone from giving up your location

LOCK DOWN THE APPS AND SETTINGS THAT COULD BE LEAKING YOUR LOCATION DATA.

[NATHAN TAYLOR]

YOU'VE PROBABLY HEARD by now that your mobile phone can and has been used by many companies to track your location and potentially every movement you make. But have you done anything about it yet? If not, then this month's column is for you.

There are lots of ways your phone can be used to track your location. The most obvious is apps that use the phone's GPS and send that data back to the app provider. Sometimes, that information is essential to the operation of an app — for example in Google Maps — but often... it's not necessary at all.

But there are other ways your phone is giving up your location as well. On Android and iOS, for example, unless you specifically turn it off, your phone will keep a log of every location you visit, and will regularly upload location and Wi-Fi data to Google or Apple's servers. Photos you take will often have geotagging information included — which will be preserved if you, say, upload the photos to Facebook or Twitter, allowing other people

to know exactly where the photos were taken. So let's take a look at a few simple things you can do to stop your location data getting out.

TURN OFF LOCATION TRACKING ON AN APPLE DEVICE

On iOS devices, you can head to 'Settings > Privacy' to find Location Services. It's here that you'll do most of your adjustments. Now, for most people, just switching the whole thing off is not an option — Maps is just too useful a feature to disable completely. We do strongly recommend that you read the 'About Location Services & Privacy' document linked from that page, however. It tells you just what information Apple gathers from you, including information that it uploads to Apple's servers.

If turning off Location Services completely is not an option for you, however, then you should go through the apps one by one and decide whether that app needs to know your location. Every app which has permission to access your GPS is listed here, and you can go

through one by one and change the setting for those apps to 'While Using' (which means that it can only access GPS while the app is open) or 'Never,' which disables GPS for those apps.

As a special note, we recommend disabling GPS for both your browser and Camera app. Disabling for the browser automatically denies any website that asks for your location data. Websites like Google can still do some location-based stuff based on your IP address (so they will still probably know what city you're in), but it won't give up your specific location. Disabling for the Camera will stop the camera app from geotagging your photos, which we'll get into more in a little bit.

Finally, there's a special section called System Services in the App list. Tap on it, and it will bring up all the different ways your phone OS itself gathers your location data.

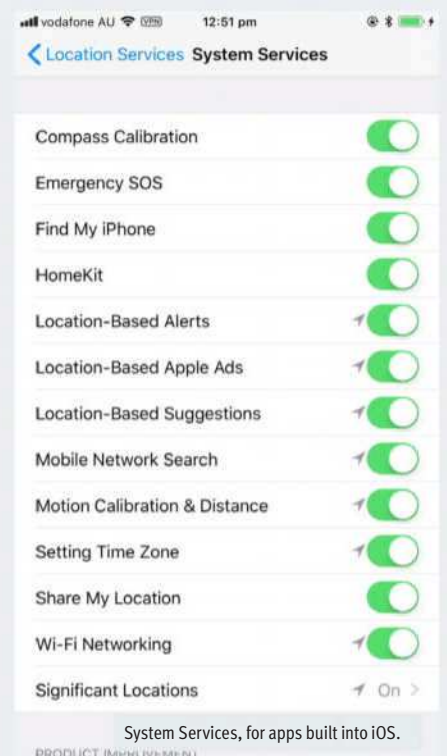
You can switch all or some of these off as you like. This will stop a lot of the location information sent back to Apple. It will stop Apple from sending you location-based alerts and ads,



Location Services on iOS.

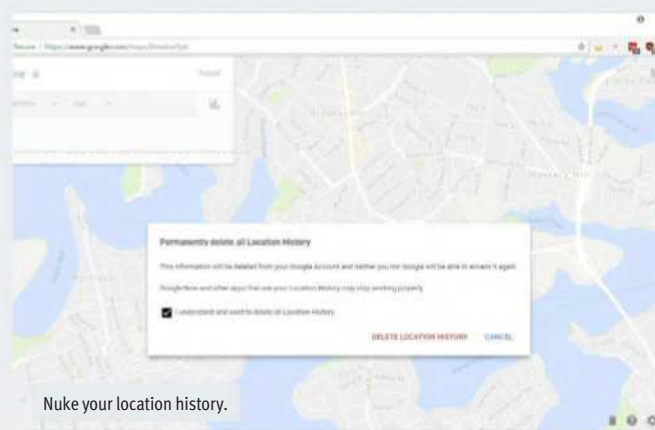
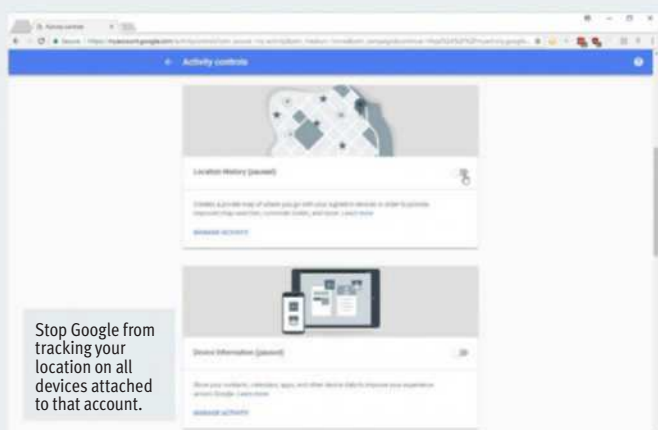


Websites don't need to know your location.



System Services, for apps built into iOS.

PRODUCT IMPROVEMENT



Nuke your location history.



will stop it from sending back anonymous data on local Wi-Fi and cellular networks and stop your phone from automatically sharing your location with friends and family.

There are some things you might want to leave on. If you switch off Find My iPhone, for example, you won't be able to use that feature if you lose your phone. SOS, Time Zone and Compass Calibration are also tools that you might want to leave on.

ON AN ANDROID DEVICE

When it comes to devices running Google operating systems, you can actually switch off location settings in several places.

The first, and easiest, is to turn off location tracking account-wide on your Google account. Open a browser on any device and follow these steps:

Go to myaccount.google.com/activitycontrols and log into Google (if you're not already). Scroll down to find Location History and turn the switch to off (paused). Google will give you a warning; just click through it. This will turn off Google's location tracking on all your devices attached to this Google account. That is, your device will no longer upload location information to Google.

Now to delete your existing records. Go to www.google.com/maps/timeline. This shows the complete history of your movements, as recorded by Google. Down the bottom right of the map, you'll see

a bin button. Click on it. You'll get a prompt asking for confirmation that you want to delete your location history. Check the box and click 'Delete location history'.

Now we've stopped Google from tracking your location. But what about other apps? For those, you'll have to go to your phone or tablet, much like on iOS above.

On the Android home page, tap on Settings. Tap on Apps or Application Manager. (On Samsung TouchWiz, this might be in the Applications tab). This will show you all your apps, and tapping on one will show its permissions.

We actually want to view this list not by app, but by permission, however. Tap on the settings gear button or the vertical ellipses on the top right, and select App Permissions. This will bring up a list of the different types of app permissions on the Android device.

Choose Location. You'll now see a list of apps with permission to access your location information. You can now individually disable location tracking for those apps that you want to deny access to.

Much as with iOS, we recommend turning off location on your Camera and browsers at least. This will stop website location tracking as well as geotagging on photos.

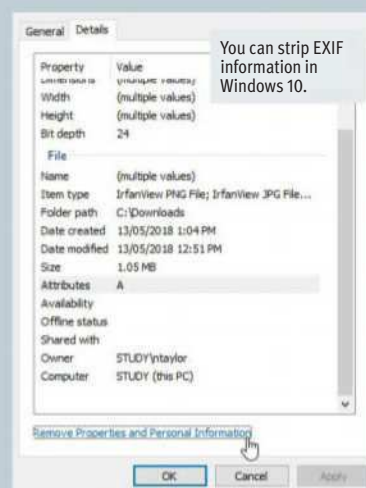
Once you've done that, your Android device should be much less open about who it shares your location with! ■

GEOTAGGING

One way you can unwittingly be tracked is by photo metadata. Most camera phones now automatically add GPS and time data to the meta information (called EXIF data) on any image you take with them. This is called geotagging. Many users find this info useful — for automatically sorting and naming your photo collection, for example. But you might not realise that other people can also use it to spy on you. They could download photos you've uploaded to Instagram or Facebook, for example, and find out exactly when and where you were when taking that photo.

In the above guides, we've walked through how to turn off Location for your Camera app, which should stop geotagging. You may also be able to go into the settings of your camera app and find the settings for location tagging and turn it off there.

Finally, if you want to strip geotag information out of photos after they've been taken, it's relatively easy to do in Windows 10. In File Explorer, select all the images that you want to strip the EXIF information out of. Right click on one of them and select Properties. In the Details tab, click on the 'Remove Properties and Personal Information' button, which brings up a dialog that allows you to strip EXIF information out of the images selected.



[HOME NETWORKING]

Diagnose Wi-Fi problems and optimise your network

GET THE TOOLS YOU NEED TO MAKE THE MOST OF YOUR WI-FI CAPABILITIES.

[NATHAN TAYLOR]

WHEN YOU'RE GOING about the business of optimising your Wi-Fi network, there are few tools more useful than a Wi-Fi scanner. These apps give you an overview of all the wireless access points in range of the device you're running it on. You can use them as mobile sensors to detect gaps in and test the strength of your own Wi-Fi network; or you can use them to detect which channels your neighbours are running their networks on.

So what are the best Wi-Fi analysers for each platform? This month, we'll take a look at our top picks, as well as walk through how you can use such an app to choose the best Wi-Fi channel for you.

TOP WI-FI ANALYSERS

WINDOWS: NIRSOFT WIFI INFOVIEW

www.nirsoft.net/utills/wifi_information_view.html

We've actually bounced around when it comes to a favourite scanner for Windows. There are actually a number of them available, but some of our favourites (like inSSIDer and Riverbed Wi-Fi Inspector) have gone commercial and only have free trial versions now.

Which brings us to Nirsoft's freeware WifiInfoView, a basic tool that doesn't have the fancy graphs and visualisation of the aforementioned tools, but still gives you a useful overview of neighbouring networks and their signal power relative to the position of your Windows PC.

While we like the simplicity of WifiInfoView, if you want something a little

more visual, you can try WiFi Analyzer for Windows 10 (matthafner.com/wifianalyzer), a tool that looks very much like Wi-Fi Analyzer on Android. It's available in the Microsoft Store.

Another worthwhile tool is the free version of Netspot (www.netspotapp.com). The free version of Netspot provides the most comprehensive overview of local wireless networks that we've seen, including performance graphs of individual wireless networks. If you want the home survey and visualisation tools, however, you'll have to fork out for the commercial version of Netspot.

MACOS: BUILT-IN

While Netspot is available for MacOS as well, you don't actually have to install anything at all on a Mac to run a survey of local wireless networks. MacOS has that capability already. Just follow these steps:

Hold down the Option key and click on the Wi-Fi signal icon at the top of the screen.

This brings up a special options menu. In that menu, select 'Open Wireless Diagnostics'.

Go up to the menu at the top of the screen. Click on Window, then select Scan from the drop-down menu.

This will bring up a Window with all the networks detected by your Mac. It will even recommend the best channels for you to use in both the 2.4GHz and 5GHz bands (more on that a little later).

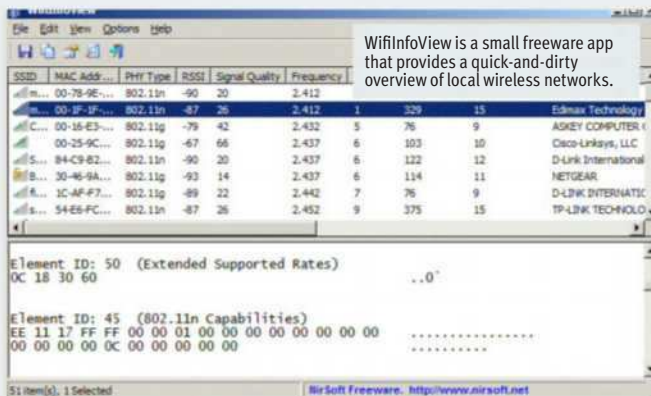
ANDROID: WIFI ANALYZER

Available on the Google Play Store

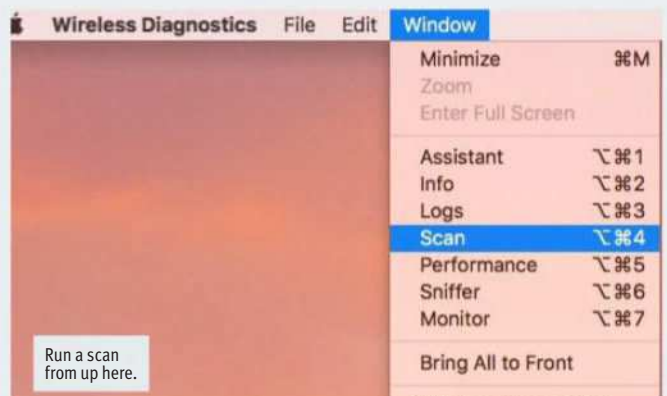
If you're a regular reader of this column, you'll probably already be familiar with Wifi Analyzer from farproc, which can be downloaded from Google Play. A free and immensely useful app, Wifi Analyzer lets you quickly visualise all the Wi-Fi networks that



The free version of Netspot, available for Windows and Mac, provides a comprehensive overview of local networks.



WifiInfoView is a small freeware app that provides a quick-and-dirty overview of local wireless networks.



Run a scan from up here.



+

SO THAT THEY'RE NOT FIGHTING OVER THE SAME AIRWAVES, IDEALLY, DIFFERENT WI-FI NETWORKS IN THE SAME PHYSICAL SPACE USE DIFFERENT CHANNELS.

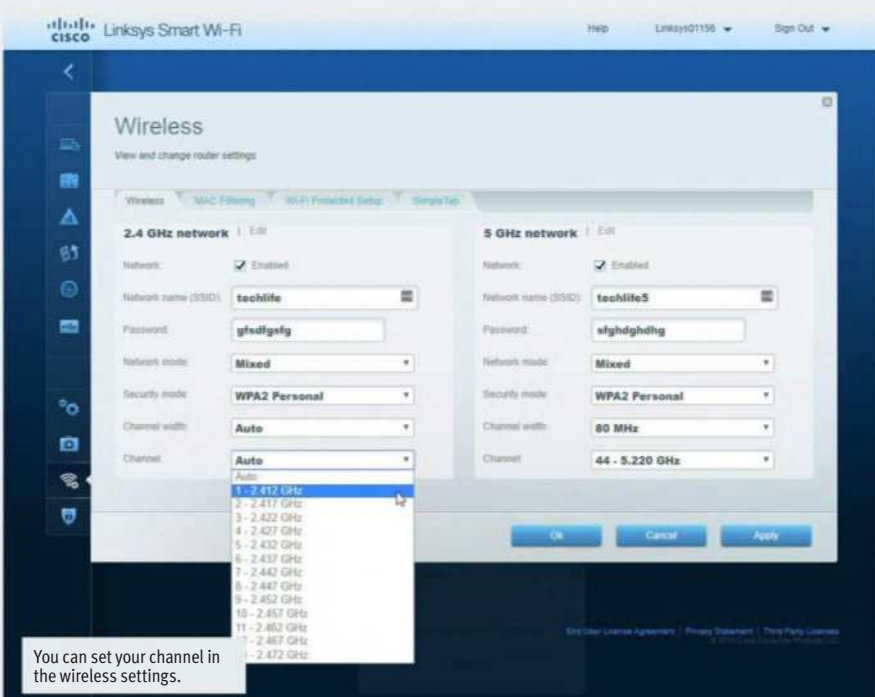
Pretty much every router and access point on the market today allows you to choose your channels — or to let the router automatically select a channel for you. To change your wireless channel, you'll have to log in to your router's admin console and find the wireless settings. There you can choose a channel, or to let the router choose for you.

Ideally, you want to set a channel that's as far away as possible from what your neighbours are using. And this is where the Wi-Fi scanners from before come in — they tell you what channels your neighbours are using and help you steer clear.

In the 2.4GHz band, there are 13 channels available in Australia. Here's the thing — even though the channels are 20MHz, they actually overlap. Channel 2 overlaps quite a lot with channels 1 and 3, for example, and a bit with channels 4, 5 and even 6. The only channels that don't overlap with each other are 1, 6 and 11 — which is why these are commonly the 'default' channels for many routers.

To choose your 2.4GHz channel, take a look at what channels your neighbours are using in the Wi-Fi analysis tool. Try to pick a channel that nobody else is using and is as far away from any of the other channels as possible, so you can grab as much of your available bandwidth as possible.

The 5GHz band is a little more complicated. Technically, there are some 35 channels available for use in Australia, although most routers only allow you to choose from four to preserve international compatibility. The good thing about the 5GHz band is that there is more space between the channels, so that you don't have to worry about overlap like you do in the 2.4GHz band. Just choose a channel that nobody else in your neighbourhood is using, and you should be good to go! ■



your Android device can detect. It displays them in a graph, showing how the networks overlap and the relative strength of each one. It can also provide a recommendation for which channel to use in the 2.4GHz band.

iOS: NONE AVAILABLE

While there are excellent tools available for Android, if you're using an Apple phone that hasn't been jailbroken, then you're out of luck. iOS does not allow apps to scan Wi-Fi networks that they're not attached to, which means that nothing like Android's Wifi Analyzer is supported on the platform. Instead the the 'WiFi Analyzer' apps available only allow you to test the network to which you're connected using a port scanner and internet speed tools.

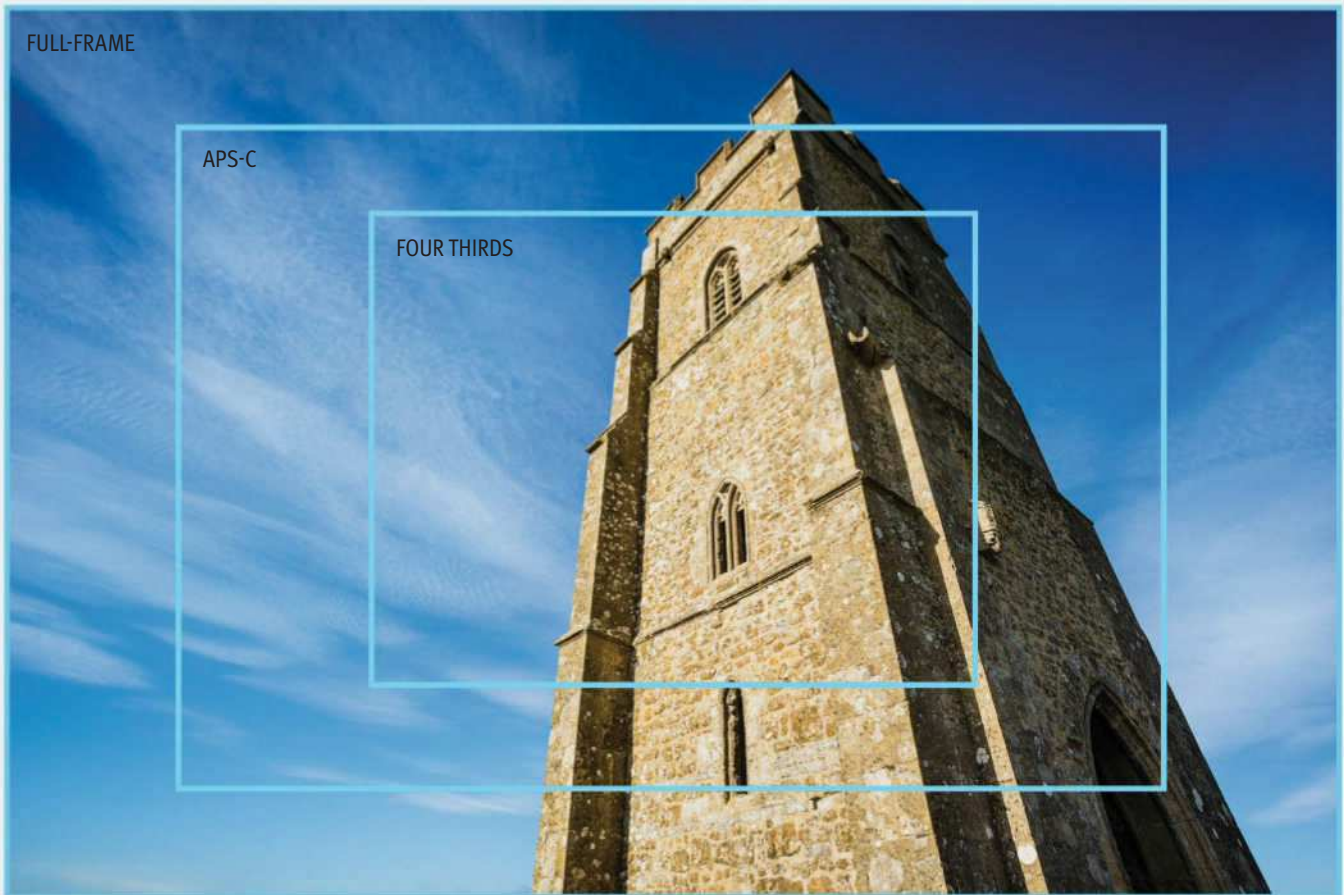
Even on jailbroken phones, the options seem limited. Previously, apps like

WiFiFoFum were available, but even that app seems to have now disappeared.

CHOOSING A CHANNEL

Now that you have a Wi-Fi network sniffer tool, you're ready to use it to choose the best channels for your home network.

So what the heck are channels, anyway? The simple answer is that they're like channels on a TV set. The radio bands used for Wi-Fi (the 2.4GHz and 5GHz bands) are broken up into segments, each 20MHz wide. So that they're not fighting over the same airwaves, ideally, different Wi-Fi networks in the same physical space use different channels. For example, if you're using channel 1, and your neighbour is using channel 6, then you're not competing for airwaves. If you were both using channel 6, then each of you would be effectively halving your available bandwidth.



[PHOTOGRAPHY]

How lens focal length affects your photos

EVERYTHING YOU NEED TO KNOW ABOUT CHOOSING THE RIGHT LENS — IN A NUTSHELL.

[CHRIS RUTTER]

FOCAL LENGTH ISN'T a measurement of how long or how short a lens is. It's actually the distance in millimetres from the optical centre of a lens to your camera's sensor when the lens is focused at infinity. Too much detail? Don't worry, all you need to think about is the way in which focal length affects image size.

For a camera with a full-frame sensor, the 'standard' focal length is about 50mm. This is the focal length that provides a similar perspective to the human eye. Lenses that have focal lengths shorter than 50mm are known as wide-angles, as they offer a wider angle of view, while lenses with focal lengths greater than 50mm are known as telephotos; these have a much narrower angle of view that can make an object look much bigger in the picture. (We explain angle of view over the page.)

Lenses for digital cameras have the focal length — or the focal length range in the case

of zoom lenses — marked on them, but the type of camera you're using can make a difference to how much of the scene or subject you capture through the lens. Full-frame sensors get their name because, at 36 x 24mm, they share similar dimensions to a frame of 35mm film. This means that they are exposed to the full view captured by a lens that's designed for a film or full-frame camera.

Most digital cameras, however, have sensors that are smaller than full-frame. As a result, they're exposed to a smaller area of the image in the centre of the lens. It's for this reason that they're sometimes called 'cropped' sensors. This can be good news if you're taking pictures of distant subjects, as you effectively get a bit more 'reach'; but it's not so good for landscapes and interior shots, where you won't be able to squeeze as much into the shot as you could with the same lens attached to a full-frame camera.

You'll often see the '35mm equivalent' (really the 'full-frame equivalent') focal length listed alongside a lens' actual focal length. This provides a standard way to compare different lens and camera combinations. It's calculated by taking a lens' focal length and multiplying it by the 'crop factor' or 'focal length multiplier' of the sensor. An APS-C sensor has a crop factor of 1.5x or 1.6x, depending on the camera, so this means a 100mm lens on an APS-C camera has an 35mm equivalent focal length of 150mm/160mm. In other words, you'd need to use a focal length of 150mm/160mm on a full-frame camera to get the same view as a focal length of 100mm on an APS-C camera.

To get around this problem, manufacturers also make a range of dedicated 'digital only' lenses with shorter focal lengths to allow for the crop.

KNOW YOUR LENSES!
YOU NEED A WHOLE SET OF LENSES
TO SHOOT AT EVERY FOCAL LENGTH



01

MACRO

These lenses can range in focal length from an equivalent of 60mm right up to 180mm. The longer the focal length, the more distance you can put between the lens and your close-up subject.



02

TELEPHOTO

Lenses in the 100–300mm range are easier to handle than super-telephotos (below). Telephoto zooms in the 100–400mm range add flexibility for quick adjustments to composition, although the maximum apertures tend to be slow compared with prime lenses.

03

MAXIMUM APERTURE

A 400mm f/5.6 lens will give you the same view as a 400mm f/2.8 lens, but the faster f/2.8 maximum aperture allows for a shallower depth of field to help the subject stand out, as well as faster shutter speeds without increasing the ISO.

04

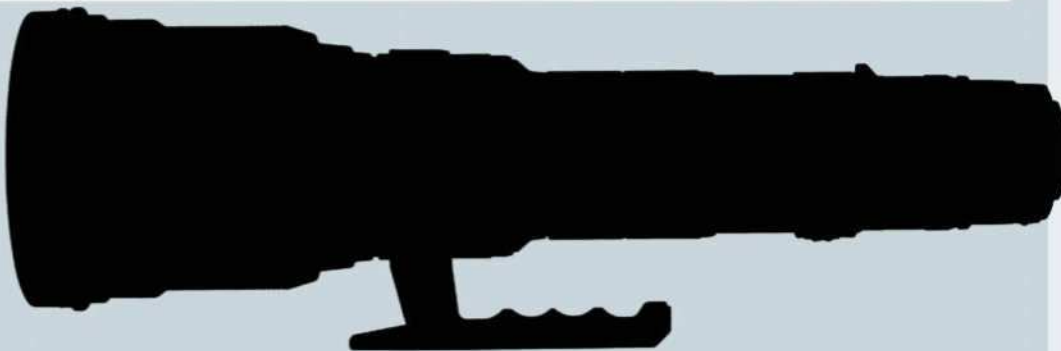
TELECONVERTER

Many telephoto lenses are compatible with teleconverters — these attach to the back of the lens and increase the effective focal length.

05

SUPER-TELEPHOTO

These lenses are mainly available as prime lenses, with fixed focal lengths of between 300mm and 800mm. You'll need a heavy-duty tripod to keep one of these beasts still during an exposure.



06

SHORT TELEPHOTO

Lightweight lenses in the 70–200mm range make excellent general-purpose long lenses. Armed with one of these and a standard zoom, you can cover the majority of photo opportunities.

07

STANDARD

A 50mm lens is the standard prime lens, while the standard zoom is equivalent to 24–70mm.



08

WIDE-ANGLE

'Digital' lenses — those designed for cameras with APS-C sensors — appear to have very short focal lengths, such as 8 or 10mm. But you need to multiply this by the crop factor of the sensor.



09

FISHEYE

These short-focal-length lenses are available as both 'classic' circular fisheye designs, which produce a round image with black borders, or as a rectilinear form, which fills the entire frame with the image.

CAMERA SHAKE

The greater magnification offered by a telephoto means that any vibration will be equally magnified. Use a lens with image stabilisation or a tripod for sharper shots.

01

COMPOSING SHOTS

The narrow view of a long lens can make it easier to compose a clean shot, as all it can take is a slight shift in camera position to remove distracting features and make an object stand out.



300mm

100mm

24mm

ANGLE OF VIEW

A LENS' FOCAL LENGTH AND ITS ANGLE OF VIEW GO HAND IN HAND – HERE'S WHAT YOU NEED TO KNOW

ANGLE OF VIEW is the amount of a scene that a lens can take in, measured in degrees — usually either horizontally or diagonally. Lenses with shorter focal lengths offer a wider angle of view than those with longer focal lengths — that's why they're called wide-angle lenses.

For example, a fisheye lens with a focal length of 8mm may be able to capture a

super-wide 180° view in a single frame. That means it can record everything in front of it — and to each side, so you need to be careful where you put your feet or tripod legs!

The narrow view offered by a super-telephoto lens, however, means that you'll only have a few degrees to play with, which can make it quite a challenge to follow fast-moving subjects and keep them in the frame.

SENSOR SIZE MATTERS

HERE'S A LIST OF COMMON HORIZONTAL ANGLES OF VIEW, AND THE FOCAL LENGTHS REQUIRED TO ACHIEVE THEM WITH DIFFERENT TYPES OF CAMERA SENSORS



01

ULTRA WIDE-ANGLE

Angle of view	117°	81°	98°
Full-frame	11mm	14mm	16mm
APS-C	7mm	9mm	20mm
Four-thirds	5mm	7mm	8mm



02

WIDE-ANGLE

Angle of view	84°	74°	65°
Full-frame	20mm	24mm	28mm
APS-C	14mm	15mm	20mm
Four-thirds	10mm	12mm	14mm

02

COMPRESSION

As the focal length increases, objects appear closer together and the background appears magnified.



200mm

03

EXTENSION

As the focal length decreases, the space between objects seems to extend, with nearby objects appearing larger than those in the background.



50mm



20mm

04

GOING WIDE

A wide-angle lens takes in a large amount of a scene in a single image, so it can be easy to miss distractions creeping into the frame, and harder to direct attention to the focal point of the image.



05

IMAGE SIZE

You can make an object appear the same size as in a telephoto shot by moving closer to it with a wide-angle lens. This does affect the perspective, however, with background details appearing smaller and farther away.



Illustration: Andy McLaughlin



03

STANDARD

Angle of view	54°	49°	40°
Full-frame	35mm	40mm	50mm
APS-C	24mm	28mm	35mm
Four-thirds	17mm	20mm	25mm



04

TELEPHOTO

Angle of view	28°	15°	10°
Full-frame	70mm	135mm	200mm
APS-C	45mm	90mm	135mm
Four-thirds	35mm	70mm	100mm



05

SUPER-TELEPHOTO

Angle of view	7°	5°	3.5°
Full-frame	300mm	400mm	600mm
APS-C	200mm	250mm	400mm
Four-thirds	150mm	200mm	300mm



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<p>\$449 www.netgear.com A router for online gaming, replete with software so you can see your ping in real time. Intense.</p>	<p>\$290 www.tp-link.com.au For a modern home streaming ultra high-def video, this handsome unit will run a 2,166Mbps AC network.</p>	<p>\$425 www.asus.com/au This full-featured unit is overflowing with options and settings, plus it has super-fast wireless.</p>	<p>\$549 www.netgear.com.au Mesh-networking has arrived with this fantastic, great-performing router and extender kit.</p>		
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<p>\$190 (diskless) www.qnap.com Despite the bargain pricepoint, this 2-bay NAS is feature packed and lets you install apps to add more functions.</p>	<p>\$280 (diskless) www.asustor.com This two-bay NAS offers excellent features and can double as a media player, with Kodi and HDMI-output to your TV.</p>	<p>\$660 (diskless) www.synology.com If you need more space, this four-bay model lets you install apps and can even transcode 4K videos.</p>	<p>\$1,100 www.synology.com A 5-bay NAS with 4 x Gigabit Ethernet ports and quad-core Atom chip, this one's for SMBs that need lots of performance.</p>		



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[BEST BUDGET]
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[BEST ALL-IN-ONE MEDIA PLAYER]
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[BEST MOBILE GAMEPAD]
iPega PG-9025

\$25 | www.dx.com
You'll need to buy it online, but this gamepad is nice and responsive, and works with both iOS and Android.

PORTABLE HARD
DRIVES
GADGETS & ACCESSORIES



[BEST BUDGET]
WD My Passport 1TB

\$89 | www.wd.com
WD's My Passport ranges come with security and backup software bundled in and good speeds for the price.



[BEST VALUE]
Silicon Power Armor A85

From \$109 | www.silicon-power.com
Near indestructible. We dropped it, took it for a dip in a pool, and drove a car over it, and the A85 didn't miss a beat.



[BEST PREMIUM]
Seagate Backup Plus 5TB

\$280 | www.seagate.com
It's a little bulkier than the Ultra Slim, left, but if you need lots of storage on the go, this 5TB drive is a neat option.



[BEST HIGH-SPEED]
Samsung Portable SSD T5

From \$199 (256GB) | www.samsung.com/au
With transfer speeds of up to 500MB/s, these portable USB 3.1 SSDs will move your data around supremely fast.

WEARABLES



[BEST SMARTWATCH FOR ANDROID]
Samsung Gear S3

\$599 | www.samsung.com/au
The S3 is pricey, but it makes a great fitness tracker and smartwatch, and can last 3 days between charges.



[BEST SMARTWATCH FOR IOS]
Apple Watch 3

From \$459 | www.apple.com/au
A tad cheaper and with optional 4G, Apple's third-gen Watch is a great companion for sporty iPhone owners.



[BEST FITNESS BAND]
Suunto Fitness 3

\$279 | www.suunto.com
A watch more than a band at heart, but the battery life is great and the all-day tracking is admirable.



[BEST EXERCISE HEADPHONES]
BioConnected HR+

\$279 | bioconnected.com
These headphones have a heart-rate sensor and a whole wodge of other tech to measure your run performance.

PC
MONITORS



[BEST BUDGET]
ViewSonic VX2757-mhd

\$250 | www.viewsonic.com.au
This 27-inch 1080p display is the top of the budget tree with a 75Hz refresh rate and FreeSync support. Tasty.



[BEST VALUE]
ASUS VX239H

\$230 | www.asus.com/au
This AH-IPS 23-inch matte LCD has great specs, a 1080p resolution and a nice price.



[BEST PROFESSIONAL]
BenQ PD3200U

\$1,299 | www.benq.com.au
A 32-inch 4K IPS panel with HDR. Adheres to sRGB industry standards and doubles as a gaming monitor.



[BEST GAMING]
ViewSonic XG2703-GS

\$899 | www.viewsonic.com.au
A 27-inch 1440p IPS display with great gaming chops and 144Hz refresh rate. It even has G-Sync support.

GAMING KEYBOARDS
PC PERIPHERALS



[BEST BUDGET]
Tt eSports Poseidon ZX

\$99 | www.au.ttesports.com
This basic compact board still has it where it counts, with solid performance and comfortable keys.



[BEST VALUE]
Logitech G610 Orion

\$120 | www.logitech.com
Available in red, blue or brown switches, it's sedate enough for offices but still has gaming features.



[BEST PREMIUM]
Corsair K70 RGB Rapidfire

\$190 | www.corsair.com
This Cherry MX Silver-switched 'board feels great under the fingers and has bright-as-hell RGB lighting.



[BEST LAPBOARD FOR LOUNGE-ROOM USE]
Razer Turret

\$220 | www.razerzone.com
This lapboard is sleeker than most, with a magnetised mousepad to help keep the included mouse grounded.

GAMING HEADSETS



[BEST BUDGET]
Microsoft LifeChat LX-3000

\$35 | www.microsoft.com.au/hardware
A cheap basic USB headset with noise-cancelling tech.



[BEST VALUE]
Cougar Immersa Pro

\$99 | cougargaming.com
A fine approximation of 7.1 surround sound from a very comfortable set of headphones.



[BEST PERFORMANCE]
Audio-Technica ATH-AG1

\$299 | www.audio-technica.com.au
A super-comfy headset with massive drivers and fantastic sound.



[NEW ON SHELF]
HyperX Cloud Alpha

\$169 | www.hyperxgaming.com
Lightweight and with soft padding, the Alphas promise respectable bass and mids, and can be used anywhere.

 <p>[BEST BUDGET] Logitech G402 Hyperion Fury</p> <p>\$49 www.logitech.com A hybrid-sensor gaming mouse with optical, gyro and accelerometer tracking, this one doesn't skip a beat.</p>	 <p>[BEST VALUE] Cooler Master MasterMouse MM520</p> <p>\$59 coolermaster.com A claw-grip number for right handers. Clunky switches aside it's very ergonomic and feels premium.</p>	 <p>[BEST AMBIDEXTEROUS] SteelSeries Sensei RAW</p> <p>\$80 www.steelseries.com Ditching unneeded features, this is a lean, mean headshotting machine that's good for lefties and righties.</p>	 <p>[BEST WIRELESS] Logitech G703</p> <p>\$99 www.logitech.com Cheaper than its G903 sibling, this mouse uses the same wireless tech for excellent performance.</p>
 <p>[BEST BUDGET] Canon Pixma MG2960</p> <p>\$36 www.canon.com.au An inkjet that can print, scan and copy in colour, send faxes, has Wi-Fi and can AirPrint and Google Cloud Print.</p>	<p>NEW ENTRY</p>  <p>[BEST VALUE] HP DeskJet Envy Photo 7120</p> <p>\$131 www.hp.com/au This inkjet with a tri-colour tank produces excellent photos, connecting wirelessly with your phone and laptop.</p>	 <p>[BEST PHOTO PRINTER] Epson Expression Premium XP-15000</p> <p>\$499 www.epson.com.au Incomparable photo prints at up to A3 size. A remarkable inkjet printer.</p>	 <p>[BEST SMALL-BUSINESS LASER] HP Colour LaserJet Pro MFP M277dw</p> <p>\$450 www.hp.com/au Built-in wireless, duplex print and scan, cloud and mobile print, and great print quality at a fair price.</p>
 <p>[BEST BUDGET] ASUS PH-GTX1050TI-4G</p> <p>\$230 www.asus.com/au You'll get respectable 1080p/Normal gaming performance from this affordable GeForce GTX 1050 Ti card.</p>	 <p>[BEST VALUE] ASUS DUAL-GTX1060-O3G</p> <p>\$350 www.asus.com/au With a GTX 1060 you can stretch to lower-detail 1440p gaming, or manage Ultra/1080p.</p>	 <p>[BEST PREMIUM] Gigabyte GV-N1070WF20C-8GD</p> <p>\$630 www.gigabyte.com.au Stepping up to a GTX 1070 lets you game at 1440p, or pair it with a G-Sync monitor for smoother rendering.</p>	 <p>[BEST EXTREME] Gigabyte GV-N1080WF30C-8GD</p> <p>\$800 www.gigabyte.com.au GTX 1080 prices have climbed recently, but this Gigabyte card is one of the fairer offerings.</p>
 <p>[BEST BUDGET] MSI B250M Mortar</p> <p>\$135 au.msi.com A great companion for the Pentium G4560; has everything you need for under \$150.</p>	 <p>[BEST VALUE] ASUS RoG Strix Z370-G Gaming</p> <p>\$289 www.asus.com/au Micro ATX done right, with enough space for two M.2 PCIe SSDs and support for 64GB of DDR4.</p>	 <p>[BEST PREMIUM] ASUS RoG Crosshair VI Hero</p> <p>\$349 www.asus.com/au Currently the best AM4 motherboard on the market — provides all the high-end features you need at a fair price.</p>	 <p>[BEST EXTREME] ASUS Prime X399-A</p> <p>\$579 www.asus.com/au This Threadripper board is feature-packed, with a highly-tweakable BIOS, great memory and storage support.</p>
 <p>[BEST BUDGET] Intel Pentium G4560</p> <p>\$79 www.intel.com This 7th-gen (aka Kaby Lake) CPU is great for those looking to build a quality budget rig.</p>	 <p>[BEST VALUE] Intel Core i5-8400</p> <p>\$269 www.intel.com This six-core Intel chip strikes a great balance between gaming and multimedia performance at a very keen price.</p>	 <p>[BEST PREMIUM] AMD Ryzen 7 1800X</p> <p>\$489 www.amd.com AMD's back with this octa-core screamer, which offers masses of performance for half the price of Intel.</p>	 <p>[BEST EXTREME] AMD Ryzen Threadripper 1950X</p> <p>\$1,399 www.amd.com If you're looking for high-end 3D design or image and video editing chops, this is amazing bang-for-buck.</p>
 <p>[BEST BUDGET] Crucial MX300 (275GB)</p> <p>\$130 www.crucial.com The affordable MX300 drives are great value and fast-enough to max out the SATA interface. Can't go wrong here.</p>	 <p>[BEST VALUE] Samsung 860 EVO 500GB</p> <p>\$239 www.samsung.com/au 500GB is the ideal spot for cost-per-gig. This updated drive from Samsung is a great choice.</p>	 <p>[BEST PREMIUM] Crucial MX500 1TB</p> <p>\$390 www.crucial.com A five-year warranty is the icing on a super-fast SATA SSD cake that offers great bang for buck.</p>	 <p>[BEST EXTREME] Samsung 960 Pro M.2 512GB</p> <p>\$425 www.samsung.com/au It's pricey, but with 3TB/s read and 2TB/s write speeds, this M.2 drive is stupid-fast.</p>

PC PERIPHERALS
PC GAMING MICE
BUYER'S GUIDE
READY RECKONER

PRINTERS & MULTIFUNCTION CENTRES

PC GRAPHICS CARDS

PC COMPONENTS
MOTHERBOARDS

PC PROCESSORS

SOLID-STATE DRIVES



[THE HELL IS THIS?]

Ridiculous tech exposed

WE SCOUR THE DARK AND OFTEN PERVERTED CORNERS OF THE INTERNET TO BRING YOU THE WEIRDEST TECH AROUND. YOU MAY WANT TO BRING A SICK BOWL OR A BOX OF TISSUES TO CRY INTO...

[CARMEL SEALEY]

WAYSKIN Home

YOUR PERSONAL SKINCARE THERAPIST.

en.wayskin.com

This isn't the first product from the South Korea-based company, with the WAY skincare device successfully being funded on Indiegogo back in 2015. What is it? Well, the Home is a "skin care device that monitors, analyses and cares for your skin" in a time- and money-friendly way, costing you just a *teeny* US\$269. Why do you need one? According to the company, you're probably "too busy to visit the dermatologist on a regular basis" (yep) or unwilling to spend lots of money on skin treatment (yep), so they've developed this at-home kit to keep your skin healthy. It's a "phone-sized device" that you press to your face throughout the day. It takes readings of your skin and your environment and sends the results to the companion app. It will then suggest a list of products to use and a host of tips to keep your skin good enough to eat. The part you press to your face is an LED pad that changes colour and apparently does different things with each colour. Call us sceptical.



SightSaver Computer Glasses

PROTECT YOUR EYES FROM HARMFUL COMPUTER SCREENS.

sightsavercomputerglasses.com

Successfully funded back in November of last year, this sunglasses-looking wearable evidently managed to scare enough people into coughing up US\$119 to save their eyesight. The lenses aren't just coloured, but rather infused by a synthetic substance called Melaneye that apparently helps things look sharper and clearer while looking at a screen. However, these glasses are potentially a victim of being too late to the party. Blue light has been tackled by most of the large tech companies now, by introducing Night Shift and equivalent features to reduce the amount of blue light emitting from our screens at certain times of the day. Some of these features have to be turned on, others are automatic, but they're all definitely more convenient than keeping a special pair of glasses with you at all times, especially ones that only come in one style and would clash with most business attire.



PROPHIX

AN INNOVATIVE WAY TO BRUSH YOUR TEETH?

www.getprophix.com

While actually in the process of rethinking their design, the idea of the US\$299 Prophix toothbrush will undoubtedly remain the same when the revised model becomes available. Watch in awe or disgust as your toothbrush provides you with a live feed to your mouth! By using the companion app, you can get all those bits you usually miss and check out angles of your teeth that you can't see in the mirror. We do have a couple of problems with this idea... One, if you visit your dentist regularly, you shouldn't need a toothbrush to tell you about any 'problem areas'. Two, none of the images show someone using the brush with toothpaste, which generally gets very bubbly and would completely cover the camera. Three, it doesn't appear to come with a light. And lastly, um... ew? Because of all of this, we're really struggling to see how the Prophix would work. Maybe this is why the company needs to rethink its design...?



WIRED CAT EAR HEADPHONES

THE PURRFECT WAY TO LISTEN.

tinyurl.com/tla78-catears

To round off this month's Ridiculous Tech, we thought we'd throw in yet another invention successfully crowdfunded on Indiegogo. And taking the spot of our 'cat-related' entry this month is a pair of headphones with cat ears on them. To be fair, there are probably dozens (if not more) versions of this device, so this one isn't actually more ridiculous than the rest. To cat-loving maniacs, it might not even be ridiculous at all, come to think of it... The site also offers other animals to choose from, wireless options and even in-ear bud versions. One of the features of this particular version, however, is "LED accent lights" on the protruding cat ears themselves that "make a statement anywhere". They certainly would, yeah... They come in different colours, too, including yellow, purple and blue — just like real cats. ■

THE
MOST FUN
YOU CAN
HAVE WITH
YOUR HANDS
WITHOUT
GOING
BLIND

SONY

MIRRORLESS | MASTERED

Sony Imaging Ambassador: Craig Parry
Taken on **α7R II**

The **α7** range from Sony

With 8 full-frame bodies and a highly awarded range of lenses, the Alpha E-Mount mirrorless system gives you the flexibility to master your craft.



Visit sony.com.au/mirrorless