

βeta

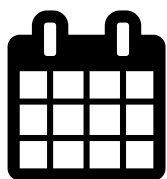
— news from computer science and engineering —



"Reviews": We opine, you choose.

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and...



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Beta

CSESoc Beta, issue 117

A fortnightly publication from CSESoc's Beta team.
Find us online at www.csesoc.unsw.edu.au
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Upcoming Events

12 April Emacs Workshop **tech** 11–12pm, Seminar Room
(first floor of the K17 building)

If you want an editor that's extensible, flexible, graphical, and helpful, why not try Emacs?

This workshop introduces Emacs as a day-to-day tool to write and edit text and code, and shows some sweet shortcuts to make your life easier. Like other editors, it's got a lot of power tucked away under the hood, and it can even help you scale its learning curve.

If you've never used Emacs before, that's cool! We don't assume you've experienced it yet, and if you have, that's great too. We do assume you have a recent GNU Emacs installed; if you've got a Mac, Aquamacs is cool too.

Visit the Facebook event at <https://www.facebook.com/events/573618552815758/>

14 April Social Team Meetup **social** 12–1pm, Seminar Room
(first floor of the K17 building)

This Thursday at 12 PM is the first Social Meetup for the year! If you're interested and helping out with CSESoc's social events come down to the K17 Seminar Room and give us your input. If you think the Social Team is something you want to be a part of, we'll be adding people to the team there on the day. Looking forward to seeing you all there!

Visit the Facebook event at <https://www.facebook.com/events/706341062839581/>

Now! Hoodies!

social *The Internets*

CSESoc is proud to announce their 2016 Hoodie Design Competition, open to all CSESoc members! We're handing it over to the awesome members of CSESoc to come up with the next new hoodie design!

Submissions will close Monday the 25th of April 2016 at 11:59 PM. After submissions close, voting will be open to your fellow CSESoc members to decide on the winning submission. Top entries will receive a free hoodie! The winning design will receive something extra, and the satisfaction of seeing many others wear something you've designed.

Facebook event: <https://www.facebook.com/events/7428006091904>

30 April Facebook Hackathon

tech *TBA*

Join Facebook in Sydney as we stay up all night hacking, learning and having some fun! Start brainstorming ideas & forming teams (of up to 4 people).

We'll supply the food, fun diversions, prizes, and some expert guidance in the form of our engineers. You bring your laptop, appetite, skills and ideas.

The winning team will get the chance to compete against teams from other Hackathons at the Hackathon Finals and be judged by our executives-held at Facebook HQ in Menlo Park, California in November!

Join the Facebook event here: <https://www.facebook.com/events/1722389834671024/>

Annihilation - Jeff VanderMeer

This is a seriously creepy sci-fi post apocalypse novel that follows a biologist on expedition into Area X. Her expedition runs into the tower. A mysterious living structure embedded into the ground. Who is producing the writing on the wall? Why does it seem alive?

I am not particularly familiar with Horror. I tend to find the genre hides information, in most cases, seemingly at random. It often is also filled with characters holding the idiot ball. Instead of scary this tends to make the genre irritating. I'm pleased to say *Annihilation* didn't do that. The biologist picked up information and shared it with the reader. The biologist was also a biologist (i.e not a complete idiot). There was still a problem, though. The information she picked up didn't really help her. In this, the novel perfectly captured the feeling of a false explanation.

The general creepy-ness factor of this goes up as the novel progresses. You learn that, unlike most post apocalypse stories, most people aren't actually aware they're in a post apocalypse world. A sense of inevitability follows; you know nothing good is going to happen but you're not going to stop reading. I lent this book to a friend. They read it in a single weekend.

The speed at which I read this possibly caused me to miss a lot of the twists. Every one I came across felt non-obvious and out of the blue. The sinking feeling you get as you experience the horror is truly excellent. As is to be expected, parts of the ending were a little weird. The ending was strange in a different direction to the rest of the novel. Despite this, it was satisfying for several reasons. You arrived at the end not knowing too much so there was a feeling of anti-climax which fit with the feeling generated by the rest of the novel.

"Can you really imagine what it was like in those first moments, peering down into that dark space, and *seeing that*? Perhaps you can. Perhaps you're staring at it now"

This is the first novel in a trilogy. Even though I loved the feeling as I read this novel I'm not certain I want to read

the second. Mostly, this was due to arriving at the end with the amount of information you did. Not enough to ruin the ending but far too much to see where a sequel would go. The second novel is apparently set in a different part of the *Annihilation* Universe, which may be little enough of a sequel so as to be readable. Who knows.

I got a physical copy but there is also a kindle version which means you can find a small preview on Amazon.

■ Andrew Semler



Proof of Zermelo's well-ordering theorem given the Axiom of Choice: 1: Take S to be any set. 2: When I reach step three, if S hasn't managed to find a well-ordering relation for itself, I'll feed it into this wood chipper. 3: Hey, look, S is well-ordered.

xkcd 982 // Randall Munroe // CC-BY-NC 2.5

Afterparty: The Afterparty Review

If I had to pick one piece of fiction for you to read this year, "Afterparty" is it.

Published in 2014 by Daryl Gregory (author of such gems as "We Are All Completely Fine" and "Harrison Squared"), and set after the smart drug revolution, "Afterparty" follows the journey of Lyda Rose. Lyda is a neuroscientist turned mental patient who sets out on a quest to find who is producing a drug called 'Numinous' after a fellow patient dies while withdrawing from it. 'Numinous' is the drug behind the book's tagline of "take a pill, get a god".

The central concept explored in this novel is the mind; specifically the interrelationship between neuroscience, drug development, and perception. Lyda acts as the central connection between the objective and subjective in the novel; she was a key part of the research group that developed 'Numinous' (a

drug intended to cure schizophrenia), but suffered an overdose and is now stuck with a hallucinatory angel known as Dr Gloria. As the book states; "There was a scientist who did not believe in gods or fairies or supernatural creatures of any sort. But she had once known an angel, and had talked to her every day".

The neuroscience presented in the novel is one of its high points; highly accurate, entertainingly packaged, and intrinsically tied into the story's progression. Recent research in neural representation is poetically explained; "The brain is a collective, a huge number of... thinking modules. It doesn't make a decision, it arrives at one". As well as this, neurochemical responses to stimuli are both accurate and amusing to read; "Dopamine, norepinephrine, and serotonin—the whole damn monoamine family—kicked in like a band of

mustangs". Overall, the presentation of science guides the reader to understanding both the brain itself and the story that is unfolding. Suitable even for people with a non scientific background, scientific concepts are presented like sub-stories, and are thus inherently accessible.

All in all, Lyda's quest through neuroscience and her own mind is an intensely engaging read, and I would recommend this book to anyone (and everyone) interested in brains, gods, and how science has the potential to change us.

■ Emily Olorin

Are you Seeing This Too?: The Mr Robot Review

Hello friend. Hello, friend?

And right off the bat, Mr Robot addresses the anxiety and insecurity that is so prevalent in the industry. Thing is though, this show isn't trying to provide a commentary on life in the Tech Industry (that's what *Beta* is for!)

Mr Robot is an award winning drama that just finished its first season. The plot of the show centres around Elliot Alderson (Rami Malek), who is a professional security engineer by day, vigilante hacker by night. The series opens to him in his therapist's office, talking about his frustrations with society.

"Oh, I don't know. Is it that we collectively thought Steve Jobs was a great man, even when we knew he made billions off the backs of children? Or maybe it's that it feels like all our heroes are counterfeit. The world itself is just one big hoax. Spamming with our running commentary of bullshit masquerading as insight, our social media faking as intimacy. Or is it that we voted for this? Not with our rigged elections, but with our things, our property, our money. I'm not saying anything new. We all know why we do this, not because Hunger Games books makes us happy but because we wanna be sedated. Because it's painful not to pretend, because we're cowards. Fuck society."

Over the course of the first season, Elliot is taken on an adventure by the mysterious Mr Robot (Christian Slater) where they attempt to bring down "E Corp", a multinational conglomerate that seems to control banks, social media, retail stores, almost every part of your life. How are they going to take them down? They're going to hack them.



I can hear you all groaning now, NCIS's "Two Idiots, One Keyboard" playing in your minds. But as you watch Mr Robot, you slowly come to the horrifying realisation that somebody involved in the production of the show seriously knows what they are doing. It's the little things that make the difference, like when Elliott uses a python script to run an exploit, or when two of the main characters have a discussion about the KDE and Gnome window managers, or when Elliot is being asked to hack something overnight, and he says "That will take months of research". It's clear there was a lot of consulting in the security industry that went into this, and it makes the show feel really authentic.

The strongest part of Mr Robot, though, is that it makes you think. If you wanted a TV show where you can turn your brain off, mess around on your phone while watching and still get the entire plotline from half paying attention, go watch something else. In this show, every interaction, every word is intentionally placed by Writer, Director and part time lurker on /r/MrRobot, Sam Esmail. The result is a show with enough action, drama and sex to get the general public into it and enough gory technical details to get the nerds into it. I wouldn't call it "fun for the whole family", but I would call it "bloody brilliant television".

■ Jake Bloom

The Right Book: Part 2

+75 years (or so)

The kids in the shop were like kids everywhere. That weird, hyperaware thing that came from the games they played all the time, even in their sleep; the flawless skin and teeth (because no parent would dare choose otherwise at conception), the loud, hooting calls that rippled through the little social groups whenever a particularly bon mot vibrated its way through their tight little networks, radiating at the speed of light.

Chloe watched them keenly from her perch behind the counter. After seventy-some years perching on a stool, she'd finally done away with it. The exoskeleton she'd been fitted for on her goth birthday would lock very handily into a seated

position that took all the pressure off her bum and knees and hips. It was all rather glorious.

Kids came into the store every day now, and in ever-increasing numbers. She flicked her eyes sideways and menued over to her graph of young people in the shop over time, warming herself on the upward trend.

It was Arthur's 110th birthday today, the mad old sod, and he was meant to be coming into the shop for one of his rare tours of inspection. That had the staff all a-twitter. He was something of a legend, the man who'd started the distributorship that put small, carefully curated handfuls of books into the few retailers across the land who'd let young people in. No one could have predicted how well books and Halal fried

chicken went together.

"How long have you known him, then?" Marcel, her store manager, was only a few years older than the kids who ghosted past her counter, playing some weird round of their game, listening to cues only they could hear, heads all cocked identically.

"Let me put it this way – the first time we met, I was riding a brontosaurus."

He did her the favor of a smile, radiant and handsome as a movie marquee. They were all like that these days. Thankfully she was old enough not to feel self-conscious about it.

"Seriously, Chloe, when did you meet him?"

"I was fourteen – no fifteen. That was before he was Sir Arthur Levitt, Savior of English Literacy, you understand."

"And before you were Chloe Autumn, superstar author?" He was kidding her. They'd stopped caring about what she wrote decades before he was born, but he knew about her history and liked to tease. He had an easy way about him, and it showed in the staff.

"Before then, yes."

"I still don't quite understand what it was he did – what was so different about his bookshop?"

"It wasn't a bookshop," she said. "You didn't know that part?" He shook his head. "Well, that's the most important part. It wasn't a bookshop. Back then, bookshops were practically the only place you could get a book. Oh, sure, the newsagents might carry a few titles, but they were the same titles, all around the country. Bookshops are fine if you already love books, but how do you fall in love with books? Where does it start? There have to be books everywhere, in places where you go before you know you're a reader. That was the secret."

"So how'd he do it?"

"I'll tell you how," Arthur said. He'd padded up to the counter on the oiled, carefully balanced carapace of his exoskeleton, moving as spryly as a jaguar. His eyes glittered with mad, birdy glee. "Hello, Chloe," he said.

"Happy birthday, love," she said, uncurling herself and levering herself up on tiptoe – the gyros whining – to give him a kiss on the cheek. "Arthur, this is Marcel."

They shook hands.

"I'll tell you how," Arthur said again, clearly enjoying the chance to unfurl one of his old, well-oiled stories. "It was all about connecting kids up with their local neighborhoods and the tastes there. Kids know what their friends want to read. We had them curate their own anthologies of the best, most suitable material from *The Story So Far*, put all that local knowledge to work. The right book for the right person in the right place. You've got to give them a religious experience before you can lure them into coming to church regular."

"Arthur thinks reading is a religion," Chloe said, noting Marcel's puzzled expression.

"Obsolete, you mean?" Marcel said.

Arthur opened his mouth, shut it, prepared to have an argument. Chloe short-circuited it by reaching under the counter and producing a carefully wrapped package.

"Happy birthday, you old sod," she said, and handed it to Arthur.

He was clearly delighted. Slowly, he picked at the wrapping paper, making something of a production of it, so much so that the kids started to drift over to watch. He peeled back a corner, revealing the spine of the book, the neat stitching, the nylon from an old, old backpack, the worn denim, the embroidered title on the spine.

"You didn't," he said.

"I certainly did," she said, "now finish unwrapping it so that we can have some cake."

150 years from now(ish)

The young man blinked his eyes at the coruscating lights and struggled into a seated position, brushing off the powdery residue of his creation. "*The Story So Far*?" he said.

"*The Story So Far*," a voice agreed with him from a very long way off and so close in, it was practically up his nose.

"Better than *Great Expectations* again," he said, getting to his feet, digging through the costumes on the racks around him. Knowledge slotted itself in his head, asserting itself. Plots, other characters, what had come before, the consensus about where things might go next. He didn't like the consensus. He began to dress himself.

"Tell me about the reader," he said. The voice was back in an instant, describing the child (four), the circumstances of his birth and life, his interests. "So I'm a picture book?"

"No," the voice said. "He's reading in chapters now. It's the cognitive fashion, here." At /here/, more knowledge asserted itself, the shape of the comet on which they all resided, their hurtling trajectory, a seed-pod of humanity on its way /elsewhere/.

"Right," he said, putting on gloves, picking out a moustache and a sword and a laser-blaster. "Let's go sell some books."

Afterword:

This is another story that was inspired by Patrick Nielsen Hayden; specifically by his very nice rant about how the collapse of small, local book distributors that served grocers and pharmacies – and the rise of national distributors who serve big-box stores – has destroyed the primary means by which new readers enter the field. It's all well and good to have terrific giant bookstores (or fabulous neighborhood stores, for that matter), but people don't go into those stores unless they already love books. In the past, the love affair with books often began outside of bookstores, in grocers and pharmacies, where you might happen upon any number of quirky, hand-picked paperbacks stocked by the local distributor. With the choice of books available outside of bookstores narrowed to the handful of titles with national distribution, it's far less likely that any given reader will discover "the right book" – the one that turns her into a book-junkie for the rest of her life.

Thus, this story. /*The Bookseller*/, Britain's oldest publishing trade magazine, commissioned a story from me for its 150th anniversary issue – three parts, depicting the future of bookselling in 50, 100 and 150 years.

(Published under the CC license, original available at craphound.com)

■ Cory Doctorow

Words of the Week

Every week, we bring you the latest and greatest in Jargon, be it obscure or otherwise. Where does this Jargon come from, you ask? Why, the Jargon Files of course, the internet's favourite place for all things *hacker*. Have fun! These weeks words are:

hacked off: [analogous to 'pissed off'] Said of system administrators who have become annoyed, upset, or touchy owing to suspicions that their sites have been or are going to be victimized by crackers, or used for inappropriate, technically illegal, or even overtly criminal activities. For example, having unreadable files in your home directory called 'worm', 'lockpick', or 'goroot' would probably be an effective (as well as impressively obvious and stupid) way to get your sysadmin hacked off at you.

RTFAQ: [Usenet: primarily written, by analogy with RTFM] Abbrev. for 'Read the FAQ!', an exhortation that the person addressed ought to read the newsgroup's FAQ list before posting questions.

nybble: [from v. nibble by analogy with 'bite' -> 'byte'] Four bits; one hex digit; a half-byte. Though 'byte' is now techspeak, this useful relative is still jargon. Compare byte; see also bit. The more mundane spelling "nibble" is also commonly used. Apparently the 'nybble' spelling is uncommon in Commonwealth Hackish.

Following 'bit', 'byte' and 'nybble' there have been quite a few analogical attempts to construct unambiguous terms for bit blocks of other sizes. All of these are strictly jargon, not tech-

speak, and not very common jargon at that (most hackers would recognize them in context but not use them spontaneously). We collect them here for reference together with the ambiguous techspeak terms 'word', 'half-word', 'double word', and 'quad' or quad word; some (indicated) have substantial information separate entries.

2 bits: crumb. quad, quarter, tayste, tydbit, morsel

4 bits: nybble

5 bits: nickle

10 bits: deckle

16 bits: playte, chawmp (on a 32-bit machine), word (on a 16-bit machine), half-word (on a 32-bit machine)

18 bits: chawmp (on a 36-bit machine), half-word (on a 36-bit machine)

32 bits: dynner, gawble (on a 32-bit machine), word (on a 32-bit machine), longword (on a 16-bit machine)

36 bits: word (on a 36-bit machine)

48 bits: gawble (under circumstances that remain obscure)

64 bits: double word (on a 32-bit machine) quad (on a 16-bit machine)

128 bits: quad (on a 320bit machine)

The fundamental motivation for most of these jargon terms (aside from the normal hackerly enjoyment of punning word-play) is the extreme ambiguity of the term word and its derivatives.

Case 3: Encapsulation

A young monk, new to the temple, not only declared all his methods public but all his instance variables as well. The head abbot grew weary of rebuking the monk and asked the Java master for advice.

The next day, the master summoned the monk to take lunch with him in his private office.

The monk entered to find a sumptuous meal laid out upon the conference table. The master then bade the monk to lie upon the floor.

The monk did as commanded, whereupon the master opened the monk's robes and drew a large knife. He pressed the naked point firmly into the monk's chest until a ruby droplet welled up around the blade. The monk cried out in terror and asked the master what his intention was.

"To slit open your belly," explained the master, "so that I may spoon the rice and pour the tea inside. My schedule is quite full, and I find this method of feeding guests to be extremely efficient."

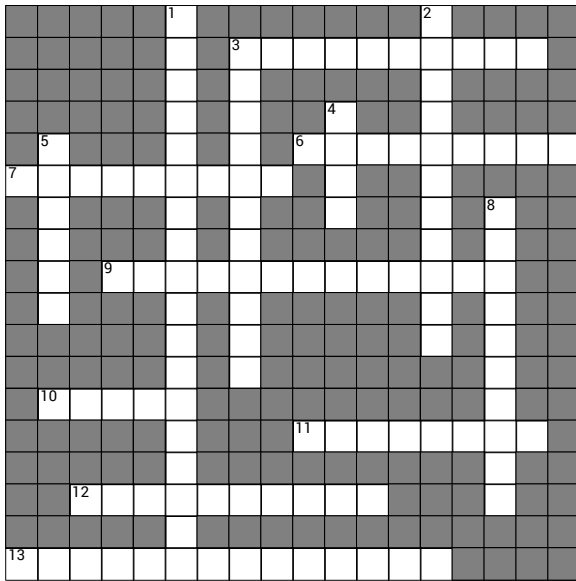
Afterward the monk required no more correction.



■ *Qi, The Codeless Code*

Puzzles

Crossword



Across. **3** P and NP classes (no comment on equality) **6** 1, 1, 2, 3, 5, 8, ... **7** Faster, less memory, more efficient **9** Non-ecclesiastical hypothetical computer **10** Above and below **11** An island with all cities seen once; roads travelled insignificant **12** Seven bridges, a topological nightmare **13** e.g. Knuth-Morris-Pratt

Down. **1** Made from recursively overlapping subproblems **2** Rabbit breeding **3** Only total if termination occurs. Partial is still pretty useful though] **4** Complexity notation, not little **5** Lacking infrastructure, not dense **7** Like code, but more fake

Takuzu

	1			0		0			
			1				1		0
0			1				1		
	0							0	
	1	1		1	1			0	0
						1			0
	1			1					
		0			0		1	1	
	1					0			1
	0	0		0	0			1	1

Brain Teasers

A: Richard Buckland orders his three grad students to assemble and declares that he will select his favourite grad student to fix the uptime problem on Open Learning. In order to win this great honour, the grad students must play a game that works as follows: the grad students all close their eyes as Richard Buckland places a hat on their heads, and hear that

each hat is either white or blue. At least one grad student is wearing a blue hat. The students are able to see the colour of each others hat, but not their own and are strictly forbidden from talking to each other. The first grad student to announce the colour of his or her own hat will have the privilege of spending the next several weeks engaged in dialogue with MongoDB. After a few

minutes, one of the grad students stands and announces the colour of her hat. What did she say, and how did she know? Note: It is known that Richard Buckland is extremely fair, thus all the grad students have an equal chance of winning. Furthermore, you can assume that all the grad students have a desire to win (poor, misguided creatures).

B: I have two children, The youngest is a girl. What is the probability they are both girls? (Hint: Its not 50%)

Issue 116 Solutions

Brain Teasers

A: In a similar manner to the XOR solution, we can use simple addition and subtraction: $a = a + b$; $b = a - b$; $a = a - b$;

B: Many people rush to 42, but this is not in fact the answer to everything (life and the universe, on the other hand...). However, if person A shakes hands with person B, the inverse (B shaking hands with A) will not occur. Therefore, the solution is $7+6+5+4+3+2+1=21$

Takuzu

0	1	0	1	0	1	0	1	1	0
1	0	1	0	1	0	1	1	0	0
0	1	1	0	0	1	0	0	1	1
1	0	0	1	1	0	1	0	0	1
0	1	1	0	1	0	1	1	0	0
0	0	1	1	0	1	0	0	1	1
1	0	0	1	1	0	0	1	1	0
1	1	0	0	1	0	1	0	0	1
0	1	1	0	0	1	0	1	0	1
1	0	0	1	0	1	1	0	1	0

Crossword

						N								
					P	A		C						
					U	G		H						
					U	P	T	I	M	E			V	
		W			P	O		F				I	V	
	T	I	C	K	E	T	S					R	M	
	R				T							T	W	
	E								B	A	C	U	L	A
	S	C	A	L	I	N	G					A		R
	H											L		E
	A		P									B		
V	E	R	S	I	O	N	C	O	N	T	R	O	L	
		K			N	G						X		
					G									
						N								
						X								

The News

GNU/Windows?! The biggest news out of Microsoft lately is the freshly-released native Linux environment on Windows 10, allowing users to try Ubuntu right out of the box. This follows hot on the news that Xamarin, the company built by the creators of Mono and snaffled up last week by Microsoft, was being open sourced.

We're DOOMed! id Software will be releasing an open beta of the long-awaited new *Doom*, scheduled to launch officially in May. It enters open beta on April 15 and wraps up on April 17, but is available to all on all platforms.

WhatsApp encrypted end-to-end. In conjunction with Open Whisper Systems, the massive messaging platform WhatsApp has rolled out end-to-end encryption across its plethora of active devices and platforms, based on the Signal protocol. Fantastic!

Chrome extensions defacto standard? Last August, Mozilla announced the Firefox extensions platform would be going away in favour of WebExtensions, a Chrome-alike API. And at the tail end of March, Microsoft announced that they would be building tools to do the same in Edge.

Catch an Uber bug-bounty! Uber is starting a 90-day bug bounty program from May 1, reaching out to the white-hat community with up to \$10k per bug, a loyalty program, and a "treasure map".

xkcd Making Science Fun. US publisher Houghton Mifflin Harcourt's 2017 editions of their chemistry, biology and physics textbooks will feature illustrations from Randall Munroe, creator of xkcd and author of *Thing Explainer*.

'Tick, Tock' goes the clock... but Intel changes tack. Fabulous chip-maker Intel is switching away from its "tick-tock" microprocessor strategy—a die-shrink on the 'tick' and a microarchitecture refresh on the 'tock' over two product cycles—to a new, three-step plan, labelled 'process-architecture-optimization', due to the increasing difficulty of shrinking

silicon lithography.

Swift lands on Linux. Swift, Apple's Objective-C killer, has landed on Ubuntu, with official binaries of the Swift 2.2 release shipped for Ubuntu. It still lacks the 'core libraries', but has the LLVM project's 'lldb' debugger, and the REPL.

April is Android Month. A whole slew of new Android devices, including the LG G5, Xiaomi Mi 5, Samsung Galaxy S7, Huawei P9, Meizu M3, HTC 10, Oppo R9, Zopo Speed 8, and new Sony Xperia handsets, all land in April by happy coincidence of the software turnaround from the 'gold master' Android, and the hardware turnaround of the new Qualcomm Snapdragon 820, both released late in 2015.

Virtual becomes Reality: Oculus Rift shipping. If you pre-ordered the fantastic VR headset in January, good news! Your shiny new Oculus Rift headset is shipping now, with a current lead time of three months on new orders. The Oculus Rift, which rose to fame from its Kickstarter in late 2012, has had several development previews released over the last three years.

Call Sweden! The Swedish Tourist Association has launched "The Swedish Number", a real phone number you can call to reach... Sweden. A random Swedish person (who, thankfully, will have signed up for the service) will answer when you call +46 771 793 336 (that's +46 771 SWEDEN), and talk to you about Sweden.

Self-balancing scooters banned. The Australian Competition and Consumer Commission, acting after a number of disastrous failures of 'hoverboards' or self-balancing scooters causing smoke, fires, and explosions, has finally issued an interim ban of the devices, following over twenty safety recall notices due to defective safety measures in their charging systems.

■ Jashank Jeremy

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