

## GLIMPSES OF THE FUTURE

A monthly digest of technologies, developments and trends that may shape our lives. (If you would prefer not to receive these digests, flip back 'NO THANKS' and you will be removed from the list). For daily glimpses follow me on Twitter: @hammondfuturist

### Will Quantum Computers Eliminate City Traffic Jams?

Whilst traditional computers use binary digits, or bits, which can either be 0s or 1s, [quantum computers](#) use quantum binary digits, or qubits, which represent and store information in both 0s and 1s simultaneously. This means the computers have the potential to sort through a vast number of possibilities within a fraction of a second to come up with a probable solution.



Volkswagen put that speed to use for a recent traffic-optimization project. Working on a \$15-million D-Wave quantum computer over the cloud, a team of five in-house data scientists took GPS data from 10,000 taxis in Beijing and simulated specific routes that would allow each car to travel from downtown Beijing to the nearest airport, about 20 miles away, in the fastest time possible without creating a traffic jam.

After six months and several attempts, the researchers came up with an algorithm for the computer that optimized the routes for each taxi within a fraction of a second. A normal computer would have taken about 45 minutes to complete

### India Scraps Coal-Fired Power Stations – Solar Cost Falling

India [has cancelled plans](#) to build nearly 14 gigawatts of coal-fired power stations – about the same as the total amount in the UK – with the price for solar electricity “free falling” to levels once considered impossible.

Energy analyst Tim Buckley said recently that the shift away from the dirtiest fossil fuel and towards solar in India would have “profound” implications on global energy markets.



According to [his article on the Institute for Energy Economics and Financial Analysis's website](#), 13.7GW of planned coal power projects have been cancelled so far this month – in a stark indication of the pace of change.

### World's First Electric Autonomous Cargo Ship Will Sail Next Year

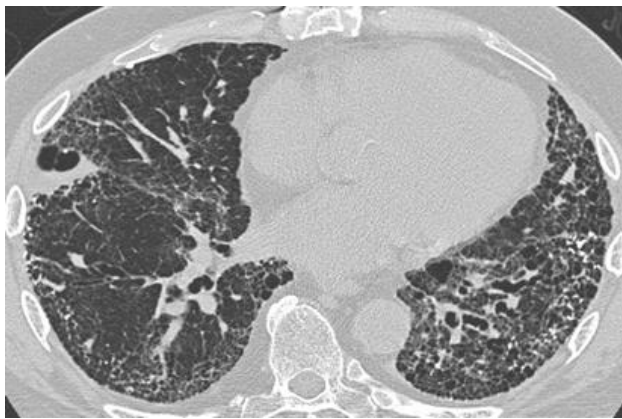
Norwegian company Yara has teamed up with maritime technology company Kongsberg to build the world's first all-electric and autonomous container ship, which is set to hit the high seas

the same task.

### **Soon All Medial Scans Will Be Examined By A.I. As Well As Doctors**

A contest aimed at automating the detection of lung cancer shows how [machine learning may be poised to overhaul medical imaging](#)

The challenge offered \$1 million in prizes for the algorithms that most accurately identified signs of lung cancer in low-dose computed tomography images. The winning algorithms won't necessarily be adopted by clinicians, but they could inspire algorithmic innovations that find their way into medical imaging.



Low-dose CT scans have shown great potential in recent years for detecting lung cancer earlier. They use less radiation and do not require a contrast dye to be injected into the body. But diagnosis is very difficult, meaning a high number of false positives and too many unnecessary medical procedures.

A machine-learning technique known as deep learning has proven especially effective for finding patterns in images in recent years. There is now growing hope that this and other machine-learning methods may help improve standards of diagnosis in medicine by automatically recognizing patterns that indicate disease—including ones that are too subtle for the human eye to catch.

late in 2018.



The hi-tech container ship, named [Yara Birkeland](#), will carry chemicals and fertilizer from Yara's Prosgrunn production plant to the nearby towns of Brevik and Larvik. It will first operate as a manned vessel in 2018, before transitioning to remote operation in 2019 and fully autonomous control by 2020.

The most immediate benefit of the new operation comes from a major reduction in NOx and CO2 emissions as the company shifts its product transportation from what previously required 40,000 truck journeys a year to this new, all-electric shipping pathway.

### **Plane Cockpits Now Rate Pilots' Flying Skills In Real Time**

Delta Air Lines has been using a system [to provide many of its pilots with objective feedback](#) about the level of their flying skills almost immediately after every take-off and touchdown. Southwest Airlines and American Airlines Group plan to start similar programs this summer.



## London Buses Start Operating “Flexible Routes”

Citymapper, the firm behind an app that suggests public transport routes through 39 cities worldwide, has launched an experimental, flexible bus service in London.

Citymapper says its bus adjusts [its route between stops](#) depending on traffic and passenger demand.



Tech companies like Uber and Lyft have been taking on taxi services for the last few years but Citymapper will be the first to offer an upgrade to public bus services.

Drivers of the 30-seater buses will stay up to date with traffic information using a tablet linked to Citymapper’s data centre. The company wants to offer a bus service that is more flexible than those currently in service. Transport for London will need to update its permits for private buses, however, as they don’t allow for flexible routes.

## Electric Cargo Bike Could Be A Boon To Deliveroo Riders

Electric bike maker Riese & Muller may have successfully married the [three elements necessary](#) for delivery riders with its full suspension, electrically boosted, cargo-carrying Load e-bike.

The specific cockpit reminders, which are either automatically printed out on paper or digitally displayed on instrument panels, target crews flying jetliner models featuring stretched fuselages, including advanced [Boeing C737s, 757s and 767s](#). Handling these extra-long aircraft requires special caution; the underside of the planes’ tails are notoriously prone to striking the ground if the nose is raised too quickly or too high, or if landing speeds are off by even a few knots.

Shortly after each take-off and landing, the systems send pilots data that allows them to compare their individual commands and proficiency to company and industry performance standards that limit manoeuvres close to runways.

## New Wearable Can Detect Cystic Fibrosis and Diabetes

A new wearable device can analyse [the chemical constituents of a patient’s sweat to accurately diagnose cystic fibrosis or diabetes](#). The device could have significant implications for patient monitoring and the development of new treatments for chronic conditions.



Researchers at Stanford and Berkeley used sensors and microprocessors stuck to a patient's skin, which stimulated the skin’s sweat glands. The microprocessors and sensors then detected the presence of different molecules and

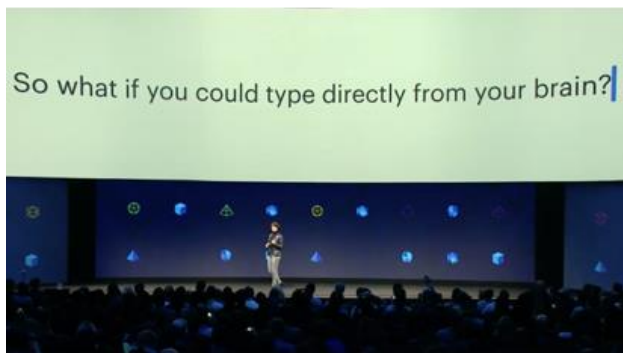




The Load has a fairly conventional chassis design. It sits the rider at the rear, and the load down low in front of them for maximum capacity and stability without obscuring the rider's line of sight. There are a number of options for the load bay, including low and high-sidewall cargo boxes, a side-by-side child seat, or a baby-seat mount. You can also add a canvas weather shield, see-through child cover, or an elastically-attached tarpaulin.

### **Facebook Thinks We Will Type By Thinking And Hear Through Our Skin**

Facebook researchers are exploring ways to [type with your brain and hear through your skin](#).



Regina Dugan, VP of Engineering and head of Facebook's Building 8 R&D team, outlined those projects in a recent keynote.

First, she raised the possibility: What if it were possible to type with your brain? This capability would have obvious benefits for paralyzed and non-vocal individuals, but Dugan pointed out that it would have enormous ramifications for the rest of the population as well. Essentially, this capability could function as a "brain mouse for AR" (augmented reality) and allow us to send

ions based on electric signals.

The team used the wearable in two separate scenarios to detect chemical indicators of each disease. The first detected high chloride ion levels within patient sweat, which is a strong indicator of cystic fibrosis. The second study compared glucose levels in sweat against levels of glucose in blood, which helps identify diabetes.

### **No Longer "Out Of Africa", It Now Looks As If The First Hominids Appeared In Europe**

It's generally accepted that humans originated in Africa and gradually spread out across the globe from there, but a pair of new studies may paint a different picture. By examining fossils of early hominins, researchers have found that humans and chimpanzees may have split from their last common ancestor earlier than previously thought, [and this important event may have happened in the ancient savannahs of Europe, not Africa](#).



The split between humans and our closest living relatives, chimpanzees, is a murky area in our history. While the point of original divergence is thought to have been between 5 and 7 million years ago, it wasn't a clean break, and cross breeding and hybridization may have continued until as recently as 4 million years ago.

Where the divergence took place is contentious as well, but Eastern Africa is the accepted birthplace of the earliest pre-humans. One of the best candidates for the last common ancestor is *Sahelanthropus*, known from a skull found in

messages without even having to take out a phone.

Mark Zuckerberg reiterated more of her analogies in a Facebook post: "Our brains produce enough data to stream 4 HD movies every second. The problem that the best way we have to get information out into the world – speech – can only transmit about the same amount of data as a 1980s modem. We're working on a system that will let you type straight from your brain about 5x faster than you can type on your phone today."

In another sensory flip-flop, Dugan discussed the possibility of hearing through one's skin. Just as Braille allows blind individuals to "read" small bumps, Facebook is investigating a tactile method for allowing the blind and deaf to communicate.

### **Toyota's "Guardian" Software Protects Drivers From Themselves**

Making a turn across oncoming traffic is one of the most dangerous manoeuvres drivers undertake every day. Researchers at Toyota think it's one of the situations in which a software guardian angel built into your car could save lives.

In trials at private testing grounds in the U.S., left turns are one of the first scenarios Toyota has used to test the concept of a system it has dubbed "Guardian," which judges whether a human is about to make a dangerous mistake.

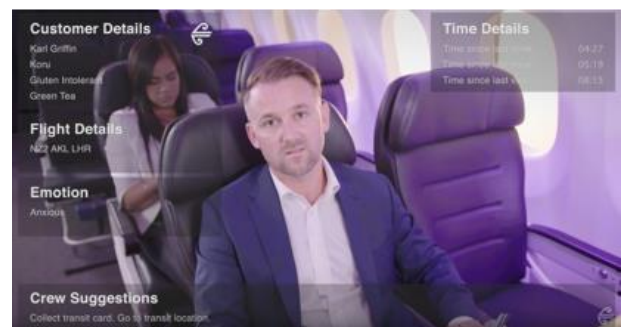


[Radar and other sensors on the outside of the car monitor](#) what's happening around the vehicle, while cameras inside track the driver's head movements and gaze. Software uses the sensor

Central Africa dating back to around 7 million years ago. But according to the new studies, bones found in Greece and Bulgaria appear to belong to a hominin that's a few hundred thousand years older.

### **Microsoft's HoloLens Lets Flight Attendants Read Your Emotions**

Air New Zealand has recently revealed it has been working with Dimension Data [to use the mixed reality smartglasses as a way of enhancing its cabin crew services](#).



The airline's project is still at an experimental stage, but it demonstrates an interesting implementation of the technology. When looking at a passenger, the HoloLens allows the flight attendant to immediately get a display of their details, preferred meal, travel plans and even the time elapsed since their last drink.

The video from Air New Zealand also implies that some work is being done on detecting a passenger's emotional state, possibly through facial expressions or heart rate detection. We see the passenger's mood in the video shift from "anxious" to "calm" after an interaction with the flight attendant, although we do wonder if our mood could shift in the other direction when approached by someone wearing such a confronting headset.

data to estimate when a person needs help spotting or avoiding a hazardous situation.

So far Toyota is just testing the ability of software to understand the hazards around a car and whether a person has spotted them, but the company plans to eventually make Guardian capable of taking action if a person doesn't look ready to do so already.