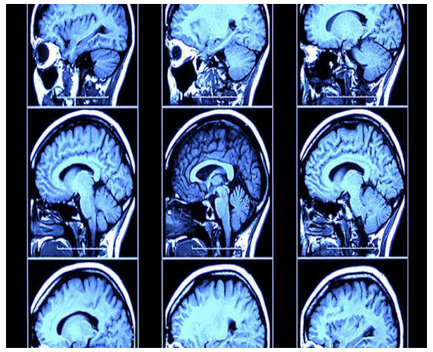
The first imaging of thoughts as it occur



Other than the wireless BCI, my favorite neuroscience breakthrough of the year was the first ever imaging of thoughts inside a brain. In the video above, the colorful block at the bottom of the image is a zebrafish's brain. The bright spot that moves around the top half of the image is a single-celled paramecium (similar to the amoeba). The bright spot at the bottom of the image, inside the brain, is the fish's thoughts. Yes, the fish's thoughts seem to almost perfectly mirror the movement of the paramecium.

Neuroscientists love the zebrafish because its brain is relatively simple ("only" 300,000 neurons), and — this is the important bit — because they're completely transparent when they're still young. In this case, some Japanese researchers genetically modified a zebrafish so that its optic tectum, the part of the brain that integrates visual data, releases fluorescent molecules — which, because the skin is transparent, can then be imaged. In the video above, we are seeing the firing of neurons as the optic nerve (on the opposite side of the brain!) registers the moving paramecium, and then the cascade of other neurons in the brain as the fish thinks about how yummy it would be to eat that tasty morsel.

This is a huge step towards understanding what actually happens inside a living brain. While we now have a pretty good idea of the form that a brain takes, and the chemical processes by which neurons communicate, we still have no idea how the form creates function. It is hoped that, if we can complete a connectome of the human brain — a complete map of how each part of the brain is linked together — we'll be able to better infer how the human brain processes data.

P1 / HYPERLOOP
Cross between a Concorde and a railgun an air hockey table."

P2 / IPHONE 'TOUCH ID'
A fingerprint scanner built seamlessly into the phone's home button.

P3 / SELF-HEALING MATERIALS
Self-healing materials which can repair damage without external human

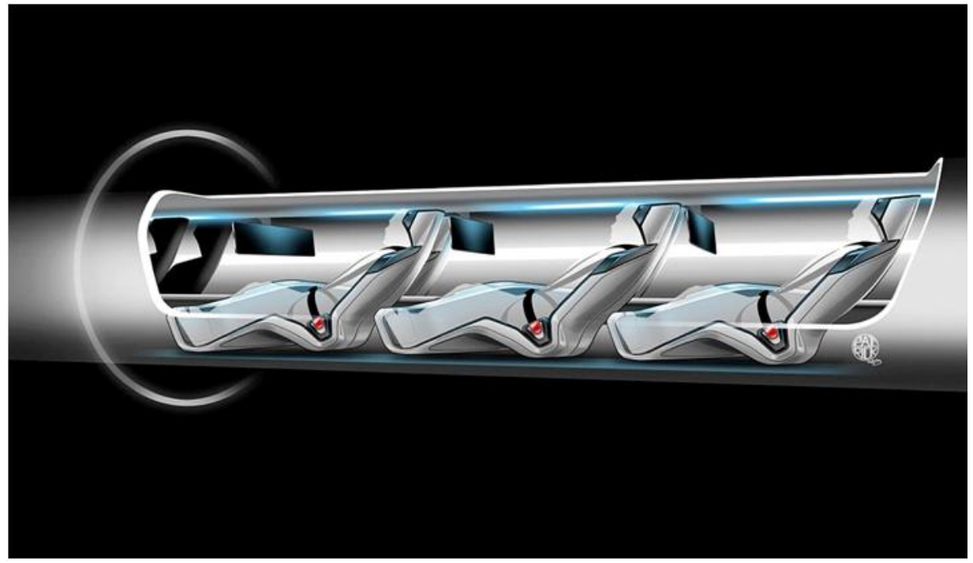
P4 / IMAGING OF THOUGHTS
This is a huge step towards understanding what actually happens inside a living brain.

NEW HORIZON COLLEGE OF ENGINEERING

ADVANCED CONTEMPORARY EMERGING TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACE / Q2 / DEC 2013



Billionaire investor Elon Musk has unveiled plans for a "Hyperloop" transport system he hopes will one day shuttle passengers and cars between Los Angeles and San Francisco travelling faster than the speed of sound.

After almost a year of speculation Musk outlined his plans for the system Monday in a blog post and a 57-page PDF. People and cars would be transported between cities inside aluminum pods traveling a speed of up to 800 miles per hour inside elevated tubes. In a conference call Musk said he had been inspired by the pneumatic tubes used for transporting mail around some buildings.

The PayPal founder has long been obsessed with transport and used his fortune to develop electric-car firm Tesla and the private spaceflight company SpaceX. Musk has previously said that Hyperloop will be a "cross between a Concorde and a railgun and

>> CONT. PAGE TWO

> "and by the time I got out of the meeting, it was on the website."

Loop Technology

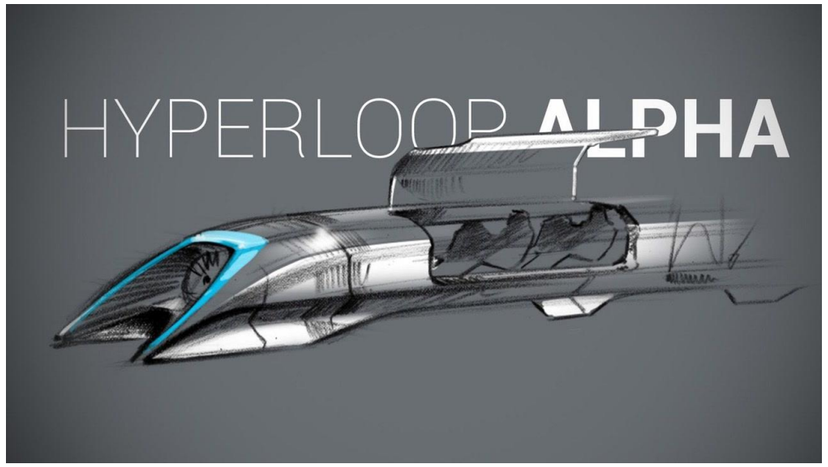
>> CONT. FROM PAGE ONE

an air hockey table."

According to Musk's blog post the Hyperloop could act as a fifth mode of mass transport after planes, trains, cars and boats. The billionaire said he was not looking to build the system himself although he was "tempted" to build a demonstration model.

Outlining his plans in an interview with Bloomberg Businessweek Musk said the tubes would be elevated on columns 50 to 100 yards apart and run alongside California's Interstate 5 highway. "You just drive on, and the pod departs," Musk said, estimating that the system could be built for $6bn with people-only pods, or $10bn for the larger pods capable of holding people and cars.

Musk said he envisioned 70 pods could travel between Los Angeles and San Francisco leaving every 30 seconds inside low pressure tubes designed to minimize friction and allow higher speeds. "It's like getting a ride on Space Mountain at Disneyland," he said.

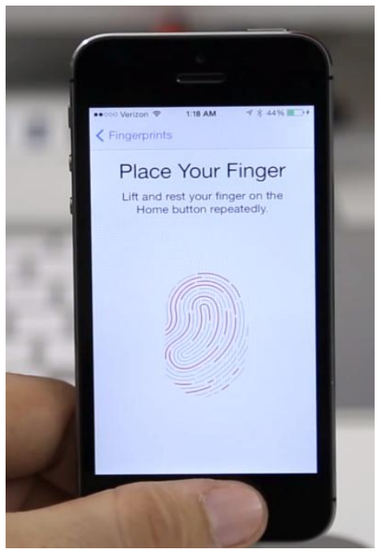


> “Cross between a Concorde and a railgun and an air hockey table.”

The system would be a closed loop, designed for cities less than 900 mile apart that have high levels of traffic.

Musk described the Hyperloop system at a conference in May and said that the solar-powered system would allow passengers to get from Los Angeles to San Francisco in less than 30 minutes. Such a journey would be five hours shorter than the time it would take to drive.

But the investor is unlikely to build any such network himself and is hoping that others will now take up the challenge with him. Talking to Tesla investors last week Musk said he had "shot myself mentioning Hyperloop, because obviously I have to focus on core Tesla business and SpaceX business, and that's more than enough.

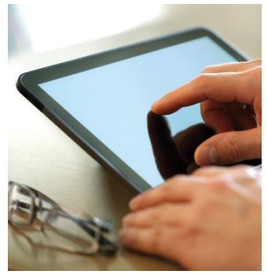


Apple's New iPhone 'Touch ID' Makes Fingerprint Scans Easy,

The latest iPhone has arrived, and along with it what may be the slickest integration of biometric security yet: A fingerprint scanner built seamlessly into the phone's home button. But privacy-conscious users would be wise to think twice. Better to use your fingerprint as another layer of protection than as a replacement for old-fashioned passwords and passcodes.

In Apple's iPhone 5S launch event Tuesday, the company's vice president of marketing Phil Schiller introduced its first-ever fingerprint scanner, which it's calling Touch ID, a feature that appears only as a thin ring of metal around the iPhone's single front-facing button. According to Apple's descriptions, the 170-micron thin scanning sensor sits under a laser-cut sapphire crystal and is surrounded by the steel detection ring, which can capture 550 pixels per inch of resolution in a user's fingerprint.

"We have so much of our personal life on these devices…and they're with us everywhere we have to go," Schiller told the keynote's audience, noting that only half of iPhone users set up lockscreen passcodes on their devices. "We have to protect them." And Touch ID's authentication, it seems, can be used to replace more than just the initial passcode lock on an iPhone. In his talk, Schiller also mentioned that it can be used to buy items in Apple's App Store, implying that it can also replace full passwords.



Self-healing materials

A growing trend in biomimicry is the creation of non-living structural materials that also have the capacity to heal themselves when cut, torn or cracked,” write the authors. “Self-healing materials which can repair damage without external human intervention could give manufactured goods longer lifetimes and reduce the demand for raw materials, as well as improving the inherent safety of structural materials used in construction or to form the bodies of aircraft. “

The notion of self-healing materials might seem beamed in straight from the plot of one of the "Terminator" movies -- but the first versions of this technology are destined to hit the market this year.

While liquid metals that can mesh back together after taking a shotgun blast remain the stuff of science fiction for now, simpler models -- such as anti-corrosion coatings that repair themselves after being damaged -- have already become a reality.

ITECH UPDATE

FITBIT FORCE

Slowly but surely, Fitbit has refined its step- and sleep-tracking hardware over the past few years, and it all culminates in the Force.

This simple wristband includes a bright OLED display that reveals your steps taken, miles covered, floors climbed, and calories burned, all in real time. The display can even function as a simple digital watch. Sync the wristband with your smartphone or desktop PC, and you can drill further into your step data, and also learn more about the quality of your sleep.

The Force may not make sense if you already wear a wristwatch, but otherwise it’s one of best activity-tracking wristbands around.

3D-PRINTED GUN

Much like 2012, 2013 was very much The Year of the 3D Printer. If we were so inclined, we could quite easily dedicate an entire top 10 list to exciting 3D printing breakthroughs. If we had to choose just one, though, it would be the plastic, 3D-printed Lulz Liberator pistol. (The runner up, if you were wondering, would be the first 3D-printed human stem cells.)