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GAME CHANGERS

# Noteworthy tech, from a brawny robot to blazing fast Internet

Broadband mavericks, entrepreneur Paul English, innovators at Harvard and MIT, and others are cranking up daring new businesses and tools.

| MAY 13, 2016

## ADVENTURES IN THE LAND OF STARTUPS

What does an entrepreneur do after hitting it big? Lots of things.

It would be easy — and incorrect — to look at Paul English as just another rich, enigmatic entrepreneur dabbling with his hobbies. The cofounder of Kayak.com left his perch at the travel search engine in late 2013, after the company had been sold to Priceline for \$2.1 billion. English moved on to do the kinds of things wealthy, successful types do: He launched a startup incubator, Blade, that hosted lots of parties and a few moderately successful businesses. He took out his \$105,000 Tesla Model S P85 for a few rides as



JONATHAN WIGGS/GLOBE STAFF

Paul English, cofounder of Kayak.com, is back with two new ventures.

an Uber driver. He created a website that acts as a matchmaker between startup founders and technological wizards looking to create companies.

But all the while, English was dreaming up a few weightier endeavors, one of them based on his expertise in the travel industry and another partly inspired by the enormous economic disparities he encountered in his own travels around the world.

The first, [Lola](#), is the “humanization” of the very industry he helped automate. It’s a chat-based travel booking tool that engages real travel agents — actual humans! — in the trip-planning process, adding a layer of knowledge and service that English sees as the next generation of online commerce. He intends to hire scores of agents for the company, [launched Thursday](#), and has raised about \$20 million to get it off the ground.

English’s other venture is [Summits Education](#), a philanthropic effort that aims to transform education systems in rural Haiti through training and development programs targeting teachers and administrators. The organization, working closely with Partners in Health, has launched with a network of more than 40 primary schools serving nearly 10,000 students.

Both projects are ambitious examples of the scope — and substance — of English’s reach. — Janelle Nanos

TOOLS FOR MAPPING THE BRAIN



KEITH BEDFORD/GLOBE STAFF

Ed Boyden creates tools to understand the brain.



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## Who's on the list the Globe's 2016 Game Changers?

These 46 innovators had the vision, leadership, and determination to make a difference in lives around the world and around the corner.

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Synthetic neurobiology is one of those terms that can be hard to wrap your mind around. Ed Boyden, who runs a [laboratory focused on the field at MIT](#), explains it with the metaphor of a computer. To understand how it works and fix any problems, you'd better have a circuitry diagram, a monitor to see what's happening, and a keyboard to enter commands. And he's trying to create those kinds of tools to understand the brain.

“The brain is so complicated — even a cubic millimeter of it has 100,000 neurons and a billion connections between them,” says Boyden, who won a Breakthrough Prize in 2015 for his work in optogenetics. That field, he explains, involves the use of light to manipulate neurons, not unlike having a keyboard to control your computer.

One intense area of exploration is a way to map the wiring of the brain. There, Boyden says, it may be useful to make brain tissue larger by employing polymers that swell and cause its molecules to separate from one another, in a process dubbed “expansion microscopy.”

Most of the 40 full-time researchers in Boyden's lab focus on developing new tools for brain research, as opposed to trying to create treatments for particular maladies like depression or Parkinson's. Think of them as IBM or Apple in the early days of the personal computer — delivering technologies that others can use in their own work. — SCOTT KIRSNER

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A brawny robot, made by Waltham company [Boston Dynamics](#) is transforming expectations about what robots walking on two legs can do. Such machines are typically clumsy. They topple over often and are difficult to control. But “Atlas” wowed robot experts with a suite of new abilities, broadcast the world over in a YouTube video Boston Dynamics released in February.

A significant upgrade from previous models, this next-generation Atlas is powered by a battery pack on its back. The robot navigated slippery snow-covered ground outdoors and, indoors, was able to bend down and lift 10-pound boxes and place them on a warehouse shelf. And even when given a hard shove by a company employee, it managed to stay on two feet. Once, when it did take a fall, it was able to pick itself up — a rare achievement for any robot.



This next-generation Atlas is powered by a battery pack on its back.

Boston Dynamics's two-decade record of building futuristic machines made it attractive to Google, which acquired it in 2013. But the immediate future of the company and the robot is uncertain. A report in March claimed that Alphabet, Google's parent company, is preparing to sell Boston Dynamics, in part because the promise of a commercially successful product is still many years away. — Nidhi Subbaraman

## CHALLENGING THE INTERNET-PROVIDER HEAVYWEIGHTS

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DINA RUDICK/GLOBE FILE

Max Ariza is an operations manager at netBlazr, which offers clients a wireless connection to the Internet.

Verizon will soon start installing high-speed fiber-optic cables in Boston, a move that should bring consumers in the city much faster Internet by the time the project wraps up in about six years. But if you can't wait that long, there might be another route.

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broadband market. These Internet services, from companies including [netBlazr](#) and [Starry](#), are still in the early stages. Starry plans to debut its service in Boston late this summer, while netBlazr says it will have thousands of customers by year's end. But their over-the-air technology hints at a new way of connecting to the Internet that could lower the installation hurdles that have made it difficult for new competitors to challenge cable and phone company heavyweights.

The general idea behind netBlazr and Starry is the same. They start with a fiber-optic Internet connection, available from several commercial providers, and use powerful radio transmitters to beam a wireless signal from atop towers or tall buildings. The signal is then received by antennas installed on buildings farther down the line.

Once the equipment is set up, netBlazr says residential customers can get up to 40 megabits per second for \$70 per month. That compares with Comcast's 25 Mbps for about the same price, not counting any promotional discounts.

The service isn't available everywhere, although netBlazr chief executive Jim Hanley says the company is growing its footprint. Today, customers can get it across Cambridge and the South End and most of East Boston and Roxbury, for example.

Trees and buildings can disrupt the signal, which means antennas must have "line of sight" to the transmitter. "We don't really go past the urban parts of the market," Hanley says. "Any kind of large, dense community is what we want to serve."

Starry hasn't disclosed its pricing, but the company is run by a notable boss. Chief executive Chet Kanojia formerly headed Aereo, [a startup that streamed broadcast TV online](#) by using Internet-connected antennas.

Aereo went out of business after the US Supreme Court ruled it was violating

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winners. — [Curt Woodward](#)

A VOICE FOR HUMANITY IN THE TECH ARENA



WGBH

MIT physicist Max Tegmark is one of the founders of the Future of Life Institute.

Entrepreneur Elon Musk and physicist Stephen Hawking are among those who've joined a cadre of world-famous technologists backing a tiny volunteer-run outfit in the Boston area that wants to make sure tomorrow's advanced technologies benefit humanity. On the radar of the Future of Life Institute: artificial intelligence

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Just 2 years old, the institute has raised about \$10 million — most of it from Musk — which it is channeling into researching social and ethical questions surrounding high tech. The outfit is run by a volunteer crew that sometimes convenes at the Winchester home of MIT physicist Max Tegmark, a cofounder and the institute's president.

In January 2015, the institute kicked up a media storm by releasing an open letter signed by more than 8,600 researchers who demanded that groups pushing the boundaries of artificial intelligence turn some attention to applying these new-



forged tools to benefit society.

The group followed that with another letter about the dangers of so-called autonomous weapon systems — smart tools that could issue commands to kill without a person pulling the trigger. Starting a conversation about preventing accidental nuclear war is a new initiative begun this year. — Nidhi Subbaraman

## SUPERSUIT BECOMES WEARABLE ROBOT

A fashion-forward supersuit designed by a Harvard University team could soon give soldiers a power boost while carrying heavy loads and could help people recovering from a stroke or those with conditions like multiple sclerosis or Parkinson's disease walk better. Conor Walsh, the Harvard engineering professor who led the team that designed the suit, calls it a “wearable robot.”

The battery-powered “exosuit” is made of wires and fabric and can be pulled on over a pair of pants. It assumes some of the effort of lifting loads or walking by giving a well-timed, battery-powered push to the leg.

Following indoor testing in the lab with wearers walking on treadmills, soldiers at the US Army's Aberdeen Test Center in Maryland got to wear the suit on a hike last summer, one of a handful of tests conducted with the military. Walsh has also partnered with faculty and physical therapists at Boston University to test applications for people who've suffered a stroke. The goal: a version of the suit that

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That kind of potential has attracted big names and big money. Sportswear maker Comments New Balance is a research partner, and the Defense Advanced Research Projects Agency and the National Science Foundation have awarded the project \$10 million over the past four years. — Nidhi Subbaraman

## SUCCEEDING WHERE FACEBOOK FAILED



LANE TURNER/GLOBE STAFF/FILE

Jana's Nathan Eagle says more than 30 million people use the company's app.

Here's something you don't see every day: a scrappy Boston startup going up against Facebook. And winning.

When it comes to a strategy for subsidizing people's data usage on smartphones in the developing world, Boston-based [Jana](#) has developed one that seems to be taking off. Focusing on consumers in India, Brazil, Indonesia, and 90 other

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In contrast, Facebook's approach to offering free data to consumers in India (as well as numerous other countries), known as Free Basics, was banned earlier this year by India's regulators. The reason? It offered access only to a collection of sites chosen by Facebook.

Jana cofounder and chief executive Nathan Eagle says his company believes people in other countries "want to use the Internet like we use the Internet," without restrictions. The company says there are now more than 30 million people

using its app.

Soon after the decision by regulators about Facebook Free Basics was announced in India, Jana raised another \$57 million in funding. That brought the sum it has amassed since the company's 2009 founding to nearly \$100 million.

Eagle says he's focused on working with advertisers and app makers to help them reach new customers. And he wants to create a profitable billion-dollar company in the process. "We're not getting confused with a nonprofit anymore," he says. — Scott Kirsner

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