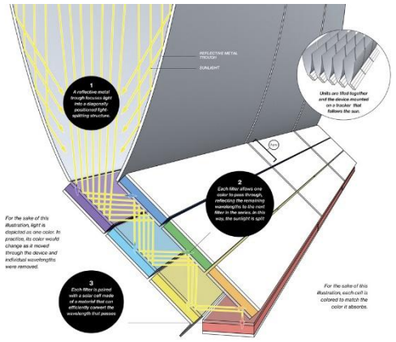
Ultra-Efficient Solar Power

Multiplying the productivity of solar-oriented gadgets would totally change the financial aspects of renewable vitality. Here is a plan that very well might make it conceivable

Harry Atwater thinks his lab can make a reasonable gadget that produces more than double the sun based power created by today's boards. Atwater's group is taking a shot at three outlines. In one (see delineation), for which the gathering has made a model, daylight is gathered by an intelligent metal trough and coordinated at a particular edge into a structure made of a straightforward protecting material. Covering the outside of the straightforward structure are numerous sun powered cells, each produced using one of six to eight unique semiconductors. When light enters the material, it experiences a progression of thin optical channels. Every one permits a solitary shading to go through to light up a cell that can assimilate it; the rest of the hues are toward different channels intended to let them through.



Another outline would utilize nanoscale optical channels that could channel light originating from all points. Also, a third would utilize a 3D image rather than channels to part the range. While the plans are distinctive, the essential thought is the same: join customarily planned cells with optical methods to proficiently outfit daylight's wide range and waste a great deal less of its vitality.

Sun based boards available today comprise of cells produced using a solitary semiconducting material, normally silicon. Since the material ingests just a limited band of the sun powered range, a lot of daylight's vitality is lost as warmth: these boards ordinarily change over under 20 percent of that vitality into power. However, the gadget that -Atwater and his partners have as a top priority would have a proficiency of no less than 50 percent. It would utilize an outline that effectively parts daylight, as a crystal does, into six to eight segment wavelengths—every one of which delivers an alternate shade of light. Each shading would then be scattered to a cell made of a semiconductor that can assimilate it. Accomplishing ultrahigh productivity in sun based outlines ought to be an essential objective of the business

ACHIEVERS OF THE QUARTER

NAME	SEMESTER	EVENTS	PLACE	PRIZE
Sai Anisha Reddy	V	Tech Quiz	NIT, Hyderabad	I
Srilekha	VIII	Technical Writing	HKBK,Bangalore	I
Nakul	VII	Hackathon - code	PESIT,Bangalore	II
Pruthvi Divakar Hegde	VI	Digital Photgraphy	HKBK,Bangalore	II

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P1 / BRAIN IMPLANTS

A maverick neuroscientist believes he has deciphered the code

P2 / MEMORY IMPLANT

The researchers took a leap forward by trying this in live rats, showing that a computer could in fact serve as an artificial component.

P3 / GOOGLE BETTER LISTENER

You'll now be able to ask Google Search the same kinds of questions as Google Now

P4 / ULTRA-EFFICIENT SOLAR POWER

Multiplying productivity of solar oriented energy.

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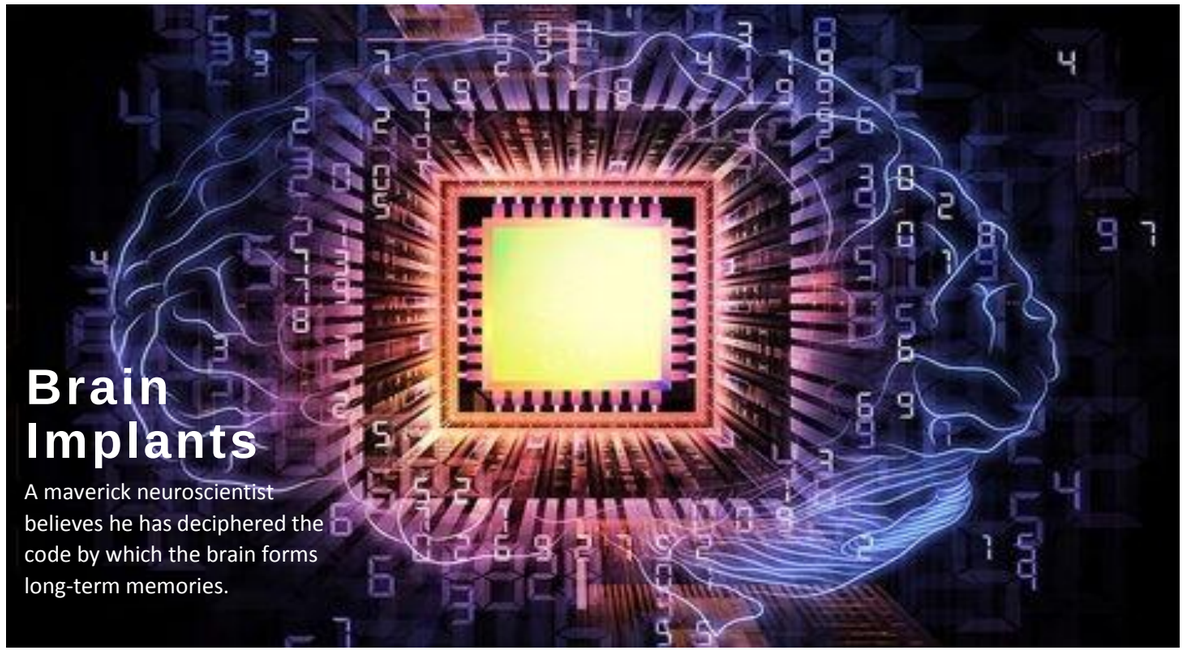


Theodore Berger, a biomedical engineer and neuroscientist at the University of Southern California in Los Angeles, envisions a day in the not too distant future when a patient with severe memory loss can get help from an electronic implant. In people whose brains have suffered damage from Alzheimer's, stroke, or injury, disrupted neuronal networks often prevent long-term memories from forming. For more than two decades, Berger has designed silicon chips to mimic the signal processing that those neurons do when they're functioning properly—the work that allows us to recall experiences and knowledge for more than a minute. Ultimately, Berger wants to restore the ability to create long-term memories by implanting chips like these in the brain.

Berger and his research partners have yet to conduct human tests of their neural prostheses, but their experiments show how a silicon chip externally connected to rat and monkey brains by electrodes can process information just like actual neurons.

Still, restoring a form of cognition in the brain is far more difficult than any of those achievements. Berger has spent much of the past 35 years trying to understand undamental questions about the behavior of neurons in the hippocampus, a part of the brain known to be involved in forming memory.

>> CONT. PAGE TWO

> "We're not putting individual memories back into the brain, We're putting in the capacity to generate memories"

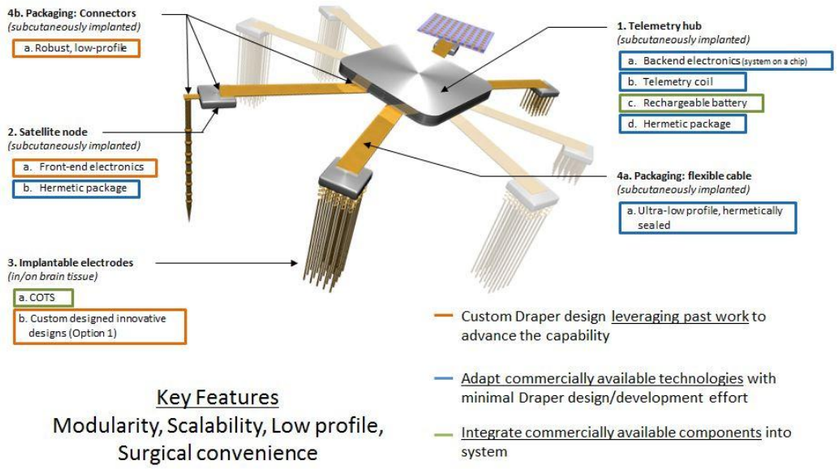
Memory Implants

>> CONT. FROM PAGE ONE

The hippocampus makes short-term memories into long-term memories. Berger has developed mathematical theorems that describe how electrical signals move through the neurons of the hippocampus to form a long-term memory, and he has proved that his equations match reality. When he was asked to define memory, he says, “It’s a series of electrical pulses over time that are generated by a given number of neurons,” he says. “That’s important because you can reduce it to this and put it back into a framework. Not only can you understand it in terms of the biological events that happened; that means that you can poke it, you can deal with it, you can put an electrode in there, and you can record something that matches your definition of a memory. You can find the 2,147 neurons that are part of this memory. And what do they generate? They generate this series of pulses. It’s not bizarre. It’s something you can handle. It’s useful. It’s what happens.” Neuroscientists track electrical signals in the brain by monitoring action potentials, microvolt changes on the surfaces of neurons.

Berger takes a marker and fills a whiteboard from top to bottom with a line of circles that represent neurons. Next to each one, he draws a horizontal line that has a different pattern of blips on it. “This is you in my brain,” he says. “My hippocampus has already formed a long-term memory of you. I’ll remember you into next week. But how can I distinguish you from the next person? Let’s say there are 500,000 cells in the hippocampus that represent you, and there are all sorts of things that each cell is coding—like how your nose is relative to your eyebrow—and they code that with different patterns.

Proposed MGH Device Architecture



> “You don’t have to do everything the brain does, but can you mimic at least some of the things the real brain does? Can you model it and put it into a device? Can you get that device to work in any brain?”

To find the site in the rabbits, they equipped the animals’ brains with electrodes that could monitor the activity of a neuron. Neurons have gates on their membranes, which let electrically charged particles like sodium and potassium in and out. Thompson and Berger documented the electrical spikes seen in the hippocampus as rabbits developed a memory. Both the spikes’ amplitude (representing the action potential) and their spacing formed patterns. It can’t be an accident, Berger thought, that cells fire in a way that forms patterns with respect to time.

This led him to a central question that underlies his current work: as cells receive and send electrical signals, what pattern describes the quantitative relationship between the input and the output? That is, if one neuron fires at a specific time and place, what exactly do the neighboring neurons do in response? The answer could reveal the code that neurons use to form a long-term memory.

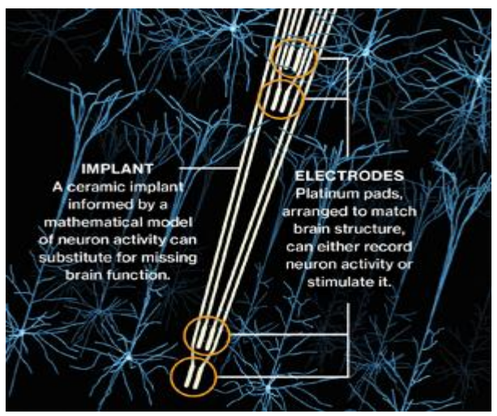
By the early 1990s, his understanding—and computing hardware—had advanced to the point that he could work with his colleagues at the University of Southern California’s department of engineering to make computer chips that mimic the signal processing done in parts of the hippocampus. “It became obvious that if I could get this stuff to work in large numbers in hardware, you’ve got part of the brain,” he says. “Why not hook up to what’s existing in the brain? So I started thinking seriously about prosthetics long before anybody even considered it.”

Next, to assess whether such a chip could serve as a prosthesis for a damage hippocampal region, the researchers investigated whether they could bypass a central component of the pathway in the brain slices. Electrodes placed in the region carried electrical pulses to an external chip, which performed the transformations normally done in the hippocampus. Other electrodes delivered the signals back to the slice of brain.

Then the researchers took a leap forward by trying this in live rats, showing that a computer could in fact serve as an artificial component of the hippocampus.

Last year, the scientists published primate experiments involving the prefrontal cortex, a part of the brain that retrieves the long-term memories created by the hippocampus. They placed electrodes in the monkey brains to capture the code formed in the prefrontal cortex that they believed allowed the animals to remember an image they had been shown earlier. Then they drugged the monkeys with cocaine, which impairs that part of the brain. Using the implanted electrodes to send the correct code to the monkeys’ prefrontal cortex, the researchers significantly improved cortex, the researchers significantly improved the animal’s performance on the image-identification task.

Despite the uncertainties, Berger and his colleagues are planning human studies. He is collaborating with clinicians at his university who are testing the use of electrodes implanted on each side of the hippocampus to detect and prevent seizures in patients with severe epilepsy.



supercalifragilisticexpialidocious

Google Search becomes a better listener, finally

Google has spent the past year developing its voice recognition tools, and on Wednesday the company announced that the voice recognition tools in Google Now will be added to Google Search.

You'll now be able to ask Google Search the same kinds of questions as Google Now, further connecting the services. Queries about five expansive categories make accessible in Search a lot of information from your Gmail, Google Calendar, and Google+. The categories include scheduled flight information, photos from Google+, event information from Google Calendar, purchase data from Gmail shipping notices, and restaurant reservations, from Gmail and Google Calendar.

The new voice-powered Search will work in most Google apps, including the Chrome browser on desktops and mobile and the Google Search apps on Android and iOS. Google will be rolling out the update over the next few days. It ought to be available to all Google users by the end of the week, according to Google spokeswoman Roya Soleimani.

The new features leverage Google's Knowledge Graph and contextual voice recognition that first **debuted in a field test** a year ago. The information exposed in Search is limited by Google account, so you can't search another person's Gmail unless you've accessed his or her account.

The new voice recognition features are robust enough to be able to work with different ways of formulating the same question. Soleimani said that asking, "What time is my flight?" will elicit the same answer as "When is my flight?" or "When does my flight leave?"

These kinds of searches have been available for a while now in Google Search only as typed queries for people participating in the field test. But this is the first time Google's voice search will be able to recognize this sort of typed query and voice query by default.

Contextual search and recognition allow people to ask more natural follow-up questions. "When is my dinner reservation?" could be followed with, "How do I get there?" Google Search then will open Google Maps to direct you to the restaurant. However, while contextual search is available in Google Search, it won't work yet with the new query categories that pull information from your Google accounts. Google would not give a timeline for when it would be available, either.

A popular search, said Soleimani, is for nutritional information at a restaurant. People like asking about the calorie count of different types of food and beverages, she explained, by starting with the query, "How many calories are in avocados?" and then following with, "What about sake?" and "What about rice?"

ITECH UPDATE

XBOX ONE UNVEILED

Microsoft beat Sony to show off the look of its next-generation console - the Xbox One - half a year before it went on sale.
The launch plans later ran into trouble when planned restrictions on second-hand games sparked a backlash that its rival Sony exploited at the E3 games show, prompting a U-turn.
The row doesn't seem to have affected sales. Microsoft recently said more than two million Xbox Ones had been sold, putting it roughly level-pegging with the PlayStation 4.
But the former Xbox chief Don Mattrick is no longer about to enjoy the glory - he has jumped ship to try and turn around online games developer Zynga.

LEAP MOTION

Improve your workplace experience with this new Leap Motion device. For those who want to do more with less, this device will help you complete different computer related tasks without using too much energy. Leap motion can do more than what most motion sensors can do. You can easily control any thing on your computer without using a mouse, all you have to do is lift your your finger and point it to what you want to accomplish, then this Leap Motion Controller will sense how your hands move and it will respond accordingly.