• Technology Controls Electronics with Brain

A new technology in Japan could let you control electronic devices without lifting a finger simply by reading brain activity. The "brain-machine interface" developed by Hitachi Inc. (HIT) analyzes slight changes in the brain's blood flow and translates brain motion into electric signals. A cap connects by optical fibers to a mapping device, which links, in turn, to a toy train set via a control

Hitachi, Ltd. researcher Akiko Obata wears head gear that reads her brain activity to make a model train run.

computer and motor during one recent demonstration at Hitachi's Advanced Research Laboratory in Hatoyama, just outside Tokyo.

Underlying Hitachi's brain-machine interface is a technology called optical topography , which sends a small amount of infrared light through the brain's surface to map out changes in blood flow.

Although brain-machine interface technology has traditionally focused on medical uses, makers like Hitachi and Japanese automaker Honda Motor Co. (HMC) have been racing to refine the technology for commercial application. Hitachi's scientists are set to develop a brain TV remote controller letting users turn a TV on and off or switch channels by only thinking. Honda, whose interface monitors the brain with an MRI machine like those used in hospitals, is keen to apply the interface to intelligent, next-generation automobiles.

The technology could one day replace remote controls and keyboards and perhaps help disabled people operate electric wheelchairs, beds or artificial limbs.

Initial uses would be helping people with paralyzing diseases communicate even after they have lost all control of their muscles.

• Viruses Produce Eco-friendly Batteries

A new podcast explores how nanotechnology researcher Angela Belcher, from Massachusetts Institute of Technology (MIT), is working with viruses to make them do good things. By exploiting a virus's ability to replicate rapidly and combine with semiconductor and electronic materials, she is coaxing them to grow and self-assemble nanomaterials into a functional electronic device. Through this marriage of nanotechnology with green chemistry, researchers are working toward building faster, better, cheaper and environmentally-friendly transistors, batteries, solar cells, diagnostic materials for detecting cancer, and semiconductors for use in modern electrical devices everything from computers to cell phones. Unlike traditional semiconductor or battery manufacturing which requires expensive and toxic chemicals, nanofactories generate little waste, grow at room temperature, and promise to be inexpensive and largely biodegradable.

• Smart Traffic Monitoring

Engineers have developed software for road traffic control boxes that can detect and notify authorities of accidents and congestion at a much lower cost. The car-sized wire loops buried in the tarmac effectively act as metal detectors. When a vehicle passes over a loop, the detector sends a signal to a computer in a control box at the side of the road. The controller may simply count the number of cars that pass by and calculate average speed, or it may actively control traffic, by operating a traffic light on a motorway slip road, for instance. The main cost of using such devices is the that of sending electronic signals between them and the transportation center that is doing the monitoring. Normally, controller boxes transmit their data very

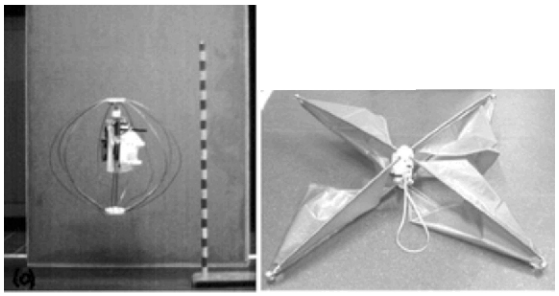
frequently, some as often as once every twenty seconds.
Initial results show that their software achieved better than 90 per cent accuracy in reporting traffic conditions at the interchange between two busy interstate roads in Columbus Ohio, using up to 200 times fewer signals than before.
Instead of sending all of the data all of the time, the new software infers road conditions based on traffic patterns. It determines whether conditions are critical enough for an alert to be sent to a state transportation authority. Otherwise, it sits quietly and leaves the communication channel free.
The approach is more efficient, because the controller boxes only send signals to the control center when absolutely necessary, which reduces communications costs. The transportation authorities would only need to electronically 'ping' a quiet station once in a while, to make sure it was still working.
Between pings, the station would store non-critical data, such as the traffic counts that authorities use to determine if a road needs resurfacing, to be retrieved later.

• Cellphone That Won't Crack Up from a Crash

Sony, Japanese electronics giant has introduced an innovation that promises to protect the sensitive innards of a cellphone in case of an impact. The company proposes to house the phone's electronics within a water-tight casing, which is itself placed within a second container filled with liquid, but punctured with numerous holes. In case the user accidentally drops the instrument, the inner compartment would push against the liquid, squeezing it through the holes into an outer chamber, thereby reducing the force of the impact and protecting the electronics from damage. Sony has said their innovation will increase the chances that the phone's functions will survive the fall.

• Jumping robots take clues from nature

Jumping robots could provide solutions to traveling across rough terrain, such as climbing stairs and jumping fences, that normally create obstacles for wheeled robots and walking robots. The researchers hope that Jollbot and Glumper, with their biologically inspired mechanisms, will serve as prototypes for future generations of space robots.
The other advantages of jumping robots include a higher damage tolerance, the ability to survive a rough landing, and a low cost, which enables semi-sacrificial missions.
Jollbot (which gets its name from its combined jumping and rolling motion) has a skeletal structure made of semi-circular hoop springs. The central axis is equipped with a battery pack, servos and a radio receiver. When compressed, the springs hold energy that, when released in an instant, provide lift to the robot for a height of about 0.18 meters, which is about 2/3 its height.



Jollbot (left) and Glumper (right).

While an unusual shape, Jollbot's design requirements closely follow a variety of biological counterparts. Jollbot can store energy, just as fleas, leafhoppers, dogs, and humans store energy in rubber-like biological materials.
Also, Jollbot has a catch mechanism that ensures it will remain ready to jump without requiring additional energy. Similarly, grasshoppers' and locusts' specialized "metathoracic" jumping legs can remain in a flexed position by a tendon hooked around a cuticle for a natural catch mechanism, like a catapult.

• Google Buys GrandCentral

GrandCentral Communications, a service that lets users forward phone numbers into a single or many different phones has been bought by Google. The announcement was posted on the Google official blog by product manager Wesley Chan.
GrandCentral has been up and running since September 2006 and provides a web-based control of phones and voice mails. Users buy phone numbers which can then be forwarded to another or several other phones. GrandCentral has

proven useful for detectives and investigative journalists who often have to provide a contact phone number, but don't want publicize their private phone numbers.
GrandCentral is currently in private beta, but Google says public beta invitations will go out shortly. There is no specification for payment by Google.

• An Electronic Shirt for Health

An electronic shirt has been developed using a garment with integrated electronic technology that can monitor the wearer's heart or respiratory functions wirelessly. When placed on electronic hangers, they enable monitored data to be downloaded onto to a computer in the wardrobe. So there's no need to worry about data being lost while the garment is being cleaned. The wardrobe has a touch screen on the outside and conductive metal bands spanning the hanging rail inside, with wires connecting it to a computer in the base of the wardrobe. When we place electronic hangers, each with their own ID and metal connection, on the rail, it detects the hangers and smart garments incorporating the conductive material and integrated electronics. Smart garments in the future may be used for a range of other monitoring services such as at home outpatient care and for people with dementia, enabling them to have a full life for as long as possible with a minimum level of intervention. They can also be monitored without having to learn to use a new device.
The smart wardrobe could also be adapted for other uses including the self diagnosis of faulty monitoring equipment; scheduling cleaning and dry-cleaning; a fashion butler to help people accessorise, colour match and select appropriate clothing for special occasions; and for preloading news, music and daily schedules into smart garments.

• Lighter Displays Posing a Challenge to LCDs

A new generation of super-thin, power-sipping displays are going to become popular in the market and posing a challenge to heavier, energy-gobbling LCDs. New screens that glow on their own are taking on their clunkier liquid crystal display rivals, which require powerful backlighting by producing sharper video images for smart phones, game consoles and portable media players.

Organic light-emitting diode (OLED) and bi-stable technologies are the most likely challengers to LCDs. An OLED screen uses as much as 40 percent less power than a comparable LCD and could be twice as thin because it does not need backlighting.
These technologies are already being used in some smaller portable devices, such as music players from Samsung Electronics and Reigncom and a thin mobile phone from Kyocera.
And Sony plans to sell small TVs using the OLED technology later this year.

• Web Images for Adding Realism To Edited Photos

A system has been developed for editing or altering photographs using segments of the millions of images available on the Web.
Whether adding people or objects to a photo, or filling holes in an edited photo, the systems automatically find images that match the context of the original photo so they blend realistically. Unlike traditional photo editing, these results can be achieved rapidly by users with minimal skills.
To make the resulting image appear as realistic as possible, the system analyzes the original photo to estimate the camera angle and lighting conditions, and then looks in the clip art library for an object a car, for instance that matches those criteria. The user need only identify the horizon in the original photo to orient the system. Using previously developed Carnegie Mellon technology for analyzing the geometric context of a photo, the system can then place the object within the scene, adjusting its size as necessary to put it in proportion to other objects of equal distance from the camera.The success of this approach depends on the number of photos available to the system.