



TECHNO

THE BIG IDEAS THAT
ARE CHANGING EVERYTHING

TRENDS

A TECH LOOK AHEAD

BY DANIEL BURRUS, CEO OF BURRUS RESEARCH



In the year ahead, we will see many current technologies that have major new improvements. Here are a few I think you will find both interesting

and useful.

WIRELESS USB

Wireless USB will eliminate the cord that connects so many of our computing devices such as printers and external hard drives giving us greater flexibility in both the home and office. Additionally, this will enable us to do cool things like send pictures wirelessly from our cameras to our computers in just a few seconds.

GPS + CELLULAR + SEARCH

Integrating cellular connectivity into GPS devices that provide contextually relevant local searches based on real-time information will allow us to find what we want when we want it. In addition, a real-time traffic information network will allow us to better avoid both construction and congestion.

WIRELESS WEB WHEN YOU NEED IT

With Sprint, Cingular, Verizon, and T-Mobile all rolling out faster Web access for both our phones and laptops, and WiFi connectivity expanding, it will be easy to stay connected wherever you go. In addition, all of the increased competition should bring down the price later in the new year. *Continued on page 2*

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A TECH LOOK AHEAD *(continued from page 1)*

OPERATING SYSTEM UPGRADES

With both the Macintosh's new operating system OS X Leopard, and Microsoft's new Windows Vista, users will see more than just a minor upgrade. In addition to a major new look and feel, Microsoft is focused on giving users far greater security and stability, as well as system-wide searching and new media applications. The new Macintosh operating system will provide upgraded system-wide search and interface improvements as well as a cool new backup system called Time Machine. Being able to run both operating systems on the fast new Intel-based Macs will add a new competitive advantage for Apple.

WIFI + VOIP CELL PHONES

Skype grew rapidly in 2006 as people used their PC to place free or low fee calls from anywhere in the world with an Internet connection. New companies such as JahJah allow you to use either a PC or smart phone to do the same, and a new wave of WiFi phones can work with Skype or Windows Live Messenger. T-Mobile is launching UMA which will allow seamless switching between cellular and WiFi. It won't be long until we will be able to seamlessly connect between all three using a smart phone.

TECHNOLOGY NEWS HIGHLIGHTS

STEM CELL CURE FOR PARTIAL PARALYSIS

Researchers at Johns Hopkins University have come one step closer to treating paralysis from spinal cord injury and damaged motor nerves. In a study on rats, mobility was regained in 11 out of 15 subjects when treated with a combination of stem cells and drugs that encourage the new cells to survive and grow. Previous studies have demonstrated that stem cells are capable of boosting nervous system function. However, in this experiment, new nerve fibers grew not only within the spinal cord, but outside the spinal cord as well, extending all the way into muscles to form neuromuscular connections. The next step is to study the technique in larger animals. The goal is to verify that the newly-formed neurons are capable of reaching adequate lengths to make the method viable for treating humans.

For information: Deepa Deshpande, Johns Hopkins University, School of Medicine, 733 N. Broadway, Baltimore, MD 21205; phone: 410-614-1445; email: ddespha1@jhmi.edu; Web site: www.hopkinsmedicine.org

MOLECULAR FACTORY

In an effort to advance the art of nano-construction, two nanotechnologists have developed a Web site (www.molecularassembler.com) where participants from around the world can collaborate on a project involving diamond mechanosynthesis (DMS). The ultimate goal of nanofactories will be to create new materials by controlling their structure at the molecular level. The resulting products can be as intricate as biological systems, but would possess optical, electrical, strength, stiffness, and other properties that are unparalleled in today's world, such as steel that is ten times stronger. The systems would operate with greater speed and reliability, and still be entirely under human control. Molecular manufacturing is also potentially cleaner, more efficient and less expensive than traditional manufacturing methods.

For information: Robert Freitas, Jr., Institute for Molecular Manufacturing, Box 605, Pilot Hill, CA 95664; email: rfreitas@rfreitas.com Ralph Merkle, Georgia Tech, College of Computing; email: merkle@merkle.com Web site: www.molecularassembler.com

SHAPE-SHIFTING ROBOTS

A new approach to robotics, the M-TRAN line of self-configurable robots is the ultimate in flexibility and adaptability. Individual modules are synchronized through wireless communications, allowing them to "morph" from an upright, walking android, to a slithering snake-like configuration, to a self-propelled wheel. The modular explorer robots can also adapt to hostile environments, making them ideal for search and rescue as well as space exploration.

For information: National Institute of Advanced Industrial Science and Technology, Intelligent Systems Research Institute, Tsukuba East, 1-2-1 Namiki, Tsukuba, Ibaraki 305-8564, Japan; phone: +81-29-861-5201; email: is-weboffice@m.aist.go.jp; Web site: www.aist.go.jp

COOL COMPUTER CHIPS

One drawback of packing more computing power into smaller and smaller chips is that they produce more and more heat per square centimeter of space. But an engineer at Intel has developed a way to minimize energy leakage – and the resultant heat generated - through more careful plotting of circuit pathways. In initial testing, circuits with five times the computing power of today's transistors were able to run on only 20 to 25 percent of the power. Such advanced circuit design may someday make it possible to operate servers without costly cooling systems, and substantially extend the processing power and battery life of laptops.

For information: Ram K. Krishnamurthy, Intel Corporation, Microprocessor Research, Corporate Technology Group, Hillsboro, OR; email: ram.krishnamurthy@intel.com; Web site: www.intel.com

MOLECULAR TRANSISTOR

Researchers at the University of Arizona may have found a way to transform molecules into working transistors. Using a patent-pending technology called Quantum Interference Effect Transistor (QUIET) they have been able to regulate the flow of current between atoms by applying a voltage to one of three metal contacts embedded in the molecule, just like tiny transistors. At one nanometer (one-billionth of a meter) in size, such devices could someday be used as "nano-robots" to perform tasks like cleaning and repairing arteries, or delivering medicines internally while collecting vital information.

For information: Charles Stafford, University of Arizona, Department of Physics, P.O. Box 210081, Tucson, AZ 85721; phone: 520-626-4260; email: Stafford@physics.arizona.edu; Web site: www.physics.arizona.edu

HYDROGEN-POWERED TOYS

A Chinese fuel-cell manufacturer recently shipped its first hydrogen-powered toy car – the H-Racer. The car, along with its refueling station, retails for about \$40. The company has plans for other hydrogen-powered toys, as well as a full-sized car.

For information: Horizon Fuel Cell Technologies Pte. Ltd., 4th Floor, Block 39, #2041 Jinshajiang Road, 200333, Shanghai, China; phone: +86-21-5270-9082; fax: +86-21-5270-5064; Web site: www.horizonfuelcell.com

HIGH TECH, HIGH TOUCH

Jaiku is a new service that allows cell phone users to keep track of where friends and family are without having to call them. The free mobile application uses information from cell phone towers to determine your location, and whenever you post an update, it is automatically broadcast to your contact list. You can share not only your location but what you're doing, whom you're with, how you're feeling, and whether or not you're available. Jaiku will also provide an overview of your buddies' latest updates, so you can know what they've been up to by simply looking at your phone. The company plans to generate revenue by offering targeted, location-specific ads at \$1 per click. Revenues are expected to reach \$500,000 in 2007.

For information: Jyri Engeström, Jaiku, Lönnrotinkatu 32D 51, 00180 Helsinki, Finland; phone: +358-40-5228496; email: jyri@jaiku.com; Web site: www.jaiku.com

THIS ROBOT REALLY COOKS!

The world's first cooking robot is expected to become commercially available in 2007. AIC-AI, as it is known, can fry, bake, boil, steam, and perform other specialized culinary feats to produce thousands of attractive and tasty dishes. The goal of the project, which took four years and cost approximately \$250,000, was to help standardize the Chinese fast food industry. However, the developers also have plans to design a model for home use.

For information: Web site: www.technovelgy.com

OMNIDIRECTIONAL IMAGING

MIT researchers have built a sphere of optical fibers that can record images from all directions, a technology that could someday lead to clothing that "sees." The sphere is basically a network of polymer and glass composite fibers with

photosensitive cores. When light strikes it from any direction, a computer algorithm analyzes the signal and constructs a 3-dimensional image based on where the photons entered and exited the sphere. Materials such as this could be integrated into soldiers' uniforms to give them a 360 degree view of their surroundings, or the spheres may be used to replace multiple surveillance cameras for enhanced security.

For information: Ayman Abouraddy, Massachusetts Institute of Technology, 77 Massachusetts Avenue, Cambridge, MA 02139-4307; phone: 617-324-0479; email: raddy@mit.edu; Web site: www.mit.edu

ACCORDION PILL

One of the challenges in getting optimal benefit from medications is that fact that they pass through the gastric system so quickly. As a result, many drugs require several doses a day in order to be effective, and variations in how quickly or thoroughly they are metabolized can lead to severe side effects. Recently, a small biotech firm came up with a solution to address this challenge. Medicine is embedded into a thin film, which is folded up like an accordion and placed in a gelatin capsule. In the stomach, the pill unfolds, staying in place for up to 20 hours as the drug is slowly released. The first version of these self-expanding, controlled-release capsules will be aimed at treating a neurological disease, and is currently awaiting FDA approval.

For information: Intec Pharma Ltd., 12 Hartom St., RMPE Building, P.O. Box 45219, Jerusalem 91450, Israel; phone: +972-2-586-4657; fax: +972-2-586-9176; Web site: www.intecpharma.com

PRECISION NAVIGATION SYSTEM

By 2010, the European Union plans to launch a new satellite navigation system that will likely render today's GPS gadgets obsolete. Known as Galileo, the new worldwide positioning technology will increase the number of satellites from 24 to 51, providing greater precision than is currently available and improving coverage at higher latitudes. Galileo will be able to determine the location of any moving or stationary object to within one meter and companies are already looking to incorporate the advanced technology into their products and services. For example, a French car rental company plans to use the system to help customers locate the nearest rental car using their cell phone. They will be able to unlock and drive the vehicle using a smart card, then park it for the next customer. Other applications for location-based technology will include traffic control, social services, justice and customs services, search and rescue, and many more. The market is expected to top \$42 billion by 2010.

For information: European Commission, Directorate-General Energy and Transport, B-1049 Brussels, Belgium; Web site: www.ec.europa.eu/dgs/energy_transport/galileo

EXECUTIVE JOB BOARD

A new Web-based job board called Blue Chip Expert was recently launched that is designed to match high-end consultants and contract workers with employers seeking top-level talent. The concept is to establish a network of referrals that will generate a national talent bank. The key is that anyone who refers a successful candidate can make a "commission" on their placement. Once you've registered on the Blue Chip Web site and created a profile outlining your qualifications, you can invite others to the site. If they get hired, you automatically receive a percentage of their contracted fee. The system is designed to help hiring managers identify potential candidates quickly and easily. Algorithms offer the ability to rank individuals on the basis of former employers or schools attended. In addition to the contract fee, the employer pays Blue Chip a 25 percent service fee. They, in turn, make payments to their members for the referral based on degrees of separation (e.g. 2 percent for a direct referral, 1 percent for a referral's referral, etc.)

For information: Blue Chip Expert, 1777 Borel Place, Suite 200, San Mateo, CA 94402; phone: 650-989-4073; fax: 650-525-0798; Web site: www.bluechipexpert.com

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