ACM TechNews

Welcome to the February 4, 2009 edition of ACM TechNews, providing timely information for IT professionals three times a week.

HEADLINES AT A GLANCE

R&D Minister Backs Computer Skills for All

Computerworld New Zealand (02/05/09) Bell, Stephen

New Zealand's Research, Science, and Technology minister Wayne Mapp says New Zealand needs a significant boost in its information and communications technology (ICT) expertise to pull itself out of the economic crisis. Mapp says improving the ICT skills of the general population, and using the available capabilities of the Internet, will help New Zealand extract itself from the recession. However, this strategy will require teaching the workforce how ICT can improve their operations. "We will need our tertiary institutions to take responsibility for this," Mapp said at the recent Australasian Computer Science Week cluster of conferences (ACSW2009). Keynote speaker Mark Guzdial, from the Georgia Institute of Technology, is developing first-year courses in computer science for students who are not computer science majors. This approach has led to similar courses at other educational institutions. Guzdial says the key is to establish the proper context, to use computer science as a "lens" through which other disciplines can be viewed. For example, students of media learn about the manipulation of an array of variables by approaching it from the context of manipulating pixels in a photograph or modifying sound files. Meanwhile, engineering students learn about programming robots, and architects learn about algorithms through graphical manipulation. Guzdial says that providing people in a variety of fields with background knowledge in computer science is crucial given the pervasive role computers and the Internet play in business and government.

View Full Article | Return to Headlines

Closing Tech Gaps With Open-Source Fixes Inc.
Daily Bruin (02/03/09) Schaefer, Samantha

University of California, Los Angeles (UCLA) students recently participated in "SS12: Coding for a Cause," a contest to design open-source projects that enhance the lives of people with disabilities. In the event, co-hosted by ACM's UCLA student chapter and Project: Possibility, student teams competed for prizes donated by Mozilla, Google, Cisco, and Lockheed Martin. Each team had a volunteer mentor to provide guidance for the students while they developed the programs. The winning project was Audio Guardian v. 1.0, a cell phone application for the hearing-impaired that records surrounding noise and alerts the user when it identifies noises such as a car horn or a fire alarm. Other projects included HandyMap, a Google Map application that displays the location of handicap-accessible services such as packing spaces and ramps, and Access Facebook, which features a variety of hotkeys, magnification, and screen-reading tools for the visually impaired. The hotkeys could be used to open Facebook features, such as the inbox, instead of requiring the user to scan the Web page for the link. Another project, Project Awe, is a Firefox plug-in that assesses and rates Web sites based on the Web Content Accessibility Guidelines. Project Awe could be used to create a database of sites that meet those guidelines.

View Full Article | Return to Headlines

Surprise! Tech Is a Safe Career Choice Today
InfoWorld (02/04/09) Kaneshige, Tom

The technology profession is proving to be one of the safest careers available during the current economic crisis, providing good pay and solid job security. "The reality is there's still a very healthy job sector in information technology," says Stanford University professor Mehran Sahami. Unfortunately, technology's struggling image continues to dissuade students from pursuing technology degrees. Tapping America's Potential, a coalition of businesses dedicated to doubling the number of students earning bachelor's degrees in science, technology, engineering, and math (STEM), reported last summer that it has already fallen behind on that goal after only three years. "If more people were aware of how strong the demand is in computing, I think there would be a healthier pipeline of students," Sahami says. The lack of STEM students led the National Science Foundation to start focusing more heavily on encouraging high school students to pursue STEM fields. Unfortunately, the problem is self-perpetuating, as the skills shortage drives the need for more H-1B workers, which further dissuades students. However, there is some hope that today's young adults are reexamining the tech industry stereotype, with recent enrollments in college STEM programs rising slightly. Meanwhile, colleges are adjusting their curriculums to offer more interesting classes earlier in their programs and linking technology classes to other fields. "There's a real social aspect," Sahami says. "There's an image problem in computer science right now that all you do is sit in a cube and program all day."

View Full Article | Return to Headlines

Leading Futurists, Thinkers to Launch Silicon Valley University
CNet (02/02/09) Terdiman, Daniel

Leading thinkers and futurists will launch Singularity University, an institution based in Silicon Valley that will offer a wide range of programs focusing on multiple technologies and fields, including biotechnology and bioinformatics, nanotechnology, future studies and forecasting, finance and entrepreneurship, and artificial intelligence, robotics, and cognitive

computing. Singularity University was co-founded by inventor and futurist Ray Kurzweil, former Yahoo Brickhouse director Salim Ismail, and X Prize CEO Peter Diamandis. They hope the program will lead to the establishment of new enterprises, the maturation of scientific and technological thinking, and the merger of professional and personal networks among the faculty and students. "If we do our job correctly, [students] will meet, [discover their] common visions, and start companies together," Diamandis says. CEOs and CTOs, rising executives who wish to bolster their knowledge and networks, and graduate and post-graduate students will be targeted by the university's 10-week, 10-day, and three-day courses. Singularity University's three-phase program starts with a series of plenary lectures in which students take the same coursework and learn basic principles about the 10 disciplines the institute covers. The second phase consists of a deeper investigation into one of the disciplines; and the entire student body collaborates on a team project in the third phase. "I have no doubt that society gets ever more complex, and the consequences of ever-growing technology become ever more difficult to anticipate and respond to," says Singularity University faculty member Paul Saffo. "So having a 10-week program of smart, committed people looking at the challenges from an interdisciplinary point of view can only be a good thing."

View Full Article | Return to Headlines

IBM's Power Play: New Supercomputer Called Fastest Ever
Investor's Business Daily (02/03/09) P. A4; Bonasia, J.

IBM has won a contract with the U.S. Department of Energy's National Nuclear Security Administration (NNSA) to build what it says will be the world's fastest computer. The next-generation supercomputer, dubbed the Sequoia, is expected to go online in 2011 and run at 20 petaflops, 15 times faster than the fastest computers available today. "These powerful machines will provide NNSA with the capabilities needed to resolve time-urgent and complex scientific problems, ensuring the viability of the nation's nuclear deterrent into the future," says NNSA's Thomas D'Agostino. "This endeavor will also help maintain U.S. leadership in high-performance computing and promote scientific discovery." Eventually, businesses and other researchers will be able to use the machine, and similar systems, to research a variety of topics, ranging from new oil deposits to virtually crash-testing cars. A prototype supercomputer called Dawn is scheduled to be delivered in the next few months to Lawrence Livermore National Laboratory. Dawn will run at 500 teraflops and will help create the foundation for Sequoia's applications. Sequoia will require much less space than current supercomputers and use less power. "This advance makes really powerful computing eligible to fall into the hands of many industrial companies, as well as academic and government users who are the traditional early adopters of supercomputers," says IBM's Dave Turek. "The energy consumption component of Sequoia is extraordinarily innovative."

View Full Article | Return to Headlines

Google Earth Dives Deep, Filling in Its Maps' Watery Gaps
New York Times (02/03/09) P. D3; Revkin, Andrew C.

When Google Earth first launched, the two-thirds of the planet that is covered by water was simply left blue. "We had this arbitrary distinction that if it was below sea level it didn't count," says Google's John Hanke. Google is now adding more data on bodies of water so new programming and data collection can be used to simulate oceans. The ocean images will soon undergo the most significant of several upgrades planned for Google Earth. Google also will add another feature, called Historical Imagery, which will

enable users to scroll backward through decades of satellite images to watch how suburbia or coastal erosion affects the landscape. Another feature, called Touring, will allow users to create narrated, illustrated tours both above land and below the surface of the water to show off a hike or scuba diving spot. The effort to fill in the oceans started two years ago when Hanke met Sylvia Earle, a former chief scientist at the National Oceanic and Atmospheric Administration. Earle told Hanke that she loved how Google Earth showed users how one area relates to another, but asked why the water had been ignored. Since then, Earle and Hanke have worked to incorporate the oceans into Google Earth. Earle, Hanke, and others believe that adding bodies of water to Google Earth will help people see how they are connected to the oceans and increase public support for marine conservation.

View Full Article | Return to Headlines

Doubts Over India's $20 Laptop
Technology Review (02/04/09) Talbot, David

India has unveiled a prototype laptop, called Sakshat, which will reportedly cost $20 and provide a way to deliver online educational materials to students throughout the country. The Indian Education Ministry says the laptop has two gigabytes of random-access memory, wireless and fixed Ethernet connections, and consumes only two watts of power. The ministry says it will be available in retail outlets in India in six months. The laptop was created over several months through a cooperative effort involving India's Vellore Institute of Technology, the Indian Institute of Science, and the Indian Institute of Technology. However, some experts doubt that it will be possible to produce a laptop for $20. The One Laptop Per Child (OLPC) foundation originally aimed to produce laptops costing about $100, but the current price of their laptop is $188. OLPC's former vice president of software Jim Gettys says creating a $20 machine is all but impossible. "I don't understand how anyone can build anything for real at that price," Gettys says. "There are too many components that cost $20 by themselves, never mind as a package." Princeton University computer scientist Vivek Pai, who works on computing solutions for the developing world, says the machine's specifications may make it suitable as an e-book reader, but he does not believe it will work as a general-purpose machine.

View Full Article | Return to Headlines

Video Game Helps With Fire Drill
BBC News (02/04/09)

Durham University researchers have tweaked the three-dimensional (3D) game engine that powers the video game Half-Life 2 to create a fire drill simulator. The researchers first created a virtual model of the school's computer science department. "We used the simulation to see how people behaved in an actual fire situation and to train people in 'good practice' in a fire," says project leader Shamus Smith. Using the simulator, people were able to become more familiar with the evacuation routine. The team decided to customize The Source Engine in Half Life 2, rather than use 3D modeling software, because it was faster, cost effective, and offered better special effects. The researchers can adapt the simulator to create virtual representations of the interior of other buildings. They also say such virtual environments can help reveal problems in the layout of a building.

View Full Article | Return to Headlines

Google Researcher Targets Web's Structured Data
IDG News Service (01/30/09) Kanaracus, Chris

Google research scientist Alon Halevy says Google is exploring how to analyze and organize structured data as way to improve Internet searches. "There's a lot of structured data out on the Web and we're not doing a good job of presenting it to our users," Halevy said at the Massachusetts Institute of Technology's New England Database Day conference. Google has been submitting queries to various forms and retrieving the resulting Web pages to include them in search indexes if the information looks useful, but it also wants to analyze the data found in structured tables on many Web sites. Halevy says Google's index turned up 14 billion such structured tables, but the company found that more than 98 percent of those tables were not very interesting and narrowed the result to about 154 million tables worth indexing. One of Google's primary goals is to provide results that organize aspects of a search query for exploratory searches. Organized search results could return information on visa requirements, weather, and tour packages for searches on travel, for example.

View Full Article | Return to Headlines

An International Project to Produce ICT-Supported Educational Materials in American Indigenous Languages
Universidad Politecnica de Madrid (02/02/09)

The CONEDUC project, a collaborative effort between the Validation and Business Applications Group at the Universidad Politecnica de Madrid's (UPM) School of Computing and Mexico's Instituo Politecnico Nacional (IPN), will develop computational linguistics technologies to develop educational materials capable of supporting the education of indigenous populations in their native languages. UPM's research team, led by Jesus Cardenosa, is the Spanish language representative of the United Nations University UNL program, which supports multilinguism on the Internet. The objective of the CONEDUC project is to use UPM's technology to develop and adapt the UNL system components to the idiosyncrasies of the Spanish language in Mexico. The project will incorporate minority languages into the UNL program. While these minority languages contain no commercial interest, they are spoken by large portions of the Mexican population, and including these languages in the UNL program will unblock access to education for those populations. At the end of the project, the IPN will have a lexical database that will serve as the foundation for creating and maintaining standard format indigenous language dictionaries. The project also will generate technologies to provide permanent support for follow-up activities, UNL technology content editor software, and indigenous languages content generation software.

View Full Article | Return to Headlines

Less Diversity on Earth According to Cornell Data Analyses
Cornell University (01/29/09) Redfern, Paul

Database specialists at the Cornell Center for Advanced Computing (CAC) assisted the university's statistical scientists in studying the biodiversity of microbial populations. Using CAC's high-performance database servers, they helped researchers create a more accurate estimate of biodiversity on Earth. Linda Woodard, an expert in the simulation modeling of ecological systems and database design, says CAC is very capable of investigating microbial diversity in specific environments as well as the entire biosphere. "Each run is independent and can be done in parallel," she says. "While researchers can only run one data set at a time on a desktop computer, we can process

multiple data sets simultaneously with our high-performance database servers." CAC says the data analysis software used is available to other researchers.

View Full Article | Return to Headlines

Multimedia System Provides New View of Musical Performance
University of Leeds (02/03/09)

University of Leeds researchers have developed new multimedia technology that will enable musicians to use three-dimensional (3D) computer analysis to improve their technique. Professor Kai Ng has created i-Maestro 3D Augmented Mirror (AMIR), a system that records a musician's posture and movement while they play, using motion capture and maps the results against ideal performance settings. "Many musicians already use video recordings of their performance to analyze technique, but this only provides a 2D image," Ng says. "The 3D image and analysis provided by AMIR will be of immense value to musicians and teachers alike." The prototype was designed for musicians playing stringed instruments, but AMIR could be adapted for other instruments. AMIR works by following markers attached to key points on the instrument and the musician's body and recording the movement on 12 cameras at 200 frames per second. Bow speed, angle, and position are measured for real-time analysis and feedback. The system also uses a Wii Balance Board to monitor data on the musician's balance. The musician or teacher can see and hear a video of the performance along with an on-screen analysis of posture and bow technique, and can even go through the performance frame by frame if necessary.

View Full Article | Return to Headlines

Improved Method for Comparing Genomes as Well as Written Text
UC Berkeley News (01/28/09) Sanders, Robert

University of California, Berkeley researchers have developed a method to compare entire genome sequences across a range of sizes, which could end scientists' reliance on a few dozen genes that the organisms being compared share in common in order to create an evolutionary tree. The method was inspired by text comparison techniques used to rate the authorship of a literary work or to spot plagiarized text, and the researchers employed a variant of the word frequency method. The technique involved the elimination of all punctuation and spaces from a text and the organization of a dictionary of all the two-letter, three-letter, and other word combinations in the books. The researchers then counted the variety of each fixed-length "word" or feature, and discovered through a test of free online books secured through Project Gutenberg that the feature frequency profile (FFP) method was more effective at identifying related books than word frequency profile analysis. The method was then applied to whole mammal genomes, and produced a family tree that was identical to the phylogenetic trees erected by scientists using genetic, morphological, anatomical, fossil, and behavioral information. Research team leader and UC Berkeley professor Sung-Hou Kim says FFP accounts for all or most of the genome's DNA or protein sequences, while gene alignment analysis selects a small group of genes from a large number of genes in each organism, and uses that to represent the organism. Kim believes the FFP method will prove useful in grouping and finding relationships among sets of other information, such as electronic data encoding text, images, and sounds.

View Full Article | Return to Headlines

Microsoft Releases 'Web Sandbox' as Open Source
InternetNews.com (01/28/09) Johnston, Stuart J.

Microsoft's Live Labs has released the source code for Web Sandbox, a technology that it hopes will make Web sites safer from attack. Web Sandbox walls off the various parts of a Web page--such as maps, visit counters, and affiliate programs that run scripts--from each other. This isolation is accomplished by virtualizing each of these components, which in turn places tighter controls on what the components can do to one another. Web Sandbox does not require browser add-ons or changes, and will work on most Web browsers that support JavaScript. Despite the release of the source code, Microsoft is advising developers not to build production Web sites with Web Sandbox since the technology is still under development. However, Microsoft is urging developers to test Web Sandbox by trying to break through its security so that its protection can be strengthened. Analysts say that vulnerabilities created by Web 2.0 mashups make technology such as Web Sandbox important. "There's a need for more Web standards and interoperability [driven by] the fact that things like cross-site scripting attacks are becoming more common," says Gartner's Ray Valdes.

View Full Article | Return to Headlines

Organic Computing Takes a Step Closer
New Scientist (01/29/09) Barras, Colin

Recent research has demonstrated that graphene can be modified to act as an insulator, potentially leading to efficient, all-carbon electronics. University of Manchester researcher Konstantin Novoselov says the semiconductor industry uses the entire periodic table to manufacture its components, but graphene alone could be modified to cover every aspect of electronics manufacturing. Using a single material would simplify construction and allow for near-seamless interconnections between conductors and semiconductors. Novoselov and colleagues have demonstrated that graphene can be modified to act as an insulator by adding hydrogen atoms to its surface. The carbon-hydrogen bonds create block electrons that otherwise would flow freely over graphene. University of Exeter researcher Alex Savchenko says the technique may make it possible to tune graphene into being a conductor, insulator, or anything in between. This means that graphene could be transformed into a working chip with conductive interconnections and semiconducting transistors by changing its chemistry in different areas. Rensselaer Polytechnic Institute researchers Philip Shemella and Saroj Nayak have reported similar insulating effects can be created by depositing pure graphene into a silicon-dioxide substrate, which causes the oxygen atoms in the substrate to form covalent bonds with the graphene, creating the same effect as bonding with hydrogen.

View Full Article | Return to Headlines

To submit feedback about ACM TechNews, contact: technews@hq.acm.org