the PIPER

6/09 Issue

Carnegie Mellon

Racing in Remembrance

PHOTO BY KEN ANDREYO

Carnegie Mellon's Society of Automotive Engineers (SAE) Racing Team dedicated its formula-one-style race car to the memory of Pittsburgh Police officers Eric G. Kelly, Stephen J. Mayhle and Paul J. Sciullo II, who were killed in April responding to a 911 call in the city's Stanton Heights section. "This is just awesome," said city police Cmdr. Larry Ross, (above) who supervised the three fallen officers. University Police Chief Thomas A. Ogden and Ross christened the racer by pouring champagne onto its hood. Several dozen people, including university and city police officers, listened to bagpiper Alasdair Gillies play "Amazing Grace" outside Scaife Hall. The students raised $175 for the fallen officers' families in a campaign called "A Penny for your Memories." To view a movie of the ceremony, visit www.cmu.edu/news/news-notes/multimedia/driving_dedicated.mov.

Bielak, Mitchell and Rousseau Receive Top Honor

■ Piper Staff

Professors Jacobo Bielak, Tom Mitchell and Denise Rousseau have been named University Professors, the highest distinction faculty can achieve at Carnegie Mellon.

Bielak is a professor of civil and environmental engineering in the College of Engineering (CIT), Mitchell is the Fredkin Professor of Artificial Intelligence and Machine Learning in the School of Computer Science (SCS) and Rousseau is the H.J. Heinz II Professor of Organizational Behavior and Public Policy at the H. John Heinz III College's School of Public Policy and Management and the Tepper School of Business.

"Jacobo Bielak, Tom Mitchell and Denise Rousseau have contributed to their fields in groundbreaking, innovative and exciting ways," said President Jared L. Cohon. "This honor pays tribute to their

Continued on page three

Gates To Return To Pittsburgh For Building Opening

Bill Gates

■ Byron Spice

Bill Gates will be returning to Carnegie Mellon in Pittsburgh on Sept. 22 to dedicate the Gates Center for Computer Science. While details of the visit have not been finalized, Gates will be on hand for the ceremony celebrating the university's long history in computer science excellence.

The Gates Center was made possible with a lead gift of $20 million from the Bill & Melinda Gates Foundation. The center is one of two signature buildings for the School of Computer Science. The buildings are scheduled to be occupied in August.

This marks Gates' third recent visit to a Carnegie Mellon campus. In February 2008, Gates visited Carnegie Mellon for a lecture, and he also visited Carnegie Mellon University in Qatar on April 18. For more on his visit to Doha, see page 11.

Q&A: Manfred Paulini Reveals Science Behind "Angels & Demons"

■ Jocelyn Duffy

Sony Pictures Entertainment's "Angels & Demons," a major motion picture based on Dan Brown's best-selling novel, focuses on a plot to destroy the Vatican using antimatter made at the Large Hadron Collider (LHC) and stolen from the European particle physics laboratory CERN. Antimatter particles are the same as matter, having the same mass, except they have an opposite charge. When antimatter and matter meet, they annihilate.

A week before the release, Carnegie Mellon hosted a public lecture, "Angels & Demons: The Science Revealed," to tell the community about the real science behind the movie. The lecture, given by Physics Professor Manfred Paulini was one of more than 60 such lectures given worldwide.

Why did you decide to give this lecture?

One of my former graduate students, Karen Gibson, who graduated from Carnegie Mellon two years ago and is now a post-doctoral researcher at the University of Pittsburgh, is a member of the Users Executive Committee at Fermi National Accelator Laboratory (Fermilab) near Chicago, where she represents the universities and communicates with the Fermilab directorate. She works there in a subcommittee on public outreach and came up with the idea for the lecture series. I was one of the first who she asked to give such a lecture, and I was glad to do it. I saw it as a good way to teach people about particle physics as well as dispel any myths about science the movie might create.

What is the role of physics in "Angels & Demons?"

Antimatter is stolen from the LHC at CERN, which is located near Geneva, Switzerland. The antimatter is hidden in Vatican City, where it acts as a ticking time bomb. The characters race to find the antimatter before it comes into contact with matter, which would lead to death and destruction.

What is antimatter?

Antimatter is real, it does exist, and we will be producing it at the LHC. For every matter particle, there exists an opposite particle called antimatter. Matter and antimatter particles have exactly the same properties; they have the same mass, except they have an opposite charge. When they meet, they annihilate, turning their mass into energy.

In the book and movie, the Vatican is threatened with ¼ gram of antimatter. If that amount of antimatter were to come into contact with matter, the explosion would be equal to 10 kilotons of the explosive TNT — the movie actually says 5 kilotons, but they missed a factor of 2 and didn't get the calculations quite right. To put that in perspective, the atomic bomb that was dropped on Hiroshima had the same energy as 14 kilotons of TNT. In the movie they say something like "the old threat is that Vatican City will be destroyed by light." If that amount of antimatter came in contact with matter, that would be exactly correct.

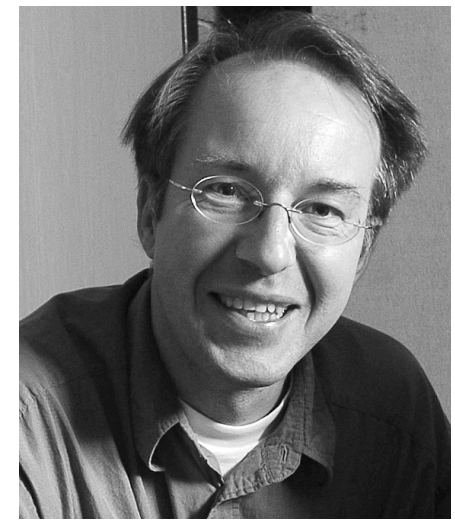

PHOTO COURTESY OF MANFRED PAULINI

MANFRED PAULINI

ONLINE: WATCH THE LECTURE AT WWW.YOUTUBE.COM/WATCH?V=GDW4PDNSX5I.

So antimatter could be used to make a bomb?

Theoretically, yes. In reality, no. Currently the largest producer of antimatter is Fermilab. Using their Tevatron particle accelerator, they create 2 nanograms (10^{-9} grams) of antimatter in one year. That's equal to 86 grams — grams not kilograms or kilotons — of TNT. It's not something you'd want to have explode under your chair, but it's still not much. It's definitely not enough to destroy the Vatican.

Would it be possible to make the amount of antimatter used in the movie?

At the current rate that we are able to make antimatter, it would take 109 million years to produce ¼ gram of antimatter, and I don't think that even the ancient brotherhood would want to wait that long!

It takes a lot of power to create even a small amount of antimatter. The electricity it would take to run the Tevatron for one year straight equals the energy in 320 kilotons of TNT, and it would be much easier to use this energy for a weapon or bomb. The only efficient way to use antimatter as an energy source would be to find and capture a source of existing antimatter in the same way we use oil or coal that we find underground in a power plant to produce energy.

You have completed research at CERN by working on the LHC's Compact Muon Solenoid experiment. Is CERN portrayed accurately?

They show CERN as a small city with labs, supermarkets, a hospital, a cinema and most importantly, a recreational shooting range. At the real CERN there is no hospital, no movie theater and certainly no recreational shooting range.

Also, in the movie, one rogue scientist uses 80 to 90 percent of the CERN's budget without even the director knowing what highly secret research he's up to. Currently more than 9,000 scientists from around the world conduct research at CERN, and all the research is public. There is no way anyone could get away with such a thing as what happens in the movie.

Does CERN have an X-33 Space Plane as was mentioned in the book?

No, we fly coach like almost everyone else!

thePIPER

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Carnegie Mellon, Pitt Receive $25 Million Federal Grant To Study How People Learn

■ Byron Spice

The National Science Foundation has renewed a five-year, $25 million grant to continue the work of the Pittsburgh Science of Learning Center (PSLC), founded by Carnegie Mellon and the University of Pittsburgh in 2004 to study how people learn and how to use those findings to develop teaching tools that can foster consistently high achievement in the nation's classrooms.

"There's a large gap, maybe even a chasm between what we know in the science of learning and what is happening in educational practice," said Kenneth Koedinger, professor of human-computer interaction at Carnegie Mellon and co-director of the PSLC with Pitt's Charles Perfetti. "The goal of the PLSC is to try to bridge that chasm and improve the exchange of high-quality ideas between practitioners in the field at high schools and colleges across the country and scientists who study learning."

Unlike most scientific research on learning, which occurs in the laboratory, the PSLC conducts its research in the classrooms of more than 50 schools and colleges across the country, including schools in New York City, Pittsburgh, Miami, Omaha, Cincinnati and Seattle.

During a recent demonstration, Britney Rush, a Steel Valley High School 11th grader, worked with a statistics program.

"It allowed me to see my thought process. It allows you to see what you have to go through to get an answer. It helps you to better understand how to solve the problem," she said.

Beth McCallister, head of the Mathematics Department for the Steel Valley School District said the cognitive tutors help students to better understand mathematical concepts.

"With the cognitive tutors there is more discovery learning," McCallister said. "It allows the kids to delve deeper into what they're learning, and helps them find the answers for themselves."

This research can occur without disrupting the classroom thanks to the use of computer tutors. Working in partnership with Carnegie Learning Inc., whose Cognitive Tutor® math software already is in use in thousands of schools nationwide, PSLC researchers are able to gather mountains of detailed information about how students respond to lessons and homework. Subsequent analysis of this data helps researchers understand the different learning styles and habits of

CONTINUED ON PAGE TEN

Giving Back

Larry Cartwright Has Spent 30 Years Sharing the Joy of His Alma Mater

■ Heidi Opdyke

Professor Larry Cartwright has been having so much fun at the university for the past 32 years that he makes it a point to give back.

"Life's not about taking, life's about giving, so you give what you can in all the ways that you can," Cartwright said.

Cartwright was recently one of 225 individuals inducted into the Dunfermline Circle Giving Society this spring. Created in 2009, the society is named for the Scottish county in which Andrew Carnegie was born, a place that remained close to his heart. The Dunfermline Circle recognizes donors who contribute $100,000 to $499,999 to the university during the course of their lifetimes or through their estates.

While the honor is new, Cartwright has been involved with promoting university stewardship for more than three decades.

"I believe in the place. I believe in what it does and the people we turn out," Cartwright said. As a co-chair of the Faculty and Staff Annual Fund, he talks about the quality of education and the excellence of the research the university provides.

"I simply believe what we do is good," Cartwright said.

Gifts from faculty and staff are often used as a way to show employee satisfaction with the university. The percentage of giving by faculty and staff is often used to encourage support from outside the university community — for instance, in helping to secure grants from corporations and foundations.

In the 2007-08 giving year, 828 members of the campus community made a gift to the Faculty & Staff Annual Fund. As of early May, 654 faculty and staff members have made their gifts for the 2008-09 giving year.

inspire innovation.

Along with donating his time and taking care of Scotty, the university's official live mascot, one of the many ways in which Cartwright gives back is through an Andrew Carnegie Society endowed scholarship.

"I get letters from the students who receive them, and they're always civil engineering students," Cartwright said. "They're always surprised when they get this award that it came from me. By that time, they've had me for at least four courses.

"It's always better if you can put a face on the money," Cartwright said. He said when he talks to faculty and staff, he looks for programs or needs that match the person's background or interests.

Campus community members who would like to make a gift can do so by check sent via campus mail to the Office of Annual Giving. You can also make your gift online at https://www.cmu.edu/campaign/ways/index.html. Printable payroll deduction forms are available, or contributions can be made by credit card.

For questions regarding the Annual Fund, please contact Carole Panno in the Office of Annual Giving at 412-268-1617 or cp1g@andrew.cmu.edu.

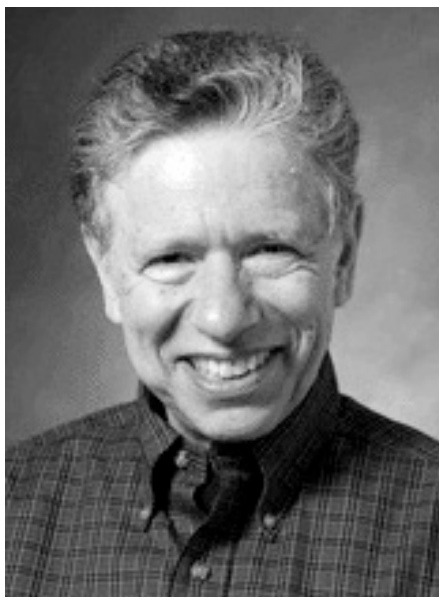
Professors Garner Highest Faculty Honor

Continued from page one

outstanding interdisciplinary work and their contributions in upholding the highest standards of the university."

For more than 15 years Bielak and his research team have collaborated with the Pittsburgh Supercomputing Center in developing and applying methodologies for modeling ground motion and structural performance in large basins in order to identify what can be done to prevent earthquake disasters.

Bielak currently leads a four-year, $1.6 million NSF-supported project to develop tools for high-fidelity, physics-based petascale simulations of entire seismic-prone regions.



Jacobo Bielak

"Jacobo Bielak is known for his pioneering work in creating three-dimensional models that can simulate how earthquakes impact buildings, bridges and other critical infrastructures," said CIT Dean Pradeep K. Khosla, the Philip and Marsha Dowd Professor of Electrical and Computer Engineering. "Jacobo has made many outstanding contributions to his research field, and also to Carnegie Mellon in his teaching and advising of students, and this honor of University Professor is well deserved."

Bielak received his bachelor's degree from the Universidad Nacional Autonoma de Mexico in 1963, a master's from Rice University in 1966 and his Ph.D. from the California Institute of Technology in 1971.

A pioneer in artificial intelligence and machine learning, Mitchell is head of the SCS's Machine Learning Department, the first of its kind when it was established in 2006. His research, which was featured on "60 Minutes," focuses on statistical learning algorithms for understanding natural language text and on understanding how the brain represents information. His work with colleagues in the Psychology Department produced the first computational model to predict brain activation patterns associated with concrete nouns, a step toward the goal of using brain scans to identify thoughts.

"Machine learning has emerged as one of the most powerful tools devised for extracting insightful information from real-world data, with applications ranging from medicine and finance to Web search engines," said Randal E. Bryant, dean of the SCS. "Tom Mitchell has been a driving force for the field of machine learning throughout his career, in the form of both technical contributions and leadership."

Mitchell earned his undergraduate degree in electrical engineering at the Massachusetts Institute of Technology and his Ph.D. in electrical engineering with a minor in computer science at Stanford University. He was named the Fredkin Professor of AI and Machine Learning in 1999. A former president of the Association for the Advancement of Artificial Intelligence (AAAI), he is a fellow of the AAAI and the American Association for the Advancement of Science and winner of the 2007 AAAI Distinguished Service Award.

Tom Mitchell

Rousseau is the faculty director of the Institute for Social Enterprise and Innovation and chair of the Health Care Policy and Management Program.

"Denise's research on psychological contracts, and more recently on evidence-based management is groundbreaking. Her work has had a significant impact on the literature in organizational behavior and management," said Ramayya Krishnan, interim dean of the Heinz College. "Beyond her research, she has made enormous contributions to Carnegie Mellon, as both a colleague to faculty and as a teacher and advisor to students."

She was the 2004-2005 president of the Academy of Management and the 1998-2007 Editor-in-Chief of the Journal of Organizational Behavior. Rousseau received her bachelor's degree, master's degree and Ph.D. from the University of California at Berkeley with degrees in psychology and anthropology. She has served on panels for the Institute of Medicine, the National Science Foundation and the National Institute for Education and is on the editorial boards of five journals. She will receive the "Academy of Management Organizational Behavior Division's Lifetime Career Contribution Award" in August. Her most recent book, "I-Deals: Idiosyncratic Deals Workers Bargain for Themselves," won the Academy of Management's George Terry Award in 2006.

Denise Rousseau

Pittsburgh Supercomputing Center Debuts Big Numbers Movie

■ Michael Schneider

High school and college students now have a ringside seat to watch atoms and molecules in super-slow motion and vivid color, as they jostle each other within the cozy environs of a human cell or a beaker on a lab bench. In "Big Numbers in Small Spaces: Simulating Atoms, Molecules and Brownian Motion," students are invited to consider how many molecules are in a single drop of water, or a single cell, and then to fly in and find out.

"Big Numbers" is the newest and most elegantly produced instructional movie from Computational Modules in Science Teaching (CMIST), an educational outreach program of the National Resource for Biomedical Supercomputing (NRBSC) at the Pittsburgh Supercomputing Center (PSC).

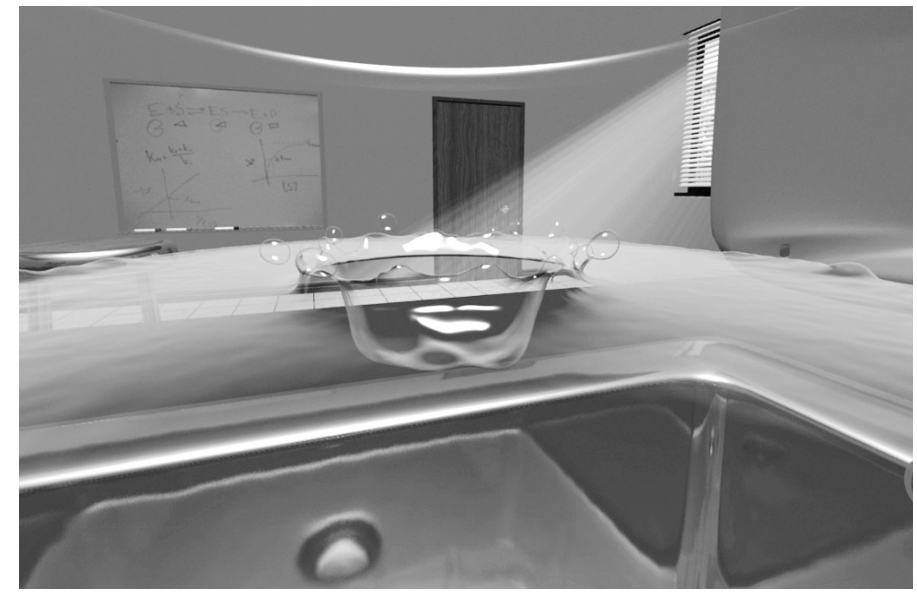
Joel Stiles, NRBSC director and associate professor of biological sciences at Carnegie Mellon, introduced the movie in May at the National Science Bowl Finals Competition in Washington, D.C.

"To address the challenge of science learning for the video-gaming, tech-savvy, multi-tasking students of today, CMIST offers highly realistic and visually appealing content in easily usable form," Stiles said.

In "Big Numbers," students "see" carbon, oxygen and hydrogen atoms in water and glucose molecules. They watch red-blood cells passing through a vessel while discovering that each of these cells can hold about three-trillion water molecules. They see supercomputer simulations of realistic atomic sizes, covalent bonds, hydrogen bonds, and other details of molecular structure and motion (molecular dynamics) before time and space leap ahead to illustrate Brownian movements of molecules on cellular and human scales.

Led by Stiles, the CMIST production team is a unique assemblage of talent, including simulation and visualization specialist Jacob Czech, e-learning and multimedia designer Jenda Domaracki, education outreach specialist Pallavi Ishwad (a former high-school biology teacher and Ph.D. scientist) and student composer Jason Mlynek from the School of Music at Carnegie Mellon.

To view "Big Numbers," visit www.nrbsc.org/cmist.



COURTESY OF THE PITTSBURGH SUPERCOMPUTING CENTER

A screen capture from the "Big Numbers in Small Spaces" movie shows the CMIST virtual laboratory from the inside of a beaker of water.

"Green" Tepper School Addition Seeks Gold LEED Rating

■ Bruce Gerson

The recently completed addition to the west entrance of the Tepper School of Business, adjacent to the Peace Garden and Hunt Library, stands as one of the greenest projects on campus. And it looks pretty cool, too.

The 4,700-square-foot building addition has an exterior clad in glass, aluminum metal and dark fiber cement board panels, and the new entrance is enclosed in glass under a two-story cantilever.

"The addition accents the surrounding architectural language of the neo-classical façade of the Fine Arts building and the modern design of Hunt Library, while not encumbering the Peace Garden space in-between all three facilities," said Joseph Pastorik, building manager for the Tepper School.

Seeking a Gold Leadership in Energy and Environmental Design (LEED) rating in the Commercial Interiors category, the addition has everything from a retention pit to control storm water runoff to lighting sensors and timers based on room occupancy and the amount of natural light. Other green elements include the use of regionally manufactured materials and certified wood from forests in which trees are replanted.

Campus Design and Facility Development Project Manager Janice Held said that 50 percent of the addition's power comes from the green wind power that the university purchases, and that the addition has plastic water bottle fill-up stations. Held also lauded the installation of a "regenerative drive elevator" that for the first time will not only make the third floor of the original building ADA accessible, but it will use the pull of gravity to generate power.

Pastorik said in 1950, the founders of the business school were challenged with the decision of either installing an elevator or equipping the facility with air conditioning. Although they chose the latter, they had the foresight to build an elevator shaft into the original building, which is now being used nearly 60 years later.

"This elevator actually makes electricity each time the elevator descends. It's very energy efficient," Held said. A regenerative drive elevator has also been installed in Doherty Hall.

The Tepper School addition has a new suite of faculty offices on the second floor and a conference meeting space on the third floor with grand views to the east and west.

The addition would be the third Carnegie Mellon project to receive a Gold LEED rating. The Carnegie Mellon Café earned gold last year and the Collaborative Innovation Center received gold certification in 2006. Four buildings have earned Silver LEED ratings — 407 South Craig (2007), 300 South Craig (2007), Henderson House (2004) and Stever House (2003). The Posner Center received a LEED certified rating in 2005.

Hot Research

Sun Has Little Impact on Global Warming

■ Chriss Swaney

Peter Adams

Gazing skyward may not be the way to stop global warming, as a troubling hypothesis about how the sun may impact global warming is finally laid to rest. Carnegie Mellon's Peter Adams along with Jeff Pierce from Dalhousie University in Halifax, Canada, have developed a model to test a controversial theory that says changes in the sun are causing global warming.

The hypothesis they tested was that increased solar activity reduces cloudiness by changing cosmic rays. So, when clouds decrease, more sunlight is let in, causing the earth to warm. Some climate change skeptics have tried to use this hypothesis to suggest that greenhouse gases may not be the global warming culprits that most scientists agree they are.

In research published in Geophysical Research Letters, and highlighted in the May 1 edition of Science Magazine, Adams and Pierce report that changes in the concentration of particles that affect clouds are 100 times too small to affect climate change.

"Until now, proponents of this hypothesis could assert that the sun may be causing global warming because no one had a computer model to really test the claims," said Adams, a professor of civil and environmental engineering.

"The basic problem with the hypothesis is that solar variations probably change new particle formation rates by less than 30 percent in the atmosphere. Also, these particles are extremely small and need to grow before they can affect clouds. Most do not survive to do so," Adams said.

Despite remaining questions, Adams and Pierce feel comfortable that this hypothesis should be laid to rest. "No computer simulation of something as complex as the atmosphere will ever be perfect," Adams said. "Proponents of the cosmic ray theory will probably try to question these results, but the effect is so weak in our model that it is hard for us to see this basic result changing."

Google Chairman and CEO Eric Schmidt Prompts Grads To Turn Off Computers, Connect With People

In his keynote address at Carnegie Mellon's 112th commencement last month, Google Chairman and CEO Eric Schmidt encouraged the Class of 2009 to focus on the people around them. The following are excerpts from his remarks.

PHOTO BY KEN ANDREYO

ERIC SCHMIDT COMPARED HOW TIMES HAVE CHANGED SINCE HE WAS IN COLLEGE.

I want to start by congratulating all the graduates, and I want to especially congratulate the parents. And for the parents, remember that the students will still need you and maybe now they'll listen to you now that they've graduated. <audience laughter> And when I see computers and mobile phones, and I want you to look and think about everybody here has a mobile phone with you and a camera, I want you to remember that everything you touch was probably invented by computer scientists that came from Carnegie Mellon. <audience cheers>

And this startling and surprising statistic is actually true, that in the '60s, much of what we know in modern computing was invented here by giants in my field. And I as a young person, roughly your age, worked with people who seemed much older than me in their 30s, who had come through that program, who ultimately came to develop the networks, the workstations, the personal computers, and the mobile computing that we use today. I was so impressed by what Carnegie Mellon had done for computer science that not only did I become a trustee for a while, but Google now has one of its very top ranked development centers here right on campus, <audience cheers> where we have, in many cases, the very best graduates and employees that we could possibly get. These are people who do amazing things as part of our underlying system, and they occasionally do interesting things as well that you wouldn't expect. They just released a product called Star Joy. You take your mobile phone and turn it towards the sky, and it tells you what the stars are doing. Right, how neat is that. <audience laughter>

Why is Carnegie Mellon the place that is so exceptional? I think it's because the culture is a culture of getting things done. It's not a purely theoretical culture, it's not a purely tactical culture, it's a culture that's about accomplishing things for the world, and that is true regardless of the division, the department, the college, the institute that you are part of and that you graduated from.

So when I think about you all, I think about you as the Facebook and the Google generation, the first generation that really grew up with the Internet. When I grew up, you know, we had Tang, you had Red Bull. We used a program that was called basic, you all used Java. We had VCRs that held a half an hour of video that cost $700, and you all can upload 15 hours of video into YouTube every minute. We got our news from newspapers, you get yours from blogs and tweets. And for those of you who don't know, that's not what you hear in zoos. We stood in line to buy Pong, you stood in line to buy Wiis. We just didn't tell anyone about our most embarrassing moments, you record them and post them to Facebook and YouTube every day. I am so happy that my record of my misachievements is not around for posterity. I'm looking forward to yours being there for many, many years. <audience laughs>

Did you know that we used mainframe computers with 300 megabytes of storage to go to the moon six times? Your iPods, 120 gigabytes have 500 times more just to get you to your next class. <audience laughs> We thought friend is a noun, right, you think it's a verb. We had phone booths, anybody seen a phone booth recently? You have cell phones. We wore watches, took pictures with cameras, navigate with maps and listened to transistor radios. You have a cell phone. <audience laughter> We thought that the marvels of computers and technology again, largely invented here, would change the world. You agree, and we're both right.

Why did you all go to college? To develop the kind of analytical thinking skills, confronting the spin, the crazy choices of information that you'll have going forward. And then I would argue that you have the opportunity to be the greatest generation because right in front of you now are tools that we never had, that you can take advantage of. And you sit there and you say this guy must be made, and maybe that's a little true, but in front of us you say oh, you know, the world's falling apart, we have this recession and so forth. I mean I did some research using my favorite search engine, of course, and the Great Depression spurred some incredible innovations … Rice Krispies, Twinkies and the beer can. You would never have gotten through college without these three things. <audience laughs> So good things happen in recessions.

Why is ubiquitous information so important? Why is it so important that we have access to all these things? It's a tremendous equalizer. In our lifetimes, literally, certainly in yours if not mine, essentially every human being in the planet will have access to every piece of information known on the planet. This is a remarkable achievement. God knows what these people will do, and it's going to be pretty amazing. And information serves as a check and balance on politicians. You know, if you were a dictator, which you're not going to be because you're fine graduates at Carnegie Mellon, the first thing you would do is shut off all communications to make sure that people couldn't take advantage of knowledge and overthrow you. So what you do now with oppressive regimes and people who do evil things is you attack them with information. You get that information out there, you use the tools and technologies that all of us have worked so hard on to make the world a better place.

So what can we do with a vastly more powerful Web? Right, the Web of information that comprises all of what we know. You can obviously have face-to-face meetings with colleagues around the world, but more importantly now we can do dynamic translations so we can translate between languages so you could actually understand. You're traveling in Mongolia and you're on a motorcycle — many of you will do this right after you graduate, right, to get away — and you have an accident, and you can actually have a doctor consult with you around the world and they can translate and provide you the health care that you need. These are very real wins.

So what should you do now? It seems to me that you should, you know, think about George Bernard Shaw who said that all progress depends on the unreasonable man. Don't bother to have a plan at all. All that stuff about plan, throw that out. It seems to me that it's all about opportunity and make your own luck. You study the most successful people, and they work hard and they take advantage of opportunities that come that they don't know are going to happen to them. You cannot plan innovation, you cannot plan invention. All you can do is try very hard to be in the right place and be ready.

So, I would tell you that amidst all this change, some truths endure. Leadership and personality matter, we saw that from our student speaker. Intelligence, education and analytical reasoning matter. Trust matters in a network world. Trust is your most important currency, which brings me to my final question,

CONTINUED ON PAGE EIGHT

Online

To view a video of Eric Schmidt's speech, see **www.youtube.com/watch?v=xiYwUde3wNo.**

President Jared L. Cohon lauded the class of 2009 and told them that they are "ready for success and impact in a way that few others are." Cohon noted that Howard Gardener, an acclaimed education theorist, recently proposed that the goals of higher education should be to develop students with disciplinary, synthesizing, creating, respectful and ethical minds. "This might be daunting for some institutions, but not for Carnegie Mellon, and not for you," Cohon said. Watch his charge to the graduates at **www.youtube.com/watch?v=QDr8KH2IYPo**.

Student speaker Allison Lukacsy (A'09) spoke of her class as a "Catalyst for Change." Watch her remarks at **www.youtube.com/watch?v=LbUvyPKhrI0.**

A GigaPan was taken of the commencement ceremony. Visit **http://share.gigapan.org/viewGigapan.php?id=23379** to check the multibillion-pixel panoramic image and add remarks about snapshots.

Family Affair

Mother and Son Receive Degrees at Commencement

■ Bruce Gerson

Most parents are able to attend their son or daughter's college graduation. But how many can say they graduated with them? Margaret Kinsky can.

Yes, it was quite a commencement weekend for Kinsky and her family. On Saturday, the longtime Carnegie Mellon staffer and current business manager for the English Department received her master's degree in professional writing at the department's diploma ceremony in McConomy Auditorium. On Sunday, she attended the Modern Languages diploma ceremony in Rangos Hall, where her youngest, Michael Borrebach — the third of her four sons to graduate from Carnegie Mellon — received his bachelor's degree in Chinese and international relations. (Nathan Borrebach earned a degree in computer science in 2002 and Peter Borrebach graduated from the School of Music in 2004.)

Later on Sunday, mother and son posed for a photo in cap and gown outside of Baker Hall before marching to Gesling Stadium to participate in the main commencement ceremony. Husband and father, David Borrebach, watched proudly.

"He's just thrilled," Kinsky said of her husband, a management consultant for the Hay Group. "I have to say he's proud of everybody, but he's been extraordinarily supportive of me as a part-time student and full-time employee. He encouraged me when I was feeling down, and … he's become an excellent cook."

After 25 years in the Psychology Department and a brief stint in University Advancement, Kinsky joined the English Department, where the results of a Strong Interest Inventory Test and her love for writing convinced her to pursue her second master's degree. She earned an MBA from the University of Pittsburgh in 1985.

"Over the years, I realized that writing was one of the things in my job that I enjoyed doing most. Writing is very rewarding," Kinsky said.

As a part-time student, she completed her course work in three and one-half years taking one or two classes per semester. It wasn't easy.

"It was tough when I was taking two courses in a semester," she recalled. "When you're also working full-time there were times when I thought I was out of my mind. You give up your weekends during certain times. I felt a little bit deprived."

Kinsky says the toughest parts were meeting competing work and school deadlines and being the oldest person in the classroom.

"Usually I would be older than all of the students and the professor. It was very typical for me to walk into the classroom the first day and all of these expectant faces would think I was the professor. And I would walk to the back row and slide into my seat and wave. And they would think 'who's that old lady?' You get a little self-conscious," she said.

PHOTO BY KEN ANDREYO

Margaret Kinsky and her son Michael Borrebach

She says the best part was being among young students and getting the opportunity to see the department from their perspective.

"I loved the classroom and being around young students," she said. "It's a much richer experience to be interacting with students as a fellow student, and interacting with professors with whom I would normally be just conducting day-to-day business. It gave me a chance to gain insight into their research and their depth of knowledge. It's inspiring to see how talented the students are and how much time they put into their class work and how seriously they take their assignments."

She also said that as a student she quickly learned which professors are more popular than others, but added, "my lips are sealed."

Karen Schnakenberg, head of the Masters in Professional Writing Program, said knowing Kinsky as a staff member in the department never posed a problem in the classroom.

"There's never been a moment of unease or awkwardness because Margaret is a consummate professional," Schnakenberg said. "We both understood that we have two different relationships and that neither should impinge on the other.

"It helps, of course, that Margaret is an excellent writer, editor and student who seeks and welcomes feedback on her work. I'd be happy to have a class full of Margarets."

What's next for Kinsky and her son?

Michael Borrebach, who spent his junior year at the Beijing Foreign Studies University in China, hopes to return to the Far East to pursue "a couple opportunities." In Beijing, he studied Chinese, economics and history, and also interned for China.org, translating news into English for the country's central news source.

"It was very tough learning Chinese. It was daunting, but I enjoyed it. I love speaking it," he said. "There's a 95 percent chance I'll be going to Beijing. I might teach."

Kinsky, on the other hand, plans on staying in the English Department and hopes to try her hand as a freelance magazine writer and editor. With two master's degrees could a Ph.D. be in the offing?

"No. I want my weekends back," she said.

First Investigative Journalism Degree Awarded

■ Heidi Opdyke

Gregory Gaudio is the university's first recipient of a master's degree in professional writing (MAPW) and investigative journalism. The latter is in collaboration with the master's of science in investigative journalism at the University of Strathclyde in Scotland, where Gaudio spent the 2008 fall semester. He returned to campus this past semester during which he completed an investigative journalism project and a related thesis.

MAPW program head Karen Schnakenberg approached him about considering the investigative journalism option, which was implemented in 2008.

"It may seem an odd time to launch a journalism degree but indications are that the field is growing, and the research skills involved certainly have broad applicability in all areas of journalism," Schnakenberg said.

Gaudio interned at the Erie Times-News before coming to Carnegie Mellon but was unsure what type of writing career he wanted. Internships with the Pittsburgh Tribune-Review and Virginia-Pilot completed during his studies here confirmed his journalism interests.

"It was really a good coincidence," he said of the new program.

Gaudio's investigative project focused on the misuse of Homeland Security grants at fire departments with Adjunct Journalism Instructor Steve Twedt, a Post-Gazette reporter and co-editor of Focus. Gaudio will continue to pursue the project during his time as an intern on the metro desk of The Washington Post this summer.

"Greg is exactly the kind of student you want to have as the pioneer in this degree," Schnakenberg said. "I know we'll all be reading his future bylines with interest."

Sheikha Hanadi Says Dream Job is at Intersection of Passion, Skills

■ Andrea L. Zrimsek

Her Excellency Sheikha Hanadi Bint Nasser Bin Khaled Al Thani offered poignant advice to the Carnegie Mellon University in Qatar Class of 2009.

"If you are looking for your dream job, you will find it at the intersection of your passion and your skills," Sheikha Hanadi said. "And if your passions change during the course of your life, don't worry: Go with it. If you're short of skills to match your dream job, learn some more. There is a reason that days like this are referred to as commencement. It's because this is a beginning, not an end."

Sheikha Hanadi is a leading and influential businesswoman in Qatar and across the Middle East. Recognized for her significant contribution to developing Qatar's economic and social presence in the Arab world, she is the founder and chairperson of Amwal, chief executive officer of Al Wa'ab City and deputy chief executive officer of Nasser Bin Khaled Al Thani & Sons Group.

COURTESY OF CARNEGIE MELLON QATAR

HER EXCELLENCY SHEIKHA HANADI BINT NASSER BIN KHALED AL THANI TOLD THE CARNEGIE MELLON UNIVERSITY IN QATAR CLASS OF 2009 TO CONSIDER GRADUATION A BEGINNING, NOT AN END.

A role model to many young people in Qatar, Sheikha Hanadi spoke to the 36 members of the graduating class as well as more than 500 family members, friends, faculty, staff and members of the Doha community.

The 36 seniors — 28 in business administration, seven in computer science and one in information systems — received diplomas in the first graduation ceremony held in Carnegie Mellon Qatar's new building in Education City.

"The Class of 2009 is our second graduating class, but it is not a class who is second at anything. They have a lot of firsts — first to occupy the new building, first to go to places like Ghana on a humanitarian mission and first to have a Phi Beta Kappa scholar," said Dean Chuck Thorpe. "Graduation is a significant passage to a new phase in your life. Wherever your life leads you, we're proud of you and proud to have you as part of the Carnegie Mellon family."

The celebration commenced the prior evening with the Senior Celebration — an evening of awards, accolades and remembrances. Awards were presented to students for their accomplishments in academic achievement and student affairs.

In the Scottish tradition of the university, a bagpiper clad in full regalia led the formal procession of graduating students, Carnegie Mellon faculty, deans, the university provost, keynote speaker and university president into the remarkable three-story walkway. After receiving their diplomas, graduates along with their families and friends enjoyed a reception marking the end of their four-year journey.

The Class of 2009 has students from Algeria, Egypt, France, India, Iraq, Jordan, Kuwait, Lebanon, Palestine, Saudi Arabia, Syria, the United States, Yemen and Qatar. Half of the graduating class had minors across a spectrum of disciplines from business administration and computer science to psychology, mathematics and history.

Strategist

Chess Grandmaster Balances School, Tournaments

■ Heidi Opdyke

Darmen Sadvakasov is ready to help the future of his country, and he has the moves to prove it.

The recent graduate from the H.J. Heinz III College's School of Public Policy and Management was recently ranked 130th in the world in chess and is moving up the ranks.

A grandmaster since 1998 when he won the World Junior Championship, Sadvakasov, of Astana, Kazakhstan, credits chess for helping him develop skills that prepared him for the workload at Heinz.

"Chess is a very good game to develop all line of skills. It helps a lot with insight in your life and helps develop such skills as memory, imagination, persistence, a lot of them," Sadvakasov said.

While at Heinz, he concentrated on economics and finance.

"Carnegie Mellon is a good school. I feel very prepared for life and reading news about economics. I can easily find trends. And when I read news about Kazakhstan, I see what problems we face with and what would be good to do. I feel the knowledge that I got here will be very useful," he said. "I had excellent professors here, I was very satisfied with the level of education I received."

Sadvakasov spent time at Carnegie Mellon on a Bolashsak or "future" scholarship. Sponsored by the government of Kazakhstan, he will return home to pursue employment. He is also a member of the national chess team and will play in additional tournaments this year. He's worked to stay in top shape.

"I've played here as often as I could," Sadvakasov said. "You know the study is tough and it takes a lot of time. But during weekends and spring breaks I've won five or six tournaments."

Sadvakasov's most recent major win was at the Foxwood Open Championship in Connecticut, where he beat grandmaster Yury Shulman for the title. More than 500 players competed.

Memorial Day weekend, he competed in the Chicago Open and finished 13th.

He's also spent time promoting chess through exhibitions where he would play multiple players at once. He's gone up against as many as 50 at a time. But recent groups have been smaller.

"At each of these events we had 15 to 20 players. Most were children. We tried to give an image to chess that it helps develop all kinds of skills," he said.

Who knows, maybe those beginners will have a chance to meet Sadvaksov one-on-one sometime in the future.

PHOTO BY BRAD STEPHENSON

DARMEN SADVAKASOV (HNZ'09) WAS RECENTLY RANKED 130TH IN THE WORLD IN CHESS BY THE WORLD CHESS FEDERATION.

piper TRIVIA

The answer to the April Piper Trivia question, "What is the name of the university's first Ph.D. graduate and what year did he or she receive the degree?" was Mao Yisheng, who graduated in 1919 from what was then Carnegie Institute of Technology.

For this month's Piper Trivia question, name the three items Google CEO Eric Schmidt said were invented during a recession in his commencement keynote address. *(Hint: The answer is in this month's issue.)* The Piper staff will give away a $25 gift card to the bookstore to the first four people who can correctly answer the question. Send your answers to **bg02@andrew.cmu.edu** with "June-July Trivia" in the subject line. The winners' names will be published in the following issue. Previous winners are ineligible.

Bagpipes Herald Bright Future for Hudson

■ Kristi Ries

When you talk with Nick Hudson, you get the feeling that this self-possessed graduate already has a fair amount of life experience under his belt.

He is familiar with explaining things to curious and appreciative onlookers, and he takes bystanders' stares and comments in stride. And lately, he's had a much larger audience. Hudson has been featured in newspapers such as The Wall Street Journal as well as on national television such as NBC's Today Show and CBS News' "Assignment America."

As the nation's only graduating bagpipe major, he has marched to the beat of his own tunes for some time now.

In fact, it was a brochure that advertised group bagpipe lessons he saw in eighth grade that initially led Hudson to his current major.

When the time came for the all-consuming college search, Hudson found his options to be extremely limited. To pursue a major in bagpipe performance, just one school in the U.S. exists: Carnegie Mellon's School of Music. Regardless of its singular status, it's a program that would arguably be the best in the country anyway. Alasdair Gillies, a world-renowned bagpiper, directs the university's piping program.

Hudson is one of just three students pursuing the major; sophomore Andrew Bova and freshman Roberta Sefcik will continue in the program this fall.

And like the Kiltie Marching Band, which celebrates its reputation as the "Band Without Pants," Carnegie Mellon bagpipe majors don traditional Scottish garb for performances. The kilt, which features Carnegie Mellon's tartan sett (or design), is a visual showcase of the university's heritage. Just as most traditional clothing was not created with today's lifestyle in mind, the kilt does not have pockets. A large leather pouch, called a "sporran," completes the ensemble and provides room for modern accoutrements such as a cell phone or car keys.

PHOTO BY KEN ANDREYO

NICK HUDSON WAS THE SOLE BAGPIPE MAJOR IN THE COUNTRY WHO GRADUATED THIS YEAR.

It's often come in handy, he says, when performing at home or abroad with world-class ensembles such as the City of Washington Pipe Band.

Hudson candidly explains that it's a lot more difficult to begin playing the bagpipes than other musical instruments.

"It takes a long time just learning to make any good sound at all," he said, demonstrating that one must first learn to play on a "practice chanter," which involves fingering keys and blowing notes before the bag and pipes are even part of the picture. Once that is mastered, maintaining continuous pressure on the bags must be learned, and through all of this, one more issue complicates the performance. All of the music must be memorized.

Hudson's academic experience differs in a variety of ways. While others take courses in music theory, the history of jazz or classical music, he studies the history and culture behind the bagpipe, a distinctly Scottish experience and one that leads to very small class sizes.

Hudson, who already performs gigs such as weddings and funerals all over Pittsburgh, also teaches private lessons to budding bagpipers and local pipe bands including the Pittsburgh Police. This fall, he will serve as a student teacher in two local school districts, adding a Music Education certificate to his already promising educational repertoire.

WATCH HIM ONLINE: WWW.YOUTUBE.COM/WATCH?V=NVY2GIEMOSW

Schmidt Speaks

CONTINUED FROM PAGE FIVE

what is the meaning of life? Correct question to ask any university. In a world where everything is remembered and kept forever, the world you're graduating in to, you should live for the future and the things that you really care about. Don't live in the past, live in the future.

And what are those things? To figure this out, you need to actually turn off your computer. I know this is difficult. You need to turn off your phone, you need to actually look at the people who are near you and around you, and decide that it is humans who ultimately are the most important thing to us, not the other aspects. You'll find out, I hope, what I believe very strongly that people all around us of every race, color and viewpoint fundamentally want the same things. They want a great and safe world, and they want prosperity and peace among all of us. You'll find that curiosity, enthusiasm and passion are very contagious, and I want you to show that because you have it by virtue of being here. You'll find that nothing beats the holding the hand of your grandchild as he takes his first step. You'll find that a mindset in its own ways, set in its ways locked down is a mind and life wasted. Don't do it. You'll find that the resilience in the human spirit is amazing. It's what got us through World War I and World War II, and it will get us through our current challenges just fine.

You'll find today is the best chance you have to start being unreasonable, to demand excellence, to drive change to make everything happen. But when you do, speaking to the graduates, always remember to be nice to your parents and true to your school. Thank you very much and congratulations. <audience applause>

Adelaide Students Partner With Public Transport To Create Real-Time Schedule Updates

■ Malcolm King

Student entrepreneurs studying at Carnegie Mellon University Australia have created a solution to one of the most asked questions in Adelaide — "Where's my bus?"

As part of their post-graduate work in information technology — which has international applications — students have created live timetable information via a mobile phone network that tells patrons when their bus will arrive.

The system, called Sandora, is a GPS-enabled device placed on a bus, train or tram to send regular information about its location to a server. This information is then compared with the original static timetable to calculate its arrival time at a particular stop.

"Commuters can either go to the Web site and use Sandora for free, or if they are on the go, they can use their mobile phone to find out when their public transport vehicle will arrive at a particular stop," said Phil Allan, a student in the Masters of Information Technology Program. "They will receive a text of the live timetable information and a Google Map showing the location of the vehicle. The application for the mobile phone will be available as a free download. There will be a small fee to access Sandora's live timetables via a mobile phone."

A successful prototype of the service was recently tested on the Adelaide Connector bus service. The prototype uses text messages to send the location information for the bus. However, future versions of Sandora will send this data either as TCP/IP data packets over the 3G Network or via a URL connection.

"Sandora can also be configured to provide other information such as interruptions to services, alternative transport services, disability access. It can also monitor school buses, track riders in the Tour Down Under as well as fleet management and taxi locations," said the project's supervisor, Associate Professor Riaz Esmailzadeh.

Allan said the system would appeal to advertisers providing opportunities to display their logos on the Google Maps that accompany the live timetable information. The next step, he said, is to test it extensively on a range of public transport and other vehicles.

"Our slogan is 'Never miss your bus again,'" Allan said.

LET'S GO ASSISTS PITTSBURGH RIDERS

Adelaide isn't the only municipality to partner with Carnegie Mellon to improve transportation service. Since March 2005, the Language Technologies Institute has been providing Port Authority of Allegheny County riders with a telephone-based interface to bus schedules and route information. Let's Go, http://accent.speech.cs.cmu.edu/, serves the Port Authority's customer service line when the office manned by customer representatives is closed. Since the system has been available, more than 75,000 calls have been fielded by Let's Go.

Spring Sports Cap Most Successful Year Ever

■ Mark Fisher

With seven teams and 14 individual student-athletes qualifying for NCAA Division III championship competition, the 2008-09 school year was the most successful in history for Carnegie Mellon's Athletics Department.

"The 2009 spring season for Carnegie Mellon athletics will go down as our best ever and caps off a year of great accomplishments for the Tartans," said Director of Athletics Susan Bassett. "We had the most teams selected for the NCAA championships in our history and our highest degree of success in the championships. Our student-athletes and coaches accomplished all this while excelling in the classroom as well. We can all be very proud of the Tartans."

This spring, three teams and seven individuals wrapped up their seasons with trips to NCAA championship events. The golf and men's and women's tennis teams appeared in team championships, while performers from men's track and field and both tennis squads competed individually as well.

Women's Tennis

The women's tennis team made its fifth straight trip to the NCAA tournament and was selected to host the South Atlantic Regional in early May. The Tartans advanced to the quarterfinals of the tournament for the first time in school history with a 5-2 victory over Johns Hopkins University, before losing to the University of Chicago in the national quarterfinals. Carnegie Mellon finished the season with a dual-match record of 21-3, setting a school record for most wins in a season, and earning a No. 3 national ranking for much of the campaign. In March, the Tartans won the inaugural Intercollegiate Tennis Association (ITA) National Division III Women's Team Indoor Championship.

Individually, three Tartans competed in the women's tennis national tournament. Freshmen Laura Chen and Amanda Wu competed in singles competition, and Chen paired up with sophomore Ashley Herrick in doubles play. Chen and Wu lost in their quarterfinal matches but the tandem of Chen and Herrick advanced to the national semifinal before falling to the eventual national champions from Chicago. Chen was named the National Rookie of the Year by the ITA. She finished her rookie year with identical 24-8 marks in singles and doubles play.

"Laura played at a consistently high level all year despite having to deal with the rigors and pressures that come with playing both No. 1 singles and doubles as a freshman," said Head Coach Andy Girard. "She has worked hard to improve many aspects of her all-around game this year and I think you are going to see more great things from her in the future."

Men's Tennis

The men's tennis team netted a school-record 20 wins and appeared in the NCAA championships for the fourth time in six years. The Tartans advanced to the regional final before being eliminated. Junior James Muliawan, who was defeated in his opening match, was the lone Tartan to compete in the national individual tournament. Tennis Assistant Coach Michael Belmonte, in his first year at Carnegie Mellon, was named the National Assistant Coach of the Year by the ITA, a first for the tennis program.

Golf

Not to be outdone, the golf team accomplished two firsts in school history by winning the University Athletic Association (UAA) Championship and earning a bid to the NCAA Golf Championships. The Tartans won five tournaments and placed in the top three in nine of their 11 tournaments this past season. Junior Christopher Lee became the third Tartan in four years and the fourth in school history to win the UAA individual championship. Head Coach Rich Erdelyi and Assistant Coach Joe Rudman took home UAA Coaching Staff of the Year honors.

Track & Field

Seniors Brian Harvey and Ryan Anderson and junior James Hulley qualified for the NCAA national event in track & field. Harvey earned All-America track honors for the third time in his career by finishing second in the 5,000-meter run in 14:40.02, just one second behind the winner. In their first trip to the national meet, Anderson finished 13th in the 3,000-meter steeplechase and Hulley posted a 15.10-meter throw in the shot put, which failed to qualify for the final round. Hulley qualified in the shot put with a school-record mark of 15.88 meters earlier in the season.

For more on the Tartans, visit www.cmu.edu/athletics.

Terry Irwin Appointed Head Of School of Design

TERRY IRWIN

■ Eric Sloss

Terry Irwin, a designer, educator and researcher working in sustainable and interdisciplinary design, has been appointed head of the School of Design, effective Aug. 1. Her appointment reflects the school's commitment to interdisciplinary practice in addressing social and ecological problems.

Irwin succeeds Stephen Stadelmeier, who has served as interim head since fall 2008.

"Terry's relationship with the School of Design spans more than 15 years," said Hilary Robinson, the Stanley and Marcia Gumberg Dean of the College of Fine Arts. "Her familiarity with Carnegie Mellon, a successful 35 years of professional experience, and her commitment to solving social and environmental issues through design makes her an ideal fit for the school. Terry will be a wonderful addition to the College of Fine Arts and we are excited for her to join the Carnegie Mellon community."

As a frequent guest lecturer and participant in the school's student portfolio day, she has worked with and hired many Carnegie Mellon graduates. Irwin has worked in university-level design education for more than 20 years at such prestigious institutions as the Otis Parsons School of Design and the California College of the Arts. Currently, Irwin is completing research toward a doctorate degree from Duncan of Jordanstone College of Art and Design at the University of Dundee in Scotland, where she also lectures.

Irwin is the co-founder and former principal and creative director of the San Francisco office of MetaDesign, an international and multidisciplinary design firm. Through the firm, she has worked with Fortune 1000 companies including Sony, Apple, Adobe and the Bank of America. During her 10 years with MetaDesign, the office grew from a staff of three to 75 and was the recipient of multiple national and international awards. Irwin received a master's degree in design from Allgemeine Kunstgewerbeschule in Basel, Switzerland.

Dean of Student Affairs Named

■ Abby Houck

Following a national search, Carnegie Mellon has named Karen D. Boyd its new dean of Student Affairs, effective July 1.

Boyd succeeds Jennifer Church, who left the university last summer to relocate with her family. G. Richard Tucker, the Paul Mellon University Professor of Applied Linguistics, served as interim dean of Student Affairs this academic year. He will return to his full-time role in the Modern Languages Department for the 2009-10 school year.

"Throughout this search and from those who have worked with her in the past, Karen was continuously described as thoughtful, genuine and enormously dedicated to the welfare of students, staff and faculty," said Michael Murphy, vice president for Campus Affairs and search committee chair. "Karen demonstrated an appreciation for the intense academic environment at the university and for our vision for unparalleled depth and breadth in the life of the campus."

PHOTO COURTESY OF KAREN D. BOYD

KAREN D. BOYD

The Division of Student Affairs coordinates student services and orchestrates the meta-curricular life of the campus. The operation focuses on the intellectual, occupational, emotional, spiritual, physical and cultural growth and nurturing of students. The division includes the Office of the Dean, the Career Center, Counseling and Psychological Services, Health Services, Orientation and First-Year Programs, the Office of International Education, Student Activities, Student Development and Student Life.

Boyd brings to campus a wealth of experience in student development, leadership development, strategic management, policy development and implementation, and planning and assessment. Her work has spanned the areas of residence life, community standards, conflict resolution, student organization advising, crisis response and financial management.

"It is my honor to join Carnegie Mellon University and to lead the Student Affairs team," Boyd said. "I look forward to working with outstanding students, faculty and staff to continue the university's long tradition of excellence."

Boyd most recently served as a doctoral graduate assistant with the Department of Counseling and Human Development Services at the University of Georgia. She previously served at Clemson University as a visiting instructor of Student Affairs and has worked at the University of Georgia, Georgia Institute of Technology, East Carolina University, Clemson University, Appalachian State University and University of North Carolina at Chapel Hill.

$25 Million Grant Supports Science of Learning Center

PHOTO BY KEN ANDREYO

KENNETH KOEDINGER (CENTER) WATCHES ANTHONY THEOFILEDES AND BRITNEY RUSH WORK ON A STATISTICS PROGRAM AT STEEL VALLEY HIGH SCHOOL.

CONTINUED FROM PAGE TWO

students and identify those lessons that are most effective in helping students learn.

"We are trying to uncover deep principles that produce learning that is robust — learning that is long-lasting and applicable to new situations," said Perfetti, Distinguished University Professor of Psychology and director of Pitt's Learning Research and Development Center (LRDC).

The computer tutors cover a range of subjects, such as algebra, geometry, physics, chemistry, Chinese and English as a second language. But the PSLC researchers have gone beyond these standard subjects to include tutoring on lifelong learning skills. For instance, they've developed a help-seeking tutor that interacts with the Carnegie Learning® Geometry Cognitive Tutor®. The help-seeking tutor determines whether students fail to ask for help appropriately — or are too quick to ask for help — by machine analysis of their normal learning interactions.

"We have demonstrated in a randomized, controlled 'in vivo' experiment that the help-seeking tutor leads to lasting effects," Koedinger said.

Eventually, PSLC research might lead to the demise of what students have long dreaded — the test. Computer tutors, they have found, can constantly assess what a student has and hasn't learned and even suggest exercises to improve areas of weakness, Koedinger said.

"In other words," he said, "we do not need to interrupt students to give a test in order to find out what their learning strengths and weaknesses are."

The PSLC is continuing a tradition of innovative education research, combining the strengths of Carnegie Mellon and Pitt in cognitive and developmental psychology, human-computer interaction, intelligent tutoring systems, machine learning and language technologies.

At Pitt, LRDC founding director Robert Glaser and past director Lauren Resnick established programs of learning research and instructional development as twin pillars of educational innovation. At Carnegie Mellon, in the 1990s, Professor John R. Anderson, a psychologist and computer scientist, led a team, including Koedinger, which created an intelligent computer tutor to teach algebra to high school students. The program actually thought like a teenager and was so successful that Carnegie Learning was spun out to develop computer tutors as a commercial product.

"The work of the PSLC is critical and very timely as we re-evaluate effective education in the United States," said Steve Ritter, co-founder and chief scientist at Carnegie Learning. "Improving student performance, particularly in math and science, is more than a social initiative, it's a national economic agenda as we strive to compete in a global economy by arming our students with 21st century learning skills."

Carnegie Learning Inc. assists PSLC researchers with running experiments using its Cognitive Tutors and with collecting and analyzing data from student use of the systems. As part of the grant renewal, the company has committed to working with researchers to analyze data from more than 100,000 students, representing a broad cross-section of student background and ability.

NEWS BRIEFS

President Cohon Honored By Civil Engineers

Carnegie Mellon President Jared L. Cohon was recently named a distinguished member of the American Society of Civil Engineers (ASCE). The ASCE's highest accolade, distinguished membership recognizes eminence in a branch of engineering. An active ASCE member, Cohon will be formally inducted, in honor of his leadership on critical environment and energy issues and for his leadership at Carnegie Mellon, on Oct. 29 at the ASCE's 139th Annual Civil Engineering Conference in Kansas City, Mo.

An authority on environmental and water resource systems analysis, Cohon received his doctorate in civil engineering from the Massachusetts Institute of Technology and his bachelor's degree in civil engineering from the University of Pennsylvania. He is a registered professional engineer in Maryland.

In May 2007, Cohon was appointed to his third five-year term as president of Carnegie Mellon. Cohon, who was named "Pittsburgher of the Year" in 2001 by Pittsburgh Magazine.

Non-exempt Employees To Be Paid Biweekly

Starting in January 2010, all non-exempt employees on the monthly payroll will be placed on the biweekly payroll system. In addition, at that time all payroll deductions for those on the biweekly schedule will be prorated and taken in equal amounts from all 26 biweekly pays in the year. Human Resources and Payroll Services has been reviewing the pay practices to ensure they have the most efficient and effective processes in place. For more information on the change, please visit www.cmu.edu/hr/learning/newsletter/index.html.

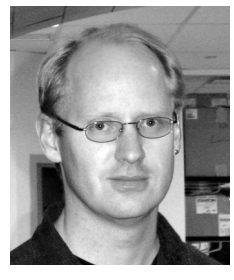
Veloso Honored for Article

Francisco Miguel Veloso, an assistant professor in engineering and public policy, was awarded the prestigious Stan Hardy Award for the most outstanding scientific article published yearly in the main journals of the field of operations management. The award is given by the Midwest Section of the Decision Sciences Institute.

Andy Award Nominations Requested

Nominations for the 2009 Andy Awards are now being accepted. The Andy Awards, named for Andrew Carnegie and Andrew Mellon, are a tribute to the spirit of teamwork and dedication embodied by staff at Carnegie Mellon. Individual staff members and teams of colleagues whose work has had a significant impact on the university are recognized for their outstanding performance and commitment to excellence through the program. All non-faculty university staff are eligible. For more information, including nomination forms and category descriptions, please visit www.cmu.edu/andyawards. All nominations must be submitted no later than 4 p.m., July 7. This year's Andy Awards will be presented at noon, Friday, Sept. 11 in McConomy Auditorium.

Urban Receives AChemS Young Investigator Award



Nathan Urban, associate professor of biological sciences at the Mellon College of Science, has received the Association for Chemoreception Sciences (AChemS) Young Investigator Award for Research in Olfaction.

The honor is awarded annually to an outstanding junior scientist who is an emerging leader in the field of olfaction and engaged in research that has a major impact in the field. Urban accepted the award during the AChemS Annual Meeting in Sarasota, Fla.

Urban investigates the molecular, cellular and circuit-level properties of neuronal systems in the olfactory bulb. Using a variety of experimental and computational techniques, he describes the detailed physiological properties of neurons and their connections with one another. He then constructs models that provide insight into how these properties give rise to more global brain functions, such as the synchronous neuronal firing that occurs when an odor is encountered. In addition to providing a better understanding of the olfactory system, Urban's work is providing a better understanding of how neurons network with one another in learning and disease.

Researchers, Scholars Gather for ICTD 2009

Gates Addresses Global Technology Needs

■ Andrea L. Zrimsek

Bill Gates recently emphasized the need for world governments, individuals, the private sector and philanthropists to come together and work to develop innovations in health care to help the world's poorest people.

"The great challenge is to figure out how software can work in a rural setting," he told a crowd of more than 350 at the Third International Conference on Information and Communication Technology and Development (ICTD2009) at Carnegie Mellon University in Qatar.

Gates, chairman of Microsoft Corp. and co-chairman of the Bill and Melinda Gates Foundation, and Carlos A. Primo Braga, director of the Economic Policy and Debt in the Poverty Reduction and Economic Management Network at The World Bank, delivered keynote addresses.

"ICTD is all about using the power of high-tech computing and communications to help the people in the neediest parts of the world build better lives," said Chuck Thorpe, dean of Carnegie Mellon Qatar. "Hosting this conference at Carnegie Mellon gave us a chance to show the world all that Qatar brings to this area: the technology of a rapidly developing knowledge based society, combined with the heart to reach out to less fortunate people."

ICTD is the top conference for innovating technology accessible and relevant to developing economies. It is a multidisciplinary forum for academic researchers and practitioners designing computing technology solutions.

"The conference expanded in several dimensions this year with the addition of workshops, panels and demos to complement the oral and poster presentations in the program," said M. Bernardine Dias, a professor of robotics at Carnegie Mellon and ICTD2009 conference chair. "The diversity and number of participants increased significantly compared to past years."

PHOTO COURTESY OF CARNEGIE MELLON UNIVERSITY IN QATAR

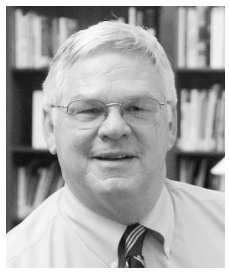
Bill Gates delivered the keynote address for the Third International Conference on Information and Communication Technology and Development (ICTD2009) at Carnegie Mellon University in Qatar.

This was the first time the conference was held in a Middle Eastern country. By having the ICTD conference at Carnegie Mellon Qatar and leveraging its strong computer science curriculum and relations in the region, it offered an opportunity to identify ways in which technology can make a difference in underserved communities and how Carnegie Mellon Qatar can contribute to advancing developments in the ICTD field.

"The Middle East is one of the most rapidly evolving and developing parts of the world, both economically and socially. It is important that we have substantive conversations about how information and communication technology can positively impact developing nations," said Dr. Hessa Al Jaber, secretary general of the Supreme Council for Information and Communication Technology (ictQATAR). "As Qatar and the rest of the region develop, ICT must remain an integral part of our strategic planning. ictQATAR will continue to champion the adoption of ICT here, connecting people to the technologies that will enrich their lives and inspire confidence in their future."

Carnegie Mellon was the hosting organization for the ICTD 2009 conference, with its TechBridgeWorld research group taking the lead organizing role.

Robert Murphy Named Career Center Director



Robert Murphy has been appointed director of the Career and Professional Development Center, effective July 1. He succeeds Lisa Dickter, who has served as interim director since Paul Fowler's departure last summer. Fowler, director of the Carnegie Mellon Career Center for eight years, was named executive director of the Career Center at Emory University in Atlanta.

Murphy currently serves as the director of Career Development, Public Service and Leadership Development at Hobart and William Smith Colleges in Geneva, N.Y. He previously spent 25 years in management and senior executive positions with Pepsi-Cola International and the Scott Paper Company. Murphy also served as a captain in the Marine Corps. He holds a bachelor's degree from Norwich University and a master's degree in education from Springfield College.

Researchers Identify Drug To Prevent Seizure Progression in Model of Epilepsy

Carnegie Mellon researchers have identified a new anticonvulsant compound that has the potential to stop the development of epilepsy. The findings are published in the current issue of the journal Epilepsia.

The research discovery builds on previous work identifying a specific molecular target whose increased activity is associated with seizure disorders, a potassium channel known as the BK channel.

"We have found a new anticonvulsant compound that eliminates seizures in a model of epilepsy," said Alison Barth, associate professor of biological sciences at the Mellon College of Science. "The drug works by inhibiting ion channels whose role in epilepsy was only recently discovered. Understanding how these channels work in seizure disorders, and being able to target them with a simple treatment, represents a significant advance in our ability to understand and treat epilepsy."

Co-authors of the study include Jesse Sheehan and Brett Benedetti, doctoral students in the Department of Biological Sciences and Center for the Neural Basis of Cognition at Carnegie Mellon. The study was funded by the National Institutes of Health, the Milken Family Foundation for Translational Research and the Alfred P. Sloan Foundation.

iTunes Offers Free Music Mix as Promotion

Carnegie Mellon students, alumni, faculty, staff, parents and friends can visit www.cmu.edu/itunes/mix to get a free mix of special songs from iTunes U. Due to iTunes restrictions, the offer is valid only for U.S. customers. Check out Carnegie Mellon on iTunes U to download free videos including popular lectures and commencement speeches.

SIFE Empowers Students, Community

■ Lisa Kay Davis

With heads for business and hearts for the world, more than 200 students who comprise Carnegie Mellon's SIFE chapter are making a difference in the community.

SIFE, Students in Free Enterprise, is an international non-profit organization that collaborates with business leaders and university students to foster social responsibility and develop business skills beyond the classroom.

The chapter was founded in 2000 and has developed a solid track record of enhancing students' educational experience while promoting community involvement. Recent group initiatives included job training for the homeless, a personal finance series, a business-ethics awareness initiative and a program designed for future entrepreneurs. The group participates in business-related competitions, the most recent of which was the National Exhibition in Philadelphia.

"SIFE gives people from all different academic majors the opportunity to get involved in the Pittsburgh community and projects abroad and is a breeding ground for lasting friendships, growth of leadership skills, and the chance to network," said SIFE team secretary Ariel Solomon. "I think the community really appreciates our SIFE team."

In 2008, the Carnegie Mellon SIFE team brought their Future Entrepreneurs Project to the Winchester Thurston School and offered the high school students an opportunity to explore their business ideas. AP Economics teacher Maurice Bajcz was happy to incorporate the SIFE project into his class schedule.

"SIFE teaches entrepreneurship. Students enjoy it, and they see some hands-on uses for what they're learning. It speaks to the budding entrepreneur," Bajcz said. He said his desire is to give his students team-based project time. "SIFE fits that bill."

Students in Bajcz's class created a "WikiBar"— a toolbar to rate the credibility of information available on the Internet. The students won SIFE's inter-high school entrepreneurship competition and received a $500 award from Morgan Stanley, a global financial services firm. Bajcz's students are using the award to implement their ideas with help from a Carnegie Mellon programmer.

SIFE also challenged members of the university community with a business ethics game show — Dilemma-Thon. Drawing from the diverse groups on campus, SIFE invited four student organizations to compete, including a Christian organization and a business fraternity. The game show tested participant and audience knowledge of ethical dilemmas through trivia questions and individual and video cases. The event

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New Alert System Being Implemented in Mellon Institute

More Than 100 Devices are Being Installed This Summer

■ Bruce Gerson

They had the idea and the technology, but they needed a working product design and a proving ground. They found both at Carnegie Mellon, and the collaboration could improve campus safety at colleges and universities worldwide.

They are the people of Metis Secure Solutions, a spin-off of Sima Products Corp. Their idea is to maximize campus security through advanced technology by providing vital information to faculty, staff and students in a matter of seconds during an emergency. Dave Hochendoner, chief technology officer for the company, said the technology is a reliable combination of two wireless data paths that can rapidly carry voice and text messages campus-wide or to specific locations.

"The emergency messages are transmitted over a mesh network, which uses the FM radio tower at WDUQ," said Hochendoner, who earned his bachelor's degree in electrical engineering and engineering and public affairs at Carnegie Mellon in 1975. "The mesh network maintains two-way communication even in the presence of dead zones, a loss of power or a cell network collapse."

But what type of instrument or device would be used to interact with individuals on the receiving end? And where could they test their product and technology? A water main break at Carnegie Mellon in 2006 and a professor's wife who happened to be the CEO of Sima, linked the company to Madelyn Miller, Carnegie Mellon's director of Environmental Health and Safety.

Miller introduced Sima to the folks at the School of Design, and in fall 2007 students in the Junior Product Development course created conceptual designs for devices that could disseminate emergency messages. The students studied university environments, such as dorm rooms, classrooms and hallways to see what devices and systems were being used and to measure their effectiveness.

"One thing we learned that transferred to the final product was that students today want more information than existing bells and sirens provide," said Tim Means, marketing director for Metis Secure. "Therefore, we built voice, text to speech conversion, lights and a large LCD screen for text into the final design."

PHOTO COURTESY OF METIS SECURE SOLUTIONS

HCI students designed a prototype for the Metis Secure Solutions alert system.

A Masters of Product Development class during the spring 2008 semester provided further refinement as three graduate students focused on how people would interact with the device to receive information.

"The graduate students looked at the basic human-computer interaction involved and created a product case design to maximize effectiveness," Means explained.

With a product design in place, the only missing piece to the puzzle was a test bed. Enter Mellon Institute, a stone and concrete fortress of a building with cell phone dead zones that would make even the Verizon Network crew cringe.

"If you can make it work in Mellon Institute, you can make it work anywhere," Miller said. "And it did."

After a successful test in Mellon Institute using 24 devices in January, 95 additional devices have been purchased and will be installed this summer. Miller hopes the system will be operational by the beginning of the school year. Environmental Health and Safety is using a $3,000 grant from the Campus Safety Health and Environmental Management Association to help fund the installation.

"The new system represents a significant improvement for us," said Sharon McCarl, associate dean of the Mellon College of Science. "Currently, the only mechanism we have to evacuate the Mellon Institute building in an emergency is to pull the fire alarm. This is very disruptive for research and is very limiting."

McCarl praised the system for its ability to send emergency information to specific parts of the building. "That may not seem significant, but if, for example, there was a chemical spill, you may want people to avoid a certain area," she said.

So, how does the system actually work? In the event of an emergency, Campus Police can select from a list of pre-recorded voice and text messages to broadcast. Using a graphical computer interface that displays a floor map of the building, they then can direct the message to all devices in the building or to specific ones on individual floors or in targeted hallways. Messages provide brief instructions, such as to evacuate, remain in the building, or avoid certain areas of the building until further information is provided. Students, faculty and staff also can use the devices to communicate back to Campus Police.

In addition to voice and text messages, the devices also use sound and lights to attract attention. Hochendoner said the devices run off the building's electrical system, but each device has back-up battery power.

In addition to Carnegie Mellon, Metis Secure Solutions is talking with several area schools regarding the installation of the system on their campuses. The schools include Slippery Rock, California, Duquesne and Pitt. Duke, Arizona State and Fairleigh Dickinson also have expressed interest.

SIFE Empowers

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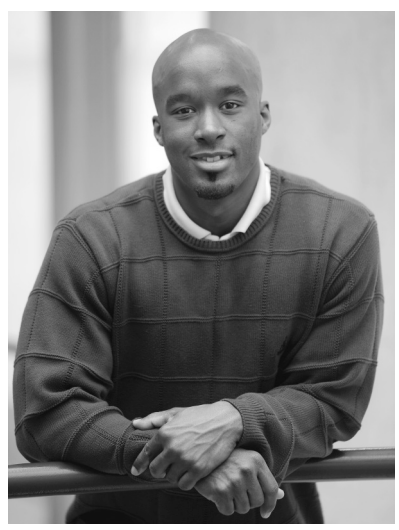
fostered idea sharing and collaboration among the different campus groups. Dilemma-Thon was named a national finalist for the Campbell's Sealed Air Business Ethics Topic Competition.

Several other Carnegie Mellon SIFE projects supported Pittsburgh community organizations, while others reach reached well beyond the region's borders. One international project was designed to assist a community in Central America.

"In Nicaragua we built a house for a family of four. Maria was a single mother with two kids. She mentioned how grateful she was because she was currently living in a tiny house with 13 other people. When it rained, she and her children would get wet due to holes in their roof," says SIFE President Sasha Urquidi. "It is not until you get out there, actually do the work, and interact with the community that you come to the conclusion that maybe what you are doing will change someone's life for the better, even in a small way."

Student Combines Computers, AI To Predict Global Illness



Sean Green is spending the summer in Bangalore, India, because he wants "to make a difference in the world." Green is using computer modeling tools to improve rural sanitation.

■ Chriss Swaney

Sean Green, a fourth year Ph.D. student in Engineering and Public Policy, is spending the summer trying to improve rural sanitation in India to combat an often underplayed health menace.

Green is using a series of computer modeling tools to identify the best way to curb the spread of diarrheal illness in more than 192 countries worldwide. In an article in the prestigious journal Environmental Science and Technology, he estimated that improving rural sanitation by 65 percent worldwide would save the equivalent of 1.2 million lives.

"We want to show where the money can be best spent in these communities where diarrheal illness kills more than two million people a year, and remains the third-leading cause of child mortality," Green said.

In research supported by the National Science Foundation, the Steinbrenner Institute for Environmental Education and Research and the Heinz Foundation, Green along with Carnegie Mellon Engineering and Public Policy professors Mitchell J. Small and Elizabeth A. Casman, developed a pattern matching computer tool that uses a set of variables describing information about a country to try to pinpoint which policies are most effective at preventing disease outbreaks.

The researchers report that the most important variable for reducing deadly diarrheal outbreaks among the factors that they considered is improved sanitation in rural areas.

"We also found that a country's overall literacy rate and economic well-being contributed to the frequency of outbreaks," Green said.

The 33-year-old former computer technician is spending the summer in Bangalore, India, to continue studying the cause and impacts of diarrheal illness.

"I had a nice job in Silicon Valley, but I really want to make a difference in the world," said Green, who is based at the Center for the Study of Science and Technology Policy in southern India. A travel grant from the National Science Foundation is funding his trip to India, where is working to develop a series of surveys to help urban slum communities near cities and non-government agencies develop the best public policies for curbing deadly diarrheal outbreaks.