Microsoft Founder Bill Gates To Visit Campus

Microsoft founder, chairman and former CEO Bill Gates will give a lecture to the Carnegie Mellon community from 4 to 5 p.m., Thursday, Feb. 21 in Rangos Hall, University Center. His talk is titled “Bill Gates Unplugged: On Software, Innovation, Entrepreneurship and Giving Back.”

The talk concludes his farewell lecture tour of five prominent universities as he transitions from Microsoft into his new role in the Bill and Melinda Gates Foundation.

Information regarding the lecture is available at www.cmu.edu/corporate/bill_gates

Carnegie Mellon

Carnegie Mellon Wins Three Carnegie Science Center Awards

Piper Staff

They’re the grand prizes in Pittsburgh science. And Carnegie Mellon hit the jackpot, winning three Carnegie Science Awards.

The Robotics Institute took home top honors, winning the Chairman’s Award. Tiziana Di Matteo, an associate professor in the Department of Physics, won the “Emerging Female Scientist” accolade, while the Entertainment Technology Center earned recognition in the Information Technology category. Award winners were announced Jan. 31.

The Robotics Institute’s award is not necessarily given on an annual basis, but

Professor Edmund Clarke Wins “Nobel Prize of Computing”

Byron Spice

The A.M. Turing Award is considered the Nobel Prize of the computing field, and this year’s winner, Computer Science Professor Edmund M. Clarke, couldn’t be more excited. Or could he?

Actually, Clarke has been more excited at least once before — back in the fall of 1982. That was his first semester as a Carnegie Mellon faculty member and the semester he implemented his first Model Checker.

Model Checking is a technique for verifying that computer circuitry or software does what it was designed to do. It is the invention of Model Checking that the Association for Computing Machinery (ACM) is recognizing by bestowing the $250,000 Turing Award on Clarke and two computer scientists at the University of Texas at Austin.

Clarke and his graduate student, E. Allen Emerson, began working on it in 1981 when both were at Harvard University. At the time, engineers checked for logic errors by running simulations to test performance of new circuit designs or by manually checking each line of software code. But computers already were

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New Method Determines Where Thoughts Originate in Brain

For a team of Carnegie Mellon computer scientists and cognitive neuroscientists, the question wasn’t only “What were you thinking?” It was also “Where were you thinking?”

Led by Cognitive Neuroscience Professor Marcel Just and Computer Science Professor Tom M. Mitchell, a research team combined methods of machine learning and brain imaging to find a way to identify where people’s thoughts and perceptions of familiar objects originate in the brain. They did so by identifying the patterns of brain activity associated with the objects.

An article in the Jan. 2 issue of PLoS One discusses this new method, which was developed over two years under Just’s and Mitchell’s leadership.

Study participants enrolled in an MRI scanner were shown line drawings of 10 different objects — five tools and five dwellings — one at a time and asked to think about their properties. Just and Mitchell’s method was able to accurately determine which of the 10 drawings a participant was viewing based on their characteristic whole-brain neural activation patterns. To make the task more challenging for themselves, the researchers excluded information in the brain’s visual cortex, where raw visual information is available, and focused more on the “thinking” parts of the brain.

The scientists found that the activation pattern evoked by an object wasn’t located in just one place in the brain. For instance, thinking about a hammer activated many locations.Swinging a hammer activated the motor area, while what a hammer is used for, and the shape of a hammer activated other areas.

According to Just and Mitchell, this is the first study to report the ability to identify the thought process associated with a single object. Earlier work showed it is possible to distinguish broad categories of objects such as “tools” versus “buildings,” but this new research shows that it is possible to distinguish between items with very similar meanings, like two different tools.

Just, who directs the Center for Cognitive Brain Imaging at Carnegie Mellon, noted that one application the team is excited about is comparing the activation patterns of people with neurological disorders, such as autism. “We are looking forward to determining how people with autism neurally represent social concepts such as friend and happy,” he said.

Just and Mitchell also recently received a three-year, $1.1 million grant for additional research in this area from the W. M. Keck Foundation, which was partially responsible for the first study’s funding as well.

Based on these results of the research published in PLoS One, Just and Mitchell will now seek to develop the first scientific theory ever conceived for producing testable detailed predictions of observable fMRI neural representations for every concrete noun in common

“THE NEXT STEP IS TO LEARN HOW THE BRAIN THINKS ABOUT ABSTRACT SUBJECTS, LIKE ART, BEAUTY OR TRUTH.” — COMPUTER SCIENCE PROFESSOR TOM MITCHELL

People who live in southern California, where earthquakes often make by shuts like a bowl full of Jell-O, may find some comfort in the latest research under way at Carnegie Mellon.

 Jacobs Bielak, a professor in civil and environmental engineering, was recently awarded a four-year grant to improve the university’s earthquake simulations to better predict the impact quakes of various sizes will have on urban areas. The goal is simple — to save lives, buildings, infrastructure and transportation systems.

Because of his extensive earthquake work, Bielak was awarded $1.6 million from the prestigious National Science Foundation (NSF) PetaApps program to develop earthquake computer simulations that play an important role in reducing seismic risks affecting the Los Angeles basin and other large coastal cities.

Bielak leads a team that also includes David R. O’Hallaron, associate professor of computer science and electrical and computer engineering at Carnegie Mellon, along with researchers from several campuses of the University of California.

“These simulations will provide unprecedented detailed knowledge of how an urban system performs in a large earthquake and what is needed for improving disaster planning and preparation,” said Bielak, who was recently elected to the Mexican Academy of Engineering.

“One of the keys to making such large-scale simulations possible is the ability to create extremely large models of earthquake-prone areas like the Los Angeles basin. This new grant will give us the resources to create three-dimensional models that can simulate how earthquakes impact buildings, bridges and other critical urban infrastructures,” said Bielak. Actual buildings can then be classified based on predictions of no damage, nonstructural damage, structural damage or collapse.

Over the past decade, Bielak, O’Hallaron and their students have successfully collaborated with researchers at the Southern California Earthquake Center (SCEC) on a series of increasingly ambitious and influential computer models of complex basin geology, earthquake sources and earthquake ground motion.

But Bielak reports that this new earthquake research is designed to push the capability of existing hardware and software programs. It will give Bielak and his team the opportunity to integrate the greatest motion of large sedimentary basins urban infrastructures, “The next step is to learn how the brain thinks about abstract subjects, like art, beauty or truth.” — Computer Science Professor Tom Mitchell

Department of Civil and Environmental Engineering at Carnegie Mellon, noted that the NSF research award is another example of the university’s successful problem-solving environment. “The project draws upon our expertise in earthquake engineering, computer and computational science and seismology,” Garrett said.

Bielak and his team also will collaborate extensively with the Pittsburgh Supercomputing Center to test some of the special algorithms and simulation structures that will allow them to generate a more accurate picture of how to improve public safety during an earthquake.
Romance Becomes Research Material in Relationships Laboratory

A comfortable “den” tucked away on the third floor of Baker Hall has some sofas, a coffee table and bookcases, and it often provides a space for romantic partners or spouses to hash out the details of their relationships. It also has two video cameras so deftly hidden that most of the couples whose exchanges are being recorded aren’t even aware that they’re there.

Brooke Feeney, associate professor of psychology in the College of Humanities and Social Sciences, uses this cozy living-room setup to study how couples interact with each other in various scenarios.

During graduate school, Feeney often had to use uncomfortable offices or conference rooms for observing couples’ communications. But she believed that the relationship dynamics she was trying to study would be more authentic if she could replicate couples’ everyday environments rather than watch them interact in an unnatural setting. So, when she came to Carnegie Mellon, she set up the Relationships Laboratory.

“We want to make research participants feel comfortable, as comfortable as they would feel if they were interacting in their own living room,” Feeney said.

Much of this research is based on the idea that people enter relationships with characteristic beliefs, expectations and behavioral patterns developed from prior experiences with significant others that influence the course of their relationships throughout the lifespan. In some of her research, Feeney has examined individual differences in expectations that people bring into their relationships and the extent to which those expectations become self-fulfilling prophecies.

While established beliefs and expectations bear heavy influence on one’s behavior in romantic relationships, Feeney notes that the patterns are not set in stone.

“It just takes effort,” she said. “If you go back and really examine these expectations and beliefs and where they’re coming from, and also have more positive relationship experiences that counter the negative ones that you’ve had, then they’re open to change.”

Feeney’s work focuses largely on the interpersonal dynamics surrounding caregiving in relationships. Her work centers around the idea that relationship partners should serve two major caregiving functions for one another. They should provide a safe haven to which a partner can “come in” for comfort and support in times of stress, and they should provide a secure base from which a partner can “go out” to explore, learn, discover, and strive to meet important personal goals. Feeney’s research examines the extent to which the presence or absence of each type of caregiving predicts important relational outcomes (such as relationship satisfaction and stability) and personal outcomes (such as self-esteem and goal accomplishment).

A major project under way in the lab is a newlywed study involving 200 couples. Funded by the National Science Foundation, this project aims to follow newlyweds over the early years of their marriages to identify specific caregiving dynamics that foretell stable, growing relationships versus ones that predict relationship dissolution. Initially, couples are being followed on the first two years of their marriages.

At a number of visits in those two years, couples complete questionnaires about their relationship history and personality characteristics, they are videotaped as they engage in interactions in the living room lab, particularly interactions about goals and stressors. They also provide reports of their daily interactions and life events at home on a PDA. The researchers then examine this data to identify behavioral patterns, personality characteristics, and relationship dynamics that predict personal and relationship well-being. An important long-term goal of this work is to develop interventions for faltering relationships.

Feeney also recently applied for funding to study the relationships of the elderly. She hopes to identify the relational dynamics that predict health, well-being, and longevity of aging individuals — as well as their adjustment to the aging process. Another goal of this work is to determine if and how relationship dynamics change throughout the lifespan.

The Relationships Lab may seem to have a decidedly romantic slant, but its work has applications for platonic relationships and family interactions as well. In fact, one of Feeney’s earlier studies looked at the dynamics between parents and teenagers and how their pre-existing positive or negative expectations led them to misremember or reconstruct relationship events that happened months earlier.

Feeney’s work in the Relationships Lab recently earned her an esteemed recognition. In December, she was honored with the Estella Loomis McCandless professorship, one of two McCandless Chairs given every three years to Carnegie Mellon junior faculty members who have shown great promise in their field.

“I feel very honored and grateful that my work has been recognized in that way. I’m deeply appreciative of the McCandless family for establishing the professorships and of Carnegie Mellon for providing such a supportive and stimulating environment in which I can do my work,” she said.

Carnegie Mellon Athletes Make Their Marks

LEFT: FRESHMAN MOLLY EVANS SET FOUR INDIVIDUAL SCHOOL RECORDS AND IS A MEMBER OF TWO RECORD-SETTING RELAY TEAMS THIS YEAR. ON JAN. 19 AGAINST ALLEGHENY, EVANS BROKE HER OWN SCHOOL RECORD IN THE 100-YARD BACKSTROKE WITH A TIME OF 58.51 SECONDS.

RIGHT: SENIOR GREG GONZALEZ, SHOWN HERE IN A GAME EARLIER THIS SEASON AGAINST BRANDON, SCORED A GAME-HIGH 20 POINTS IN CARNEGIE MELLON’S 86-55 UPSET VICTORY OVER TOP-RANKED WASHINGTON UNIVERSITY ON FEB. 3. FOR HIS PERFORMANCE, GONZALEZ EARNED UNIVERSITY ATHLETIC ASSOCIATION ATHLETE OF THE WEEK HONORS.
Tony Spear wants to put the “wow” back into space exploration, to once again spark the excitement of the Apollo 11 moon landing in 1969 or of the astounding Red Planet images transmitted by the Mars Pathfinder mission’s Sojourner robot in 1997.

“Do they have a lot of space experience? No, but I do.”

“It’s a very talented team,” he said.

“The Carnegie Mellon approach is ageless—to use your brain to understand the problem and then come up with a plan.” — Tony Spear, Lunar X-Prize Team Project Manager

As project manager for Pathfinder at NASA’s Jet Propulsion Laboratory (JPL), Spear already has staked that sort of fervor. He sees the same potential in the Google Lunar X-Prize, which will award $20 million or more to the first private group to operate a robot on the moon by 2012. As the program manager for the X-Prize team being assembled by William “Red” Whittaker, Spear once more is in a position to make history in outer space.

“We have the opportunity to go to the moon and gain that ‘wow factor’ again,” said Spear, who graduated from Carnegie Tech in 1962 with an electrical engineering degree. “I think the X-Prize is going to be a big deal.”

Part of its appeal is the size of the monetary prize, but a larger part is the sheer audacity of a private group mounting its own mission to the moon. Another part of it is the mission outlined by Whittaker: landing a rover in the Sea of Tranquility on the 40th anniversary of Apollo 11. The plan is for the rover to visit the site where Neil Armstrong set foot on the moon and beam back high-resolution images of whatever remains—simultaneously capturing both the lunar-landing technology and the University of Arizona will provide mission control, cameras and spacecraft integration.

Spear, 71, a consultant since retiring from JPL in 1998, met with several potential teams this fall. He came away from a December meeting with Whittaker’s nascent team convinced that it potentially could be the best of the lot. “It’s a very talented team,” he said.

“Do they have a lot of space experience? No, but I do.”

Spear now splits his time between Pittsburgh, the University of Arizona in Tucson and his home in Pasadena, Calif., as he begins “an unbelievably difficult challenge.” The team still must obtain such basics as a launch vehicle, while operating on a projected budget of less than $100 million.

But his Carnegie Tech training serves him well in this new endeavor, just as it did when he was at NASA. “The Carnegie Mellon approach is ageless—to use your brain to understand the problem and then come up with a plan,” he said. “That’s what Carnegie Tech taught me and that’s the same process we’re using now.”

**Grad Students Lead Phase II Development Of New Emergency Communications System**

**Interactive Products Will House SMART Radio Technology**

Three students in the Masters of Product Development Program are engaged in an independent study this semester that ultimately could help improve campus safety at colleges and universities worldwide.

Under the guidance of Associate Design Professor Eric Anderson and Assistant Human-Computer Interaction Professor John Zimmerman, Matt LaGrandeur, Tiffany Yang and Sid Butalia will build upon the work of 17 junior design students who last fall created conceptual designs for devices that could carry emergency messages to people in hallways, classrooms, offices and dorm rooms. The product designs included everything from lighted baseboards to signage that also served as message boards.

Last fall’s Junior Product Development course served as phase one of a collaborative effort between Carnegie Mellon and SIMA Products Corporation to develop a Scalable Mesh Alert Radio Transmission (SMART) emergency communications system. The SMART system broadcast technology, developed by SIMA, uses a combination of wireless technologies to deliver emergency messages to devices placed in various locations on campus. Messages can be sent campus-wide and can also be targeted to specific locations, including buildings, floors of buildings and individual rooms. In the event of power and/or phone outages, the system is backed-up by battery power.

A small box-like device with a message screen and audio component, conceived by Zoe Bridges, was the student design selected by SIMA last fall to test the SMART technology. Bridges’ design was a better fit for the working components than the other concepts, but LaGrandeur, Yang and Butalia are charged with “exploring the issues more deeply and creating a product that responds to clarified environmental, physical and interactive needs,” say Anderson and Zimmerman.

Dave Hochendoner, chief technology officer for SIMA, said he’s looking for a product that uses text, lights and voice to optimize effectiveness. Another goal is that the product be able to be manufactured at a reasonable cost.

The graduate student trio’s work will focus on how people interact with a device to receive information. Further development could result in the device being used as a means for two-way communication.

“Butting down how this product will be used is crucial to the success of the project,” said Butalia, who earned his undergraduate degree in mechanical engineering at Carnegie Mellon. “We have to determine what’s needed to optimize interaction and deter chaos.”

Yang, who earned her bachelor’s degree in mechanical engineering from MIT, LaGrandeur, a computer science and product development grad from Stanford, and Butalia are working with the Environmental Health and Safety Department, University Police, Computing Services and Internal Communications to understand how Carnegie Mellon responds in an emergency situation and how emergency messages are crafted and disseminated. They will also be working in faculty and staff offices and classrooms in Wean Hall to test product usability.

Anderson and Zimmerman said the students have many issues to consider, such as what lighting, graphics, audio and visual indicators to use, as well as visibility and location. For example in a hallway the device has to be high enough to be visible, but also low enough to comply with ADA requirements, Anderson said.

Zimmerman said by the end of February the students should have a product model to present and by the end of the semester a working prototype that houses the technology developed by SIMA.

“We have a pretty aggressive schedule,” Zimmerman said.
Sharon Burks is going out on top. After three decades in the Computer Science Department, Burks — who’s done just about everything except teach — is retiring on Friday, Feb. 15. As she walks out of her fourth floor Wean Hall office for the last time, she’ll be clutching the 2007 Barbara Lazarus Award for Culture and Climate, the prestigious honor she received at last month’s MLK Day celebration recognizing her as one who has helped make this campus a caring place.

The prestigious Lazarus Award is a validation of sorts for Burks, who’s held myriad roles helping students, faculty and staff since joining computer science in 1977. In fact, she’s held so many roles that her job is being distributed among several existing staff and four new hires.

“This award says to me that there are people who recognize that I did more than just my job,” says the associate dean of the School of Computer Science and assistant head of the Computer Science Department. “I did something I really loved, and people were helped by my having done that.”

As she neared the end of her Carnegie Mellon career, the Piper sat down with Burks to gain a little insight into the person who’s made a living giving.

Q: How did you feel when President Cohon called your name as the Lazarus award winner?
A: Shocked. I really was shocked. At first, I wasn’t sure I heard my name right. They had just introduced all these people and I knew what wonderful jobs they do. I felt unfit to be in their community in some ways, but honored. I did work with Barbara on some committees and I feel so honored to have an award that carries her name.

I think people who work with students a lot are doing it because we love to do it, not because it’s a job. So therefore you don’t feel like it’s something you should be rewarded for. You get your rewards everyday when you work with the students.

Q: By all accounts, you’ve done it all in computer science. What have your major duties been over the past 30 years?
A: When I came here there were 15 professors and fewer than 50 Ph.D. students. It was a very small department and we didn’t have many staff, so you really did do a little bit of everything. When I came I did everything from planning the faculty meeting and serving the food to handling all the re-appointment and promotion cases and dealing with all the students on a daily basis. I also edited the Computer Science Research Review that was published every year. It was sort of well, whatever needs to be done, let’s see if Sharon will do it. And that’s how I grew. I kept getting new challenges. Everything I did was a new learning experience.

As the Computer Science Department got larger I added more responsibilities and when the School of Computer Science came along I added even more responsibilities.

Q: You worked very closely with many Ph.D. students from around the world. How did you form a bond so easily with everyone?
A: By just being nice to them. International students have nobody. One of our students — she was the only female in a Ph.D. class of about 17 — wanted to know what to buy when you have a sore throat and your ear aches. We talked about it. She just wanted somebody to listen and to help with those small things. She left me a little sticky note that read “Wherever I go, I hope there’s always a Sharon.” I think that’s the way you relate to students. Every department has to have somebody that students can go to when they have a question or need to know what to do. It was easy working with people who needed you.

You get to know Ph.D. students very well. They’re here a long time. On average about 6 to 6.5 years. Some are here 8 years or more. There are students I got to know in the ‘80s that I am still very close with.

Q: Having been here for 30 years, you obviously loved your job. What made it so right for you?
A: Well, I think I’m a people person. If I have a skill it’s talking with people and being impartial, unbiased and fair. I think people know that about me so they’re willing to talk to me about things.

You know this is not rocket science that we do here, or at least that I do. Anyway. It’s all just common sense. It’s about treating people the way you’d like to be treated. It goes back to that childhood Golden Rule that we’re taught. That’s all I’ve ever tried to do.

Q: Speaking of rocket science, this must’ve been an exciting environment in which to work.
A: Absolutely, exciting. And frustrating at the same time. You did feel like there was always something new to learn. I’ve grown up with the computer age. I was here when Allen Newell was here. We used to talk about cookies and not computers. I remember meeting Grace Hopper. She was just an amazing person. I feel like I was there at the beginning and have seen so many changes.

It’s been a very exciting place to be. It’s always exciting being around people who are so intelligent. I cannot imagine a place where the faculty, who are so intelligent and out there on the cutting edge, are always willing to share everything with everybody. That makes it a pleasant environment.

Q: Who are some of the most memorable faculty?
A: Allen Newell just because he was Allen. He was such an important person but he always took the time to come and talk to those of us who were not important.

John Bentley was one of my favorite faculty members. He came here with a Ph.D. at 21. He was an assistant professor. He rode a skateboard up and down the hallways. He had toys. He was growing up as a professor in our department. He was fun to be around.

I had a unique opportunity to work with Jeannette Wing because she’s just such an amazing lady. She’s a bundle of energy and it was nice to see women in an environment where they are treated equally and their ideas are treated equally.

Q: Were you close with Randy Pausch? In his last lecture he said that if you weren’t going to be here life wasn’t worth living.
A: That’s just Randy. I don’t think of Randy as a professor because he was one of my students. He was one of those students in the ‘80s that are still dear friends. He’s been to my house to hit baseballs in our batting cage. He’s really an amazing fellow. He is everything everybody thinks he is and more.

Q: What are your retirement plans?
A: We’re going on an Alaskan cruise on May 30, compliments of the Computer Science Department. This has been the most generous department. We expect a lot of people, but we give a lot in return. I haven’t figured out the rest yet, but I want to do the things I’ve never had the time to do before. We want to travel. We have a whole list of places we want to go. We want to take some driving trips to see a lot of the U.S. I’ve done the East Coast, I’ve done the West Coast, and I’ve done most of the South. But I’ve never seen what’s in the middle.

Q: You’ve undoubtedly given students, faculty and staff a lot of good advice. What advice do you have for Carnegie Mellon?
A: Realize that if you want to continue to have good people you have to treat them well. People who are respected well and treated well will give you so much back. I’ve always felt respected here.
Carnegie Mellon Honors Dr. Martin Luther King’s Legacy

Carnegie Mellon recognized the work of civil rights leader Dr. Martin Luther King Jr. on Jan. 21 with an afternoon of special events, some of which are pictured below. A writing contest was part of the celebration, and three Carnegie Mellon students earned prizes for their poetry. Here are the winning entries.

**Sally Mao**  
**Freedom Poll**

Let Freedom Ring, says the windwhipped banner, the words themselves like grinning teeth whiter than bone or ash or cigarette paper.

We are confused: what does that ringing sound like? A telephone? A gong? A cry? Suspicious, we investigate.

We ask the flightless birds

what freedom sounds like, and they respond:

Quite simply, the sashay of falling nuts.

Fruits rolling, windless, an aria of leaves.

We ask the monk burning alive in the forest, and he says:

Freedom doesn’t ring. It is soundless, emotionless.

It perishes at the first sign of desire. It leaves the warm body chilled, vaporous.

To a twelve-year-old boy in the thimble factory, freedom the croaking of cicadas & bullfrogs;

To a graffiti artist in Paris, freedom the sputter of aerosol over tarmac;

To a homesick saxophonist, Miles Davis’s Godchild exhaling on the record player;

To wild horses, freedom the echoes on tall bright grasses;

To my great-grandfather, freedom the radio before static electricity swallowed all sound the day each of his sons were murdered.

To my father, freedom the cough of foghorns parting the river’s mouth, the path to Shanghai, then America, the eyelashes & laughs of strangers.

And he tells me no freedom is a scream, a burning, a symphony of suffering—No freedom is as eloquent & absolute as death. How can a whole country kill for this, when each sound of freedom is as small & specific as a dewdrop, a particle, a single intonation in this carnival of noise?

**Zeb Girouard**  
**Legacy 1673-2007**

Layer of ice forms on powder, the green grass below a shadow, implied. I remember

when field and pasture stretched. Stone walls cordoned off property and historic nature trails.

Old lady picked one up: trespassers deserve brain hemorrhage.

Death on brilliant grass.

The dandelions hid the secret.

Property values low in the next town over, why live here?

Here we blend in with the snow.

White, black, spots cover nothing but cattle, raised here among the freshest grass.

Truth is, no one really asked permission.

Beautiful, the grass can stretch for miles. We’ll take it.

From you, or you, anyone that stands in our way.

Push everyone out into the snow.

They shiver, rejected, docile, cattle.

Blankets make everything better. Cover the land with tall grass and stone walls.

Keep out everything but the snow.

**Joella Still**  
**Six Purple Grapes**

Sit under the white leaves.

Color the air.

H a n g i n g on the vine.

Tomatoes or raisins in the sun.

Say goodbye to Du Bois and Dr. King with the swivel of a pen.

Bic used to be cute.

Blue vs. Black.

Books vs. drugs.

Birth vs. death

Lose testosterone or get it back on a $100,000 bail.

Don’t speak.

Let Mr. Gibney, Mrs. Flower, and the school nurse feed the judge.

Let the judge help you join your brother, father, uncle, and cousin.

Add to pie charts and graphs.

Let them lift every voice and sing
program began in January when two KAIST doctoral students traveled to Pittsburgh to be in
allow KAIST and ETC faculty and students to participate in semester-long exchange programs
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— and the Heinz School. Its MSIT-IS program blends information security technology with
Security (MSIT-IS) track in Kobe, CyLab Japan offers a 16-month graduate degree program
Established in 2005 as a collaboration between Carnegie Mellon and the Hyogo Institute
Tsamitis, is the director of the College of Engineering's Information Net-
Khosla is the dean of Carnegie Mellon's College of Engineering and co-founder of
Carnegie Mellon CyLab Japan honors its second graduating class
The Willie Lynch Letter and its
Arts
Wells Theatre, Purnell Center for the
Opening Night: Fati's Last Dance
Thursday, Feb. 19, 7 p.m.
Friday, Feb. 20, 7:30 p.m.; Saturday at 2 and 8 p.m.
Connan Room, University Center (UC)
Sponsored by SPIRIT, BGSO, CAUSE,
Wednesday, Feb. 27, 7 p.m.
McKenna/Peter/Wright, UC
February 2008
Philip Chosky Theater
Performance Times: Tuesday through Friday,
at 8 p.m.; Saturday at 2 and 8 p.m.
Soul Food Sampler
Monday, Feb. 25, 11:30 a.m.-1 p.m.
Connan Room, University Center (UC)
Speak Your Mind: Campus Tuesday, Feb. 26, 4-7:30 p.m.
Connan Room, UC
Between the Lines Productions
Presents From Auction Block to Hip-Hop
Wednesday, Feb. 27, 7 p.m.
McKinnon Auditorium, University Center
Sponsored by SPIRIT, BGSO, CAUSE, Student Development, Student Senate, and the Department of History

INTERNATIONAL DISPATCHES

CyLab Japan Honors Its Second Graduating Class
Carnegie Mellon's Pradeep K. Khosla and Dena Haritos Tsamitis were joined by Gov. Toshizo
Khosla is the dean of Carnegie Mellon's College of Engineering and co-founder of
Carnegie Mellon CyLab, is the director of the College of Engineering's Information Net-
working Institute and director of education, training and outreach for Carnegie Mellon CyLab.
Established in 2005 as a collaboration between Carnegie Mellon and the Hyogo Institute
of Information foundation to offer a Master of Science in Information Technology — Information
Security (MSIT-IS) track in Kobe, CyLab Japan offers a 16-month graduate degree program
that prepares students to become leaders in information security.
CyLab Japan is an initiative of INI — the education partner of Carnegie Mellon CyLab — and the Heinz School. Its MSIT-IS program blends information security technology with management and policy.

ETC, Korean Institute Sign Agreement
Carnegie Mellon's Entertainment Technology Center and The Korean Advanced Institute for
Science and Technology's (KAIST) Graduate School of Culture Technology in Daejeon and
Seoul, Korea, have signed a Memorandum of Understanding for joint research, development
and personnel exchange. This development comes on the heels of the ETC's very successful
first appearance this past fall at the G-Star Gaming Conference in Seoul. The agreement
will allow KAIST and ETC faculty and students to participate in semester-long exchange programs
while also setting the stage for joint projects between the two schools. The student exchange
program began in January when two KAIST doctoral students traveled to Pittsburgh to be in
residence during the spring semester.

Dr. Pausch Goes to Washington

Computer Science Professor Randy Pausch recently visited Washington, D.C., to urge legislators to increase their support of pancreatic cancer research. Above, Pausch (second from left) poses with (L-R) Megan Gordon Don, director of government affairs for the Pancreatic Cancer Action Network (Pancan), House Majority Leader Steny Hoyer and Pancan President and CEO Julie Fleshman. "Congress needs to take a tremendous step up and provide the funding required to conduct the research that will lead to early detection methods, effective treatments and ultimately a cure for pancreatic cancer," said Pausch, who is battling the terminal disease. For more information on Pancan, visit www.pancan.org.
Students Journey Through Odyssey
With Faculty, Staff and Alumni Mentors

More than 70 sophomore students devoted the last three days of their winter break to personal development through Carnegie Mellon’s inaugural Odyssey program created by Stephanie Wallach, director of the Fellowships and Scholarships Office and Indira Nair, vice provost of education and professor of engineering and public policy.

In her opening remarks, Nair explained that Odyssey, named after Homer’s epic poem, was designed to assist students in their personal, academic and professional journeys.

Students from a variety of disciplines took advantage of the opportunity to interact with one another. In addition, five students from Carnegie Mellon Qatar’s campus participated in the program while visiting Pittsburgh for the first time.

“I like to get to know about different ideas. I learned that people can have different and similar opinions about the same issue,” said Fatma Al-Fakhri, a business administration major from Qatar.

The first day of the program focused on the “Definition of the Person” and featured self-reflection and self-awareness exercises led by Denise Rousser, the H. J. Heinz II Professor of Organizational Behavior; David Kaufer, professor and head of the Department of English; and Emily Stark, associate teaching professor in the Department of Biological Sciences.

Ryan Handerhan, an information systems and Japanese double major, noted that Odyssey strengthened his ability to write about himself and his future plans. “You should use words that signify transformation and growth. Rather than using ‘I am,’ I plan to use ‘I have’ and ‘I will,’” he said.

Students learned to frame issues and define research questions as part of the second day of the program, titled “Definition of Problem.” They also split into mock research teams and crafted proposals, which were evaluated and discussed on the last day of Odyssey. Faculty who presented on research skills included Bruce Armitage, professor in the Chemistry and Biological Sciences departments; Roberto Weber, associate professor of social and decision sciences; and Carey Morewedge, assistant professor of social and decision sciences.

President Jared Cohen kicked off the final day of Odyssey by sharing his personal journey through his early academic career, highlighting the mentors and factors that influenced his decision-making processes. The final session, titled “Future Plans for a Global Citizen,” featured a panel of alumni from New York City, Baltimore, Washington D.C., and Pittsburgh. Alumni panelists included Chris Kasabach (CFA 1991); Justin Hakuta (H&SS ’04); Brian Namey (H&SS ’03); Tara Santtoke (MCS 1997); Andress Appolnon (H&SS/CFA ’02); and Daniel Gilman (H&SS ’04).

Because this was the program’s first year, coordinators conducted pre- and post-surveys to gauge student expectations and knowledge. The post-survey also provided a forum for student feedback.

“Student response has been gratifying,” Wallach said. “The students learned things they hadn’t thought about as systematically before — about writing, research, experiential learning opportunities, fellowships and scholarships. They showed real enthusiasm about taking charge of their education, both at Carnegie Mellon and beyond.”

Carnegie Mellon Honored With Three Science Awards

Continued from page one

Instead it is only conferred when an individual’s or organization’s achievements warrant exceptional recognition. That was the case this year.

The Carnegie Science Center noted the institute’s “reputation as the best place on Earth for robotics research,” and credited its students, faculty and staff for their work to maintain the region’s standing as a center of the robotics industry. The Science Center specifically cited the institute’s 15 spin-off companies located in the area and its creation of the National Robotics Engineering Consortium.

Robotics Institute Director Matt Mason valued the unusual recognition of the institute as a whole, rather than just particular researchers.

“The Robotics Institute is a community of collaborators who share ideas and technology,” Mason said. “Usually the superstars receive the recognition, but we owe our success to a much larger group of people who generally go unrecognized.”

DiMatteo quickly made her mark in the fields of cosmology and astrophysics as one of just a few women studying the skies for the origins of the universe. She earned her award not only for her past accomplishments, but for her future potential as well.

“When I heard about the award I was extremely pleased, as although I have only lived and worked here for a few years, the institutions and people of Pittsburgh have been very supportive of my research. I’ve had the sense that people here are genuinely interested in what I have been doing, even though it involves studying fairly unusual things like supermassive black holes, and getting this award is a wonderful culmination of that,” DiMatteo said.

A pivotal part of Carnegie Mellon’s growing cosmology program, DiMatteo is perhaps best known for developing the most detailed computer simulations of galaxy formation. These simulations are giving scientists deeper understanding into how galaxies evolve over time and have the potential to unravel the mysteries of the universe.

In addition to her work on cosmological simulations, DiMatteo is collaborating with astrophysicists worldwide to detect a narrow band of cosmic radiation that reveals “the epoch of reionization,” a time 100 million to 1 billion years ago when the earliest stars were formed. She also is working on collaborations to understand the origins of gamma-ray bursts from black holes using Chandra Satellite and XMM-Newton observations.

The Entertainment Technology Center (ETC) was honored for its leadership in its field and its status as the only program to offer a two-year master’s degree in entertainment technology.

In particular, Don Marinelli, Scott Stevens and Michael Christel were acknowledged for their work on Informedia, a project that works toward machine comprehension of video and film media. Marinelli is the ETC’s director, and Stevens is an adjunct professor there. Christel is a senior systems scientist in the Computer Science Department.

“This is a testament to a dynamic faculty and staff and a well-deserved accolade for an amazing student body encompassing the best and brightest in the arts and technology,” Marinelli said.

The Carnegie Science Awards are presented by the Carnegie Science Center, which established the program in 1997 to recognize and promote outstanding science and technology achievements in western Pennsylvania. The program is sponsored by Eaton Corporation. All awardes will be formally recognized at a May 9 banquet.
Engineering Undergrads’ Design Takes Breathalyzer to New Heights

Carnegie Mellon undergraduate students mixed a pinch of innovation with common sense to place second in a national engineering competition for a handheld device they designed to help monitor airline passengers’ blood alcohol levels.

“The competition was an amazing opportunity to showcase the skills we have built at Carnegie Mellon. Our six-member team came together with great teamwork to create an innovative product,” said Steven Ramirez, a senior mechanical engineering student who served as the team leader.

Team members will share $2,500 after placing second in the AHETEMS Design Competition at the 31st national conference of the Society of Hispanic Professional Engineers (SHPE) in Philadelphia last November. AHETEMS (Advancing Hispanic Excellance in Technology, Engineering, Math and Science) is the educational foundation of SHPE.

The Carnegie Mellon team designed its “BreathAir” competition entry to help flight attendants monitor passengers’ blood alcohol content. Through the main components of a breathalyzer and a PDA, the device could help prevent discomfort and delays during the flight as well as prevent potential incidents of driving under the influence after leaving the airport.

“The most challenging part was working with a device so unfamiliar to us as a breathalyzer,” said Ramirez, external vice president of SHPE at Carnegie Mellon.

In addition to Ramirez, who is from Powell, Ohio, the other Carnegie Mellon team members included Shameer Bolanos, a junior electrical and computer engineering major from Culver City, Calif.; Reyes Flete, a freshman mechanical engineering major from Bronx, N.Y.; Michael Salame, a senior mechanical engineering major from Norwich, Conn.; and Jorge Villarreal, a junior chemical and biomedical engineering major who is also from Powell, Ohio.

The design competition’s other top winners were teams from Stanford University (first place) and San Francisco State University (third place).

Biological Sciences Student Receives Prestigious HHMI Fellowship

At age nine, Bertrade “Betty” Mbom moved with her family to the United States from Cameroon. Her parents organized the move because they wanted a better education for their five children, and they got it. Mbom, 21 — the youngest of those children, all of whom went to college — will graduate from Carnegie Mellon in May with a bachelor’s degree in biological sciences. She’ll continue her studies thanks to the Howard Hughes Medical Institute, which named Mbom one of five recipients of the prestigious Gilliam Fellowships for Advanced Study. The fellowship will fully support up to five years of Mbom’s doctoral studies.

During her first year of college, Mbom saw something at Carnegie Mellon that needed changing — the way minority science students experience their first year of college life. “I had a really hard time my first year,” she said. “There’s work being done [at Carnegie Mellon and across the country] to recruit minority students into the sciences, but not as much attention is paid to keeping them there.”

Working in Biological Sciences Professor John Woolford’s yeast genetics laboratory during her first year helped her adjust to the rigors of college life, and she regained her confidence.

Mbom said her parents always told her, “If you think there’s something that needs to be changed, don’t wait for someone else to do it.” So in 2007, she worked with Rea Freeland, associate dean for Special Projects at the Mellon College of Science, to start COaching Minority Progress and Academic Success in Science (COMPASS), a mentoring program for minority freshmen. COMPASS provides students with mentors, informs them about Carnegie Mellon resources and gives them opportunities to get to know one another. Participants have reported such a positive influence on their college experience that other colleges at Carnegie Mellon are contemplating adopting the program.

Mbom also mentors students in local schools and has volunteered as a judge for science fairs. She has also spent time organizing disaster relief work during college breaks in Mexico and New Orleans.

Mbom’s love for research began as a high school senior, when she participated in MIT’s Minority Introduction to Technology and Science (MITES) program. She worked on a genomics project in the lab of the Whitehead Institute’s Eric Lander.

“I remember being fascinated by all of the questions that were still unanswered in biology, and the tools that could be used to answer those questions and discover new ones along the way,” she said. Her experience of doing undergraduate research for four years in Woolford’s lab solidified her desire to pursue a research career.

In graduate school, Mbom plans to study a group of compounds called Eg-5 inhibitors. These chemicals stop cell division by disrupting the creation of the mitotic spindle — the weiblike construction that holds the chromosomes in the center of the cell and then pulls them apart into two daughter cells. Cells with disrupted spindles die prematurely.

This research will build on her experience in the HHMI Exceptional Research Opportunities Program (EXROP), which provides talented undergraduates from disadvantaged backgrounds with summer research experiences in the labs of HHMI investigators and HHMI professors. Through EXROP, Mbom spent time in HHMI Professor Timothy Stearns’ laboratory at Stanford, where she worked to understand the significance of the abnormal spindles. “I want to go further with this project and see if Eg-5 inhibitors could be used as cancer therapy,” she said.

The importance of education remains a strong refrain in Mbom’s life. Her career plans include becoming a professor, and she hopes that when minority students see her teaching in the classroom, they will know that their career aspirations are possible. She also hopes to expand COMPASS into a national organization to guide minority students who aim for research careers, as well as help younger students see the wonder and fun of science.
Interactive Video Game Puts Storytelling in the Hands of Children

Many of the children scattered throughout the three rooms of the Children’s Books section in the Carnegie Library of Pittsburgh’s Oakland branch sit quietly next to their parents, who read from the colorful hardbound books, fueling the youngsters’ vivid imaginations. But others stare bright-eyed at computer screens that help them channel their creativity.

My StoryMaker, a computer program developed at Carnegie Mellon’s Entertainment Technology Center (ETC) with support from The Grable Foundation, is an interactive video game that allows children like kindergartner Lucas Ritz to create their own scenes, characters and stories, like “The Fox and the Genie Have Lunch.”

“The game allows children to be their creative selves,” said Alyson Szymanski, project manager for My StoryMaker. “All children are story machines — they make up scenarios and play imaginary games all the time. This tool gives them a chance to do this in a public forum to demonstrate that learning and literacy can be a part of that.”

Children can log on to one of the many computers in the cluster and create their own stories. The program begins by having children type in their name and then prompts them to plot out the story they want to create. Screens encourage children to select various characters, backgrounds and props that are important to the development of a story. The characters are adorable cartoon-like figures, including a lion, pirate, dinosaur, fox and even a witch. When a new author clicks on characters, they appear neatly on the screen, ready to be instructed how to interact with one another. The child authors can make a witch and pirate have lunch in a cave, for example. The compelling animations allow children to connect with a lifelike being.”

Szymanski said. “They also drive the story action and provide the main focus for the children.”

ETC student Brad McKinley was the character designer. He worked with six other team members on My StoryMaker.

Children can create as many pages as they like for their stories, and when they are finished, they publish their work simply by clicking on the “end” button. The book is also digitally published and can be viewed and read on the screen of a purple kiosk near the reference desk.

The Sunday afternoon that young Ritz found his way on to the computer and started My StoryMaker, he took fancy to the fox and the genie. He thought they should have lunch in a castle and smiled while clicking on the castle icon and a black iron pot to cook the feast. His mom, Amy, helped with some of the typing, but this was Ritz’s creation — his first published book and he’s only in kindergarten.

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Carnegie Mellon Hosts Open Learning Symposium

**Ken Walters**

For the first time, researchers who study the science of learning and course developers will come together from across the country to share ideas, discuss issues and identify new research areas at Opening Learning Interplay, a symposium for the open educational resource field, from March 10-12 at the University Center.

Carnegie Mellon’s Open Learning Initiative (OLI) will host the symposium. A leader in its field, the OLI works to achieve the Web’s full potential for online learning by developing scientifically based, cognitively informed online courses in fields ranging from chemistry to statistics. The initiative’s efforts, which draw on the expertise of cognitive scientists and specialists in human-computer interactions, among others, not only enhance the specific courses that the OLI offers, but they also have value for online learning programs in general.

“Both the learning science and course developer communities have valuable resources that can benefit each other,” said OLI Project Director Candace Thille. “Interplay will bring expertise from both groups to create the next evolution in developing and delivering online courses.”

The symposium is the outcome of a year-long process, which included a series of three small workshop-style, multi-day meetings with leading thinkers and researchers in the learning sciences field interacting with open educational resource developers. The presentations at the symposium will be shaped by the interactions people had at the preliminary meetings.

The symposium will explore a broad range of perspectives on the nature of learning, including:

- the practice of applying results from the learning sciences to the design of open educational resources, to increase the likelihood of having a positive impact on learning outcomes;
- the role of current research, the roles of technology and virtual environments, and new areas of research;
- fostering dialogue between developers and learning scientists to better understand research and voice issues within development projects that seem to conflict;
- examples of existing collaborations between learning scientists and developers — showing how both communities can work together to open learning.

To learn more or to register for the symposium, which is sponsored by The William and flora Hewlett Foundation and the Pittsburgh Science of Learning Center (PStLC), please visit http://www.cm.edu/oli/symposium2008.
Clarke Receives Turing Award

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so complex that these methods fell short. Clarke and Emerson envisioned an automated alternative, a method of formal verification that analyzes the logic underlying a design much as a mathematician uses a proof to determine that a theorem is correct.

They developed a theoretical technique for determining whether an abstract model of a hardware or software design satisfies a formal specification. Moreover, when the system under scrutiny failed the specification, the method could identify a counterexample to show the source of the problem.

Clarke left Harvard to join Carnegie Mellon in the summer of 1982. As a new faculty member, he had a free semester ahead of him so he decided to implement his theory, writing the computer code for his first Model Checker. “I started the last week of August and I had really finished it by Christmas,” including the first paper about it, he said.

He knew he was on to something when he began testing EMC with example problems. “I would often get an answer different than what I expected,” he recalled. He suspected bugs in his program. Over time, however, he realized the problems weren’t in the Model Checker, but in the examples themselves. “That’s when I knew this was going to be important.”

Unlike the old hit-or-miss test regimes, the Model Checker could analyze all the possible states of a given circuit or system. But it was limited to designs much smaller than those of interest to computer makers.

In 1987, another of Clarke’s graduate students, Kenneth McMillan, found a solution. He realized that Model Checking could be implemented by a series of operations on binary decision diagrams (BDDs), a method of representing symbolic information that had been developed by computer scientist Randal E. Bryant. This new system, called Symbolic Model Checking, was able to analyze billions of billions of states, making it relevant to commercial computer design problems and leading to its widespread adoption.

“Ed Clarke and his students have been able to apply abstract logical theories to the real-world problem of making sure our computer systems will really work,” said Bryant, now dean of the School of Computer Science. “His work has been very influential on mine, and I consider it a privilege to have served and worked with him at Carnegie Mellon.”

Clarke will share the 2007 Turing Award with Emerson, now a professor at the University of Texas at Austin, and with Joseph Sifakis who, working independently, developed a similar technique at the Centre National de la Recherche Scientifique at the University of Grenoble. They will receive the award at an ACM awards banquet in San Francisco on June 21.