



the PIPER

CMU'S NEWS SOURCE FOR FACULTY & STAFF 11/14 ISSUE

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Just Breathe

Back Home

Siger To Direct Strategic Planning Process

■ Mike Yeomans

Since leaving Pittsburgh to attend Columbia University, Rick Siger's career has been on a fast track.

His rapid progression shaping public policy in the areas of science, technology and economic development — first in Virginia, and then in Washington, D.C. — resulted in his appointment as chief of staff in the White House Office of Science and Technology Policy in 2011.

But the further he progressed, the more it became apparent to him that all roads headed back home, and specifically to Carnegie Mellon.

Siger, a native of nearby Fox Chapel, joined CMU in September as director of Strategic Initiatives and Engage-

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PHOTOS BY SEAN ARCHIE (E'16)

NEED A BREAK? THE MINDFULNESS ROOM ON THE FIRST FLOOR LOUNGE IN WEST WING IS DESIGNED TO PROMOTE RELAXATION AND REDUCE STRESS. ABOVE, CMU STAFF AND STUDENTS DISPLAY WHAT MINDFULNESS MEANS TO THEM. CLOCKWISE FROM TOP LEFT ARE ANGELA LUSK, HOUSEFELLOW FOR STEVER HOUSE; EMILY MELILLO (A'19); IDA CHOW (A'18) AND EMILY SU (DC'18); AND MICHAEL BOOKER (E'16). READ THE STORY ON PAGE 8.



Program Provides Offices with Framework for Sustainability

■ Bruce Gerson

Carnegie Mellon has always prided itself on being environmentally responsible, but there's a new movement afoot that's challenging the university community to further reduce its carbon footprint.

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Silver Anniversary

School of Computer Science Celebrates 25 Years

■ Byron Spice

Little hoopla surrounded the creation of the School of Computer Science.

Carnegie Mellon President Richard Cyert told faculty and staff on Dec. 13, 1988, that the new school would begin operations soon and the school was officially announced in a news release on Jan. 3, 1989.

Few people off campus took note.

Maybe it was the holidays; maybe it was that CMU already had established itself as a computer science pioneer. But it was the last time SCS would be ignored.

Now, as the school celebrates its 25th anniversary, its graduate programs are consistently top-ranked by U.S. News & World Report, it boasts 12 Turing Award Laureates among its alumni and faculty and, most significantly, its

graduates are highly prized by recruiters.

President Subra Suresh possessed a competitive respect for SCS's capabilities when he was MIT's dean of engineering and oversaw that institution's computer science program.

"One of the things I've realized since coming here," he said at the October kickoff of SCS25, "is that the School of Computer Science is even richer, even broader, even deeper, even stronger than I ever knew."

CONTINUED ON PAGE SEVEN

Necessary Investment

Hamburg Hall Project Features Grand Lobby, New Auditorium

■ Bruce Gerson

Out of sight, but definitely not out of mind.

While some campus construction projects are very visible to passersby, such as Scott Hall and the Cohon University Center addition, there's a provocative project unfolding off of Forbes Avenue, nestled in between Hamburg and Smith halls, that will greatly enhance the Heinz College, improving its facilities to help meet its growing size and stature.

Ranked first among graduate schools by U.S. News & World Report (2012) for its School of Information Systems and Management and ninth for its School of Public Policy and Management, the Heinz College has seen tremendous growth over the past 14 years, expanding its programs and more than doubling its number of students from 726 in 2000 to more than 1,500 today. In the past five years, 17 new faculty members and 17 new post-doctoral researchers have been hired.

"The growth attests to the quality and competitiveness of the Heinz College education and to the worldwide reputation and prominence of its entrepreneurial and innovative faculty," said Heinz College Dean Ramayya Krishnan, the William W. and Ruth F. Cooper Professor of Management Science and Information Systems.

Heinz College areas also garnering top national rankings by U.S. News



HEINZ COLLEGE FACILITY ENHANCEMENTS WILL INCLUDE A GLASS-ENCLOSED ROOFTOP COURTYARD (TOP PHOTO) ABOVE A NEW 150-SEAT AUDITORIUM (BOTTOM PHOTO) NESTLED BETWEEN HAMBURG AND SMITH HALLS.



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include public policy analysis (7), environmental policy and management (8), public finance and budgeting (13), health policy and management (16), and nonprofit management (21).

"While the college's reputation and programs have grown, its physical space has not. This investment in infrastructure is necessary for the Heinz College to stay competitive, and to attract the best and brightest students and top faculty by providing space for collaborative, project-based learning in state-of-the-art facilities. This is an urgent priority for the college," Krishnan said.

Krishnan said the new space would allow Heinz College programs to continue to hire new faculty, continue to grow its Ph.D. and master's degree programs, and eliminate the need for space outside of Hamburg Hall.

Here's a rundown of the four-phase project.

PHASE 1 — completed in summer 2013 — upgraded and relocated student services offices to the ground floor and created nine interview rooms for on-campus recruiters.

PHASE 2 AND 2.5 of the program, an \$18 million effort funded largely in part by a \$10 million gift from The Heinz Endowments, is set to begin later this year or early 2015. Phase 2 will feature a new 150-seat auditorium tucked into the surface parking area between Smith and Hamburg halls, and the transformation of Hamburg Hall 1000, the large lecture hall commonly called the "rotunda."

The rotunda, which currently has poor sight lines and acoustics, will be converted into a grand entrance and lobby area where students, faculty, staff and visitors can network and collaborate on projects. The lobby will connect to the new classroom — modeled after Rashid Auditorium in the Hillman Center — and will include a rooftop courtyard that can be enjoyed during the spring and summer months. The new auditorium is expected to be operational by fall 2015.

Phase 2 also will see construction of an ADA-compliant entrance to Hamburg from Forbes Avenue. In addition, existing infrastructure will be upgraded to meet current building codes.

Phase 2.5 is scheduled to begin in 2016 when the Institute for Complex Engineered Systems, now located on the first and second floors of the west wing of Hamburg Hall, will move to Scott Hall.

Ralph Horgan, vice provost for Campus Design and Facilities Management, said the space vacated by ICES would be made into "forward-looking classrooms that will allow faculty to experiment with new pedagogies." The 10,000 square feet of space also will be used to create faculty and student offices.

PHASE 3 of the program will see construction of a glass roof above, and glass walls surrounding the rooftop courtyard of the new lecture hall. A café in the courtyard will be added once the glass-enclosed room is completed.

PHASE 4 will renovate third-floor faculty and Ph.D. offices, and meeting spaces.

Back Home: Siger To Direct Strategic Planning Process

CONTINUED FROM PAGE ONE

ment, a position in which he will focus on directing the university's strategic planning process. He also will coordinate the university's engagement in regional and national economic development initiatives, as well as engagement with key university partners and stakeholders.

From cybersecurity, to energy policy, to advancing the nation's science, technology and innovation agenda, to unlocking the secrets of rebuilding rust-belt cities, Siger said Carnegie Mellon's influence is growing in Washington, D.C., and beyond.

"Pittsburgh is a great story from a public policy perspective," he said. "There is a reason the president has come to Pittsburgh and to CMU so many times. There is an energy and momentum in the narrative of the city and of the university that is compelling.

"I think that is the reason so many people are 'boomeranging' back here. There is the sense that profound things are happening. Young people want to contribute to building something that is much bigger than themselves," he added.

Siger pointed to new leadership in key organizations in the public, private and nonprofit sectors across the region, including new Pittsburgh Mayor Bill Peduto, as creating the conditions for transformational change.

"This is an important moment in time for CMU and the region to step up to a larger role — both nationally and internationally," he said. "Pittsburgh was the frontier of an expanding new nation and the engine of the industrial revolution. The city and the university are now poised to lead in a new global era where human capabilities and creativity are being rapidly transformed by technology."

Siger said the university's strategic



A NATIVE OF NEARBY FOX CHAPEL, RICK SIGER JOINED CMU IN SEPTEMBER AS DIRECTOR OF STRATEGIC INITIATIVES AND ENGAGEMENT.

planning process comes at an important time for the CMU community to reflect on the university's strengths and how to build on them. The process also serves as an opportunity to collectively identify new areas of emphasis and investment.

"CMU has a well-earned reputation as being a place where stakeholders from widely different perspectives come together to solve problems that improve

the world," he said. "I look forward to the innovative ideas that emerge from the strategic planning process, and to establishing a framework to measure progress against those goals."

Prior to his time at the OSTP, Siger served as deputy chief of staff and chief of staff to the deputy secretary at the U.S. Department of Commerce. Before arriving in Washington, he served as

deputy secretary of commerce and trade in the cabinet of Virginia Governor Tim Kaine, focusing on rural economic development and energy policy, among other areas.

An avid outdoorsman, Siger has guided canoeing trips across North America, most recently in the Yukon Territory and Alaska.

Strategic Plan 2015

University Community's Input Is Essential, Urban Says

■ Michael Yeomans

Transformative.

That's the theme of a strategic planning process now underway that, once completed in 2015, will be used as a guide to lead Carnegie Mellon's efforts in teaching, research and university life for the next five to 10 years.

CMU leaders have begun reaching out across the university to gather feedback and input on the university strengths, areas that need to be better and areas that should be improved. A town hall meeting to hear thoughts from the university community was held on Nov. 17. That meeting was recorded and is available on the strategic planning website at www.cmu.edu/strategic-plan.

"The planning process will touch

every academic and administrative function within the global CMU community," said Interim Provost Nathan Urban, the Dr. Frederick A. Schwertz Distinguished Professor of Life Sciences. "We will seek to leverage the input and wisdom of all part of campus in this process. This is your chance to help chart the course for our collective future."

The plan is being built around three focus areas, which are being led by a college dean and senior administrator. The areas and leaders are:

- **Transformative Teaching and Learning**, led by Interim Provost Nathan Urban and Richard Scheines, dean of the Dietrich College of Humanities & Social Sciences;

- **Transformative Research, Creativity, Innovation and Entrepreneurship**, led by Vice President for Research Farnam Jahanian and James Garrett, dean of the College of Engineering; and
- **The Transformative CMU Experience**, led by Vice President for Campus Affairs Michael Murphy and Ramayya Krishnan, dean of the Heinz College.

The area leaders have created committees of faculty, staff, students and alumni, and will be conducting focused outreach in the days and weeks ahead.

Two additional town hall meetings will be scheduled in the first quarter of 2015 to provide progress reports and to solicit more feedback from the university

community.

The final report is planned for release in September. At that time, an implementation plan will be created and metrics identified to measure the plan's impact.

Urban encourages the university community to participate in the planning process.

"Your input is essential to ensure we have a plan that represents the rich diversity of knowledge and thought that we are blessed with at CMU. I look forward to the participation of each and every member of the Tartan community," he said.

If you have a question about the strategic planning process, or would like to make a suggestion, please go to www.cmu.edu/strategic-plan and follow the link in the navigation column on the left.

Scotty Goes Green: Program Provides Offices With Framework for Sustainability

CONTINUED FROM PAGE ONE

The size of a Scotty dog's paw is what organizers have in mind.

The Scotty Goes Green program, named by CMU Environmental Coordinator Barb Kviz, aims to engage faculty and staff in efforts that will make their offices more sustainable, energy-efficient and cost-effective. Offices are defined as "any organization or part of an organization that shares common areas and resources, such as kitchens, meeting rooms, storage rooms and other commonly shared spaces."

The program, modeled after a University of Maryland initiative, provides participants with survey questions to measure their current level of environmental friendliness, and checklists of activities that they and their co-workers can follow to meet bronze, silver and gold levels of certification.

Activities fall under eight categories: participation, energy, transportation and commuting, kitchen, events, reduce and reuse, recycling and purchasing. Offices must comply with 75 percent of the checklist to meet the specified standard of excellence.

For example, the bronze checklist includes: turning off lights in unoccupied rooms; turning off computers and monitors at night; participating in food composting; using reusable cups at events; and recycling batteries using the FMS battery collection service.

The silver checklist includes: replacing old power strips with "smart" power strips; replacing incandescent lights with compact fluorescent lights (CFLs) or light-emitting diodes (LEDs); taking advantage of telecommuting and conference call opportunities; eliminating bottled water; hosting zero waste

events; and buying recycled office products.

Activities to reach the gold level include: supporting at least one student or campus-wide sustainability initiative or event; unplugging office appliances at night; carpooling when travel is required; and using rechargeable and reusable batteries for all small equipment.

Launched in September, the program has 18 offices registered thus far, including the entire Civil and Environmental Engineering (CEE) Department, which includes about 3,400 square feet, 250 people, 40 offices and five labs. CEE is the first academic department to take the challenge.

Jodi Russo, assistant to the department head, and Ron Ripper, manager for the Hauck Environmental Engineering Lab, are co-chairs of the CEE Scotty Goes Green Team.

"We're looking to go green everywhere," Ripper said. "Our department head, David Dzombak, has been a champion for green practices ever since I've been here, so the program is a very good fit for us."

"Dave wants to be a leader in this effort and being the Civil and 'Environmental' Engineering Department, we should be a leader," Russo added.

Ripper said master's degree students on the Scotty Goes Green Service Project Committee have distributed surveys to faculty, staff and students in the department to get a baseline of its green activities so they can complete the pre-audit portion of the program.

"I don't anticipate any problems of being at the bronze level. Once we get certified bronze, we'll begin working

toward silver," Ripper said. "I would hope to get the silver certification by the end of the school year."

Ripper and Russo said the department currently does a nice job of recycling and composting food products. They noted a holiday party held in conjunction with the Engineering and Public Policy Department a few years ago.

"We had close to 200 people and we had about one-half bag of trash. It was phenomenal. We now purchase compostable plates and flatware," Ripper said.

Another bragging point for the department is a water filtration system in the CEE office's kitchen sink.

"It takes our tap water, filters it, and gives you high quality drinking water. This replaces bringing filtered water in. There's no plastic bottle waste, no transportation to and from the water company, and people reuse their own drinking cups and mugs," Ripper explained.

Russo said moving forward the department will be ramping up its efforts in energy-efficiency.

University Registrar John Papinchak is the Scotty Goes Green rep for Enrollment Services on the lower level of Warner Hall.

"Everyone has a recycling bin at their desk, and we eliminated Styrofoam cups. We gave everyone a travel mug, and brought in extra mugs for guests to use for water, tea and coffee. We participate in recycling ink cartridges, batteries and CDs," Papinchak said.

Learn more about the program at www.cmu.edu/environment/get-involved/scotty-goes-green-office-certification-program.html.

SCOTTY GOES GREEN PARTICIPANTS

Hunt Library

Sorrells Library

Facilities Management Services, 1st and 2nd floors

Institute for Complex Engineered Systems

Student Affairs Operations

Mellon College of Science Communications

Civil and Environmental Engineering Department

Athletics Department/Cohon University Center

Warner Hall, 3rd floor

Dining Services

FMS/Service Response Center

Campus Affairs Systems

Alumni Relations and Annual Giving

Registrar's Office

Enrollment Services

University Copy Centers

Naval ROTC Program

Counseling & Psychological Services

Wean Hall Sculpture On the Move

■ Kelly Saavedra

The orange block sculpture that signals the entrance to Wean Hall is going to be relocated, as Scott Hall development calls for reconfiguration of the nearby grounds.

"For the Love of Two Oranges" was created in 1969 by L. Clarke Winter, who worked as an art professor at CMU from 1955 to 1972. The university's Public Art Committee has been charged with finding a suitable location, one that will continue to honor the artist's intentions for viewing the sculpture.

"It's clear from the current location that the artist wants you to walk around the piece, so it will be important that people can walk around it in its new location," said John Carson, head of the School of Art. "There aren't many options available, as most of the campus is sloped."

The committee is considering recommending a site near Doherty Apartments, which is at the corner of Beeler Street and Forbes Avenue across from East Campus Garage.

"It's a charming setting there, under the trees," Carson said. "As the seasons change — picture it under falling snow, for example — it would give extra dimension to the piece," Carson said.



PHOTO BY KELLY SAAVEDRA

That's Entertainment

Students Go One-on-One With Industry Professionals

■ Piper Staff

More than 65 students switched seats to chat with somebody different every 10 minutes. But instead of a phone number, they were looking for a job offer.

Students from multiple disciplines recently participated in the Themed Entertainment Association's (TEA) Experience Café, a job fair-type event that brought together students with creators, developers, designers and producers of compelling experiences for visitors to theme parks, casinos, museums and other destinations.

At the Experience Café at CMU, students had the opportunity to meet with representatives from BaAM Productions, Artistic Entertainment Services, Universal Creative, Main Street Design, Forrec Ltd., Garner Holt Productions and Disney Research. Anthony Daniels, an Entertainment Technology Center (ETC) visiting scholar and world famous icon of the movie franchise "Star Wars," also participated.

In addition to general sessions hosted by each professional, there were

casual, interactive "speed dating" periods in which students had one-on-one interviews and showed their portfolios and resumes or asked general questions.

ETC student currently studying at the Silicon Valley campus watched a live stream of the general sessions and participated in the one-on-one interviews through SKYPE.

"There was an extraordinary turnout for this event. It was wonderful to see the students networking not only with the professionals but with one another," said Shirley Saldamarco, an ETC faculty member and one of the organizers of the event.

"There is enormous interest among CMU students in learning more about the careers available in themed entertainment and how they can apply their skills to work being done by companies that either work directly or indirectly with theme parks, science centers and museums. Robert Cortelyou, from Universal Creative, thanked me for inviting him and said he had a terrific time. He



said he was intrigued by the diversity of backgrounds. Each student brought something different to the table. Students and industry professionals all had a great time," she said.

Participating students represented majors from mechanical engineering to robotics, drama, design, art and English.

"It was great to be able to finally have a one-on-one sit down with some great folks from the TEA. I hope that we can continue these types of events in the future, not only for the CMU students, but so that the industry experts can see all the great work we do here," said ETC

student Casey Ging.

"I just want to say thank you for giving us an amazing chance to meet some people from different fields. The one-on-one section is really good to understand how we can put our skills into some physical entertainment projects," said Jiahao (Simon) Xia, a grad student at the ETC.

In addition to Saldamarco, the event was supported by ETC Director Drew Davidson, Dean of Student Affairs Gina Casalegno and Dan Martin, dean of the College of Fine Arts.

STEM Superstars

CMU Hosts Nation's Top Competition for High School Students

■ Abby Simmons

Carnegie Mellon is welcoming a group of emerging STEM superstars to its Pittsburgh campus Nov. 21–22.

This is the university's 12th year hosting the Siemens Competition in Math, Science and Technology, thanks to the dedicated staff in Conference and Event Services and numerous faculty members who volunteer their time each year.

"During the school year, we're usually focused on assisting faculty with conferences, campus events and company recruiting sessions," said Beth Yazemboski, director of Conference and Event Services. "This is an opportunity for us to have a hand in students' experiences."

Regarded as the nation's premier scientific research competition for high school students, the Siemens Competition aims to impress upon students the value of scientific study and encourage them to consider careers in these disciplines. The competition also gives CMU faculty and researchers a chance to interact with potential prospective students and future leaders in their fields.

"THE DAYS I SPEND AT THE COMPETITION EACH YEAR ALWAYS REMIND ME OF THE GREAT CREATIVITY AND ENERGY OF YOUNG MINDS. IT IS SIMPLY EXHILARATING TO MEET THEM AND TO SEE THEIR WORK."

STEPHEN GAROFF, HEAD, DEPARTMENT OF PHYSICS

Twelve faculty members led by Physics Department Head Stephen Garoff will be judging up to five individual and team entries based on a report, poster display, oral presentation and private Q&A session.

Several faculty members have served as judges every year that CMU has been a host site.

"The days I spend at the competition each year always remind me of the great creativity and energy of young minds," Garoff said. "The potential is enormous, and through their hard work on their projects, we get to see the potential begin to become reality. It is simply exhilarating to meet them and to see their work."

Joshua Kubiak, a CMU student who won fourth place nationally in 2011 for his organic chemistry research, will be covering this year's competition

on Twitter, using the handle @CMUSiemensComp.

"The Siemens Competition provided me with experience in scientific communication, confirmed my interests in a research-based career, and gave me the opportunity to meet brilliant and inspiring students from across the nation," Kubiak said.

Kubiak, a junior majoring in materials science and engineering and chemistry, is now an undergraduate research assistant in the labs of Michael Bockstaller and Krzysztof Matyjaszewski, based in the College of Engineering and Mellon College of Science, respectively.

For the second year in a row, students will be treated to an interactive demonstration at the Center for Cognitive Brain Imaging led by Senior

Research Psychologist Rob Mason. Roberta Klatzky, the Charles J. Queenan Jr. Professor of Psychology, will deliver the keynote address at this year's awards dinner at the Carnegie Science Center.

Conference and Event Services helps to orchestrate a memorable experience for the students, arranging travel, overnight accommodations, catering, the awards dinner and photography.

Eric Grotzinger, Mellon College of Science associate dean for undergraduate affairs, and Amy Burkert, vice provost for education, serve as university ambassadors.

Other regional competitions are held at CalTech, Georgia Tech, MIT, Notre Dame and University of Texas at Austin. Winners compete for a national title and a \$100,000 scholarship at George Washington University in December.

The CMU campus community is invited to interact with the Siemens Competition's regional finalists at a public poster session from 6 to 7:15 p.m., Friday, Nov. 21 in Rangos 1, Cohon University Center.

Great Things About SCS

WHAT'S SO GREAT ABOUT CMU'S SCHOOL OF COMPUTER SCIENCE?

HERE'S OUR TOP 25 LIST:

- 1. Artificial intelligence, 1955-56.** Herb Simon (H'90) and Allen Newell (IA'57) wrote a working computer program without a computer that could solve logic puzzles just like a human.
- 2. Multi-core processors, 1971.** CMU researchers are the ones who turned this sci-fi concept of the early '70s into a reality.
- 3. Tutoring machines, 1973.** A bit more advanced than flash cards for learning tough subjects, these tutors present harder or easier problems as students learn or stumble.
- 4. Speech recognition, 1976.** If you have an iPhone, ask Siri to look up "Hearsay I," the first computer system capable of continuous speech recognition, developed by CMU's Raj Reddy and his students.
- 5. Emoticons, 1982.** CMU computer science professor Scott Fahlman first suggested them to identify humorous content in posts. We've been looking at the world sideways ever since. :-)
- 6. Andrew project, 1982.** Researchers from CMU and IBM launched the Andrew Project, giving every student, faculty member and employee access to email, word processing, file-transfer services and graphics programs.
- 7. Autonomous robots, 1983.** Thanks to Red Whittaker (E'75,'79), robots moved off the assembly lines and into places no human ever could go. His Robotic Reconnaissance Vehicle spent four years inspecting and cleaning up the contaminated reactor building at the crippled Three Mile Island nuclear plant.
- 8. User interfaces, 1983.** Why should humans adapt to fit computers? Shouldn't computers adapt to fit humans? That was the attitude of CMU researchers, who applied design principles to computer science to develop better, easier-to-use interfaces.
- 9. Machine translation, 1984.** Every "Star Trek" fan knows about the universal translator. Scientists in CMU's Language Technologies Institute are moving those gadgets from science fiction to real life.
- 10. Mach kernel, 1985.** In computer-speak, a "kernel" is the heart of an operating system. At the core of all modern Apple devices — iPhones, iPads and MacBooks — is the Mach kernel, developed at CMU under the leadership of then-professor Rick Rashid.



CMU'S "BOSS" WON THE 2007 DARPA URBAN CHALLENGE ROAD RACE.



HERB SIMON AND ALLEN NEWELL, "FATHERS" OF ARTIFICIAL INTELLIGENCE, PONDER THEIR NEXT MOVES OVER A GAME OF CHESS.

- 11. Computer chess, 1990.** For many years, it was considered the "holy grail" of artificial intelligence for a computer to compete against the world's best chess players. Hitech, developed by CMU researcher Hans Berliner (CS'74), was the first computer to achieve grandmaster status, and CMU alumni helped develop "Deep Blue," the IBM machine that beat human chess champion Garry Kasparov in 1997.
- 12. Java, 1991.** As a CMU grad student, James Gosling (CS'83) worked on the Andrew project, which stressed interoperability between computers. Those lessons served Gosling well when he developed Java, the first programming language able to run on almost any platform.
- 13. Email attachments, 1992.** Steve Jobs liked the email system built into CMU's Andrew so much that he tried to hire Nathaniel Borenstein (CS'81,'85) and his team to create a similar program for Apple. Borenstein didn't take the offer, but he did like Jobs' idea about attaching documents to email. Borenstein went on to develop the MIME standard used by all email programs to send photos and other files over the Internet.
- 14. Web search engines, 1994.** The World Wide Web was still a toddler when CMU researcher Michael "Fuzzy" Mauldin (CS'83,'89) developed one of the first successful search engines, Lycos. It was the most-visited site on the Web by 1999.
- 15. Model checking, 1994.** CMU professor Edmund Clarke had long stressed the importance of verifying computer hardware and software through a formal problem-solving technique called "model checking." In 1994, his arguments gained new weight with the discovery that Intel's amazing new Pentium chip made errors on certain math problems. Clarke went on to receive the Turing Award for his role in the development of model checking.
- 16. CAPTCHAs, 2000.** Spam and malicious attacks were a growing problem on the Internet when hackers developed automated bots that could sign up for email and other Web services without human intervention. Luis von Ahn (CS'03,'05), Nick Hopper (CS'04), John Langford (CS'02) and CMU professor Manuel Blum invented a "Completely Automated Public Turing Test to tell Computers and Humans Apart," or CAPTCHA, to help foil the bots. A later variation, reCAPTCHA, is helping digitize old books and newspapers.
- 17. Robotic video cameras, 2001.** When Baltimore Ravens quarterback Trent Dilfer dropped back to pass, TV viewers of Super Bowl XXXV saw something they'd never seen before: the motion froze, and the view suddenly rotated to show Dilfer's opposite side. CBS called it Eyevision. The synchronized system of robotic cameras and advanced image processing was the brainchild of CMU's Takeo Kanade, one of many advances he pioneered in computer vision.
- 18. Self-driving vehicles, 2007.** CMU's early attempts at self-driving vehicles progressed at a crawl around Pittsburgh's Schenley Park in the late 1990s. But they were going full-throttle by the time CMU's self-driving SUV named BOSS won the 2007 DARPA Urban Challenge road race.

19. Thought reading programs, 2007.

Your brain reacts in different ways, depending on what words you're thinking about — ways that are measurable with magnetic-resonance imaging, or MRI, machines. CMU researchers Tom Mitchell and Marcel Just are decoding those brain scans and making progress at reading people's thoughts.

20. Kidney donor matching, 2008.

Organ transplants save lives every day, but more might be saved if it was easier to match recipients with donors who are unrelated. An algorithm developed by CMU scientists is close to enabling a nationwide network that would match living kidney donors with potential recipients whom they've never met.

21. RNA sequencing via videogames, 2010.

Thanks to crowdsourcing, science isn't just for scientists anymore. People without formal training in molecular biology are producing new insights into genetic encoding through a videogame called EteRNA, developed by researchers at CMU and Stanford, that lets players fold and shift RNA molecules to solve on-screen puzzles.

22. Language learning software, 2010.

Learning a second language has always been challenging, but a CMU spinoff called Duolingo is proving that it doesn't have to be expensive. Duolingo has developed language tutoring software that enables users to learn Spanish, English, Italian, German, Portuguese or French for free through its website and mobile apps. In the process, Duolingo users are helping to translate the Web.

23. Question-answering computers, 2011.

Searching the Web for information is rarely as simple as asking a question in plain English. So-called "question-answering" machines moved from laboratories to TV screens when an IBM computer called "Watson" defeated two human champions on the game show "Jeopardy!" At the heart of Watson was computer architecture developed by CMU's Eric Nyberg and his students.

24. Encrypting online information, 2012.

Credit card numbers and other data used online is safer thanks to an encryption scheme developed by CMU alumna Shafi Goldwasser (S'79). She shared the 2012 Turing Award for her role in developing practical encoding schemes that are difficult to break.

25. Smart, adaptable traffic signals, 2012.

Smart traffic lights developed at CMU's Robotics Institute are saving time and energy, and cutting down on the amount of air pollution created by idling cars. First rolled out in Pittsburgh's East Liberty neighborhood, the new signals are being studied around the country.

The Softer Side of Robotics

New Disney Movie Character Inspired By Inflatable Robotic Arm at CMU



CMU ROBOTICS PROFESSOR CHRIS ATKESON PRESENTS PRESIDENT SURESH WITH A PLUSH TOY VERSION OF DISNEY'S NEW MOVIE CHARACTER "BAYMAX," WHICH WAS INSPIRED BY AN INFLATABLE ROBOTIC ARM IN ATKESON'S LAB.

■ Byron Spice

When Director Don Hall saw a robot arm made of balloons at Carnegie Mellon's Robotics Institute several years ago, he knew instantly that Baymax, a pivotal character in a Disney animated feature, also would be an inflatable robot.

In the action-packed, comedy-adventure "Big Hero 6," a robot designed to care for humans is transformed into a fighter that joins a band of high-tech heroes. Among the cast of voices is

CMU alumnus James Cromwell (A'64).

Baymax, while fictional, reflects a growing field of research at CMU called soft robotics. CMU has hired two new professors who work in this area: Carmel Majidi and Yong-Lae Park.

"The movie is a tremendous win for soft robotics," said Chris Atkeson, professor of robotics. Mobile robots made from soft materials — fabrics, balloons,

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SCS Celebrates Silver Anniversary CONTINUED FROM PAGE ONE

From speech recognition to CAPTCHAs, self-driving cars to kidney donor matching, SCS has earned its recognition around the world as a leader in all facets of computer science and robotics education.

Though the school was created 25 years ago, the history of computer science at CMU began much earlier, in 1956, when Herbert Simon, Alan Newell and RAND's Cliff Shaw created the first artificial intelligence program — several months before the campus' first computer was installed. In 1958, Alan Perlis began teaching the first freshman-level computer programming course in the United States and, in 1961, the university began an interdisciplinary computer science Ph.D. program.

The Computer Science Department (CSD) was established in 1965 and, by the time SCS was created, had become a free-floating department. The new school, first proposed by Nico Haberman, head of the CSD, and then-Provost Angel Jordan, included the CSD, the Robotics Institute and the Center for Machine Translation, which later grew into the Language Technologies Institute.

The school did not include computer engineering, but was dedicated to a vision of computer science first espoused by Perlis, Simon and Newell — not just the theory and design of computers, but also "the study of the phenomena arising from them." SCS faculty and students thus have taken a broad view of computer science, with the school now also including the Human-Computer Interaction Institute, the world's first Machine Learning Department, the Institute for Software Research and

the Lane Center for Computational Biology.

In 1989, SCS had just 33 faculty members and 185 graduate students, with no undergraduates. It conducted \$39 million in sponsored research. Last year, SCS had 284 faculty members and a total student enrollment of nearly 1,700, including undergraduate, master's degree and Ph.D. students, and conducted \$124 million in research.

The undergraduate program, which began in the 1989-90 academic year, has been a particular success, SCS Dean Andrew Moore said.

"The trajectory and the career paths of the people coming out of that program are not just similar, they are strictly faster and superior to those from every other school in the world," said Moore, based on his experience as a Google vice president and on reports from colleagues at Facebook, DropBox and Microsoft.

"It's not just high IQ," he added during the SCS25 keynote event in October. "They can work together and get things done."

The undergraduate program also has distinguished itself in its diversity, with women representing 41 percent of this fall's first-year students. Nationally, the percentage of women graduating from U.S. computer science programs averaged just 14 percent last year.

Moore said the focus of SCS25, like the focus of the school, remains on the future and making lives safer and more meaningful.

"It's not just that it's fun to be building the future — it is," Moore said. "Here at Carnegie Mellon, we also feel a sense of earned responsibility for it."

Rising Star

Country Music Is Serious Business for Tepper Alum

■ Jordan Markley

Kenny Chesney was a valet. Toby Keith played football. Merle Haggard was in jail.

And Dan Smyers?

Before the rising country star took to the stage with songwriting partner Shay Mooney, the Dan + Shay guitar slinger studied finance at Carnegie Mellon University.

“It was very important to me to graduate and complete my education at Carnegie Mellon,” Smyers (TPR’10) said. “Being a musician, it’s not just learning the notes I get to play on stage. I’m basically running a small business here. A lot of the things I learned are very transferrable to what I do now.”

Smyers spent his high school years touring and cutting his teeth in the music industry. He always had a passion for learning, and when he was accepted to the Tepper School of Business, he knew it was time to dive back into school full time.

Though he did record a solo EP while he was at CMU, he spent most of his time in the classroom and the library, sometimes taking eight or nine classes in order to graduate in three years — while still taking a few precious electives in the College of Fine Arts.

One of his favorites was Jazz History, taught by two-time Grammy Award-winner Eric DeFade.

“That class was just incredible. Professor DeFade was awesome,” Smyers said. “You could just feel the energy by walking through the School of Music and School of Drama. There’s just so much talent and creativity going on there, producing so much awesome stuff. And the way that those schools operated was a little different from Tepper, which enabled me to broaden my horizons.”

DeFade was excited to learn of Smyers’ success.

“I remember Dan as an extremely conscientious and open-minded student,” DeFade said. “He was always willing to try new concepts.”



DAN + SHAY: DAN SMYERS (TPR’10) AND SHAY MOONEY.

Tepper School Professor Evelyn Pierce remembers Smyers from her Business Presentations class.

“In my day, we’d have said he was the one with ‘the coolest vibe’ — a very positive aura; simultaneously alert, involved and mellow. No surprise that he was an outstanding presenter. I’m thrilled that he’s found a way to share that energy with others,” Pierce said.

“He should know that I still have all his PowerPoint decks, but I promise never to sell them to any rabid fans,” she added. “Lucky us at CMU to be able to say, ‘We knew him when.’”

Smyers’ creative energy drove him to Nashville after graduation. But the path between Tepper and the Nashville limelight wasn’t smooth.

“It was tough roughing it for a few years because the degree from Carnegie

Mellon is so valuable,” Smyers said. “Especially at first, but I knew I was passionate about it, and you know I just kept grinding and living out in Nashville.”

That work paid off.

Dan + Shay’s formation and almost overnight success has the ring of Music City folklore. The duo first sang together at a mid-winter party, under a tent Smyers and his roommates had constructed. At the time, they were volunteering for medical studies and taste testing pizzas to make a living.

Less than a week after meeting Mooney, the duo’s first song was optioned by Rascal Flatts. Months later, they were cutting an album they co-wrote with Music Row stalwarts Danny Orton, Rhett Atkins and Ben Hayslip.

Dan + Shay received nominations

this year for Vocal Duo of the Year (American Country Music Awards), Duo Video of the Year (Country Music Television Awards), and Vocal Duo of the Year (Country Music Awards).

After a summer of opening for Hunter Hayes and Blake Shelton, Dan + Shay are now headliners on their own tour, “Where it All Began.” Thanks to his time at Tepper, Smyers can partner with managers to make sure they grow their brand and business the right way.

“When I talk about it with our manager and our business manager, they say that it’s cool to work with someone who understands these things, the investments and savings,” Smyers said. “I’m very thankful that I can keep track of that, where our business is and how we’re growing.”

Just Breathe

Room Promotes Meditation, Relaxation

■ Kelly Saavedra

Here comes the hustle and bustle of the holiday season. It’s a time of planning, preparing food, shopping for gifts, visiting with friends and family ... and a whole lot of stress.

So, take a break from the chaos and give yourself a gift by visiting Carnegie Mellon’s Mindfulness Room. Located on the first floor lounge of West Wing, between Margaret Morrison Carnegie Hall and Gesling Stadium, the Mindfulness

Room has a peaceful décor designed to help you relax, recharge and, well, just breathe.

Walls painted a soft, banana-creamie yellow and sparsely decorated with inspiration surround this cozy space, which is populated with plenty of pillows for meditating — a practice many regard as an anchor in life’s storms.

“If we observe our daily lives, most of it is spent reacting to external circumstances,” said Hari Chandan CONTINUED ON PAGE NINE



MEDITATION SESSIONS ARE HELD IN THE MINDFULNESS ROOM ON THURSDAY EVENINGS DURING THE SPRING AND FALL SEMESTERS.

Top Brass

CMU Staff at Roots of Popular Pittsburgh Ensemble

■ Kelly Saavedra

From the feel-good vibe of 1950s Swing to the solemn sound of “Taps” at military funerals, brass instruments in capable hands can eloquently express the range of human emotions.

“Brass is just incredibly versatile, and very similar to the human voice,” said trumpet player David Gardner (A’13), an administrative assistant in CMU’s Department of Individual Giving. “For me, being a brass musician is the equivalent of being fluent in another language, one that’s universal. It’s a means of expressing our humanity. It’s how we cope.”

Hearing his dad play trumpet in church on Sundays and observing the impact it had on the congregation lit the fire in Gardner to follow suit.

“That sound — the power of it — I wanted to have that capacity to play lyrically like he did and, frankly, blow the house down,” Gardner said.

Gardner’s dream is now his reality. He is a co-founding member of The Brass Roots, a collection of Western Pennsylvania’s finest brass musicians quickly growing in popularity in Pittsburgh. Through dynamic musicianship and innovative programming — including a live Twitter feed, meet-and-greets and leaving the lights on during performances — the group is taking classical music and packaging it in a way that makes it more accessible to concert-goers.

“Classical music is often viewed as stodgy because you have to sit in a seat and stay quiet the entire time. It’s difficult to be engaged when you’re in a roomful of quiet people all sitting in the dark,” Gardner said. “There is a clear barrier between musicians in the classical realm and their audience, and our goal is to get rid of that barrier.”

For non-aficionados, the 13-piece ensemble can be compared to a human chorus. It consists of:

- a trumpet section (representing the soprano vocal range);



THE BRASS ROOTS (ABOVE) POSE IN FRONT OF THE COLLEGE OF FINE ARTS BUILDING. (LEFT TO RIGHT) DAVID GARDNER (A’13), KENTON BANDY, KYLE ANDERSON (A’14), JONATHAN SPEEK (A’14), CHRISTOPHER PEARLBERG (A’14), HENRY ATTAWAY (A’14), MIKE DORATO, MORGAN WYNN (A’15), DEBORAH MCDOWELL (A’13), AND JOSEPH HUGHES (A’14). NOT PICTURED: CARLOZ GIL (A’15).

- a French horn section (alto vocal range);
- trombone (tenor vocal);
- euphonium (a “baby tuba,” also tenor); and
- tuba (bass).

Jonathan Speek (A’14), a payroll clerk in CMU’s Payroll Services Department, is the group’s tuba player. He spoke of a successful turnout when they invited one audience to join them at a local restaurant after a performance.

“We’re always trying out new ideas to engage our audiences,” Speek said. “And just so you know, tailgating is not off the table.”

The Brass Roots hold the distinction of being the first ensemble-in-residence at Soldiers and Sailors Memorial Hall in Oakland. Their unique sound has earned them recent television appearances on KDKA and WQED, and a polished reputation means members get requests to play with the Pittsburgh Symphony Orchestra, Pittsburgh Opera and River City Brass Band when a need arises.

“We are always working,” said Gardner, who got his first big opportunity as an undergrad in the form of a brief tour with Barry Manilow.

“A lot of the opportunities we receive are the result of being in the right place at the right time,” Gardner said, “but you also have to be able to perform at the highest level on any given day.”

For a brass musician, that means regular physical exercise to keep facial muscles, finger dexterity and lung capacity in tip-top shape.

“Tuba, in particular, requires a lot of air,” Speek said.

So, he goes running. A lot.

In a place like East Liberty Presbyterian, one of several local churches that have established a partnership with the ensemble, the effort pays off.

“East Liberty Presbyterian is an amazing space,” Speek said of the church’s European-style architecture and stellar acoustics. “It’s really epic. The organ in there is amazing, and the

organist is very, very good. The space was treated acoustically to be able to handle organ, which is very similar to brass acoustically, so it’s an ideal venue for us.”

Speek began playing tuba in middle school, when he was handed down his older brother’s professional-level instrument and lessons with prominent players.

“For some reason, the tuba was cool to me,” he said. He soon learned not everyone shared his opinion.

“I was watching MTV one time when I was younger, and they had a ‘sexy’ meter for the different instruments,” Speek recalled. “Guitar raised the needle all the way to the maximum. Drums came in right behind the guitar. Flute received kind of a quiver. And then the tuba gave the needle just this, like, little bump.”

He laughed.

“Looking back, I think, ‘wow, I could have chosen *anything* else.’”

For upcoming performances and tickets, visit The Brass Roots website at www.thebrassroots.com.

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Mantripragada, who earned a doctorate in engineering and public policy from Carnegie Mellon in 2010 and leads guided meditation sessions in the Mindfulness Room on Thursday evenings during the spring and fall semesters.

“Meditation is a tool that helps us anchor ourselves to our inner peace, making us less dependent on external stimuli, however intense they may be. We become truly free and find more fulfillment in our lives,” he said.

Mantripragada’s sessions typically draw anywhere from 10 to 20 people. He begins each session with a brief descrip-

tion of the two styles of meditation that he will guide participants through, mindful (pun intended) of newcomers or those who may be returning after a gap.

The first style of meditation involves rhythmic breathing, chanting, emptying the mind and filling the mind with positive things. The second style, which also calls for rhythmic breathing but in a different way, teaches awareness of the body and focusing and holding attention on an image.

“There is no rush, and an all-pervading calm hangs over the room the whole time,” said Kunal Ghosh, assistant head for Undergraduate Affairs and a teach-

ing professor of physics, who regularly attends the meditation sessions. “I feel more agitated on the days when I don’t meditate. On the days when I do meditate, I find myself less quick to respond emotionally to negative words or acts, if I even choose to respond at all.”

Ghosh added, “I also find that my brain remains very fine-tuned after I meditate, and my concentration in any task I use it for, even solving a physics problem, increases quite a bit.”

David Creswell, a professor of psychology at Carnegie Mellon, recently wrapped up a study on mindfulness meditation — the act of staying focused

on experiencing the present moment.

His experiment involved study participants who gave speeches and performed difficult arithmetic under harassing conditions. He found that three consecutive days of mindfulness meditation practice for 25 minutes each day reduced their psychological stress.

Creswell meditates regularly and thinks of it as exercise for the mind — the more you do it, the bigger the benefits.

“I have been so delighted to see the Mindfulness Room become available to the campus community,” Creswell said. “Everyone should check it out.”

Eberly Center Helps Teachers with Student-Centered Approach

■ Stephanie Magulick

It's a different kind of scientific laboratory. There are no bubbling beakers, test tubes or microscopes. The students are teachers. And the science is learning.

The Eberly Center for Teaching Excellence and Educational Innovation at Carnegie Mellon aims to improve teaching by focusing on the student. The center provides faculty and graduate students with the framework and support to design and implement new teaching methods that have been proven to be effective.

"We have always taken a student-centered approach, in which teaching focuses on creating the contexts and experiences through which students learn, rather than transmitting information to students," said Marsha Lovett, director of the Eberly Center for Teaching Excellence and a professor of psychology.

Lovett provided opening remarks on recent developments in Learning Sciences at the IEEE Professional Communication Society Annual Conference in October, which was hosted by Carnegie Mellon's Department of English and College of Engineering.

Carnegie Mellon English professors Suguru Ishizaki and Necia Werner co-chaired this year's annual conference. The theme, "Meeting Grounds: Lifelong Learning from Classroom to Workplace," highlighted the cross pollination of ideas.

Over the past two years, the number of faculty and graduate students seeking teaching consultations with the Eberly Center has doubled to more than 200 in the last academic year. By using an evidence-based approach, instructors are able to leverage technology to enhance student learning.

Last year, the Eberly Center launched a new series titled "Spotlight



MARSHA LOVETT IS THE DRIVING FORCE BEHIND CMU'S EBERLY CENTER FOR TEACHING EXCELLENCE.

on Innovative Teaching," in which CMU faculty from across campus came together to discuss colleagues' teaching innovations, such as "flipping the classroom" and "teaching with clickers."

In a "Flipped Classroom," students' initial exposure to content is obtained outside of the classroom through readings, instructional videos, individual or collaborative activities, or a combination of these. Then, in the classroom, a significant portion of the time is used for practice, application exercises, discussion-based activities, team-based learning and other active learning techniques.

"It was nice to point out to [students] that they were really able to do a lot of learning on their own, in a way that I think a lot of students don't believe they can," said Associate Teaching Professor of Philosophy Mara Harrell in a testimonial on the Eberly Center website.

In another testimonial, Assistant Teaching Professor of Computer Science Charlie Garrod said, "When you flip a course, you close the feedback loop every day. It is an amazing experience to watch your students work and to see exactly what it is they are struggling with."

With clickers, instructors are able to pose questions to students

and immediately collect and view the responses of the entire class. After the instructors present multiple-choice questions, students click in their answers using remote transmitters. The system instantly collects and tabulates the results, which instructors can view, save and display anonymously for the entire class to see.

The center also works closely with faculty and graduate students to help them identify their strengths as teachers and to jointly devise strategies to improve their teaching and course development.

Lovett is the force behind the Eberly Center. Her research focuses on how students learn, memory and problem-solving, and she applies the theoretical and empirical principles of cognitive psychology to help instructors improve their teaching.

"The work I do at the Eberly Center is helping to bring the research from the Learning Sciences across the world into our practice here at CMU," said Lovett. "We distill the research on learning for faculty and graduate student instructors and collaborate with them to design and implement meaningful educational experiences."

The Eberly Center is a key component of the Simon Initiative. Launched last year by President Subra Suresh, the Simon Initiative aims to leverage CMU's decades of learning data and research into how students learn to improve outcomes for students everywhere.

The Eberly Center also supports and advances the ProSEED Simon Initiative Faculty Seed Grants program, which allows CMU faculty to pursue projects aimed at improving student learning outcomes through technology.

Perhaps Herb Simon, CMU's late Nobel Laureate and pioneering educator for whom the Simon Initiative is named, said it best.

"Learning results from what the student does and thinks and only from what the student does and thinks. The teacher can advance learning only by influencing what the student does to learn," Simon said.

Lovett was one of many CMU faculty members at this year's IEEE conference. Others were:

Joanna Wolfe – Director, Global Communications Center

Necia Werner – English professor

Suguru Ishizaki – English professor

Stacie Rohrbach – Design professor

Barbora Batokova – SEI UX Strategist

Todd Waits – SEI Digital Media Forensics Specialist

Anne Connell – SEI Interactive Design Team Lead

Constantine Cois – SEI Senior Network Software Developer

Joseph Yankel – SEI Java Developer

Janel Miller – CEE Assistant Teaching Professor

New Disney Movie Character Inspired By Inflatable Robotic Arm at CMU

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light plastics — offer advantages over metal robots, including lower weight, lower cost and greater safety when operating near people, he noted.

In the public mind, robots are almost universally metal — whether they be the industrial robots assembling cars or the robots of popular science fiction, such as WALL-E. In the future, some robots will be wearable, others disposable.

"I think this movie will be inspirational for a lot of people," Atkeson added.

At CMU, researchers are proving that these soft robots can do real work while developing technologies, such as artificial muscles, touch sensors and pressure-sensitive skins, that will make them practical.

Park, assistant professor of robotics, is working with Atkeson to develop a lightweight robotic arm that will use balloon-like artificial muscles and use balloons as exterior cushions.

Park also is developing new types of soft sensors and soft actuators for controlling robotic devices, as well as devices that could be used to compensate for limb disorders or to extend human capabilities.

The inflatable robotic arm that proved so inspirational to Hall was developed in Atkeson's lab by Siddharth Sanan, then a graduate student.

"We did not invent the idea of an inflatable robot arm," Atkeson said. "What we wanted to know was — how do we make it practical?"

A project within CMU's Quality of Life Technology (QoLT) Center, the team was particularly curious to learn whether an arm of balloons could do work that required a high degree of safety — giving a patient a sponge bath, for instance, or feeding a patient.

The QoLT Center is focused on research in assistive robotics and other human-computer systems that can support people in everyday living. Examples include personal robots that serve people at home such as HERB, the Home Exploring Robot Butler; computerized coaches for rehabilitation and support in daily functional tasks; and a range of technologies that either extend or enhance the care of professional and informal caregivers.

Health care is a natural application for inflatable robots; robots made of soft materials are less likely to cause injury. But Sanan also emphasizes that inflatable robots could be exceptionally portable — something that could be stowed in a backpack, for instance, or launched into space as a small package.

"We also are looking at cheap ways of making robots," Atkeson said. "One way is to steal from the clothing and toy industries, which already know how to make stuff inexpensively."

He said that fabrics and plastics are inexpensive and cutting them and joining them by melting, gluing and sewing is something accessible to lots of people.

"We're going to make Home Ec hot again," he added.

Building a More Resilient Pittsburgh

Forum Marks SEER's 10th Anniversary

■ Erika Ninos

Another winter is at Pittsburgh's door, and residents are already discussing how to deal with the effects of extreme temperatures and water infrastructure woes that plague the city.

Top of mind at a campus forum in October was "Building a More Resilient Pittsburgh," co-hosted by the Steinbrenner Institute for Environmental Education and Research (SEER) in partnership with the City of Pittsburgh and CMU's Program for Deliberative Democracy.

The distinguished panelists included CMU Professor Peter Adams; SEER Faculty Director Neil Donahue; CMU Research Scientist Kelly Klima; Fred Brown, associate director for development at the Kingsley Association; and Grant Ervin, sustainability manager for the City of Pittsburgh.

The forum kicked off with introductory remarks from Donahue on global warming and its potential effects locally; the financial and health co-benefits of policies designed to reduce greenhouse gas emissions; and an overview of environment-related research from CMU's Department of Engineering and Public Policy.

Nearly 100 students, community members, faculty and staff then broke into moderated, small-group discussions about extreme temperatures and water infrastructure issues.

Many of the discussions focused on the idea of the Community Clean Water Fund currently being considered by the city. This fund would support green infrastructure projects city-wide and would provide incentives for developers and homeowners to increase the amount of green space on their properties.

One group of student participants raised questions about what student residents who may have no long-term ties to the region could do, and perhaps more importantly, why students who may only live in the area for four to six years should feel obligated to do anything at all in their adopted home on the Carnegie Mellon campus?

Their questions were answered by community activist and Kingsley Center Associate Director Fred Brown, who spoke about a "moral obligation" to be aware of your impact, whether you live on campus or in a neighborhood and whether you live in an area for six months or six years.

As the Steinbrenner Institute continues its 10th anniversary celebration, it hopes to accelerate further discussions of environmental challenges while presenting opportunities to face those challenges through CMU's unique blend of interdisciplinary culture and experience.

Steinbrenner Institute Sows Impact Through Education

■ Erika Ninos

When Carnegie Mellon Trustee Lowell Steinbrenner and his wife, Jan, founded the university's Steinbrenner Institute for Environmental Education and Research (SEER) in 2004, they committed the institute to changing how the world thinks and acts with regard to the environment.

Ten years later, SEER looks back on its cultivation of ideas and programs that continue to make an impact on environmental education and research.

- SEER's Media Fellowship program, which began in 2005, has brought over 40 high-profile print, TV, radio and Internet environmental journalists to Pittsburgh, broadening their horizons on environmental challenges and teaching them about CMU's environmental research.
- SEER's Graduate Fellowship program, instituted in 2007, has supported 31 doctoral students conducting interdisciplinary research in four of the university's colleges, and expanded in 2014

to include a CMU Presidential Graduate Fellowship in Sustainability Science.

- A diverse array of student initiatives and organizations focused on environmental education and sustainability are supported through Steinbrenner Environmental Education Development (SEED) grants. Since 2007, SEER has given over \$50,000 to student and faculty projects across campus.
- SEER's U.S. Environmental Sustainability Ph.D. Fellowship program, which began in 2011, has supported seven Ph.D. fellows studying topics related to U.S. environmental resource sustainability.
- SEER's annual Environmental Expo began in 2012, providing a forum in which students and faculty can learn about the full range of environmental research, performance, design, studio/art projects and student sustainability initiatives.
- SEER continues to co-sponsor the biannual Engineering Sustainability Conference with the University of Pittsburgh's Mascaro Center for Sustainable Innovation. The international conference draws hundreds of engineering, sustainability and policy professionals "to Pittsburgh for workshops."
- The SEER sponsored Distinguished Lecture Series in Environmental Science, Technology and Policy continues to bring experts in topics as diverse as climate change, food and agricultural policy, and risk analysis to campus for public lectures and forums.
- Richard and Jordan Landers enabled SEER to develop and implement curricular modules focused on climate change that will be woven coherently throughout required courses in undergraduate majors, starting with chemical engineering. The objective is for all graduating CMU students to "be climate literate."

For Your Benefit



CARNEGIE MELLON HELD ITS ANNUAL BENEFITS AND FITNESS FAIR EARLIER THIS MONTH, WHEN FACULTY, STAFF AND STUDENTS HAD THE OPPORTUNITY TO HEAR FROM HEALTH CARE PROVIDERS, REPRESENTATIVES FROM HEALTH AND WELLNESS PROGRAMS AND FITNESS VENDORS, AND ALSO TAKE PART IN FREE HEALTH CARE SCREENINGS.

ALSO ON HAND WERE REPRESENTATIVES FROM COMPANIES AND ORGANIZATIONS THAT OFFER DISCOUNTS AND OTHER PERKS TO MEMBERS OF THE CMU COMMUNITY THROUGH STAFF COUNCIL'S CMU PERKS PROGRAM. CMU EMPLOYEES CAN RECEIVE SPECIAL OFFERS FROM COMPANIES SUCH AS AT&T WIRELESS, CITIZENS BANK, THE HILTON GARDEN INN UNIVERSITY PLACE, HOWARD HANNA REALTY, ENTERPRISE RENT-A-CAR, PNC BANK, SPRINT, T-MOBILE AND VERIZON WIRELESS, AND DISCOUNTS ON NEW GM AND FORD VEHICLES.

FOR MORE INFORMATION ABOUT CMU PERKS, VISIT THE STAFF COUNCIL WEBSITE AT WWW.CMU.EDU/STAFF-COUNCIL/INDEX.HTML.

CMU Crowdfunding

New Program Takes School Projects to the People

■ Bruce Gerson

If students have a university-related project, or an idea for one, but need funding to get it going, there's a new program at Carnegie Mellon that just might fit the bill. Or help pay the bill, actually.

CMU Crowdfunding, sponsored by University Advancement through the Office of Alumni Relations & Annual Giving, is designed for students and student organizations to pitch their projects — and funding goals of between \$2,000 and \$10,000 — to the university community and the public at large via social media, including videos and text similar to crowdfunding efforts like Kickstarter or Indiegogo.

Projects are posted to the Web at www.crowdfunding.cmu.edu for a 30-day period, during which individuals can donate funds directly to the project via credit card. Payments are processed through CyberSource, a secure payment processing system used by Carnegie Mellon.

"CMU Crowdfunding is beneficial to the individual or group seeking support and to the donors as well," said Mary Ann McCollough, director of Constituent Insights and Business Operations for Alumni Relations & Annual Giving. "The program allows individuals and organizations to state their case directly to the public and donors to know exactly where their gift is going."

McCollough said the university's Office of Alumni Relations and Annual Giving will coordinate a review commit-



tee to select about five to six projects every 30 days for participation from among the applications received from the student community.

"Projects selected cannot be funded by existing operating budgets in any form," McCollough said. "They also must be upcoming projects. Funds cannot be used to reimburse projects already completed."

The first five initiatives selected were recently posted online. They'll be live until Dec. 16. The projects are:

- Carnegie Mellon's swimming and diving team, led by Nicole Crimi (DC'15), is raising money to help fund its annual winter training trip to the Charles Hadley Aquatic Complex in Miami; their goal is \$8,000;

- The Catholic Newman Club, led by Luke Tsai (E'16), is seeking funding to send members on a spring retreat and mission trip; their goal is \$2,500;
- Lily Daigly (DC'16) and CMU's chapter of Camp Kesem, a nonprofit organization that runs one-week summer camps for children in families affected by cancer, is raising money to support campers between the ages of 6 and 17; their goal is \$7,500;
- Daniel Mathews (A'15) and fellow School of Drama students are raising money to support a June trip to the Prague Quadrennial of Performance Design and Space, often called the Olympics for theatre designers, in the Czech Republic; their goal is \$10,000; and

- The CMU Global Medical Brigades, led by Jeremy Applebaum (CS'16), is seeking funds to purchase medication and health care supplies to take to Nicaragua, where they will help set up medical clinics in rural communities; their goal is \$5,000.

"The groups will receive all the funding, even if the dollar goal is not achieved," McCollough said. "If the funds raised exceed the goal, the group will receive all the funding with the expectation that the funds will be used for the project. There is no administrative or processing fee," she said.

McCollough said the gifts go directly to the project and not the university, so they are not tax deductible, or eligible for matching gifts. However, she said the gift would count as a gift toward the CMU Annual Fund, and donors will be recognized as CMU donors.

To apply to the program, interested parties must complete a short application and submit it to crowdfunding@andrew.cmu.edu.

If selected, project leaders must agree to attend an orientation session, develop and maintain website content and a short video (2-3 minutes), develop an email list of at least 100 individuals prior to the launch of the project, spend all funds toward the project as outlined in the proposal, provide updates on their progress and meet all deadlines outlined by the review committee.

Zoom, Zoom!



PHOTO COURTESY OF THE COLLEGE OF ENGINEERING

MECHANICAL ENGINEERING ALUMNI ANDREW CHARTERS (E'10) OF CHIP GANASSI RACING AND MIKE SEREBRENNIKOV (E'12) AND MANA HESHMATI (E'11) OF FORD MOTOR COMPANY (L-R) VISITED CAMPUS EARLIER THIS MONTH TO ENGAGE WITH STUDENTS AND TO SHOWCASE GANASSI'S RACECAR TECHNOLOGY DURING THE COLLEGE OF ENGINEERING'S FORD DAY ON NOV. 7.

AS PART OF THE ACTIVITIES, FOUR STUDENTS WERE AWARDED FORD BLUE OVAL VEHICLE TEAM SCHOLARSHIPS RECOGNIZING THEIR ACADEMIC ACHIEVEMENTS. RECIPIENTS WERE MECHANICAL ENGINEERING SOPHOMORE MILES SMITH AND JUNIOR GUOCHEN SHEN, AND ELECTRICAL AND COMPUTER ENGINEERING SOPHOMORE BRIAN KHOURY AND JUNIOR SHEPHARD EMERSON.