



the PIPER

CMU'S NEWS SOURCE FOR FACULTY & STAFF

6/14 ISSUE

Carnegie Mellon University

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INTRIGUING SOLUTIONS TO MEDICAL
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CMU Takes Center Stage at Tony Awards

■ Piper Staff

From Carnegie Mellon's partnership with the Tony Awards and its first prime-time TV commercial to alumni presenters, nominees and Tony recipient, CMU had a leading role in the star-studded spectacular that was the 68th Annual Tony Awards®, presented by the American Theatre Wing and The Broadway League.

Alumna Jamie DeRoy (A'67) took

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Twists and Turns of Time

Team Creates Smartwatch Prototype

■ Kelly Solman

The time for smartwatches has arrived.

Carnegie Mellon's Future Interfaces Group is exploring wearable technologies to make information and communication even more accessible.

"For highly glance-able information such as notifications, directions, an upcoming meeting or your calendar, our smartwatch is much less distracting [than looking at a Smartphone], and it's much less socially intrusive," said Chris Harrison (CS'13), an assistant professor in CMU's Human-Computer Interaction Institute and director of the Future Interfaces Group.

Harrison and doctoral student Robert Xiao recently demonstrated the

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CMU-Rwanda To Graduate First Class



STUDENTS ESTHER KUNDA, ANDREW KINAI, ALAIN SHEMA AND MERAB TWAHIRWA (L-R) ARE AMONG THE FIRST 22 GRADUATES OF CMU IN RWANDA. WHILE COMPLETING THEIR MASTER'S DEGREES ON THE PITTSBURGH CAMPUS THEY DEMONSTRATED THEIR SCHOOL PRIDE WITH A UNIVERSITY TRADITION — PAINTING THE FENCE.

■ Kelly Solman

Merab Twahirwa (E'14) and three of her classmates from the inaugural class at Carnegie Mellon in Rwanda were given the opportunity to complete the coursework for their master's degree in information technology in Pittsburgh.

While they were in the city, they paid homage to the first-of-its-kind program in Africa via one of CMU's most popular traditions — painting the Fence.

"We wanted to paint Carnegie Mellon in Rwanda and the link to our website on the Fence so that more people can learn about CMU's presence in Rwanda," Twahirwa said. "Rwanda is an exciting place to know, and Africa is growing fast. IBM, Phillips and GE are already setting up offices there. I think people should know what opportunities there are at CMU in Rwanda."

Twahirwa and 21 others will graduate from CMU in Rwanda's Master of Science in Information Technology

program on July 24.

Accustomed to serving the Rwandan community, Twahirwa was thrilled to participate in CMU's 1000Plus day of community service by helping to plant trees on Pittsburgh's riverfront.

"Back home in Rwanda, on the last Saturday of every month, people do community work just like this. So it was exciting to do something similar in Pittsburgh," she said.

She said she felt the same CMU

spirit of innovation and work ethic in Pittsburgh that she had come to know in Rwanda. It made her feel at home.

"I worked just as hard at CMU in Rwanda, so I didn't think classes in Pittsburgh were too much work and I didn't feel lost or out of place," Twahirwa said. "I think it was a really good idea for CMU to come to Rwanda because they are developing the capacity of people in Africa to solve

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home her second consecutive Tony Award as a producer for the winner of the Best Musical, “A Gentleman’s Guide to Love and Murder.”

“Congratulations to Jamie on winning a 2014 Tony Award,” said CMU President Subra Suresh. “It’s always exciting to see Carnegie Mellon alumni be recognized for their outstanding contributions to Broadway and the American theatre. This is another example of how, for 100 years, CMU’s School of Drama has prepared and supported talented individuals, both on stage and off, to reach the highest levels of their profession. The entire CMU community is very proud to celebrate with Jamie.”

Previous theatre producing credits for DeRoy include dozens of shows, among them Tony Award winners “Vanya and Sonia and Masha and Spike” in 2013 and the revival of “The Norman Conquests” in 2009.

Carnegie Mellon also took center stage as the first, education partner of the Tony Awards. Alumni Matt Bomer (A’00) and Zachary Quinto (A’99) announced the partnership during the broadcast before millions of viewers on CBS.

As part of the exclusive higher education partnership, CMU and the Tonys will present The Tony Honor for Excellence in Theatre Education Presented by Carnegie Mellon University during next year’s telecast.

Carnegie Mellon premiered its first prime-time television commercial during the show. The 30-second animated spot, which highlights CMU’s success in the arts, business,



STUDENTS, ALUMNI, FRIENDS AND STAFF OF THE UNIVERSITY MET OUTSIDE RADIO CITY MUSIC HALL SUNDAY, JUNE 8, TO SEE THE MORNING DRESS REHEARSAL OF THE TONY AWARDS.



MATT BOMER (A’00) AND ZACHARY QUINTO (A’99) REHEARSE THEIR PRESENTATION ABOUT CMU’S PARTNERSHIP.



COLLEGE OF FINE ARTS DEAN DAN MARTIN AND HIS WIFE, CHERYL PINTO, POSE ON THE RED CARPET.



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sciences and technology, aired twice during the Tony broadcast. Tony Award winner Billy Porter (A’91) recorded the voiceover.

Hosted by Tony Award winner, Academy Award®-nominated and Golden Globe®-winning actor Hugh Jackman, the Tony Awards also featured appearances by Patrick Wilson (A’95) and Judith Light (A’70).

Recognized for excellence in acting, producing, sound and lighting, this year’s Tony Award nominees reflect the breadth of drama education at CMU, and the range of impact alumni are having on the Broadway stage.

The other 2014 Tony Award nominees were:

- Peter Hylenski (A’97), Best Sound Design of a Musical, “After Midnight”
- Leigh Silverman (A’96), Best Direction of a Musical, “Violet”
- Cherry Jones (A’78), Best Performance by an Actress in a Leading Role in a Play, “The Glass Menagerie”
- Paula Wagner (producer), Best Play, “Mothers and Sons”
- Sutton Foster, Best Performance by an Actress in a Leading Role in a Musical, “Violet”

The awards ceremony was highlighted by selections from various productions that included CMU alumni. Performing were Daisy Hobbs (A’10) in a selection from “Aladdin,” Andrew Kober (A’06) in an act from “Les Miserables” and Kaleigh Cronin (A’11) in “Cabaret.”

Nominations for the Education Honor will be open to the public and accepted starting this fall at tonyawards.com and cmu.edu. For more information visit <https://www.facebook.com/tonyeduhonor>.

Presidential Scholarships/Fellowships To Help Attract the Best and Brightest

■ Piper Staff

Carnegie Mellon President Subra Suresh heard what folks had to say and he's doing something about it. He recently announced the creation of endowed Presidential Fellowships for graduate students and Presidential Scholarships for undergraduates.

"This project is a direct outcome of the numerous suggestions and comments I received from the CMU community during my listening tour," Suresh said in an email to the university community. "It seeks to address one of the most pressing challenges for CMU as we compete globally to attract the best and the brightest students, as well as attract and retain the faculty who mentor them."

President Suresh said that during the course of the past several months, the university has established a permanent endowment pool of about \$30 million, which will fund many Presidential Fellowships/Scholarships per year in perpetuity. Commitments for these endowment funds have been secured from individual donors, alumni, CMU trustees, CMU faculty and philanthropic organizations.

The initial gifts of \$30 million will form the nucleus of an endowed fund that the university will build upon in the years ahead. These funds will exist

to help provide support for graduate and undergraduate students, including top applicants and those with significant financial need.

"Building a significantly greater permanent endowment to provide sustained financial resources for these fellowships and scholarships will remain a priority project for the university for years to come," Suresh continued. "I am enormously grateful to all those who have made possible this new and substantial endowment for student support through their generous contributions."

The Presidential Fellowships and Presidential Scholarships will be among the most competitive and prestigious awarded by the university. They will have a number of distinguishing features:

- Presidential Fellows will be selected annually through a process overseen by the provost that invites nominations from the department heads and deans of the schools and colleges at the university. The Office of Undergraduate Admission will orchestrate support for the Presidential Scholars with input from the provost and the deans.
- The designation Presidential Fellow or Presidential Scholar will recognize

the high accomplishments of the students selected for these awards. It will symbolize a record of distinction and the potential for further excellence.

- These fellowships and scholarships will be named after donors and benefactors to recognize their generosity and commitment to Carnegie Mellon.
- Students receiving the Presidential Fellowships and Scholarships, their faculty and staff mentors, and the donors who make these awards possible will be recognized each year in a special event hosted by the university president. This event will highlight the academic work being performed by the fellows and scholars.
- Presidential Fellowships will help increase the academic options for graduate students by allowing their work to transcend traditional academic barriers by affording them the opportunity to explore a range of research areas before selecting their research focus.

A full list of the inaugural cohort of donors of Presidential Fellowships and Scholarships along with further information about the fund will be announced in the months ahead.

CMU-Rwanda's First Class

CONTINUED FROM PAGE ONE

their own problems."

Bruce Krogh, director of CMU in Rwanda and professor of electrical and computer engineering, said, "We are very happy that four of our first graduates were able to complete their program in Pittsburgh. They got to take advantage of the wealth of courses offered there, and they helped promote awareness of the unique opportunities our students have in Rwanda to be educated in the context of the explosion of technology and innovation happening in Africa today."

Michel Bézy, associate director of CMU in Rwanda and a distinguished service professor of engineering and public policy, said the kind of interaction that the students have at CMU in Rwanda is special.

"We feel very good about the quality of the education we deliver at CMU in Rwanda," Bézy said. "Our students get the opportunity to apply what they learn inside local companies, analyzing their markets and providing advice on strategic use of digital information in enterprises. Then, they do an internship at a local company in Africa. And finally, they work together in teams of three or four and solve a practicum submitted by the industry. We keep the bar very high. We push them to their limits to show them what they can do."

Twahirwa agreed, noting that faculty members are helpful in many ways.

"Our faculty members understand that Rwandan students have different challenges as a result of their background, and they show you that you can achieve much more than you might think," Twahirwa said.

Twahirwa arrived in Pittsburgh for her final semester of the two-year program with classmates Alain Shema (E'14), Esther Kunda (E'14) and Andrew Kinai (E'14).

"Enrolling in the program was a risk, but it has paid off. It has been worth it. It was something new, so you didn't know if it would work out, but the opportunity came at the right time for me," said Kinai, who is now interviewing for jobs.

"I always tell people, if you can come to CMU in Rwanda, it's a big opportunity. The way the courses are structured, it's relevant in terms of where we are in Africa today," Kinai said.

From her CMU education, Twahirwa said she gained a solid understanding of technology, business, innovation and the sustainability of those innovations, and how to scale them and create jobs for Africans.

"I love the culture of Africa. It might be a challenge for some people because there are many languages there, but it's exciting to me. People are very welcoming, and when you bring innovation that matters to them, they are willing to accept it," she said.

ProSEED Grants Fund Good Ideas

■ Piper Staff

Carnegie Mellon faculty, students and staff are full of new and good ideas — ideas to enhance teaching and learning with technology, to enrich quality of life through novel connections/collaborations and more.

Two new ProSEED grant programs aim to support a lively collection of these ideas in and outside the university.

In the first cycle of these seed grant programs, 12 grants (of 42 submitted) will go to faculty for technology-enhanced learning projects awarded as part of the university's Simon Initiative.

Eighteen grants (of 29 applications) will go to the ProSEED Crosswalk program for projects that sit at the intersection of disciplines or communities, demonstrate creativity and entrepreneurship, and enhance quality of life. The ProSEED/Crosswalk program also provided five supplemental grants to the Small Undergraduate Research Grants and GradUate Small Project Help programs aimed at supporting cross-disciplinary student research teams.

"These seed funds are designed to stimulate creative collaborative thinking across campus through a variety of approaches and linking various disciplines," said President Subra Suresh, architect of the seed grant programs.

"Many new and worthwhile ideas have been generated by applicants from every college for both Crosswalk and Simon, and I look forward to seeing the impact they will have."

Grants were selected by committees representing a range of university communities and academic interests. Funding for the ProSEED programs will begin this summer.

Examples of the ProSEED/Simon Initiative seed grants include:

- Development of web-based argument-diagramming tools to be used in "Interpretation and Argument" and many other courses. Investigators: Bruce McLaren and Mara Harrell;

- Creation of computer-based resources for a peer-to-peer support program for first-year students in biological sciences and chemistry. Investigators: David Yaron, Jonathan Minden and Gordon Rule.

Among the ProSEED/Crosswalk projects receiving funds in this cycle:

- "Symphony App" — Music and computer science are teaming up to develop an app to enhance the classical music concert experience. Collaborators: Norman Sadeh, Denis Colwell and Salem Hilal;
- "Mellon Fitness Intensity Training (F.I.T.)" — Exercise programs for students, faculty and staff at the Mellon Institute. Collaborators: Olivia Molinar, Jon Willcox, Nathaniel Frezzell and Pawel Krysz;
- "Moneythink CMU" — Outreach initiatives to improve financial literacy, particularly among K-12 students. Collaborators: Anusha Kukreja, Jillian Ward, Satvika Neti and Kathleen Conway.

For additional details on funded projects and more information on these seed grant programs, visit www.cmu.edu/proseed.



Computer Science Graduate Committed to ‘EXCEL’

■ Kelly Solman

Charles Swanson, a recent computer science graduate, was chosen to receive one of two Outstanding Supplemental Instruction (SI) Leader awards from the International Center for Supplemental Instruction at the University of Missouri-Kansas City.

The award recognizes the contributions Swanson has made to the CMU community through six semesters as an EXCEL Group leader and four semesters as the student supervisor of the SI and EXCEL programs.

“We try to keep the students as active and engaged as possible. This is a challenge when students aren’t comfortable with the material, or when you only have one hour a week with them, or when they are shy or low on energy,” Swanson said.

SI and EXCEL are academic enrichment programs offered for traditionally difficult courses, such as 21-127 Concepts of Math. The program consists of regularly scheduled, informal review sessions.

All students are encouraged to attend SI sessions or sign up to join an EXCEL group, and students with varying levels of academic preparedness and diverse ethnicities participate.

The sessions are facilitated by trained SI/EXCEL leaders who, like



CHARLES SWANSON

Swanson, previously have done well in the course and who attend all class lectures (for SI), take notes, act as model students, and design practice problems, review materials and collaborative activities for their weekly sessions and exam review sessions. Faculty meet with SI leaders weekly to answer questions, clarify ideas, offer suggestions and ensure material continuity.

“When you are designing ways to make technical subjects engaging — and dare I say fun — you never get it right. There is always some way you can im-

prove on it. I have so much fun thinking about it,” Swanson said.

Swanson also was head course assistant for the fundamentals of programming course for the Computer Science Department, where he oversaw 36 teaching assistants. Now that he’s graduated, he is headed to New York City to work for MongoDB.

He said the head course assistant role constantly provided him with puzzles to solve.

“The logistical issues have been the hardest part — organizing effective, quick and fair ways to grade 360-plus submissions with an average of 1,000 lines of code, or getting 36 incredibly busy people together for a staff meeting,” Swanson said.

Swanson saw the goal of the course was having the students learn as much as possible while they enjoy the experience.

“We definitely push people to their limits sometimes, so we have to keep a close eye on how everyone’s doing,” he said. “But I think the reason the course works so well is that we have so many support systems for you if things aren’t working.”

The support systems include recitation, office hours and tutoring, and Swanson said people take advantage of these things.

“The obvious ways to check on whether or not we’re succeeding are the quality of the homework, quizzes and exams,” he said. “But we also meet with students individually, and we compare feedback to find hints as to how much is sinking in. But probably the best measures we have are comparing midterm and final exam performance to previous semesters and, of course, their term projects.”

Swanson’s supervisor, Jessica Owens, first met Swanson when he trained for the SI/EXCEL leader position in the spring of 2011. She said his exceptional passion and talent for creating collaborative learning environments for his peers became evident quickly.

“Charlie set the record for the highest number of student contacts generated by one EXCEL leader in a single academic year and earned a perfect mean student satisfaction rating,” Owens said of his first year.

Swanson said he was happy to be nominated for the Outstanding SI Leader Award, but he never expected to win it.

“If anything, this award helps me to appreciate just how hard we’ve all worked over the past couple years,” he said. “It’s very satisfying to see something come out of that.”

Staff, Students Recognized for Tutoring Excellence

■ Abby Simmons

Academic Development and its 114 peer tutors, most of whom are undergraduate students, are simply the best.

That’s according to the National Tutoring Association, which named CMU the winner of its 2014 Tutoring Excellence Award for four-year colleges or universities.

John Lanyon, peer tutor program coordinator, and Linda Hooper, director of Academic Development, accepted the award and delivered a presentation about CMU’s program in April at the NTA annual conference in Tampa, Fla.

“We learned we need to be taking more of a leadership role by sharing how CMU trains its peer tutors and conducts evaluations — a lot of schools could benefit from our model. We also brought some new ideas back from our peers that we can put to work here,” Lanyon said.

Academic Development learned about the award in January and brought a celebratory cake to the first peer tutor meeting of the spring semester. Lanyon said the recognition motivated the students to maintain their standard of excellence through the particularly gloomy winter weather.

“They were gratified that an organization outside of the campus community recognized the quality of their work,” Lanyon said.

Academic Development offers two types of peer tutoring — walk-in services and standing appointments. With one week of classes left in the academic year, the walk-in service had logged more than 5,000 contacts, defined as individual occurrences of a student seeking tutoring help. Students also made more than 650 standing appointments for tutoring assistance in 2013-2014. Appointments for the

fall 2013 semester alone covered 74 courses in 22 academic departments.

Lanyon conducts the Seminar in Peer Tutoring training class each spring, and interviews, supervises and evaluates tutors. The five-member Academic Development team coordinates with faculty, staff and other members of the campus community to explore tutoring and academic support options for specific courses and departments.

“My job is like being a baseball manager. I build the lineup and put our tutors in the best possible position to be successful, but it’s up to them to carry out the work,” Lanyon said.

Senior global studies major Kate Fisch has been a tutor for the Interpretation and Argument course, a requirement for all first-year undergraduates, since her sophomore year. While she excelled in the class, she noticed that it was challenging for international

students and peers pursuing technical fields.

“This dynamic was what initially drew me to the tutoring program. It facilitates student interaction across all colleges and departments, allowing us to share our strengths and interests with others,” Fisch said.

Peer tutoring is one of Academic Development’s four core services. The others are academic counseling, supplemental instruction and EXCEL collaborative learning groups.

“The staff of Academic Development is absolutely devoted to their work. The range and quality of programs and services available in this office have made a vital contribution to the academic excellence of this university and the strength of our school community. Being a part of this program has certainly been a highlight of my undergraduate career,” Fisch said.

Revealing Roboburgh

Third Round of LaunchCMU Returns to Silicon Valley

■ Mark Burd

A surprise visit and encouraging remarks by Ray Lane, distinguished entrepreneur and chairman of the Carnegie Mellon Board of Trustees, complemented LaunchCMU, a Silicon Valley showcase of cutting-edge technology and innovation.

The program was held on June 5 at the Oracle Conference Center in Redwood City, Calif., and brought together venture capitalists, investment experts, CMU startups, faculty and alumni.

Now in its third cycle, LaunchCMU is spearheaded by the Center for Innovation and Entrepreneurship and the theme for the spring's event, "Revealing Roboburgh," shined a bright light on how robotics technology originating at the university is making a successful impact in the marketplace.

The program allowed for extensive interaction between the attendees and included a series of talks by the founders and current executives of successful CMU startup companies including Anki, 4Moms, BlueBelt Technologies, Platypus, IAM Robotics, and TerrAvion.

Robert Daley, co-founder and CEO of 4Moms, a company that makes high-tech baby gear, challenged attendees

to "divorce themselves from concept of humanoid robotics" as promoted by popular media. He noted the highly successful application of technology in his company's products — including power folding strollers that regenerate their energy during use and an infant seat that replicates the soothing motions that parents make — as prime examples that robotics doesn't need to have a human form to effectively serve humanity.

Anki co-founder and president Hanns Tappeiner shared insights on market segmentation and how his company identified the opportunity to deploy new technology in products for the toys and entertainment industry. Their initial product, Anki DRIVE, an interactive battle racing game, has introduced an unprecedented level of gameplay, interaction and depth into a physical form — essentially, a video game brought to life. Gameplay also has created a wealth of data that is useful in understanding player behavior and extremely valuable in the development of future products.

Innovations destined to make an impact in the marketplace are in continuous development at Carnegie Mellon. Manuela Veloso, the Herbert A. Simon

University Professor of Computer Science, explained the symbiotic autonomy of human and robot interaction, noting the enjoyment and amazement that her visitors realize when they are led through the corridors to her office by a robotic escort. She noted that there are service tasks, including transportation and other assignments, like mapping wireless signal coverage, for which autonomous robotics technology is ideally suited. A point that was reiterated by Paul Scerri, president of Platypus, a CMU technology-startup that uses autonomous boats to collect water information.

One highlight of the showcase was CHIMP (CMU Highly Intelligent Mobile Platform), a robot built to compete in the DARPA Robotics Challenge and developed by the Tartan Rescue Team under the auspices of CMU's National Robotics Engineering Center. The robot, which qualified for the DARPA challenge finals to be held later this year, exemplifies how robots can be designed to work in dangerous environments.

This next Launch CMU showcase will be held in fall 2014 in Pittsburgh.



"Lucky After Dark"

Exhibit Shares History of Pittsburgh's Gay and Lesbian Nightlife

■ Shilo Rea

The Pittsburgh Queer History Project, an oral history and media preservation initiative directed by Carnegie Mellon's Harrison Apple (BXA'13) and Tim Haggerty, has its first exhibit on display through June 29 at Future Tenant Gallery.

"Lucky After Dark: Gay and Lesbian Nightlife in Pittsburgh, 1960-1990," explores the role after-hours nightlife in postwar Pittsburgh played in establishing and shaping gay and lesbian identities. Apple, CMU's Center for the Arts in Society (CAS) artist-in-residence, is the exhibit's curator. He founded the Pittsburgh Queer History Project after uncovering a wealth of information during his undergraduate research into queer urban archeology.

ONLINE:

WWW.PITTSBURGHQUEERHISTORY.COM

Paul Eiss, CAS director and associate professor of anthropology and history in the Dietrich College of Humanities and Social Sciences, called the work "one of the most impressive oral historical projects I've witnessed."

"I knew Harrison as a student in the global studies major, and his work as an artist, whether performance or visual, and as a historian has always blown me away," Eiss said. "He has a rare passion and diverse talents, and I feel privileged to have watched him work on 'Lucky After Dark.'"

Using unpublished archival material, oral interviews, photographs and material evidence, "Lucky After Dark" celebrates the social institutions that men and women developed in a period of discrimination and condemnation, and thoughtfully challenges existing interpretations and assumptions about the development of an LGBT (Lesbian, Gay, Bisexual and Transgender) culture in Pittsburgh.

"Invisibility still dominates the discussion of LGBT community formation in the 20th century," said Haggerty, director of the Dietrich College's Humanities Scholars Program and a leading expert on cultural roles for men and policy issues concerning sexuality. "Assumptions that 'gay life' evolved in San Francisco, New York or LA while smaller cities lagged behind or remained off-the-grid are rebuked by the example of Pittsburgh, where a subculture evolved in reaction to local conditions and opportunities."

Funding for the "Lucky After Dark" exhibition was provided by the Pittsburgh Foundation's A.W. Mellon Educational and Charitable Trust Fund and the Scott Noxon Fund, and Carnegie Mellon's Frank-Ratchye Fund for Art @ the Frontier and the Humanities Scholars Program.

Artistic Endeavors

Block Trades Curtains for Canvas in His Off Time

■ Dan Mohler

Dick Block, associate head of the School of Drama, has worked on Broadway stages for such productions as "Evita," "42nd Street," "Barnum" and "Cats." He's been active with projects designed at the Pittsburgh Playhouse, Opera Theater of Pittsburgh and the Pittsburgh Public Theater and he's been a familiar face at the School of Drama for 22 years.

It's seldom that Block speaks of his other passion, painting.

In 1989, he took his first painting class focusing on watercolors at Carnegie Museum. Block, along with three colleagues, Linda Kauffman, distinguished service professor of biological sciences; Suzanne Colvin, former project director for the Psychology Department's Pittsburgh Mind-Body Center; and Pat Kelly, retired Pittsburgh Public School music teacher and member of Associated Artists of Pittsburgh, have been painting together for more than 20 years.

Block calls his painting a stress reliever, because it's the painting that lets him immerse himself in the details of the brush alone.



His inspiration comes from a number of sources, but he says it's impossible to pinpoint his muse.

"One of the joys of being an artist is that one never knows when an idea will strike or when an image will be the genesis of an idea," Block said. "I think the real trick is keeping your eyes open to anything and everything and observe what is around you."

He often works on two paintings at a time and varies his subject matter between landscape, portrait and abstract styles.

"I suspect it's the theatre training that encourages me to jump around — it keeps me from getting bored and doing the same thing over and over again," Block said.

Block is fascinated by the different ways in which people see the same things.

"I am just as taken with the ways in which other painters make their marks on the paper," he said.

"I have enjoyed painting with the same group of people for more than two decades because we are all so different in our approach. We constantly learn from one another and encourage each other to try what will inevitably be more challenging," Block said. "Since we paint in the studio of a local artist, Robert Robinson, he has served as guide and mentor to all of us."

The group met Robinson when they registered for one of his painting classes taught at the Pittsburgh Center for the Arts more than 10 years ago.

The quartet meets weekly to paint at Robinson's studio. Their most recent show was in April.

Commencement Speakers Challenge Students To Make the World a Better Place

■ Piper Staff

Speakers at Carnegie Mellon's 117th Commencement reminded graduates that college is not only about finding their own paths, but also learning how to make a difference in the world at large.

CMU alumnus and trustee Jeffrey Housenbold (TPR'91), president and CEO of Shutterfly Inc., shared his life story and wisdom with the more than 3,000 graduates and their families. He said growing up he heard many reasons why he wouldn't succeed.

"You will hear a lot of 'nos' in your life," Housenbold said. "My hope is you find your inner courage to tell the naysayers no. Go out and prove them wrong."

An Andrew Carnegie Presidential Scholar, Housenbold earned his bachelor's degree in economics and business administration from CMU in 1991, and his MBA from Harvard Business School, where he was a Dean's Fellow.

"Know the world will never be perfect. It is run by imperfect people," Housenbold said. "And Carnegie Mellon grads find a way to make the world a better place."

Student speaker Bryan Lewis (E'13, '14) inspired the audience with his speech about helping others reach their potential. Lewis earned his master's degree in energy science, technology and policy after earning his bachelor's degree in civil and environmental engineering and engineering and public policy a year ago.



IAN EVERHART (HNZ'14) SWINGS A TERRIBLE TOWEL DURING COMMENCEMENT. EVERHART GRADUATED WITH A JOINT DEGREE IN PUBLIC POLICY AND MANAGEMENT FROM CMU AND A JURIS DOCTORATE FROM THE UNIVERSITY OF PITTSBURGH.

"My experience here has helped define who I am," Lewis said. "In your journey to develop your passions and find your purpose always remember to know who you are, where you came from and to know what matters."

"In the end we won't be remembered for how many degrees we receive or how much money we make, but for what we give, and for what we share. Give of yourself and let your passions inspire others," he said.

President Subra Suresh reinforced the messages made by Housenbold and Lewis in his charge to graduates. He described the greatest problems of the 21st century as unexpected consequences of

some of the greatest achievements of the 20th century, noted by the National Academy of Engineering.

President Suresh told graduates to go outside their comfort zones and

TRIO RECOGNIZED FOR LEADERSHIP, ACCOMPLISHMENTS

During the ceremony, honorary degrees were given to three exemplary leaders whose life and work cross many of Carnegie Mellon's fields. They were:

John Wells, a 1979 graduate of CMU's School of Drama and one of the most influential and successful producer-directors in American film and television, received a Doctor of Fine Arts degree. Wells is the creative force behind two of television's most popular programs of the past two decades, "ER" and "The West Wing." His recent work in television includes the TNT series "Southland" and Showtime's "Shameless." In 2013, he produced and directed "August: Osage County," which starred Meryl Streep and Julia Roberts, and received two Academy Award nominations.

Manfred Honeck, internationally renowned music director for the Pittsburgh Symphony Orchestra (PSO), received a Doctor of Fine Arts degree. Honeck has led the PSO since 2008 to great acclaim. He is a sought-after guest conductor who has performed with some of the leading orchestras of the world.

Telle Whitney, president and CEO of the Anita Borg Institute for Women and Technology, was awarded a Doctor of Science and Technology degree. Under her leadership, the Anita Borg Institute has expanded opportunities for women in technology professions, enabling women to make new and varied contributions to computing and related fields. She has earned numerous awards for her work, including the Association for Computing Machinery's Distinguished Service Award.



DENÉE BENTON (A'14), TSILALA GRAHAM-HAYNES (A'14), ALESIA ETINOFF (A'14) AND DANIEL BELLOMY (A'14) TAKE A SELFIE.

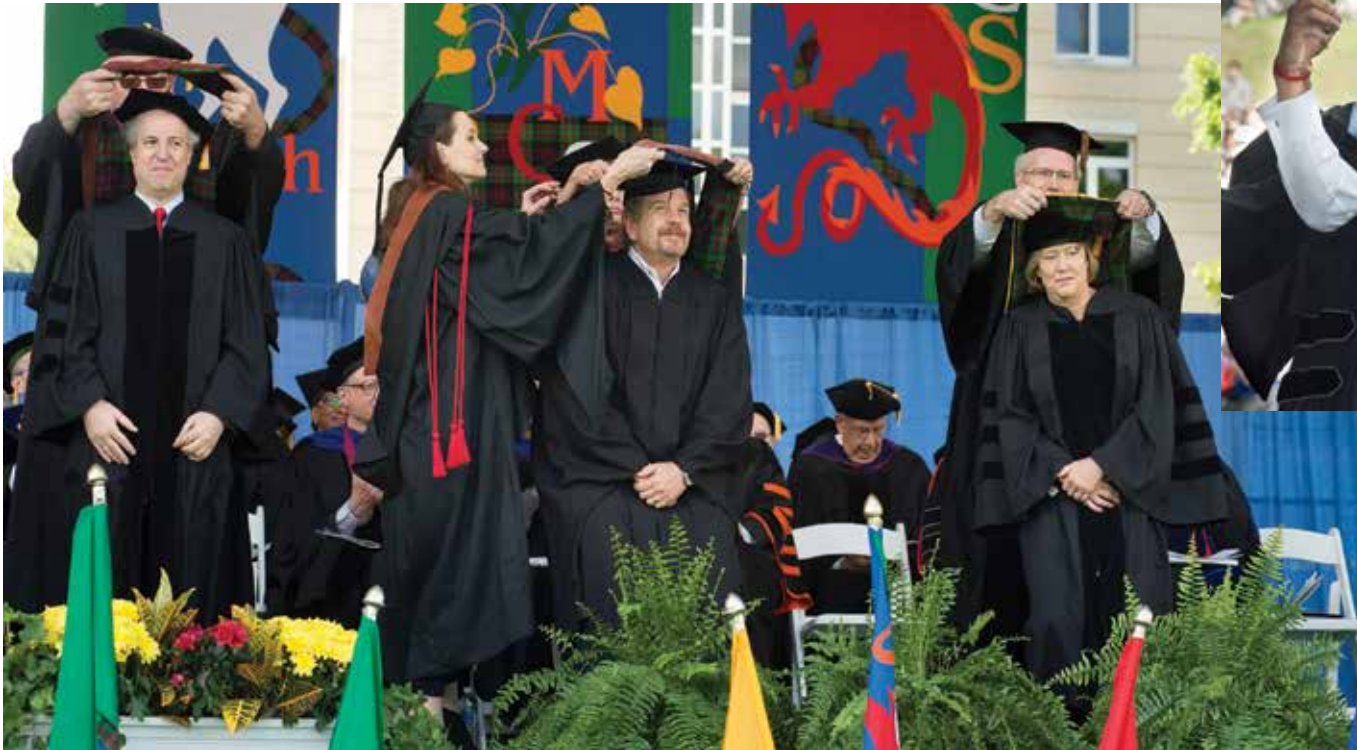


PHOTO BY KEN ANDREYO

THREE HONORARY DEGREE RECIPIENTS RECEIVE HOODS DURING COMMENCEMENT. FROM LEFT, CFA DEAN DAN MARTIN HONORS MANFRED HONECK, FACULTY MARSHAL ANNE MUNDELL AND BOARD OF TRUSTEE MEMBER PAULA WAGNER DO THE HONORS FOR JOHN WELLS AND SCS DEAN RANDY BRYANT CONFERS THE DEGREE UPON TELLE WHITNEY. (SEE PAGE 6 FOR MORE ON THE RECIPIENTS.)

remember to employ a human-centered framework when attacking these challenges. “I firmly believe that CMU’s unique strength in crossing boundaries will position us to be global leaders in addressing many of those grand challenges — more so than any other university,” he said.

Citing renowned management consultant Peter Drucker, Suresh added, “Management is doing things right. Leadership is doing the right things.” At CMU, your experiences have helped you focus on doing the right things and also helped you learn how to do them the right way.”

President Suresh said he always would remember this as his freshman year commencement.

“It’s been a very busy and productive year for all of us,” he said. “You are privileged to have amazing choices before you. I will confidently predict one thing: the pace of change will accelerate and bring incredible new capabilities for us.”



PHOTO BY KEN ANDREYO

SPEAKERS JEFFREY HOUSEBOLD (TPR’91), BRYAN LEWIS (E’13, ’14) (BACKGROUND), PRESIDENT SUBRA SURESH AND CHAIRMAN OF THE BOARD OF TRUSTEES RAY LANE TAKE A SELFIE.

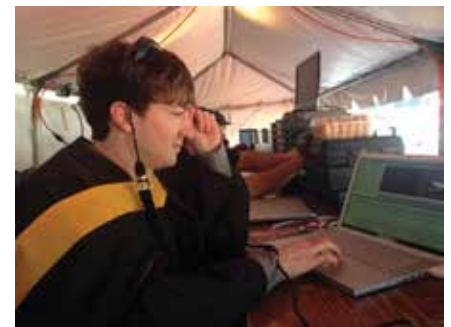


PHOTO BY CARRIE CHISHOLM

JOHN PRZYBORSKI (CS’14), SENIOR PRODUCER OF DIGITAL PRODUCTIONS FOR CMU’S MARKETING COMMUNICATIONS, GRADUATED WITH A MASTER’S DEGREE FROM THE HUMAN-COMPUTER INTERACTION INSTITUTE. PRZYBORSKI DIRECTED HIS 10TH CMU COMMENCEMENT CEREMONY.

Family Affairs **Bartels and Hallinens Celebrate Their Fifth CMU Graduates**



PHOTO COURTESY OF DONNA BARTEL

CHUCK BARTEL (HNZ’95), A 35-YEAR STAFF MEMBER AT CMU WHO IS CURRENTLY DIRECTOR OF GLOBAL IT SERVICES IN COMPUTING SERVICES, AND HIS WIFE, DONNA (THIRD FROM RIGHT), HAD THEIR THIRD DAUGHTER, CHELSEA (DC’14), GRADUATE WITH A BACHELOR’S DEGREE IN CREATIVE WRITING AND MINORS IN ART AND DRAMA. OTHER CMU GRADS IN THE BARTEL FAMILY PICTURED (L-R) INCLUDE LINDSEY BARTEL (DC’11), MELISSA BARTEL KOTTERMAN (E’08) AND HER HUSBAND, WILL KOTTERMAN (E’07).

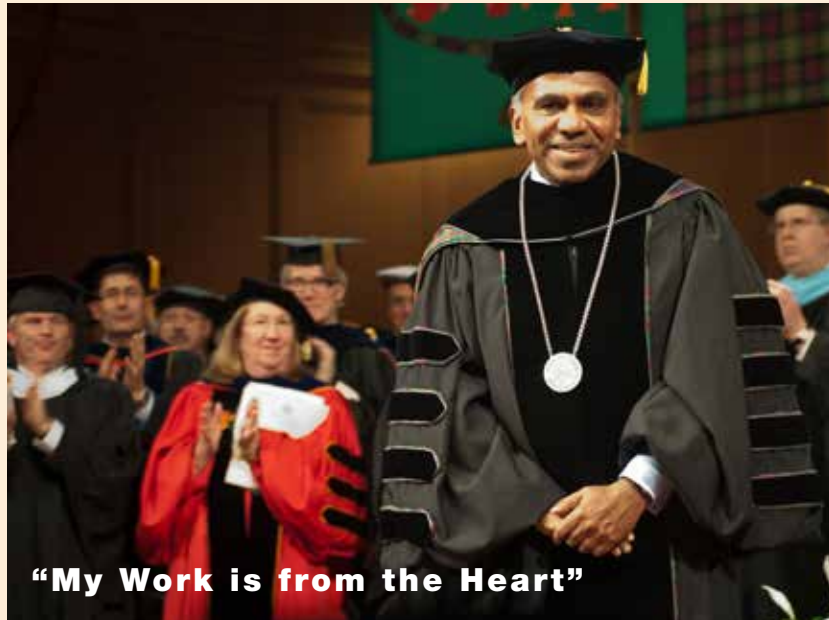


PHOTO COURTESY OF JUDY HALLINEN

KELSEY HALLINEN (S’14), A PHYSICS MAJOR WHO EARNED PHI BETA KAPPA HONORS, JOINED FOUR OTHER CMU GRADS IN HER FAMILY. FROM LEFT ARE HER FATHER, KEN HALLINEN (TPR’82, DC’85), DIRECTOR OF RESOURCE PLANNING AND MANAGEMENT FOR COMPUTING SERVICES; BROTHER-IN-LAW ROSS KUKULINSKI (E’09); SISTER NICOLE HALLINEN (DC’09); PEGGY HALLINEN; AND MOTHER JUDY HALLINEN (DC’83), ASSISTANT VICE PRESIDENT OF EDUCATIONAL OUTREACH AND DIRECTOR OF THE GELFAND CENTER FOR SERVICE LEARNING AND OUTREACH. THE DAY BEFORE CMU’S COMMENCEMENT, JUDY RECEIVED HER DOCTOR OF EDUCATION IN HIGHER EDUCATION MANAGEMENT FROM THE GRADUATE SCHOOL OF EDUCATION AT THE UNIVERSITY OF PENNSYLVANIA. JUDY AND KEN HALLINEN HAVE EACH BEEN EMPLOYED BY THE UNIVERSITY FOR MORE THAN 30 YEARS.

Year in Review

It's been a remarkable year at Carnegie Mellon filled with new beginnings and memorable milestones. From the inauguration of President Subra Suresh, a novel program in New York City, a pioneering partnership with Yahoo and the first graduating class in Rwanda, to centennial anniversaries for the School of Drama and Spring Carnival, a 25th birthday for the School of Computer Science and a decade of success for CMU's campus in Qatar, the university celebrated its future while giving a nod to its glorious past.



"My Work is from the Heart"

SUBRA SURESH WAS INAUGURATED AS CARNEGIE MELLON'S NINTH PRESIDENT ON NOV. 15, 2013, THE 113TH ANNIVERSARY OF THE UNIVERSITY'S FOUNDING BY ANDREW CARNEGIE. THE INVESTITURE CEREMONY FOLLOWED THE INAUGURAL THEME "CROSSING BOUNDARIES, TRANSFORMING LIVES," AS SURESH COMPARED THE JOURNEY HE TOOK TO ARRIVE AT CMU WITH EXPERIENCES SIMILAR TO ITS FOUNDER. HE HAD HIS OWN TAKE ON THE UNIVERSITY'S MOTTO, "MY HEART IS IN THE WORK," WHEN HE STATED, "MY WORK IS FROM THE HEART."

Gifts Support Tepper Quad

ON INAUGURATION DAY FOR PRESIDENT SURESH, CMU ANNOUNCED A HISTORIC GIFT OF \$67 MILLION FROM THE CHARITABLE FOUNDATION OF ALUMNUS AND RENOWNED INVESTOR DAVID A. TEPPER (TPR'82) FOR A NEW ACADEMIC HUB ON THE PITTSBURGH CAMPUS, WHICH WILL INCLUDE A NEW HOME FOR THE TEPPER SCHOOL OF BUSINESS. THE GIFT IS THE UNIVERSITY'S LARGEST FROM A CMU GRADUATE AND THE LARGEST FOR A BUILDING PROJECT.

IN LATE FEBRUARY, JAMES R. (TPR'66) AND SUSAN S. SWARTZ CONTRIBUTED \$10 MILLION TO SUPPORT THE TEPPER QUAD.



Alumna Earns Rhodes Scholarship

COURTNEY WITTEKIND (A'13) RECEIVED A RHODES SCHOLARSHIP, THE PREMIER AWARD FOR INTERNATIONAL STUDY, FOR HER WORK IN ART, ACTIVISM AND ANTHROPOLOGY ON BEHALF OF DISPLACED PERSONS AND REFUGEES. SHE EARNED A BACHELOR OF HUMANITIES AND ARTS DEGREE AS PART OF THE BXA INTERCOLLEGE DEGREE PROGRAM AND STUDIED ABROAD IN NICARAGUA AND THAILAND. CMU'S FOURTH RHODES SCHOLAR PLANS TO PURSUE A DOCTORATE IN ANTHROPOLOGY AT OXFORD.



New Tartans Arrive

SUBRA SURESH, CARNEGIE MELLON'S NINTH PRESIDENT, TOOK OFFICE ON JULY 1 AND WELCOMED HIS FIRST FRESHMAN CLASS IN LATE AUGUST. CALLING HIMSELF A "FRESHMAN" DURING HIS WELCOME ADDRESS AT ORIENTATION, HE CONGRATULATED THE CLASS OF 2017 AND SAID HE'D BE LEARNING RIGHT ALONG WITH THEM.



Improving Learning for All

CARNEGIE MELLON CREATED THE SIMON INITIATIVE TO HARNESS AND LEVERAGE ITS DECADES OF CROSS-DISCIPLINARY RESEARCH TO IMPROVE LEARNING OUTCOMES FOR STUDENTS OF ALL AGES. THE EFFORT IS NAMED TO HONOR THE WORK OF THE LATE NOBEL LAUREATE AND CMU PROFESSOR HERBERT A. SIMON. COMPLEMENTING THE SIMON INITIATIVE IS THE GLOBAL LEARNING COUNCIL, A CONSORTIUM OF EXPERTS FROM ACADEMIA AND INDUSTRY DEDICATED TO SHARING DATA AND BEST PRACTICES.



A Powerful Presence in Davos

CARNEGIE MELLON HAD ITS MOST ROBUST PRESENCE TO DATE AT THE WORLD ECONOMIC FORUM IN DAVOS, SWITZERLAND, IN JANUARY. THE FORUM IS THE PREMIER GATHERING OF THOUGHT LEADERS FROM AROUND THE GLOBE. REPRESENTING CMU TO SPEAK ABOUT THE SCIENCE OF LEARNING, ADVANCED MANUFACTURING, SCIENTIFIC RESEARCH AND ROBOTICS WERE PRESIDENT SURESH AND FACULTY MEMBERS EMMA BRUNSKILL, JUSTINE CASSELL AND KEN KOEDINGER. ABOUT 20 CMU TRUSTEES, ALUMNI AND PARENTS ALSO ATTENDED. CMU IS ONE OF ONLY 25 UNIVERSITIES, 11 IN THE U.S., INVITED TO PARTICIPATE IN THE GLOBAL UNIVERSITY LEADERSHIP FORUM.

Students Are Mathematical Whizzes

A TRIO OF CMU STUDENTS — MICHAEL DRUGGAN (S'15), LINUS HAMILTON (CMU'16) AND THOMAS SWAYZE (S'17) — PLACED SECOND IN THE MATHEMATICAL ASSOCIATION OF AMERICA'S 74TH WILLIAM LOWELL PUTNAM COMPETITION, THE FOREMOST MATHEMATICS CONTEST FOR UNDERGRADUATE STUDENTS IN NORTH AMERICA. CMU ALSO HAD 35 STUDENTS WHO SCORED AMONG THE TOP 10 PERCENT, THE SECOND MOST OF ANY UNIVERSITY.



Taking A New Twist

EXPLORING HEALTH, DISCOVERING WELLNESS, A FIRST-OF-ITS-KIND INTERACTIVE EVENT FOR THE CMU COMMUNITY, TRANSFORMED THE COHON UNIVERSITY CENTER INTO A HEALTH CLUB FOR THE BODY, MIND AND SOUL. THE DAYLONG EVENT, PART OF THE YEARLONG CELEBRATION OF THE INAUGURATION OF PRESIDENT SURESH, FEATURED ACTIVITIES AIMED AT REDUCING STRESS, INCLUDING AN INFLATABLE TWISTER GAME. PICTURED ARE (L-R) STUDENTS COLIN MERET (DC'14), PHILIP DOMINICI (DC'17), JANET LORENZ (E, BXA'14), SANGEETHA SANKARAN (S'17) AND PRIYANSH CHORDIA (E'15).



Drama Celebrates 100 Years

THE SCHOOL OF DRAMA CELEBRATED ITS CENTENNIAL THIS YEAR WITH GALAS IN PITTSBURGH, NEW YORK AND LOS ANGELES. TONY AWARD-WINNER PATINA MILLER (A'06), OSCAR-WINNING COMPOSER STEPHEN SCHWARTZ (A'68) AND PATRICK WILSON (A'95), WHO HAS GARNERED TONY, EMMY AND GOLDEN GLOBE NOMINATIONS, HEADLINED THE CELEBRATION AT STEINER STUDIOS IN THE BROOKLYN NAVY YARD. IN HONOR OF THE SCHOOL'S 100TH ANNIVERSARY, CMU IS PARTNERING WITH THE TONY AWARDS AND WILL PRESENT THE ARTS EDUCATOR OF THE YEAR HONOR AT NEXT YEAR'S AWARDS CEREMONY.



Having a "Project InMind"

CARNEGIE MELLON AND YAHOO INC. ANNOUNCED A FIVE-YEAR, \$10 MILLION PARTNERSHIP TO CREATE TECHNOLOGIES THAT WILL ENABLE MOBILE DEVICES TO ANTICIPATE YOUR NEEDS AND WANTS TO CREATE A BETTER USER EXPERIENCE. THE PARTNERSHIP, TITLED "PROJECT INMIND," IS HIGHLIGHTED BY AN INDUSTRY-FIRST MOBILE TOOLKIT THAT WILL SERVE AS A LIVING LABORATORY ENABLING CMU RESEARCHERS TO EXPERIMENT WITH YAHOO'S REAL-TIME DATA SERVICES.



Students Visit Capitol Hill

STUDENTS IN CMU'S WASHINGTON SEMESTER PROGRAM (WSP) VISITED THE U.S. SENATE AND MET WITH SEN. RAND PAUL (R-Ky.). THE PROGRAM PROVIDES AN OPPORTUNITY FOR STUDENTS INTERESTED IN INTERNATIONAL AND PUBLIC POLICY TO STUDY IN D.C., AND PROVIDES AN IN-DEPTH LOOK AT HOW GOVERNMENT WORKS. THE PROGRAM HELPS STUDENTS SECURE INTERNSHIPS MATCHING THEIR INTERESTS AND STRENGTHS. (WSP STUDENTS PICTURED ARE LATIF ELAM (DC'15), CHLOE HAWKER (DC'15), EMILY LAROSA (DC'15), MOLLY SHANLEY (DC'15), MEGAN STEINMETZ (DC'15) AND EDWARD WOJCIECHOWSKI (DC'15). AT FAR RIGHT IS STUDENT CORINNE ROCKOFF (DC'14).)

Marking a Decade in Doha

CARNEGIE MELLON CELEBRATED THE 10-YEAR ANNIVERSARY OF ITS CAMPUS IN DOHA, QATAR, WITH A CEREMONY THAT HIGHLIGHTED CAMPUS ACHIEVEMENTS AND FEATURED LEADERS FROM CARNEGIE MELLON AND QATAR FOUNDATION FOR EDUCATION, SCIENCE AND COMMUNITY DEVELOPMENT, INCLUDING CHAIRPERSON HER HIGHNESS SHEIKHA MOZA BINT NASSER. THE CAMPUS HAS GROWN TO 400 STUDENTS IN FIVE ACADEMIC PROGRAMS AND 300 STUDENTS HAVE GRADUATED FROM THE CAMPUS.

DISTINGUISHED VISITORS HAVE INCLUDED BILL GATES, HILLARY CLINTON, FORMER U.S. SECRETARY OF ENERGY STEVEN CHU AND FOUNDER AND CHAIRMAN OF VIRGIN GROUP, SIR RICHARD BRANSON TO NAME A FEW.



Driving the Future

COLLEGE OF ENGINEERING PROFESSOR RAJ RAJKUMAR AND HIS RESEARCH TEAM ARE WORKING TO MAKE THE HIGHWAYS SAFER BY TAKING THE DRIVER OUT OF THE DRIVER'S SEAT. CARNEGIE MELLON'S CADILLAC SRX, EQUIPPED WITH RADAR IN ITS BUMPERS, MIRRORS AND BODY PANELS, AND COMPUTERS UNDER THE CARGO FLOOR, NAVIGATED HIGHWAY TRAFFIC DURING A 33-MILE DRIVE FROM CRANBERRY, PA., TO PITTSBURGH INTERNATIONAL AIRPORT. IN ADDITION TO CONTROLLING THE STEERING, SPEED AND BRAKING, THE AUTONOMOUS SYSTEMS DETECT AND AVOID OBSTACLES ON THE ROAD. PICTURED IN THE PASSENGER SEAT IS U.S. REP. BILL SHUSTER (R-PA.), CHAIRMAN OF THE HOUSE TRANSPORTATION AND INFRASTRUCTURE COMMITTEE.

Distracting Decorations

Study: Heavily Decorated Classrooms Disrupt Attention, Learning In Young Children

■ Shilo Rea

Maps, number lines, shapes, artwork and other materials tend to cover elementary classroom walls.

However, new research from Carnegie Mellon shows that too much of a good thing may end up disrupting attention and learning in young children.

Published in *Psychological Science*, Carnegie Mellon's Anna V. Fisher, Karrie E. Godwin and Howard Seltman looked at whether classroom displays affected children's ability to maintain focus during instruction and to learn the lesson content. They found that children in highly decorated classrooms were more distracted, spent more time off-task and demonstrated smaller learning gains than when the decorations were removed.

"Young children spend a lot of time — usually the whole day — in the same classroom, and we have shown that a classroom's visual environment can affect how much children learn," said Fisher, lead author and associate professor of psychology in the Dietrich College of Humanities and Social Sciences.

Should teachers take down their visual displays based on the findings of this study?

"We do not suggest by any means



STUDY RESULTS SHOWED THAT CHILDREN LEARNED MORE WHEN THE ROOM WAS NOT HEAVILY DECORATED.



that this is the answer to all educational problems. Furthermore, additional research is needed to know what effect the classroom visual environment has on children's attention and learning in real classrooms," Fisher said "Therefore, I would suggest that instead of removing all decorations, teachers should consider whether some of their visual displays may be distracting to young children."

For the study, 24 kindergarten students were placed in laboratory classrooms for six introductory science lessons on topics they were unfamiliar with. Three lessons were taught in a heavily decorated classroom, and three lessons were given in a sparse classroom.

The results showed that while children learned in both classroom

types, they learned more when the room was not heavily decorated. Specifically, children's accuracy on the test questions was higher in the sparse classroom (55 percent correct) than in the decorated classroom (42 percent correct).

"We were also interested in finding out if the visual displays were removed, whether the children's attention would shift to another distraction, such as talking to their peers, and if the total amount of time they were distracted would remain the same," said Godwin, a Ph.D. candidate in psychology and fellow of the Program in Interdisciplinary Education Research.

However, when the researchers tallied all of the time children spent off-task in both types of classrooms, the rate of off-task behavior was higher in the

decorated classroom (38.6 percent time spent off-task) than in the sparse classroom (28.4 percent time spent off-task).

The researchers hope these findings lead to further studies into developing guidelines to help teachers optimally design classrooms.

The Institute of Education Sciences, part of the U.S. Department of Education, funded this research.

Last fall, CMU launched the Simon Initiative to accelerate the use of learning science and technology to improve student learning. Named to honor the work of the late Nobel laureate and CMU Professor Herbert Simon, the initiative will harness CMU's decades of learning data and research to improve educational outcomes for students everywhere.

Twists and Turns of Time CONTINUED FROM PAGE ONE

technology for international journalists in Pittsburgh for a conference. One of the biggest challenges in academia is getting innovative ideas out of the lab and into the public eye.

"The press are really the avenue to get ideas into the public. What people want, industry follows. Our job is to get the interesting — and sometimes crazy — ideas out there, to get people excited," Harrison said.

Xiao and Harrison, whose team includes doctoral student Gierad Laput, showed the audience how a user could check time and calendar meetings, find directions and even play video games on the device.

"To illustrate the potential of our approach, we developed a series of example applications, many of which are cumbersome — or even impossible — on today's smartwatch devices," Xiao said.

Wearable technology is a multibil-

lion dollar industry still in its infancy. Rumors of Microsoft and Apple smartwatches have been circulating for around a year.

"The era of worn computers is imminent — starting with technologies like smartwatches and Google Glass — but no company has quite cracked the nut yet ... the interface continues to be a stubborn problem," Harrison said. "Worn interfaces must be small to be unobtrusive, but our fingers are relatively large. This means we have to think beyond touch interaction in order to use these devices effectively."

By using the watch face as a multi-degree-of-freedom mechanical interface, their approach enables rich interaction without obstructing the screen with fingers. The prototype supports continuous 2D panning and twisting as well as binary tilt and click.

"Through Chris's tutelage, and just hacking on things, I'm developing

the technical skills necessary to tackle and implement cutting-edge ideas," Xiao said, "to take formless ideas and turn them into physical manifestations and actually test them out and show them in the real world."

Xiao admits that working on human-computer interaction at small scales is difficult. He said he feels fortunate to be conducting the research in what he calls the best human-computer interaction program in the world.

"This is an awesome, awesome place to work. There are lots of cool ideas, lots of cool people, lots of really neat technology that we get to play with," Xiao said. "This is definitely the place to go if you want to do some serious forward-thinking in your research."

Harrison pointed out that CMU has the first degree-granting HCI program in the world.

"In most places there may be only

one lab or a single professor who does HCI. CMU made a big bet 20 years ago, and this was before anyone was really thinking about it," he said.

Harrison said research is not just about publishing papers.

"Getting people excited to go into technology careers, take technology classes, get people into research, generates economic activity," Harrison said. "It has all of these incredible ripple effects."

Harrison and Xiao are exploring other ways to improve multi-touch devices beyond the smartwatch. They are co-founders of Qeexo, a startup company that develops "rich-touch" interactive technologies spun off from CMU in 2013.

The company, with a business office in San Jose, Calif., and a research and development office in Pittsburgh, announced \$2.3 million in Series A funding at the end of May.

Where Humans Dare Not Go

Autonomous Airboats Provide New Data on Water Quality in Kenya

■ Byron Spice

Small, autonomous airboats masquerading as crocodiles gathered data on hippo hygiene and water quality this spring in Kenya.

No human would dare venture into the brown water where hippos slosh around. But the animals — among Africa's most dangerous — tolerated the boats developed at Carnegie Mellon's Robotics Institute and operated by CMU spinoff Platypus LLC.

One did give chase, but briefly.

"Those were 30 seconds that none of us will forget," said Paul Scerri, an associate research professor in CMU's Robotics Institute and president of Platypus.

In the end, the 13-pound boat managed to outrun the 2-ton hippo.

An estimated 4,000 hippos use the Mara River as a toilet with potentially deadly effects for fish living downriver.

The airboats skimmed over the surface of several hippopotamus pools in the river, where they scanned the river bottom for deposits of hippo dung and made various measurements of water quality.

They supported the work of researchers Amanda Subalusky,

Christopher Dutton and David Post of Yale University, and Emma Rosi-Marshall from the Cary Institute of Ecosystem Studies, who have been studying water quality on the Mara since 2008. The team suspects that hippos, who spend their nights grazing in the savanna grasslands and their days wallowing and defecating in the river, are responsible for water quality problems, particularly during periods of low flow.

Each hippo produces about 22 pounds of wet dung each day, Subalusky said. When the river is running high, this dung simply moves down river, but during low flows the dung settles to the bottom of hippo pools, where bacteria feed on it and consume lots of oxygen. During subsequent high flows, oxygen levels downriver crash and fish kills can occur. She and Dutton suspect this is because hippo feces are being flushed from the hippo pools. The problem is, they haven't been able to get close enough to find out.

"Hippos are very territorial and aggressive and have been known to attack boats," Subalusky explained. "We have to work with armed rangers when we get in the river anywhere, but we would



RESEARCHERS MAKE ADJUSTMENTS ON AN AIRBOAT BEFORE SENDING IT INTO KENYA'S MARA RIVER.

never be able to get into a hippo pool."

One of their mentors connected them with Scerri, who arranged for Christopher Tomaszewski, Abhinav Valada and John Scerri of Platypus to take three of the boats to Kenya in March. The boats use Android smartphones for onboard computing and are designed to navigate autonomously, working alone or in groups to perform water monitoring in bodies of water or aid first responders following floods.

During the trio's three-week stay in Kenya they were able to deploy the boats, one at a time, over 10 different hippo pools. "It's a different sort of scientific process in the field there," said Scerri, who visited the project for four days. "You go where you can and do what you can." The sonar sensors aboard the boats were used to create depth maps of the pools and to measure the depth of the fecal deposits, while other sensors checked such water quality parameters as water temperature, oxygen content and electrical conductivity.

The data are still being analyzed and are unpublished, so the researchers can't draw any conclusions yet. But as luck would have it, they were able to measure several pools both before and after a flushing event, so they have reason to hope that the findings will be meaningful.

The boats were disguised as crocodiles at the suggestion of a local Maasai guide and, with one exception, the hippos seemed unfazed by the presence of the strange machines. A winch system added to one of the boats failed and the water-cooled boats suffered from clogged intakes at least once, but otherwise the boats fared well, Scerri said.

The boat deployment was sponsored in part by Project Olympus, a School of Computer Science program that helps faculty and students develop their ideas into commercial products and services. Subalusky, Dutton, Post, and Rosi-Marshall are supported by the National Geographic Society, Switzer Fellowship, World Wildlife Fund, National Science Foundation and Yale.



A HIPPO, ONE OF THE MOST DANGEROUS ANIMALS IN AFRICA, FOLLOWS AN AIRBOAT CAMOUFLAGED TO LOOK LIKE A CROCODILE.

Andrew Carnegie Prize in Mind and Brain Sciences

■ Shilo Rea

Carnegie Mellon awarded Ricardo Dolmetsch, the global head of neuroscience at the Novartis Institutes for Biomedical Research, with the second annual Andrew Carnegie Prize in Mind and Brain Sciences.

The prize, given by the Center for the Neural Basis of Cognition (CNBC) and funded by the Carnegie Corporation of New York as part of its centennial celebration, recognizes trailblazers in the mind and brain sciences whose research has helped advance the field and its applications.

"Dr. Dolmetsch's research is highly innovative and he has staked out pioneering terrain to help us understand the biochemistry of autism," said Marlene Behrmann, CNBC co-director



RICARDO DOLMETSCH HAS BUILT MODELS OF GENES ASSOCIATED WITH AUTISM, SETTING THE FOUNDATION FOR THE DEVELOPMENT OF NEW THERAPIES.

and the George A. and Helen Dunham Cowan Professor of Cognitive Neuroscience at CMU.

Dolmetsch, who originally worked in biophysics, changed the direction of his research to focus on autism after his son was diagnosed with the disorder. As part of the award ceremony, Dolmetsch gave a presentation on "Insights Into the Brain of a Child With Autism" and discussed the progress his lab has made. He stressed that in order to develop effective treatment, the underlying genes, cells and behaviors all must be understood.

Behrmann said he gave a sobering and staggering saga of genetics and biochemistry. "I never imagined these kinds of things would be possible," she said. "It's really inspirational."

Crossing Boundaries To Transform Lives

Interdisciplinary Teams Provide Intriguing Solutions to Medical Problems

■ Kelly Solman

This past spring, students in the two-semester Biomedical Engineering Design course presented innovative solutions to pressing medical problems.

The course brought together students from diverse backgrounds to develop solutions from concept all the way to prototype.

“Engineering, design and humanities students have pedagogies and skill sets that are significantly different from each other,” said Conrad Zapanta, associate head of CMU’s Department of Biomedical Engineering.

Graduates of biomedical engineering pursue careers in many biological and medical fields, including biotechnology, medical device, pharmaceuticals and health care policy.

“Some go to graduate school and medical school to pursue advanced degrees,” Zapanta said.

Fifteen teams developed projects, ranging from developing sterilizers for low-resource areas to a brace for rehabilitating Achilles tendon injuries. Some past projects from the course have been developed further and are currently being used clinically.

Some of this year’s projects were:

Grip It Good

Millions of Americans suffer from disability due to diseases such as diabetic neuropathy, arthritis or stroke. The goal of the Grip It Good project team was to help occupational therapists more accurately assess their patients and improve treatments.

“Currently a hand dynamometer is used for these purposes, but it doesn’t incorporate a very natural, gripping-type motion,” said Ethan Ungchusri (E’14), who joined forces with Luke Auyeung (E’14), Cheryl Deng (E’14), Nathan Hahn (DC’14), Tomas Dardet (E’14) and Ting Xu (E’14).

“We believed that by using something familiar like a soda can and putting four sensors inside, patients could interact with the measuring device in a more natural way,” Ungchusri said.

Here’s how it works: The patient is first asked to grab the can, hold it for 10 seconds and release it. Then, the patient is asked to grab the can as hard as he or she can for 10 seconds. A two-week treatment follows.

“At the end of the two-week treatment, the patients are asked to grab the can again, hold it for 10 seconds, release and then grab the can hard, just as they had prior to treatment,” Dardet said. “A doctor can then compare the results from the two sessions to see if the patient’s grip strength actually improved.”



FROM LEFT, NATHAN HAHN (DC’14), CHERYL DENG (E’14), TOMAS DARDET (E’14) ETHAN UNGCHUSRI (E’14), TING XU (E’14) AND LUKE AUYEUNG (E’14) USE SENSORS IN SODA CANS TO HELP OCCUPATIONAL THERAPISTS ASSESS PATIENTS’ GRIPS.



FELIX CHIU (E’14), LIANA KONG (A’15), VICTORIA PATINO (E’14), CHAVA ANGELL (E’14) AND KEITH JOSEPH (A’15) DEVELOPED THE PEOPLEPROP BRACE TO SUPPORT PATIENTS WITH NEUROMUSCULAR DISORDERS.

PeopleProp

Chava Angell (E’14), Felix Chiu (E’14), Keith Joseph (A’15), Liana Kong (A’15) and Victoria Patino (E’14) developed the PeopleProp brace to support patients with neuromuscular disorders, such as Parkinson’s disease.

“We designed the brace to alleviate some of the symptoms of postural instability associated with the disease,” Angell said.

“Parkinson’s patients tend to slump over, and that can cause difficulties in breathing,” Angell added. “As you can see, our brace pulls back the shoulders, providing a lot more support. It’s very lightweight and comfortable.”

Many braces on the market are rigid and limit the range of motion. This team’s solution is made of spandex, Velcro and a cotton blend.

“Also, our brace is unobtrusive. A patient can wear this under clothing, taking away the stigma associated with wearing this kind of corrective piece in public,” Angell said.



CATHERINE RUDNICK (E’14), ROBERT WINKELMAN (E’14), ROMA LUTHRA (E’14) AND TEJANK SHAH (E’14) DESIGNED A PRESSURE SENSOR CAP TO HELP COACHES KEEP FOOTBALL HELMETS PROPERLY FITTED THROUGHOUT THE SEASON.

Football Informatic Technology (FIT)

Concussions are a major concern in contact sports today, particularly American football.

“Although the symptoms of sports-related concussions are generally considered minor and transient, recent research has suggested that an extensive history of sport-related head injury may result in the enhanced onset of neurodegeneration,” said Roma Luthra (E’14), a fifth-year senior whose team took on the challenge of helmet safety. “With the potential for such significant negative consequences associated with head trauma, the sport of football has recently come under great scrutiny.”

Luthra and her teammates — Robert Winkelman (E’14), Catherine Rudnick (E’14) and Tejank Shah (E’14) — designed a pressure sensor cap that could potentially prevent concussions.

“There are air bladders inside the helmet that can be adjusted using a pump,” said Winkelman, who played

on CMU’s Tartan football team. “But how they’re fitted today is that a coach will come up to a player typically at the beginning of the season, have the player don the helmet, and as the player is wearing it, the coach will ask ‘How does it feel?’ And they’ll just add air to adjust the player’s comfort level.”

The air pressure in the helmet is subject to change as the season progresses — affected by seasonal temperatures, for example — and follow-up fittings are not required. The cap uses a software interface to collect quantitative data using four sensing resistors inside the helmet to record the initial fit.

“That fit can be saved and used in follow-up fittings later in the season to make sure every time the player takes the field, the helmet is fitting as good as it was on day one,” Winkelman said.

“Our cap was pretty inexpensive to build, too,” he added. “One cap would suffice for an entire team of football players. And it would only cost the team about \$100.”