thePIPER

CMU'S NEWS SOURCE FOR FACULTY & STAFF 3/15 ISSUE

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Carnegie Mellon University

Data Doctors

Mining Big Data For Your Health

■ Ken Walters

An app that would allow doctors to quickly compare charts of patients suffering from the same illness is an example of how health care can be revolutionized by leveraging the massive amount of health care data that exists today.

Transforming this explosion of health-related "big data" into technologies, products and services that will improve health care is the goal of the new Pittsburgh Health Data Alliance, a joint effort between Carnegie Mellon, Pitt and UPMC.

Using health care data to its full potential will require close collaboration among the leading health sciences research at Pitt, world-class computer science and machine learning at CMU, and the clinical care, extensive patient data and commercialization expertise at UPMC.

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Tony Tandem

PHOTO BY TIM KAULEN

Award-winning actress and CMU alumna Judith Light (A'70) and Peter Cooke, head of the School of Drama, were selected to be among the judges who will choose the winner of the inaugural Tony Award for Excellence in Theatre Education. The award will be presented by CMU during the 69th Annual Tony Awards telecast on June 7. Read the story on page 8.

Sharks Bite

Investors Vie for Cut of Alum's Company

■ Kelly Saavedra

Being surrounded by hungry sharks can be a good thing.

It was for entrepreneur Bobbie Rhoads, a Tepper School alumna who waded into ABC's "Shark Tank" and came out a winner.

The long-running reality TV show

Continued on page ten

Earth Hour

'De-Lightful' Event Kicks Off Astronomical Year

■ Bruce Gerson

Carnegie Mellon and Pittsburgh will kick off their International Year of Light celebration in the dark.

"De-Light Pittsburgh," the city's 2015 Earth Hour project, is one of many celebrations planned worldwide. From 8:30 – 9:30 p.m., Saturday, March 28, Pittsburgh will join cities around the globe, from Sydney, to Paris to New York, in turning off lights to raise awareness for the environment and sustainability.

Around the world, lights will be turned off at iconic structures, such as the Eiffel Tower and Brooklyn Bridge. On campus, exterior lights will go dark on the Pausch Bridge, Hamerschlag Tower, Mellon Institute, Hunt Library, Doherty Hall, the East Campus Garage and Walking to the Sky.

In Pittsburgh, the event also aims to raise consciousness of light pollution and will serve as a launching point for stargazing, astronomy outreach events and activities throughout the year.

Diane Turnshek, a special faculty member in the Physics Department who has taught astronomy during the summers at CMU, Pitt and other local universities, is spearheading the effort at CMU. She said Earth Hour is a time to get people's attention and to make them

Continued on page six

Building a Smarter Campus

CMU Partners With IBM To Save Energy, Lower Costs

■ Abby Simmons

A university known for its smart people hopes to gain recognition for its smart buildings.

CMU has partnered with IBM to become the first higher education institution to pioneer the use of a new cloud-based analytics system for reducing energy and facility operating costs.

Don Coffelt, associate vice president for Facilities Management Services, says CMU expects to save approximately 10 percent on utilities, nearly $2 million annually, when the technology is fully integrated in 36 buildings on the Pittsburgh campus.

"On its own, the deployment of this technology will drive significant energy and operational savings with a very attractive return on investment," Coffelt said. "Just as important, improved building performance enhances the occupant experience and provides a much more effective education and research environment."

Buildings are expected to become the largest consumer of global energy by 2025, according to the National Science and Technology Council. Systems such as elevators, HVAC, lighting and alarms constantly report data across building networks. However, most organizations do not use the data as well as they could to monitor overall building performance, identify trends in building use or improve customer satisfaction.

CMU will address these challenges by using the new IBM Building Management Center delivered on the IBM SoftLayer cloud to monitor thousands of data points from building automation and control systems. The Building Management Center also will detect system problems and proactively trigger corrective actions.

Approximately 15 CMU staff members will be involved in the pilot phase. Their initial work will focus on HVAC systems in nine buildings, including the Cohon University Center, Hunt Library, and the Gates and Hillman centers. The full system implementation, expected within three years, will involve additional staff and extend to lighting, water and other utilities.

"We are building an FMS culture that rewards being proactive, and the IBM software gives our staff a tool to identify and diagnose problems before they create issues for students, faculty or staff," said Steven Guenther, director of Facilities Operations. "When we dispatch someone for a repair, they will have a jumpstart on solving the problem."

FMS receives and completes around 60,000 service requests annually. With that much workflow, it can be a challenge to prioritize what should be done first. Guenther said the IBM system assigns a rank or value to each deficiency so that his team can make better decisions.

The Smarter Buildings Initiative supports CMU's technology-enhanced education and research focus, as well as its commitment to sustainability. The initiative will connect with research already underway at the university's Smart Infrastructure Institute, of which IBM is a founding partner, and the Center for Building Performance and Diagnostics.

Wayne Balta (E'82), vice president for IBM Corporate Environmental Affairs and Product Safety, has been a strong supporter of the project.

"IBM and Carnegie Mellon share a commitment to innovation and a rich history of collaboration. Given CMU's renown as a world leader in engineering and computer science, this new collaboration for smarter buildings is a natural fit," Balta said.

Faculty and students affiliated with CMU's multidisciplinary Metro21 initiative, which seeks to design and develop solutions to improve the economy and quality of life in metropolitan areas, are planning to use data generated from the Building Management Center in their research.

The initiative also contributes to the university's role as a founding partner in the Oakland expansion of the Green Building Alliance's Pittsburgh 2030 District. Pittsburgh is one of just five U.S. cities to launch 2030 districts, which challenge partner organizations to achieve 50 percent reductions in energy use, water consumption and transportation-related emissions by the year 2030.

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A Visit with Victor

PHOTO BY TIM KAULEN

KDKA's Lynne Hayes-Freeland and Chris, a 17-year-old young man from Haiti who is in the foster care system in southwestern Pennsylvania, enjoyed a recent game of Scrabble with Victor the Gamebot. Chris, who also visited the Robotics Institute's Personal Robotics and Biorobotics labs, is interested in computer science and will appear on "Waiting Child," a regular KDKA news segment featuring children who are available for adoption. Anyone interested in adopting Chris can call Allie Kirsch at Professional Family Care Services, 814-255-9559, extension 106.

Pickin' and Grinnin'

Statistics Professor Takes Time For Banjo

PHOTOS BY TIM KAULEN

■ Kelly Saavedra

Oh, play me some mountain music, like grandma and grandpa used to play.

Maybe you know that line from Alabama's number one hit "Mountain Music." What you may not know is Brian Junker, associate dean of CMU's Dietrich College, has been granting that request weekly at the Schenley Park Visitor's Center.

Junker, who has played guitar off and on since he was a teenager, took up the banjo eight years ago after becoming perplexed during a performance by local songwriter Emily Pinkerton.

"I couldn't figure out how the motions that her hand was making corresponded to the number of notes coming out of the instrument," he said.

He later learned it's a banjo-playing style known as clawhammer, in which the hand assumes a claw-like shape and the thumb and middle or index finger strum the strings downward with the back of the fingernail.

Pinkerton let him borrow her banjo for a few weeks to give it a try. He enjoyed playing it so much that he bought one for himself.

Known to bring square dancers and cloggers to their feet for some pretty quick stepping, "old-time" or "mountain" music has a distinct and rhythmic sound that developed as European immigrants played their fiddles and mandolins alongside banjos brought from Africa.

The movie soundtrack from "Oh Brother Where Art Thou?" starring George Clooney led a fresh wave of interest in this kind of music around 2000, paving the way for crowd-pleasers like Mumford & Sons, the Avett Brothers and Allison Kraus' collaboration with Robert Plant.

Junker's weekly jam session fuses together similar sounds. On any given Thursday from noon to 1 p.m., five to 10 musicians — including an engineering manager from Apple's CMU offices, a paleobotanist and educator at the Carnegie Museum of Natural History and a visual artist from the South Hills — can be found circled around the back corner table of the Schenley Park Visitor's Center wielding a variety of stringed instruments.

The group provides lively background music for the lunch crowd, breaking only for a sip of coffee, bite of sandwich or spoonful of soup.

"Sometimes people will clap, and we'll embarrassedly acknowledge that they clapped, but we're not playing for the other people in the room," Junker said. "We're playing for each other."

That reality has not deterred the occasional parent in the crowd seeking entertainment for a son or daughter's upcoming graduation party.

"They'll ask us, 'could you guys come and do the same thing you're doing here? You don't have to perform, but we'll set aside a table for you. And you just play that stuff, and we'll party.' We've done that, and it's worked out really great," he said.

You can listen to Junker and other members of the Thursday group play their music Saturday, March 28 on WRCT radio during a morning family entertainment show called the "Saturday Light Brigade."

Junker also helps organize "SongSpace," a small concert series in Pittsburgh that brings high-quality singer-songwriters to perform at the First Unitarian Church on Morewood Avenue. He says the performers enjoy the connection with the audience in such an intimate setting, and the audience gets a lot out of listening to them.

Statistics Professor Brian Junker (left, and above, second from right) joins friends for lunch and a friendly jam session on Thursdays at the Schenley Park Visitor's Center.

Professionally, Junker has been teaching statistics at CMU since 1990. Two years ago, he was appointed as an associate dean of the Dietrich College. Most of his work involves the application of statistics to psychological measurement, social science and education research.

He is on the design and analysis committee for the National Assessment of Educational Progress, which evaluates what America's students know and can do in various subject areas and is a major source of data for national policy, as in the impact of the "No Child Left Behind" law on student achievement.

Junker also studies social networks among teachers and students, runs a postdoctoral training program in statistics funded by the U.S. Department of Education and has consulted on a variety of other problems, from the patterns, causes and effects of Alzheimer's disease to the perception of "popular sound" in music.

Junker believes that creating some contrast in your life, both in how you go through life physically as well as mentally, is extremely important, whether it's through playing banjo, exercising, reading novels or some other interest.

"I absolutely love statistics. But when that is the only thing I do, my thinking gets brittle. It's not as creative, it's not as flexible as it should be," he said.

"In the daytime, I'm charging strong like any CMU person would do. If I take out the banjo or a guitar after dinner in the evening, and I sit and play, it's a completely different mental exercise. It really clears my mind out for the next day, so I can be fresh and ready to go."

Carnegie Mellon University

INTEGRATED INTELLIGENCE

SAN FRANCISCO AND BEYOND

■ Greg Faist

On an evening befitting its "integrated" theme, Carnegie Mellon brought together more than 400 alumni, trustees, faculty, students, parents and friends for an energy-filled celebration of CMU's leadership at the boundaries of human and machine intelligence.

The event also raised funds for Presidential Fellowships and Scholarships, which provide direct financial support to graduate and undergraduate students.

Among the speakers and presenters were President Subra Suresh; trustees Ray Lane, Manu Narayan (A'96), James Rohr and David Tepper (TPR'82); CMU Professor and CEO of Duolingo Luis von Ahn (CS'03, '05); co-founder and CTO of SolePower Hahna Alexander (E'12); Student Body President Ian Glasner (E'15); and President of the Graduate Student Assembly Carolyn Commer (DC'08, '15).

Their remarks and expert insights were paired with uplifting musical performances by students Joanna M. Latini (A'15) and Daniel Arnaldos Navarro (A'15), and vocal coach and chamber music coordinator Karen R. Verm, which brought the event's theme, Integrated Intelligence, fully to life.

Several highlights from the event's featured speakers included:

- Suresh outlining CMU's leadership bridging people and technology;
- Glasner and Commer reflecting on their student experiences;
- von Ahn discussing the widespread impact and proven effectiveness of the learning platform his company, Duolingo, has created;
- Rohr and Tepper exploring the global outlook for financial markets, as well as the importance of giving back to CMU; and
- Alexander providing the inside story of how her startup, SolePower, developed its wearable energy-harvesting technology.

"I've had the honor of serving as Carnegie Mellon's chairman of the Board of Trustees for six years, and I've never been prouder than I am tonight," Lane said. "This is an amazing evening. It's allowed us to bask in the glory of what is Carnegie Mellon, and brings to your heart and your mind exactly what this university is all about."

PHOTOS BY TARA LUZ STEPHENS

More than 400 from CMU attended the Integrated Intelligence event in San Francisco. Pictured above are (l-r): Nancy Merritt, Executive Director, Alumni Relations & Annual Giving; Trustee Rebecca Allison (BHA'96, HNZ'01); Arnold Blinn (S'87); Barbara Bessey (TPR'71,'75); Renee Atwood; Sheetal Bagde; Merline Saintil (CS'05).

The event was a first of its kind for CMU with net proceeds from sponsorships and ticket sales benefiting undergraduate scholarships and graduate fellowships. Sponsors included Shutterfly Inc., Salesforce, James Rohr and 24 other corporations and individuals. Among the many high-profile attendees were trustees Jeffrey T. Housenbold (TPR'91), president and CEO of Shutterfly Inc., and Keith Block (DC'84, HNZ'84), president and vice chairman of Salesforce, as well as one of CMU's newest strategic partners, Travis Kalanick, co-founder and CEO of Uber.

Three Gifts = $17 Million

During the event, CMU announced three gifts totaling $17 million to support the David A. Tepper Quadrangle and the Presidential Fellowships and Scholarships initiative.

Gifts from James and Sharon Rohr, as well as Legendary Entertainment, whose founder and chairman, Thomas Tull, is a trustee, will support the Tepper Quad. A gift from Wallace Sadauskas (TPR'43) and the estate of his late partner, Patricia Chotiner Traylor, will support Presidential Fellowships and Scholarships.

"The university is committed to attracting and supporting outstanding students from around the world, and offering them an innovative education that takes advantage of CMU's path-breaking research and practice across disciplines. These gifts help fulfill this fundamental vision," Suresh said.

More on Integrated Intelligence

The theme of the event — Integrated Intelligence — reflects how CMU refers to the increasing interconnections of people and machines. CMU understands that technological advancement by itself is not enough.

The real opportunity is to benefit people around the world by designing and integrating smart, seamless technologies that assist humans with solving major societal challenges.

To learn more, visit www.cmu.edu/integrated-intelligence.

Prerna Singh (TPR'12), Angie Im (HNZ'13) and Tanvi Srivastava (TPR'12) show off the group photo they had taken at the event.

Tepper Quad To Become CMU's North Star

The lot at the corner of Morewood and Forbes avenues will soon undergo a transformation to become the centerpiece of Carnegie Mellon's new north campus.

The first phase of the Tepper Quad will:

- introduce a new hub for technology-enhanced learning initiatives, including Carnegie Mellon's Simon Initiative, leadership in the Global Learning Council and expansion of successful online degree programs including the Tepper School's Online Hybrid MBA format;
- capitalize on Carnegie Mellon's campus-wide culture of innovation and entrepreneurship by facilitating and uniting activities in collaborative spaces that are vital for new venture creation and innovation, including curricula,

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CMU at Heart of Texas Festival

■ Kelly Saavedra

Thousands descended on Austin, Texas earlier this month for the 22nd annual South By Southwest (SXSW) Festival, and Carnegie Mellon was at the heart of it.

Known worldwide for showcasing the hottest trends in music, film and emerging technology, SXSW carved out a prime spot for CMU in the festival's Education Startup Village based on the university's impressive record of innovations in health care, Big Data, new creative industries and more.

Much of CMU's focus centered on integrated intelligence, a phrase used to describe the coming together of people, technology and machines to improve humankind. More than two dozen faculty, students and alumni presented their work and collaborated with other thought leaders from around the globe to foster the next big breakthrough.

Electrical and Computer Engineering Professor Priya Narasimhan was on hand to demonstrate her team's YinzCam app, already deployed in sports venues worldwide to bring fans closer to the game, including the Super Bowl. Robotics Professor Illah Nourbakhsh discussed Airviz, his startup dedicated to empowering citizens to improve personal air quality.

Tepper alumnus Alberto Gandini (TPR'09) fielded questions about his startup Accel Diagnostics, which is making preventative health care affordable and accessible through its mobile blood diagnostic tests that enable monitoring and diagnosis of life-threatening medical conditions anytime, anywhere.

Astro Teller (CS'98), a CMU Ph.D. recipient in artificial intelligence, Google X visionary and SXSW keynote speaker, shared never-before-heard stories and hard-learned lessons from his experiences as a scientist, inventor and entrepreneur.

Heinz College, which has been represented at SXSW for many years, was once again in attendance as professors Ari Lightman and Vibhanshu Abhishek entertained crowds with "My Data is Bigger Than Your Data," a lively panel discussion on Big Data, social media and marketing.

This marked the fifth year that students from the Heinz College Master of Entertainment Industry Management (MEIM) program traveled to the festival to attend SXSW workshops, presentations and alumni discussions.

"As CMU students continue to marry the creative arts with technology, attendance at a festival like SXSW offers a unique, first-hand opportunity to experience the very best of interactive, music and film together in one amazing week," said Dan Green (A'94) MEIM director.

Festival planners did not overlook outstanding student creativity. They selected Marioneta, a project by students at CMU's Entertainment Technology Center, as one of the featured installations. Marioneta allows guests to inhabit a collection of antique puppets in a virtual environment.

"Much of the innovation we showcased at SXSW grew out of integrated work across disciplines," said Thanassis Rikakis, vice provost for design, arts and technology at CMU.

Rikakis was a featured panelist at "Shaping Technology for Improved Future Human Life," where he joined colleagues Manuela Veloso (CS'89, '92) and Ken Goldberg (CS'88, '90) to discuss the integration of technological advances with humans and nature, and how merging the two will better our world.

Virtual Puppeteering Project Fun for All Ages

■ Kelly Saavedra

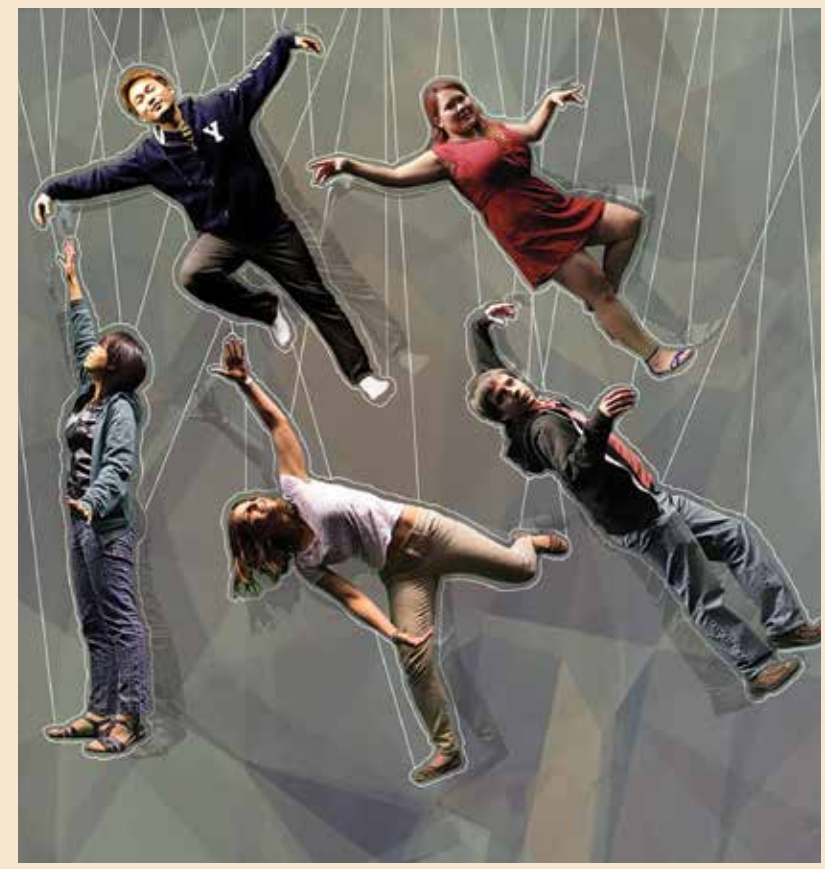
An antique puppet collection is often fragile and not to be touched by a museum's young visitors.

But a tech-savvy student team from CMU's Entertainment Technology Center is giving kids of all ages unique access to some of these treasures.

Marioneta, an installation at the Children's Museum of Pittsburgh, allows users to virtually become a puppet of their choosing from a valuable collection donated by Margo Lovelace. Users can then interact with other puppets and objects in an onscreen virtual world through the physical movements they make in real life.

"So, for example, you can choose to be the princess puppet, and by making the related arm motions, you can make the puppet pick up a pumpkin in the fall, or break a lantern filled with fireflies in the spring," said Marioneta team member Christina Tarn. "Kids love to pick up and drop the wooden barrel full of peaches and watch all of the peaches spill onto the ground."

The hardworking Marioneta team usually spends their weekends testing and refining their work at the museum. But a sweet invitation from the South by Southwest Festival had them spending one March weekend in Austin, Texas, where they demoed their project for festival-goers.



Team Marioneta (l-r) includes ETC students Emily Chang, Hyunghwan Byun, Maria Alejandra Montenegro, Christina Tarn and Alexander Moser.

Spinoff Introduces Home Air Monitor

■ Byron Spice

Speck, a personal air pollution monitor (left) introduced at the SXSW Interactive Festival, will enable people to monitor the level of fine particulate matter suspended in the air inside their homes, helping them assess if their health is at risk.

Developed at CMU's Robotics Institute and now being marketed by CMU spinoff company Airviz, Inc., Speck provides people with an unprecedented depth of knowledge about their personal exposure to the tiniest particulates capable of lodging deep in the lungs and aggravating heart and lung diseases.

"Sometimes you can see air pollution as a haze in the distance, but in and around your home, it's invisible," said creator Illah Nourbakhsh, professor of robotics.

Knowledge of particulate levels empowers people to reduce exposure by opening or closing windows, altering activities, or taking action such as using HEPA air filters, Nourbakhsh said.

In the Pittsburgh region, about 300 Specks already are in use. Some are used in homes to monitor indoor air quality for people susceptible to asthma or other conditions, while others are being used by citizen groups to monitor particulates emitted by coke batteries or by natural gas production.

One family in a pilot project had a young asthmatic daughter. Family members had installed an air conditioner to help her breathe, but didn't realize until they used Speck that particulate levels increased when the air conditioner was running, Nourbakhsh said. They subsequently purchased a filter for the air conditioner.

Speck has a display screen that shows instantly whether unhealthy levels of particulates are present. It also is Wi-Fi-connected, enabling the monitoring data to be uploaded to a database controlled by the user.

Speck was developed over the past four years in Nourbakhsh's CREATE Lab. The devices are being sold online for $200 each at https://www.specksensor.com/. The Speck is designed and assembled in Pittsburgh.

Pittsburgh's LED Project

Second Phase Shines Light on Neighborhoods

■ Bruce Gerson

Carnegie Mellon's Remaking Cities Institute (RCI) is literally casting a new light on Pittsburgh.

The institute led the effort to relight more than 30 business districts, replacing 3,300 sodium and mercury vapor streetlights with long-lasting, energy-efficient, light-emitting diode (LED) bulbs. And now it has its sights set on Pittsburgh's 90 residential neighborhoods.

With backing from the city and funding from the Heinz Endowments and CMU's Metro 21 Initiative, the RCI will use this second phase of the project to develop and propose recommendations and technical specifications for replacing more than 37,000 neighborhood streetlights with LEDs.

A portion of this phase will include measuring the impact of the LED work completed in the business districts in 2012.

RCI Director Don Carter, the study's principal investigator, wants to know, "Was it worth it? Did it impact your business, did you feel safer, did it affect crime and traffic accidents? We're going to go back and interview people from the Public Works and Public Safety departments and the businesses to find out."

While LED lamps are more expensive than sodium vapor bulbs, Carter believes the research will confirm that the first phase of the project has been a good economic investment.

"LEDs last seven to 10 years as opposed to two to three years for sodium vapors, and they use about one-seventh of the energy," he said. "You get your money back pretty quickly."

Carter noted that the Clinton Climate Initiative estimates that conversion of streetlights to LED technology can reduce annual energy costs up to 70 percent.

In addition to cost and energy savings, he pointed to some other benefits of LEDs. Not only are they brighter, they are directional, meaning they can be pointed downward toward the street and sidewalk to reduce light spill.

They also can be equipped with technology to improve energy efficiency, maintenance and safety.

Before and After: The image on the left shows a neighborhood street lit with sodium vapor streetlights. On the right is the same street under LED lighting.

"The new technology is so advanced, not only in the light source, but you can add controls and sensors so every single light can have its own IP address," Carter said. "So, in a central control room, you'll be able to see if a light on Beeler Street has gone out, or is about to go out.

"You can add controls to flash the lights in case of an emergency. You could also begin to monitor air pollution, sound — you can hear if a gunshot was fired," he added. "We're looking at how we can turn these streetlights into sensing computers."

Carter said the city did not install control and sensing technology in the business district streetlights due to the cost, but sensors could be easily added. He said the new proposal would recommend that the technology be included for the neighborhoods.

Project manager Steve Quick, an RCI research associate and adjunct professor, noted that a big advantage of the technology would be the ability to adjust the intensity of the lights at different times, similar to motion sensors.

"The sensors could increase the brightness when needed, such as when pedestrians or cars are approaching or for an event like a block party. This dimming capability is important for energy savings, particularly in areas where bright lighting is not needed all the time," Quick said.

Quick and the project team are meeting with Debra Lam, Pittsburgh's chief innovation and performance officer, to discuss all of the advantages the LED sensing capabilities would bring to the city. Managing the large amount of data that this neighborhood-watch-like technology would be able to gather, such as maintenance, noise and safety issues, also is being discussed.

"You need to collect it [data]. You need to analyze it. And you need to distribute it to decision-makers," Carter said.

In addition to Carter and Quick, the RCI interdisciplinary team includes Professor of Lighting Cindy Limauro; Assistant Computer Science Professor Kayvon Fatahalian; RCI researchers Zharfa Ranjbar and Olivia Wells; and Computer Science Ph.D. student Evan Shimizu.

Limauro, a professor in the schools of Drama and Architecture, is a principal of C&C Lighting, LLC, a Pittsburgh-based consulting firm with extensive expertise in LED technology. She played a major role in the Pausch Bridge and Hunt Library lighting projects at CMU, and in the lighted weather beacon atop the Gulf Tower downtown.

The RCI is part of Metro21, a multidisciplinary research and educational initiative housed in the Heinz College that aims to design, develop, deploy and evaluate solutions to the challenges affecting the economy and quality of life in metro areas. Rick Stafford, distinguished service professor of public policy, directs Metro21.

"CMU and Metro21 are about R, D and D — research, development and deployment. We do the basic research, we develop the product and we get it deployed. Carter said. "The goal is to get it into the hands of people that can make things happen."

Earth Hour Kicks Off Astronomical Year

Continued from page one

aware that there are many different things we can do to be good stewards of the planet.

She also hopes the event gets folks looking at the stars.

"You can see much more in the dark. Many observatories have had to close down because they were built too close to city lights," she said.

The idea for an astronomical take on Earth Hour originated with Turnshek, who was a lead author of "The Astronomical Footprint," a grant proposal submitted to the Heinz Endowments that also included the "Our Pittsburgh Constellation" project.

Our Pittsburgh Constellation is a Google map of all things astronomical in Pittsburgh.

"Astronomy enthusiasts can come to this one location to see where all the planetariums are, where the star parties are, where the classes are being taught, where the observatories are, where the museums are, where the telescopes are sold," explained Turnshek.

The map will be put on the Earth Hour website, which will serve as a clearinghouse for all of the astronomical events happening this year. The locations on the map are identified with stars, leading to the Pittsburgh Constellation.

"We're going to run a contest for artists on what they see in the stars on the city map. What is this Pittsburgh Constellation? What patterns in the stars do they see?"

Pirates, penguins, pierogies and other Pittsburgh items come to mind.

Other activities planned throughout the year include a citizen science project, called "Globe at Night," in which citizens will go to a website to record their location, via longitude and latitude, and the brightness of the sky via a smartphone app.

Turnshek will be launching a series of art classes in which participants will be painting astronomical objects, such as comets, galaxies, star fields, planet scapes, things that would be more visible if we turned off the lights, she said.

"We're shooting for astronomically correct art, so you can learn a little astronomy while creating art. That way we'll teach them an appreciation of the sky. Our goal is to use art to help create social change," she said.

The art will be displayed at Assemble, an art gallery in Garfield.

In addition to Turnshek, Earth Hour organizers at CMU include Don Carter, director of the Remaking Cities Institute, Don Coffelt, associate vice president and director of Facilities Management Services, University Engineer Marty Altschul, the Astronomy Club and Sustainable Earth.

Representing Pittsburgh are Aftyn Giles, sustainability coordinator in the Office of the Mayor; Anna Siefken of the Green Building Alliance; and Susan Rademacher of the Pittsburgh Parks Conservancy.

One-Way Trip to Mars

Alum Reaches Round Three In Selection Process

■ Kelly Saavedra

It's an idea that's out of this world.

A non-profit in Denmark plans to land the first humans on Mars in 2025 — without a return flight home — and Carl LeCompte, an alumnus of the School of Computer Science, is on the short list.

More than 200,000 aspiring astronauts threw their space helmets into the ring to participate in the Mars One mission. Round three in the selection process has whittled that initial group down to 100, and LeCompte is still in the running.

"The idea of not just trying to survive but thrive in an alien environment has always held a strange sort of fascination for me. I feel it's the next big step in human evolution, and I want to be a part of that," he said.

Mark Stehlik, a professor of computer science at CMU, finds the notion of the Mars One project fascinating — a logical next step in our evolution as a space-exploring species. He also noted it takes a special kind of person to decide to participate in such a historic mission, one that has the opportunity to significantly enhance the human race.

He remembers LeCompte as a first-year student in 2004.

"In many ways, I am not surprised about Carl's interest in the Mars One program, nor am I surprised about his advancing as far as he has in the selection process," Stehlik said. "Carl was always smiling, very pleasant, a very smart student. And, if I recall correctly, he had a strong interest in physics. The combination of his intellect, affability, scientific interests and innate curiosity seem like an ideal mix for a candidate for this mission."

Round one of the selection process required LeCompte to submit a one-minute video explaining why he should be among the first humans who set foot on Mars.

"I'm a quick learner, and I'm good at adapting the tools I have at hand. But most importantly, I'm at my best when I'm building a home for myself and those around me," he said. "And, all gimmicks aside, I feel that's why we're going to Mars. As much as we're going there to explore and learn, we're going there to live."

LeCompte reserves a profound admiration for space pioneers Yuri Gagarin, Alan Shepard, Buzz Aldrin and Neil Armstrong, to name a few — the first ones willing to go where no one had gone before, pushing the boundaries of human achievement.

"I believe part of what makes us special as humans is the desire and ability to become more than what we are," LeCompte said. "It's time to not just visit a new world but to settle down there, and take a step on the road to becoming an interplanetary species."

Some are begging LeCompte not to go — technology doesn't exist for a return flight to Earth — but he says he is riveted by the sheer difficulty involved in figuring out how to live in such a hostile environment, not to mention enamored by the magnitude of the camaraderie he expects the team will enjoy as their efforts progress and succeed.

CARL LECOMPTE (CS'08) IS STILL IN THE RUNNING FOR THE MARS ONE MISSION.

James Kuffner, a visiting robotics professor, saw LeCompte's team spirit in action in 2006, when LeCompte helped contribute to a research project in Kuffner's lab that explored new technologies for building smarter and safer automobiles. LeCompte helped build a multiscreen driving simulator so that others could test ideas for smart, multi-car motion control.

"He was one of the best students I taught that year," Kuffner said. "He was very bright, motivated and inquisitive. It is wonderful to hear about this potential opportunity for Carl. If selected, I am sure he will make our country, CMU and me, personally, very proud."

Stehlik echoed that sentiment.

"I am proud to know someone personally in the late-stage candidate pool of Mars One," Stehlik said.

"And I am happy that there is an opportunity to add some Tartan plaid to the Red Planet."

Students Flight Test Sensors for Moon and Mars

■ Byron Spice

A team of CMU undergraduates have traveled to California's Mojave Desert to flight test a sensor package they developed for analyzing large pits in the surface of the moon or Mars.

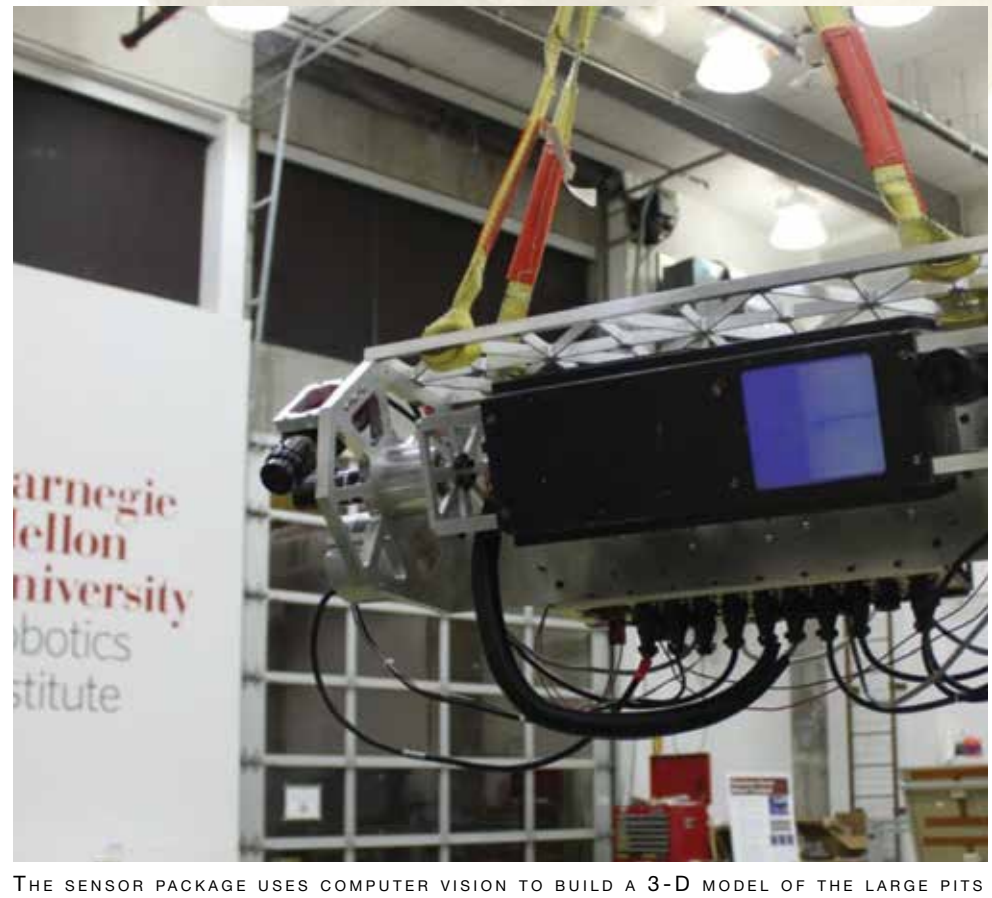
The flight tests are being conducted aboard a reusable vertical-takeoff, vertical-landing rocket called "Xombie," built and operated by Masten Space Systems.

The three flights — two tethered and one free flight — are taking place at the Mojave Air and Space Port and are funded through the Undergraduate Student Instrument Program (USIP) of NASA's Science Mission Directorate and the Flight Opportunities Program of NASA's Space Technology Mission Directorate.

The hardware and software package developed by the students would be used for a robotic lunar mission to the Lacus Mortis region of the moon planned by Astrobotic Technology and

CONTINUED ON PAGE EIGHT

THE STUDENTS' SENSOR PACKAGE IS BEING TESTED ABOARD THE ROCKET XOMBIE.



THE SENSOR PACKAGE USES COMPUTER VISION TO BUILD A 3-D MODEL OF THE LARGE PITS IN THE SURFACE OF THE MOON AND MARS.

Bravo! Bravo!

Nominees Pouring In for Inaugural Tony for Theatre Educators

■ Pam Wigley

The mission isn't accomplished quite yet, but it's well on its way.

When Carnegie Mellon became the first higher education partner of the Tony Awards last spring, one of the primary missions of the relationship was to recognize theatre educators who inspire K-12 students. Today, about 250 teachers have been nominated and 2,000 more nominations are in progress for the inaugural Tony Award for Excellence in Theatre Education.

"We wanted to recognize teachers who have a positive effect on students in their elementary and high school years because that's where a foundation of expression is built," said Peter Cooke, head of the School of Drama. "These individuals help to provide a creative outlet for students, who find value in the arts at a time in their lives when they need to be part of something beyond a general classroom experience."

Dan Martin, dean of the College of Fine Arts, said there also are instances in which theatre educators pave a path for a student's broader talents and increased self-esteem. As a result, students across a broad spectrum of studies have benefited from their arts education.

"Carnegie Mellon's involvement in this program shows that our entire global university recognizes and values the contributions of K-12 educators," Martin said.

The award, which CMU will present during the 69th Annual Tony Awards telecast June 7, will honor a current

K-12 theatre educator at an accredited institution or recognized community theatre organization in the U.S., who has had great impact on the lives of students and who embodies the highest standards of the profession.

Cooke, Light Named to Judges Panel

A panel of judges, representing the American Theatre Wing, The Broadway League and Carnegie Mellon, will select the award finalists and winner.

Cooke and alumna Judith Light (A'70) are the judges representing CMU. Cooke is an internationally recognized performing arts educationalist, administrator, researcher and theatre practitioner. He has designed some 150 productions across the disciplines of drama, opera, dance, puppetry, music theatre, television, casinos and large-scale events.

Light won back-to-back Tonys for Best Performance by an Actress in a Play for her performances in "Other Desert Cities" (2012) and "The Assembled Parties" (2013). She also won back-to-back Drama Desk Awards for those performances.

"This award is about being able to start a national conversation about how important education is and particularly education in the arts," Light said.

"When you keep arts at the forefront of our educational system you are helping people to relate to the world differently, to be able to relate to themselves differently, and to take that education and lift the culture, because it is only through the arts that we can actually really do that."

Joining Cooke and Light as judges are:

- Sue Frost, founding member of Junkyard Dog Productions and current executive committee member of The Broadway League;
- Nina Lannan, founder of Bespoke Theatricals and former chair of The Broadway League;
- Lawrence Otis Graham, New York Times best-selling author and American Theatre Wing trustee; and
- Thomas Schumacher, producer and president of Disney Theatrical Group, American Theatre Wing Advisory Committee executive committee member of The Broadway League.

Nominations are being accepted online through March 31. To nominate a deserving teacher, go to www.tonyawards.com.

The Tony Effect

Carnegie Mellon's partnership with the Tony Awards has greatly increased visibility for not only the School of Drama, but for the entire university.

Consider:

- CMU's first prime-time television commercial during the Tony Awards telecast, which was seen by more than 7 million viewers around the world, aired twice during the broadcast. The animated spot, narrated by alumnus Billy Porter (A'91), highlighted CMU's success in the arts, business, science and technology;
- Alumni Matt Bomer (A'01) and Zachary Quinto (A'99) announced the partnership during the live CBS broadcast as the Carnegie Mellon University banner hung as a backdrop;
- The partnership generated more than 1,000 print, online and broadcast stories in the international and national media;
- News placements include more than 100 million CMU branded impressions, according to PRtrak, a media analytics consulting firm;
- Coverage of the partnership reached more than 9.3 million followers on Twitter.

According to PRtrak, the above was worth more than $5 million of advertising.

Students Flight Test Sensors for Moon and Mars Continued from page seven

Carnegie Mellon. Orbital imaging suggests this region contains a pit — also known as a skylight — that may serve as an entrance to a cave.

As the landing craft flies over the pit, the sensor package uses computer vision to build a 3-D model of the depression. Upon landing, a CMU-developed robot, called Andy, would then explore the pit.

"This would be our first close-up look at a pit," said Neal Bhasin, a senior majoring in computer science who led the development team. Though the moon is covered by impact craters, the existence of numerous pits was discovered only a few years ago by orbiting spacecraft.

"We want to see if we can model the pit walls well enough to find cave openings," he added.

Pits also are abundant on Mars where, at their lowest depths, they may harbor signs of prior life that haven't been detected yet on the planet's surface.

The students have tested their computer vision technology in CMU labs and in flight using a helicopter flying in the vicinity of Zelienople, Pa. The flight test aboard Xombie will more closely approximate the flight of Astrobotic's Griffin landing craft during its final approach to the moon — a powered rocket descent. At the Mojave site, a circle of shipping crates are being used to mimic the lunar pit.

"It's an amazing achievement from such a young group. Apollo included a lot of 20-somethings. Youth generates a lot of innovation and energy."
— William "Red" Whittaker

William "Red" Whittaker, professor of robotics and supervisor of the student team, said NASA's USIP has launched many student payloads aboard sounding rockets or beneath balloons, but securing a flight using a vertical-takeoff, vertical-landing rocket such as Xombie is unprecedented.

"I'm immensely proud of the team and of its technical accomplishments," Whittaker said. "It's an amazing achievement from such a young group. Apollo included a lot of 20-somethings. Youth generates a lot of innovation and energy."

The importance of the sensors to the Astrobotic/CMU mission "is huge, immense," Whittaker said. Not only will the 3-D models of the pit provide guidance for the Andy rover, they will give scientists information about pits that couldn't be obtained from orbit.

Planetary scientists, volcanologists and other scientists will be able to use that precious information to obtain new insights into the moon and its history, even if the rest of the mission is unsuccessful.

The caves that researchers hope to find in the pits could be lava tubes and thus could help explain the moon's volcanic past. Caves also could be important habitats for future human explorers.

In addition to Bhasin, the team includes Kerry Snyder, a senior computer science and robotics major; Oliver Daids, a sophomore computer science major; Rick Shanor, a senior in mechanical engineering and robotics; Ashrith Balakumar, a sophomore mechanical engineering major; and Edward Nolan and Brent Strysko, both seniors majoring in electrical and computer engineering.

Kevin Peterson, Astrobotic's chief technology officer, has mentored the team.

"Steubenville"

Director Engages 'Self' in Timely, Moving Documentary

■ Amy Gijsbers van Wijk

Eleanor Bishop used her theater skills to bring real life drama to the studio stage in the Purnell Center for Performing Arts.

As a John Wells Directing Fellow in the School of Drama, the New Zealand native and her collaborators created a documentary-style play called "Steubenville," centered on the highly publicized 2012 rape of a high school girl by members of the football team in Steubenville, Ohio.

While many directors work with plays that have pre-existing texts and performance histories, Bishop chose a different path. Her style involved incorporating both acting and personal moments in which the actors are themselves, part of a process that Bishop considers largely documentary.

"My process is a lot about documenting the world and then documenting the self," Bishop said. "So [the team] did a lot of talking together about our own experiences with sex, romance, growing up and trying to investigate ourselves, how we fit into the culture and how this culture affects us."

Her decision to create the work was influenced by recent national events.

"I wanted to do this play now because we're at a moment in American culture where the country is discussing rape and what rape culture is," she said. "There have been so many cases that have come to light recently, and people are shocked. There is energy and a momentum to talk about it, particularly in the environment that we are a part of, a college campus."

Creating a theatrical work based on real, living people dealt its own set of challenges, Bishop said, and one issue she ran into involved representation.

"How do you represent Jane Doe, this woman who has never spoken to the media and who does not want to speak? It is important in this piece that we can't speak for her," Bishop said. "And any attempts to imagine what she might be like or what she's thinking seemed futile, or dishonest."

The Wells program taught her the techniques of live camera, live camera acting, blue/green screen and composited backgrounds, all of which made their way into "Steubenville."

Overall, a lot of her classes focus on the student articulating his or her unique artistic vision, she said, and having identified herself as a feminist artist, "Steubenville" was a large step toward realizing her own artistic vision.

Her collaborators included CMU actors, designers and playwrights, all of whom welcomed the chance to personally impact the university and Drama School through their work.

PHOTOS BY TIM KAULEN

"Steubenville" director Eleanor Bishop (left) works with actress Molly Griggs (A'16) as she rehearses her lines for the play.

"It's hard to find a complex sexuality for women, especially in film and television, and usually those roles are based around men," Bishop said. "The business is so much about how you look. 'Are you or are you not sexy.' It allows people to be categorized and put into boxes and that can be very damaging."

Molly Griggs, a junior at CMU and one of the "Steubenville" actors, said it wasn't a typical acting experience.

"The fact that this piece was so personal made it harder sometimes. It required a particular kind of bravery," Griggs said. "There was much more of Molly, the person, in 'Steubenville.' As an actor, it was the hardest thing I've ever done."

IDs of March

Identity System To Help Research Attribution

■ Cindy Carroll

A new campaign, ORCID@CMU, has nothing to do with spring, but it could help your career blossom.

Increasingly, reputations and careers are built on enabling others to quickly and confidently identify you and your body of work. Funders, publishers, scholarly societies and associations, fellow researchers and potential collaborators need to be able to identify you and your work for many reasons, from benchmarking and record-keeping, to discovery and access.

Launched this month, this new university initiative will help the research recognition process by offering faculty, graduate students and researchers the means to obtain an Open Researcher and Contributor ID (ORCID®) and link it to their Andrew ID.

And yes, of course, there's an app for that: orcid.library.cmu.edu.

Why ORCID?

"An ORCID ID uniquely identifies you throughout your career," said Scholarly Communications Librarian Denise Troll Covey. "It distinguishes you from other researchers with the same or similar names, and identifies you with all the name variations by which you may be known."

Covey said it also allows researchers to bring together their works and data associated with other institutions and identity systems. "You can maintain all your important contributions in one place, including citations and links to publications, datasets and software," she said.

At CMU, campus systems will strategically harvest ORCID IDs from the identity management system. For example, the Sponsored Programs and Research Compliance System will use the IDs to facilitate communication with research sponsors.

Why Now?

Many publishers and granting agencies now ask for this ID with submissions to more comprehensively link researchers with all of their research activities.

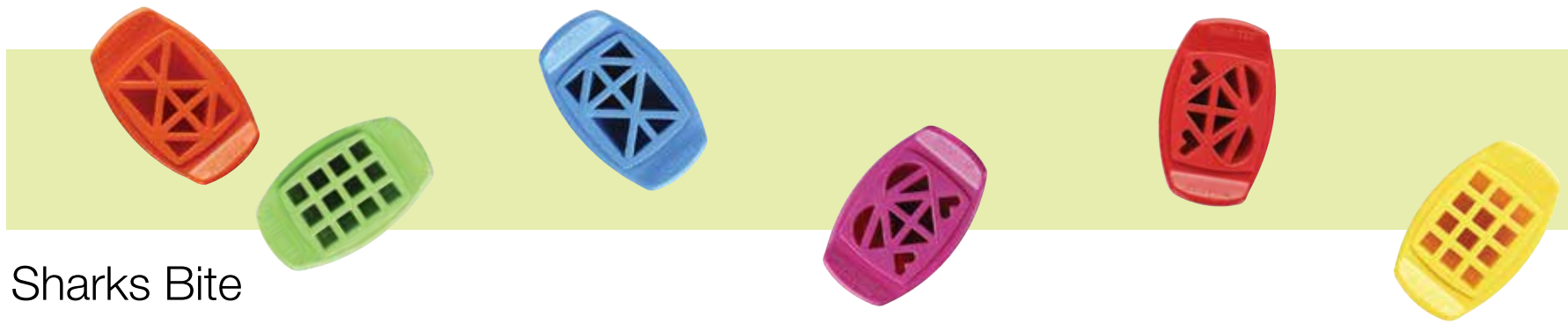
Universities are integrating ORCID IDs with campus systems to facilitate grant management and research assessment. And competition for limited resources and pressure to increase impact make efficiently identifying researchers and their contributions mission critical.

What You Need To Do

1. Go to orcid.library.cmu.edu, indicate whether you want to create an ORCID ID or provide an existing ORCID ID, then authenticate with your Andrew ID and follow the brief instructions.
2. Take a few minutes to add important information to your record. You can easily add other names you're known by, import your citations from Scopus, Web of Science, Google Scholar and other vendors with ORCID integrations, and control what information in your ORCID record is displayed publicly.

See ORCID @ CMU http://www.library.cmu.edu/datapub/id/orcidinitiative for detailed instructions and information.

If you have questions, contact Covey at troll@andrew.cmu.edu or 412-268-8599.



Sharks Bite

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features a panel of potential investors called "sharks," who consider pitches from contestants seeking an investment in their business or product.

Rhoads pitched them her "FunBites" product, food cutters that slice sandwiches, fruit, veggies and more into fun shapes in a single step. The idea behind FunBites is to make healthy meals appeal to even the pickiest of eaters — kids.

Rhoads has been selling FunBites on her own for three years, and has done nearly $500,000 in sales. Now, she's eyeing the big-box stores.

BOBBIE RHOADS

"I've taken this company as far as I can go as one person," she told the shark panel. "I need help opening doors."

During her presentation, she served up food shaped into triangles, hearts and squares and showed how easy the shapes were to make with her cutters. When she finally made the ask — $75,000 in return for 20 percent equity — it created a feeding frenzy.

Three sharks offered her deals. Among them was Pittsburgh native Mark Cuban, a businessman, investor and owner of the NBA's Dallas Mavericks, Landmark Theaters and Magnolia Pictures.

CMU ALUMNA BOBBIE RHOADS (ABOVE) PRESENTS HER PRODUCT ON ABC'S "SHARK TANK." AT LEFT, SHARKS KEVIN O'LEARY AND LORI GREINER GO ONSTAGE TO TRY THE PRODUCT.

The most enticing offer came from Lori Greiner, the "Queen of QVC" responsible for launching over 400 products.

Greiner offered Rhoads $75,000 for 25 percent equity, and she accepted.

"I must say Bobbie is a great role model for our CMU entrepreneurs," said Dave Mawhinney, co-founder and director of CMU's Center for Innovation and Entrepreneurship. "Her perseverance in getting onto the show and her pursuit of the American Dream with FunBites is an inspiring story."

For Rhoads, the best part about being an entrepreneur is the freedom to have her ideas come to life the way she wants them to.

"This is also the worst thing, in a way, in that you don't have anyone checking your work!" she said. "You have to trust your knowledge and your gut instinct."

As a mother of two young daughters, Rhoads is happy juggling work and family and has some advice for other moms who want to follow their dreams.

"Believe that you can do it, and you can. It's just a juggle. Plus, the more you involve your kids in the business, whether helping or sharing the successes, the more they will cheer you on and want to give you time to make it a success," she said.

Her husband, Ed, who earned a bachelor's degree from the College of Engineering and a master's degree from the Tepper School, manages background operations and IT for the company.

Working on campus at the Center for Technology Transfer and Enterprise Creation gave him exposure to the patenting process, which he said he found helpful when he applied to get a patent for FunBites.

And while some people steer clear of mixing business with family, the Rhoads family appears to thrive on it.

"In our case, it's pretty simple because FunBites is Bobbie's company," Ed said. "She's the boss. I do my best to support the team in areas where Bobbie and others should focus elsewhere."

He added, "Communication is key. And a little wine at the end of the day doesn't hurt. It's important to try not to lose perspective; it's a long journey but worth it in the end."

Tepper Quad To Become CMU's North Star

CONTINUED FROM PAGE FOUR

THE ABOVE RENDERING IS AN OVERVIEW OF THE PLANNED TEPPER QUAD.

research, mentoring and partnerships with alumni and stakeholders that support venture capital and seed funding;

- create a 21st century research and learning environment that features new flexible, collaborative spaces for learning alongside world-class amenities that benefit the entire campus community;
- build upon the strengths of the undergraduate business program to expand enrollment by 40 percent and broaden business education offerings for all students across the Carnegie Mellon campus; and
- increase the total master's degree student population at the Tepper School by 50 percent, which includes the Tepper MBA program and new specialized master's degree programs.

The creation of the Tepper Quad was made possible by a lead gift of $67 million from the charitable foundation of alumnus and investor David Tepper (TPR'82).

For regular updates throughout the planning and construction process, visit The Tepper Quad website at http://tepper.cmu.edu/who-we-are/tepper-quad.

Transforming Health Care

CONTINUED FROM PAGE ONE

"I think this is a watershed moment for data science and health care, and how all these areas will intersect so that we can make new discoveries addressed to the needs of patients, citizens and doctors in ways in which we can only imagine today," said CMU President Subra Suresh. "There are very few places in the world where institutions with this kind of capacity can come together to work together on a problem that benefits not only the region but the region's economy."

Initially, the alliance will include two research and development centers: the Center for Machine Learning and Health (CMLH), led by founding director Eric Xing, a CMU professor in the Department of Machine Learning; and the Center for Commercial Applications of Healthcare Data, spearheaded by Dr. Michael Becich, chair of the Department of Biomedical Informatics at Pitt. Scientists from all three institutions will participate in the work of each center.

The CMLH will work on challenging problems at the intersections of health care and machine learning. Data from sources as varied as electronic medical records, genomic sequencing, insurance records and wearable sensors will be used to directly improve health care.

For example, imagine a smartphone app that suggests the single dietary change that will most improve your health, based on your genetic makeup and medical history. Or suppose a physician receives an automatic alert when a patient enters the earliest stages of transplant rejection.

UPMC CEO JEFFREY ROMOFF, CMU PRESIDENT SUBRA SURESH AND PITT CHANCELLOR PATRICK GALLAGHER (L-R) ANNOUNCED THE FORMATION OF THE PITTSBURGH HEALTH DATA ALLIANCE AT A PRESS EVENT AT UPMC'S HILLMAN CANCER CENTER IN SHADYSIDE ON MARCH 16.

"I THINK THIS IS A WATERSHED MOMENT FOR DATA SCIENCE AND HEALTH CARE, AND HOW ALL THESE AREAS WILL INTERSECT SO THAT WE CAN MAKE NEW DISCOVERIES ADDRESSED TO THE NEEDS OF PATIENTS, CITIZENS AND DOCTORS IN WAYS IN WHICH WE CAN ONLY IMAGINE TODAY."
— CMU PRESIDENT SUBRA SURESH

The CMLH will focus on five areas: big health care data analytics; personalized medicine and disease modeling; issues of privacy, security and compliance in the context of big data; data-driven patient and provider education and training; and a new general framework for big data in health care.

"We envision data-driven medicine based on the experience of many thousands of actual patients that will produce targeted, not generic, assessments of an individual's disease risk and make personalized recommendations for treatment," said Xing, who was awarded an IBM Open Collaboration Research Award in 2012 to develop novel ways to use big data to search for associations between genetic variations and their links to outcomes such as major diseases.

Xing said a near-term project he envisions is the development of an automated patient diagnosis system. A doctor could query this system to determine possible diagnoses for a set of symptoms and lab findings. The system would search medical literature and analyze collections of patient data to provide possible diagnoses.

"Eric is the perfect person to direct this center. He is a world leader in the field of machine learning and an expert in computational biology and chemistry," said Andrew Moore, dean of the School of Computer Science.

Pittsburgh Mayor Bill Peduto praised the partnership and emphasis on big data, calling it "ed-meds on steroids." He said his brother, who was diagnosed with cancer last year, is now doing well because his treatment was influenced by data acquired from similar patients worldwide. He said the new alliance would make data work for patients around the world.

Mural, Mural on the Wall

"THIRD DIMENSIONAL CELLULAR AUTOMATON" IS THE TITLE OF THE NEW MURAL IN THE GATES AND HILLMAN CENTERS, PAINTED BY BRIAN HOLDERMAN.

THIS PIECE WAS COMMISSIONED BY THE BUILDING'S ART COMMITTEE ON THE SUGGESTION OF FORMER DEAN OF THE SCHOOL OF COMPUTER SCIENCE RANDY BRYANT. THE COMMITTEE IS MADE UP OF BOTH FACULTY AND STAFF, AND CHAIRED BY CHARLOTTE YANO (A'96, HNZ'05).

SPANNING NEARLY TWO YEARS OF PLANNING, SUBMISSIONS WERE SOLICITED FROM SEVERAL ARTISTS. HOLDERMAN WAS ULTIMATELY SELECTED BASED ON THE QUALITY OF HIS OTHER WORK AROUND PITTSBURGH AND WILKINSBURG, AND HIS WILLINGNESS TO COLLABORATE WITH THE COMMITTEE ON DESIGN IDEAS.

THE DESIGN WENT THROUGH SEVERAL REVISIONS. THE FINAL WORK WAS INSPIRED BY THE ARCHITECTURAL ELEMENTS OF THE BUILDING AND A SCIENTIFIC PHENOMENON KNOWN AS "CELLULAR AUTOMATA."

FROM SOME SPOTS THE BENT WALL APPEARS TO FLATTEN OUT, AND IN OTHERS THE CURVE IS ACCENTUATED. ABSTRACT, MID-CENTURY, POST-MODERN, AND BOLD, WHICHEVER SPOT YOU VIEW IT FROM, IT GETS YOUR ATTENTION.

Parenting Advice

Roboticist Recommends Raising 'Technologically Fluent' Kids

■ Byron Spice

Illah Nourbakhsh says robots and artificial intelligence will increasingly displace people from many conventional jobs.

The professor of robotics has even written a book about it, called "Robot Futures."

It's enough to make parents despair over their children's career prospects, he acknowledged, and that's why he's publishing a pair of follow-up books, "Parenting for Technology Futures." "Part 1: Education and Technology" is now available on Amazon.com.

The key, he said, is to raise children who are "technologically fluent."

"If we want our children to flourish in a technology-rich future, we need them to understand technology deeply— so deeply that our kids influence the future of technology rather than simply being techno-consumers, along for the ride," he writes.

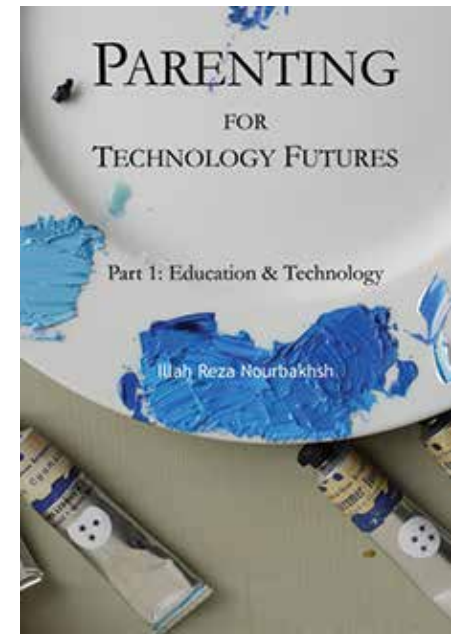
In the 64-page first volume, Nourbakhsh provides an overview to help parents understand the strengths and shortcomings of technology education in schools, including the movement to STEM (science, technology, engineering and mathematics) education, digital learning and massive open online courses (MOOCs).

He also emphasizes the important roles that parents play, noting students only spend 20 percent of their time in school. Even if parents don't consider themselves technologically fluent, they can help their children achieve fluency with sufficient time and effort.

"There are no shortcuts to developing tech fluency, and there is no way to outsource the parent's role to school, after-school or video games," Nourbakhsh writes.

Owning a computer is not essential to a child becoming technologically fluent, he noted, but a parent does need to devote time to the process. He suggests educational resources that are available to parents, some at little-to-no cost.

"There is no doom-n-gloom or fear-mongering about technology in this book," said Junlei Li, associate professor of psychological science, early learning and children's media at St. Vincent College. "Rather, there is a lot of encouragement and empowerment that comes from understanding what technology can and cannot do for our children and ourselves. There is a clear call to assert ourselves, as human beings, to make and give meaning to the technology around us."



Though an upcoming second volume will go into step-by-step detail on how parents can help their children embrace technology as a tool, rather than fear it, the first volume includes some suggested activities.

For instance, one exercise Nourbakhsh recommends is creating a "Producer/Consumer Table." Sit with your child and compile a list of ways she uses a computer. Then, rewrite the list into a series of columns: Produce, Interact, Consume.

Activities that involve watching shows, reading cartoons and looking at other people's blogs and galleries should be placed in the Consumer column, while activities such as writing poems, creating a picture blog and editing videos would be placed in the Produce column. Activities such as running a touch-typing tutor, playing games or using Khan Academy would be categorized as Interact.

"If the activities are evenly distributed between Produce, Consume and Interact, then you are doing very well indeed," he said. "If there are nearly no activities under Produce, and the Interact category lacks creative or knowledge-building examples, then there is room for mindful improvement."

At Carnegie Mellon, Nourbakhsh directs the CREATE Lab, where research projects include such educational programs as integrating robotics into non-technical school subjects, developing a robot that helps students learn computer programming and a program that encourages students from kindergarten and up to explore the workings of their toys and learn about electrical circuitry.

Come Fly With Me

Workers are busy installing Art Professor Clayton Merrell's biggest public art project to date. Merrell (bottom left) is transforming the airside center core floor at the Pittsburgh International Airport into an intricately patterned terrazzo image of the sky. The terrazzo is being laid out like a paint-by-number, with sections that include drawings of various flying machines. The project is expected to be completed by October 2015. Learn more about the project and listen to a podcast with Merrell at http://dipodcast.com/2015/02/10/s02e07-clayton-merrell/.