BUFFALO Engineer

2016

CIVIL COMPETITION

UB-ASCE student teamwork builds bridges –and more– to help reach career goals

Onion Studio, Inc.

University at Buffalo
School of Engineering and Applied Sciences

MESSAGE FROM THE DEAN

Onion Studio, Inc.

Liesl Folks, PhD, MBA
Dean, School of Engineering and Applied Sciences

Fostering soft skills for career success

We are passionate about providing our students with opportunities to develop hard and soft skills during the course of their degree programs, reminding them often of the importance of each in the workplace.

Our faculty spend vast hours pondering the analytical skills and technical knowledge students need to succeed in the modern world, and developing meaningful coursework that connects rigorous fundamental concepts with real-world needs. As a result, our graduates stand among the best in the world for their hard skills, making us proud of all they achieve.

In parallel, the faculty and staff have created a large array of programs to advance students' understanding of the soft skills that make collective human efforts successful, particularly in a global economy.

Our taxonomy of these essential skills is just as complex as the degree programs that brought students to SEAS in the first place, ranging from communication to self-assessment to ethical reasoning to conflict management to cultural competency, with much in between.

As we have expanded our experiential learning opportunities for students, we also have found new and exciting ways to engage them in learning across the soft skills spectrum. There are now well over 200 different offerings that our students can choose from, thus enabling them to round out their professional skillset.

We are thrilled, too, that increasing numbers of alumni have remained involved with our school in a myriad of ways, exemplifying the value of networking and providing real-world advice, mentoring and connections leading to job opportunities. You will read in these pages about just one example of how our active and engaged alumni help students develop their soft skills through their involvement with the American Society of Civil Engineers.

As we celebrate our first 70 years as New York State's premier public school of engineering, we look forward to graduating students who are equipped with all the skills they will need to tackle the biggest problems we face, regionally, nationally and across the world.

BUFFALO ENGINEER

Buffalo Engineer is published by the UB School of Engineering and Applied Sciences to showcase the excellence of our faculty, staff, alumni and students.

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University at Buffalo
School of Engineering and Applied Sciences

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Address Changes

UB Alumni Association members can update their address information at *https://alumni.buffalo.edu/alumni-connections*. All others should email *ub-seas@buffalo.edu* or clip the address label and return it with the correct address to: Buffalo Engineer, School of Engineering and Applied Sciences, University at Buffalo, 208 Davis Hall, Buffalo, NY 14260.

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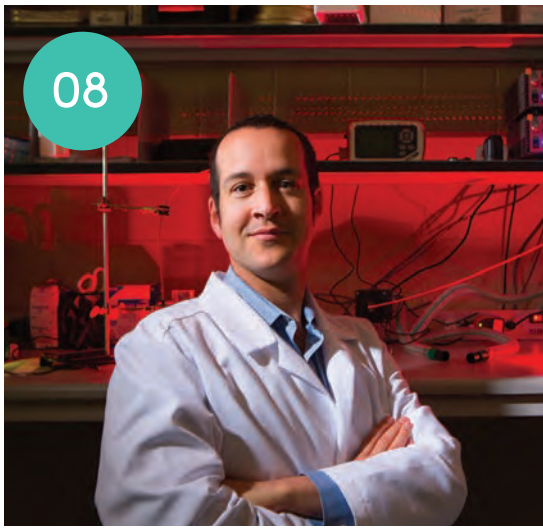

Douglas Levere

ON THE COVER AND ABOVE

In alumni arena, UB-ASCE member Maria Camila Lopez Ruiz works on the team's entry into the steel bridge competition. Above, Mitchell Hares, Neil Ferguson and build captain Wil Nagengast are timed while they assemble the bridge. Their efforts paid off with a first place finish. Read more about how being a member of this student club enriches the student experience and prepares them to enter the field of civil engineering in our feature story on page 10. Photos by the Onion Studio, Inc.

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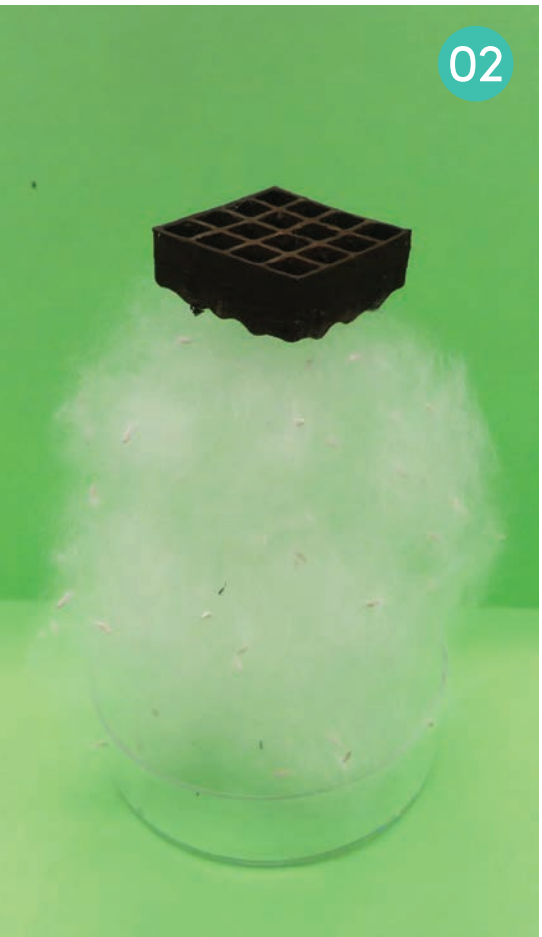

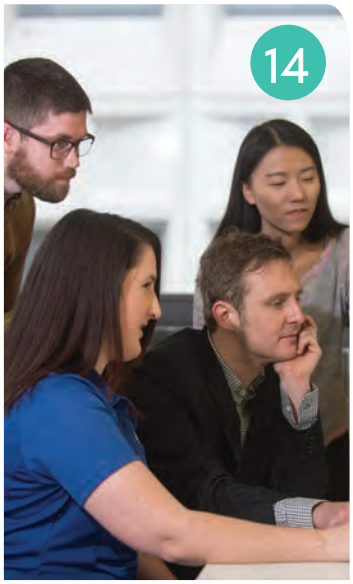

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Powering a pacemaker with your heart?

The implantable pacemaker, a medical marvel that has extended millions of lives since its invention nearly 60 years ago, is getting a 21st century makeover.

First came a wireless version; these pacemakers, which are AAA battery-sized and placed inside the heart via a catheter through the leg, are being tested in humans in the United States, Canada and Australia.

Now, researchers are developing technology to make these devices battery-free. The advancement is based upon a piezoelectric system that converts vibrational energy—created inside the chest by each heartbeat—into electricity to power the pacemaker.

"Essentially, we're creating technology that will allow pacemakers to be powered by the very heart that they are regulating," said M. Amin Karami, assistant professor of mechanical engineering, who is leading the research.

The technology may eliminate the medical risks, costs and inconvenience of having a battery replacement every five to 12 years for millions of people worldwide.

Douglas Levere

M. Amin Karami

A state of constant motion

The idea of heart-powered pacemakers came to Karami after doing PhD work on piezoelectric applications for unmanned aerial vehicles and bridges. He wanted to apply that knowledge to the human body. The heart was an obvious choice because of its relative strength and constant motion.

"To see the heart in motion—even an animation—is to be awestruck," said Karami. "It moves significantly. In turn, that movement creates energy that we're just now figuring out how to harvest."

He initially designed a flat piezoelectric structure for a conventional pacemaker. A prototype generated enough power to keep the pacemaker running at a range of seven to 700 beats per minute.

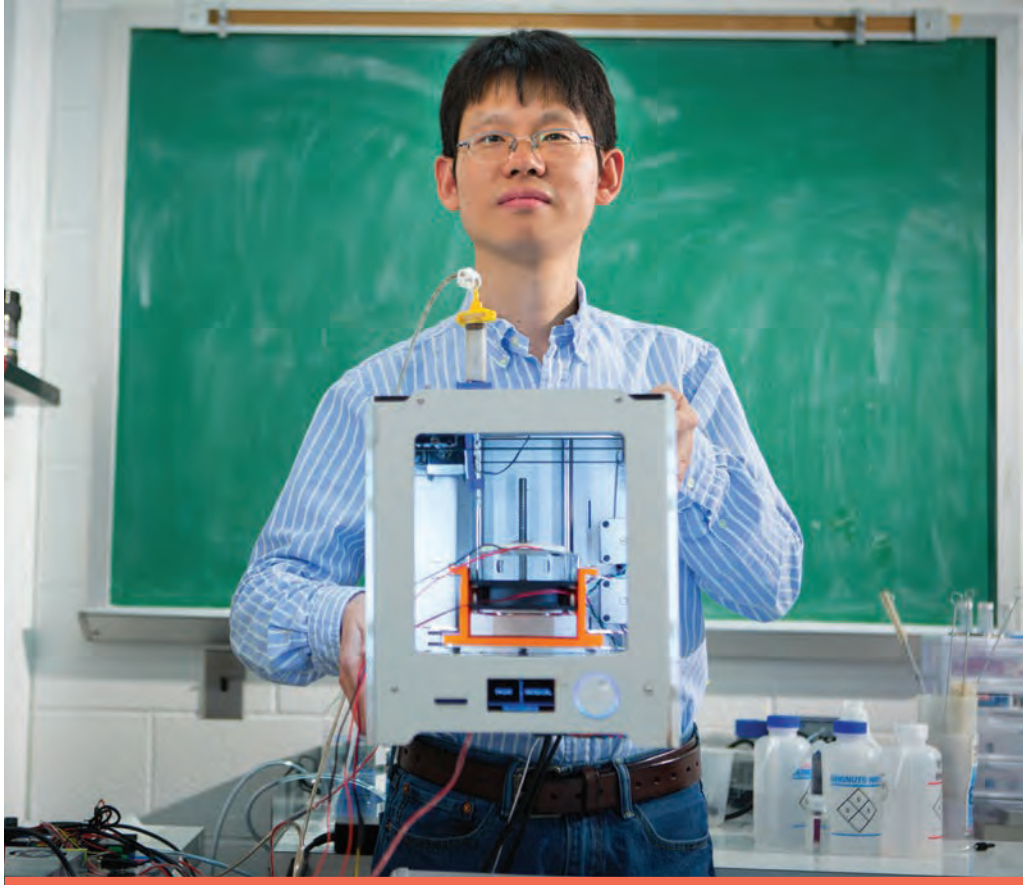
Karami, who is already talking to device-makers, is building the new prototype and expects to have animal tests done within two years. From there, it should be ready for human trials and, eventually, approval from the U.S. Food and Drug Administration.

The research is supported by UB's Translational Pilot Studies Fund, an initiative of UB's Office of the Vice President for Research and Economic Development.

>> Cory Nealon

The secret to 3-D graphene is to freeze it

Douglas Levere



"Graphene is notoriously difficult to manipulate, but the structures we built show that it's possible to control its shape in three-dimensional forms," said Chi Zhou, assistant professor of industrial and systems engineering and a member of the Sustainable Manufacturing and Advanced Robotic Technologies (SMART) Community of Excellence.

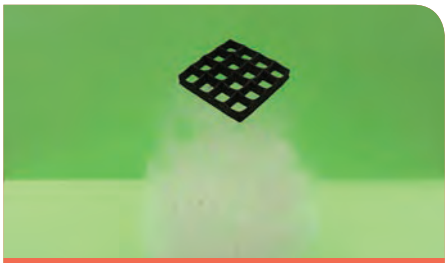
Graphene is a wonder material saddled with great expectations. Discovered in 2004, it is one million times thinner than a human hair, 300 times stronger than steel and is the best known conductor of heat and electricity. These qualities could, among other things, make computers faster, batteries more powerful and solar panels more efficient.

Another option is to use a 3-D printer. In this scenario, scientists typically mix graphene with a polymer or other thickening agent. This helps keep the structure from falling apart. But when the polymer is removed via thermal process, it damages the delicate structure.

However, the material is difficult to manipulate beyond its two-dimensional form.

A research team comprised of engineers from UB, Kansas State University and the Harbin Institute of Technology in China may have solved that problem.

A study published in the journal *Small* describes how the team used a modified 3-D printer and frozen water to create lattice-shaped cubes and a three-dimensional truss with overhangs using graphene oxide. The structures could be an important step toward making graphene commercially viable in electronics, medical diagnostic devices and other industries.



Graphene is incredibly light, so it has no problem resting on top of this cotton-like material.

"Graphene is notoriously difficult to manipulate, but the structures we built show that it's possible to control its shape in three-dimensional forms," said Chi Zhou, an assistant professor of industrial and systems engineering and a member of the Sustainable Manufacturing and Advanced Robotic Technologies (SMART) Community of Excellence.

In their experiments, the research team mixed the graphene oxide with water. They then printed the lattice framework on a surface of -25°C. The graphene is sandwiched between the layers of frozen ice, which act as a structural support.

After the process is completed, the lattice is dipped in liquid nitrogen, which helps form even stronger hydrogen bonds. The lattice then is placed in a freeze dryer, where the ice is changed into gas and removed. The end result is a complex, three-dimensional structure made of graphene aerogel that retains its shape at room temperature.

The researchers plan to build on their findings by investigating how to create aerogel structures formed of multiple materials.

In addition to Zhou, authors include Qiangqiang Zhang and Hui Li, students at Harbin, Feng Zhang, a student at UB, and Dong Lin, assistant professor, and Sai Pradeep Medarametla, a student, both from Kansas State University.

The research team also received support from UB faculty members Mark Swihart, Distinguished Professor of Chemical and Biological Engineering and director of the New York State Center of Excellence in Materials Informatics, and Jonathan Lovell, assistant professor of biomedical engineering.

>> Cory Nealon

UB joins White House's new Smart Manufacturing Innovation Institute

UB is among a select group of academic institutions, industry partners and nonprofits tapped by the White House to form an advanced manufacturing hub designed to sustain the nation's manufacturing resurgence.

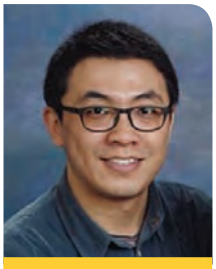
President Barack Obama announced in June that the Smart Manufacturing Leadership Coalition (SMLC)—a consortium of nearly 200 organizations, including UB, from more than 30 states—has formed a partnership with the Department of Energy to oversee the hub, which is called the Smart Manufacturing Innovation Institute (SMII).

Headquartered in Los Angeles, SMII includes five manufacturing centers that will focus on local technology transfer and workforce development.

UB will operate in the Northeast Regional Manufacturing Center led by Rensselaer Polytechnic Institute. Industrial partners include: GLOBALFOUNDRIES, United Technologies, Corning Glass, Saint-Gobain, Praxair, Pfizer, EWI, MathWorks, Analog Devices and Eastman Business Park.

UB has long recognized the importance of advanced manufacturing to the local and national economies. Supporters of the new partnership include UB's New York State Center of Excellence in Materials Informatics, the Sustainable Manufacturing and Advanced Robotic Technologies (SMART) Community of Excellence, and its recently launched Department of Materials Design and Innovation, a collaboration between the College of Arts of Sciences and SEAS.

This "nanocavity" may improve ultrathin solar panels, video cameras and other optoelectronic devices



Qiaoqiang Gan

One of the latest advancements in the field of two-dimensional semiconducting materials centers on molybdenum disulfide (MoS), which is being explored for use in optoelectronics.

Recently, a team co-led by Qiaoqiang Gan, assistant professor of electrical engineering, placed a single layer of MoS molecules on top of a photonic structure called an optical nanocavity made of aluminum oxide and aluminum.

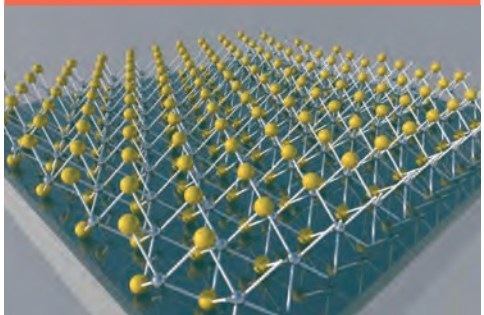
The results, described in the paper "MoS monolayers on nanocavities: enhancement in light-matter interaction" and published in the journal *2D Materials*, are promising.

"The nanocavity we have developed has many potential applications," said Gan. "It could potentially be used to create more efficient and flexible solar panels, and faster photodetectors for video cameras and other devices. It may even be used to produce hydrogen fuel through water splitting more efficiently."

Zhiwen Liu, professor of electrical engineering at Penn State University Park, is the paper's other co-lead author. Additional authors include UB graduate students Haomin Song and Dengxin Ji; and Penn State University Park students Corey Janisch (also a co-lead researcher), Chanjing Zhou, Ana Laura Elias and Mauricio Terrones.

The research was supported by grants from the National Science Foundation, the U.S. Army Research Office and the U.S. Air Force Office of Scientific Research.

An optical nanocavity made, from top to bottom, of molybdenum disulfide (MoS2), aluminum oxide and aluminum.



Tweets may ease winter travel

Go ahead, rant about the snow on Twitter. It can ease traffic on slippery, congested roads.

That's the crux of a study that examined how weather-related tweets can be analyzed to bolster computer models which, among other things, recommend safe driving speeds and which roads motorists should avoid during inclement weather.

"It doesn't matter if someone tweets about how beautiful the snow is or if they're complaining about unplowed roads. Twitter users provide an unparalleled amount of hyperlocal data that we can use to improve our ability to direct traffic during snowstorms and adverse weather," said Adel Sadek, director of UB's Institute for Sustainable Transportation and Logistics, and the study's lead author.

"It's snowing like crazy here" and other tweets can boost computer models that guide traffic.

Co-authors of the study, which was published in the journal Transportation Research Record, include Qing He, Stephen Still Assistant Professor in Transportation Engineering and Logistics; Jing Gao, assistant professor in the Department of Computer Science and Engineering; Ming Ni, a PhD candidate at UB; and Lei Lin, who earned a PhD from UB in 2015.

The study was funded in part by the Transportation Informatics Tier I University Transportation Center.

Robot bees fly and swim, soon they'll have laser eyes

How do you teach robotic insects to see? By equipping them with tiny laser-powered sensors that act as eyes, enabling the miniature machines to sense the size, shape and distance of approaching objects.

"Essentially, it's the same technology that automakers are using to ensure that driverless cars don't crash into things," said Karthik Dantu, assistant professor in the Department of Computer Science and Engineering. "Only we need to shrink that technology so it works on robot bees that are no bigger than a penny."

Dantu is the principal investigator on the UB-led research project, funded by a $1.1 million National Science Foundation grant, which includes researchers from Harvard University and the University of Florida.

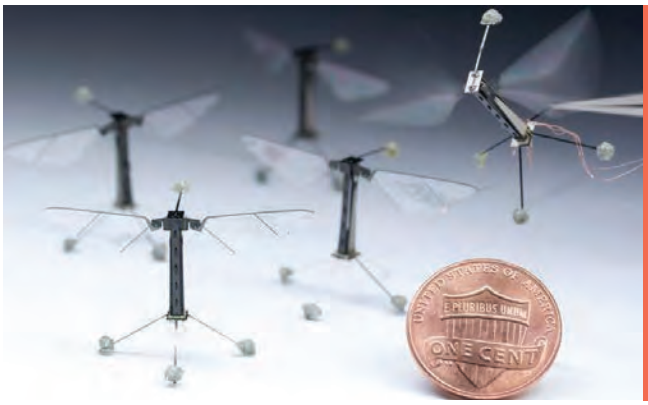
Researchers have shown that robot bees are capable of tethered flight and moving while submerged in water. One of their limitations, however, is a lack of depth perception.

This is problematic if you want the bee to avoid flying into a wall or have it land in a flower, said Dantu, who worked on the RoboBee project as a postdoctoral researcher at Harvard before joining UB in 2013.

Karthik Dantu

The UB team will address the limitation by outfitting the robot bee with remote sensing technology called lidar, the same laser-based sensor system that is making driverless cars possible.

The technology the team develops likely won't be limited to robot insects. The sensors could be used, among other things, in wearable technology; endoscopic tools; and smartphones, tablets and other mobile devices.



Robot insects may someday be used in agriculture and disaster relief situations.

Photo credit: Microrobotics Lab, Harvard John A. Paulson School of Engineering and Applied Sciences and the Wyss Institute for Biologically Inspired Engineering.

Kayaking for kids

Associate Professor Emerita Deb Walters (faculty, 1983-2002, Department of Computer Science and Engineering) completed "Kayak for Safe Passage Kids," her 2,503 mile solo kayak tour from Maine to Guatemala, on February 10, 2016.

Walters and her kayak raised over $400,000 for Safe Passage, a charity working in Guatemala City since 1999, that brings hope, education, and opportunity to the children and families making their lives around the city's garbage dump.

"They have such grit and determination to work for a better future for their children," Walters says of the mothers she has talked to during her many trips to the country, "and they inspire me to demonstrate that with a little grit and perseverance, an ordinary person like me can do extraordinary things."

Douglas Levere

Self-driving car at UB highlights cutting-edge transportation research

Few recent technological advancements have generated as much buzz as self-driving cars. From Silicon Valley to Detroit and beyond, researchers are working around the clock to bring autonomous vehicles to the masses.

While that's still a few years away, the Buffalo Niagara region got a preview of the future with a self-driving vehicle demonstration in a parking lot at UB's North Campus.

The event featured a self-driving SUV developed by Southwest Research Institute, a Texas-based nonprofit applied research and development organization. The vehicle is designed to improve safety at roadside construction projects.

Southwest Research Institute partnered with UB's Institute for Sustainable Transportation and Logistics, and the UB-headquartered Transportation Informatics Tier 1 University Transportation Center, both of which conduct cutting-edge transportation research, to coordinate the event, which took place on June 24, 2016.

Erie County, which is exploring implementing Southwest Research Institute's technology in roadside operations, was also a partner in the event.

This image shows a vortex laser on a chip. Because the laser beam travels in a corkscrew pattern, encoding information into different vortex twists, it's able to carry 10 times or more the amount of information than that of conventional lasers.

A new spin on data transfer

A UB-led research team is pushing laser technology forward using a light manipulation technique called orbital angular momentum, which distributes the laser in a corkscrew pattern with a vortex at the center.

The team was able to shrink the vortex laser, usually too large to work on today's computers, to the point where it is compatible with computer chips. Because the laser beam travels in a corkscrew pattern, encoding information into different vortex twists, it's able to carry 10 times or more the amount of information than that of conventional lasers, which move linearly.

The vortex laser is one component of many, such as advanced transmitters and receivers, that ultimately will be needed to continue building more powerful computers and datacenters.

The study was published by the journal *Science*. Authors are assistant professor Liang Feng and professor Natalia M. Litchinitser (co-leads), PhD candidates Pei Miao and Zhifeng Zhang, assistant research professor Jingbo Sun, and postdoctoral researcher Wiktor Walasik, all from the Department of Electrical Engineering; and Stefano Longhi, professor at the Polytechnic University of Milan in Italy.

The research was supported with grants from the U.S. Army Research Office, the U.S. Department of Energy and the National Science Foundation.

Filtering the carbon from coal

Despite gains by natural gas, wind and solar, coal remains the top electricity producer in the United States.

Accordingly, interest is strong in developing technology that curbs unwanted effects, such as greenhouse gas emissions, that result from coal's combustion.

To address the matter, the U.S. Department of Energy has awarded a $1.9 million grant to a research team led by the University at Buffalo. The researchers will develop a membrane to remove carbon dioxide, which makes up the vast majority of greenhouse gas emissions, from gasified coal before its combustion.

"The idea is to decarbonize coal before burning it," said Haiqing Lin, the grant's principal investigator and an assistant professor in the Department of Chemical and Biological Engineering.

Lin will work with UB Distinguished Professor Mark T. Swihart, who serves as executive director of the New York State Center of Excellence in Materials Informatics.

Also working on the project are Helios-NRG, LLC of Amherst, New York; Membrane Technology and Research, Inc. of Newark, California; and the National Carbon Capture Center in Wilsonville, Alabama.

The team will develop and test a polymer-based membrane outfitted with palladium-based nanoparticles. The polymers act as a filter, largely preventing the passage of carbon dioxide, while the palladium acts as a bridge that enables hydrogen gas to more easily pass through the membrane.

Theoretically, the hydrogen gas would pass through the membrane and then be burned which, in turn, would power turbines. Meanwhile, the carbon dioxide could be geologically sequestered, and used to create chemicals or pumped underground for enhanced oil recovery.

UB awarded $2.6 million from SUNY to recruit top faculty researchers for biomedical engineering and UB RENEW

UB has been awarded two grants worth $2.6 million to hire senior faculty members who will grow UB's research expertise in biomedical engineering, energy and the environment, and other disciplines, while providing students with world-class educational opportunities.

The grants, from the State University of New York's Investment and Performance Fund, are part of a statewide commitment of roughly $8 million to numerous SUNY campuses in support of SUNY's Empire Innovation Program, which helps campus efforts to recruit faculty with proven track records of externally-funded research.

At UB, the money will support the university's Department of Biomedical Engineering and UB RENEW, a cross-disciplinary institute that tackles pressing environmental issues.

Here IS HOW

UB introduces a new framework to tell its story

UB has begun telling its story worldwide in a more compelling and cohesive way with the launch of a new identity and brand strategy for the institution.

The new strategy features two key components, both of which resulted from a year-long process involving the expertise and input of thousands of alumni, students, faculty, staff, prospective students and community members.

The first is a brand framework that conveys UB's distinctiveness. Based around a concept called "Here is How," it presents UB as an extraordinary university in an extraordinary city – an institution that represents not only a place, but also a unique way of getting things done.

The second is to align all of UB's schools and institutes under one official name, the University at Buffalo, with the interlocking UB as the official university logo. The State University of New York will continue to be a major part of the university's name, particularly for international markets where the SUNY name is widely known and valued.

The Division of Athletics and all UB athletics teams will use "UB" and "Buffalo" as their primary identities. Athletics is introducing a new spirit mark for the UB Bulls and will use the tagline "New York's Public Powerhouse" to emphasize UB's strength in New York State and its stature as one of the nation's leading public research universities.

The university will align the "Here is How" framework throughout the university in the coming years.

Department of Computer Science and Engineering celebrates 50 years

CSE50 1967-2017

The Department of Computer Science and Engineering (CSE) is celebrating 50 years of innovation and invention in the field of computer science and engineering, by honoring and celebrating its world-class faculty, staff, students, alumni and friends.

A Distinguished Speaker Series comprised of successful female computer scientists started on November 10, 2016 with Nancy Amato from Texas A & M University. Future speakers include Wendi Heinzelman (February 2), Ellen Zegura (April 20), Barbara Ryder (May 4) and Cynthia Rudin (May 11). The all-female line-up is also a way to commemorate the 110th birth year of Grace Hopper, a pioneer in the field of computer science.

On September 28, 29, 30 and October 1, 2017, a four-day celebration will be held that includes tours, notable guest speaking engagements, sessions with students to discuss current research activities, a golf outing, and a bon voyage brunch. For more information, visit *http://cse.buffalo.edu/alumni.*

Thom Dunning, center, talks with UB's Michel Dupuis (left) and Abani Patra (right) during CDSE Days. Dunning was one of three keynote speakers at the six-day event, which brought some of the nation's most prominent scholars in the field of data-enabled science to UB.

CDSE Days spotlight big data and supercomputing

Interested in personalized medicine? Want to know how IBM's Watson outsmarted "Jeopardy!" champ Ken Jennings? Curious about big data and the world's most powerful supercomputers?

These topics—and much more—were discussed at this year's CDSE Days, a six-day program at the University at Buffalo that explored how big data and high-performance computing have become essential to scientific progress, economic competitiveness, national security, medicine and other issues.

The program brought some of the nation's most preeminent scholars of data-enabled science to Buffalo. Highlights included:

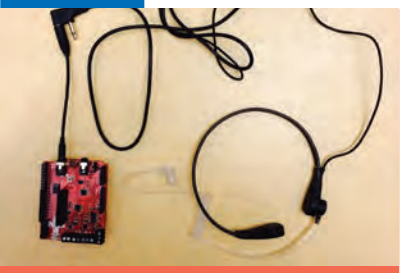
- A keynote lecture by David Higdon, professor in the Social Decision Analytics Laboratory at the Biocomplexity Institute of Virginia Tech, entitled "Connecting model-based predictions to reality."
- A workshop by Gandolfo "Randy" Messina, worldwide public sector manager, IBM Watson Analytics, entitled "An introduction to Watson analytics."
- A keynote lecture by Thom H. Dunning Jr., director of the National Center for Supercomputing Applications at the University of Illinois at Urbana-Champaign, entitled "Leading-edge computers and the extraordinary research they enable."
- A keynote lecture by Mark Ainsworth, professor of applied mathematics at Brown University, entitled "Multigrid at scale?"

CDSE stands for Computational and Data-enabled Science and Engineering, a new doctoral program at UB.

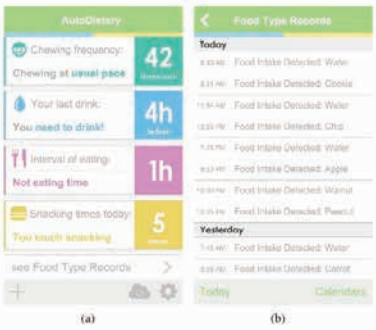
This necklace 'hears' what you eat

The food-tracking wearable device could help fight diabetes, obesity, bowel disorders and more

Wenyao Xu



Prototype of the AutoDietary food-tracking system.



Prototype display of the mobile app for AutoDietary.

Carrots and apples not only taste different, they make distinct sounds when chewed.

This may seem like trivial knowledge, but it's not in the laboratory of computer scientist Wenyao Xu, who is creating a library that catalogs the unique sounds that foods make as we bite, grind and swallow them.

The library is part of a software package that supports AutoDietary, a high-tech, food-tracking necklace being developed by Xu and researchers at Northeastern University in China.

Described in a study published February by *IEEE Sensors Journal*, AutoDietary is like Fitbit and other wearable devices. Only instead of tracking burned calories, it monitors caloric intake—in other words, what we eat—at the neck.

"There is no shortage of wearable devices that tell us how many calories we burn, but creating a device that reliably measures caloric intake isn't so easy," says Xu, assistant professor of computer science.

AutoDietary wraps around the back of the neck like a choker necklace. A tiny high-fidelity microphone—about the size of a zipper pull—records the sounds made during mastication and as the food is swallowed. That data is sent to a smartphone via Bluetooth, where food types are recognized.

The study describes how 12 test subjects, male and female, ages 13 to 49, were given water and six types of food: apples, carrots, potato chips, cookies, peanuts and walnuts. AutoDietary was able to accurately identify the correct food and drink 85 percent of the time.

"Each food, as it's chewed, has its own voice," said Xu, who says the device could someday help people suffering from diabetes, obesity, bowel disorders and other ailments by enabling them to better monitor their food intake and thus improve how they manage their conditions.

Xu plans future studies to build upon his library by testing different foods and recording the sounds they make. He also plans to refine the algorithms used to differentiate the foods to improve AutoDietary's ability to recognize what's being eaten.

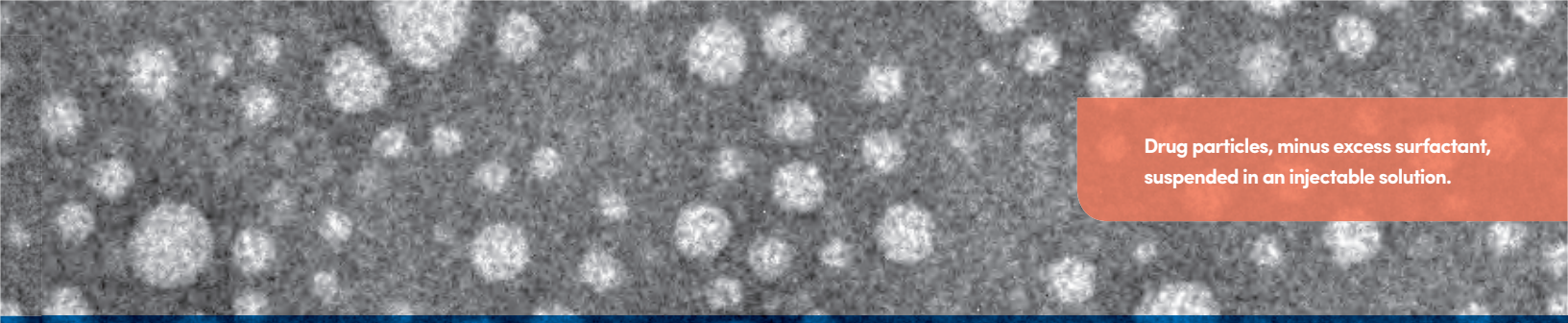
While promising, a wearable necklace that measures sound has limitations when used alone. For example, it cannot differentiate similar foods such as frosted corn flakes and regular corn flakes. It also can't distinguish the ingredients of complex foods, such as soup or chili.

To address these limitations, Xu is planning a biomonitoring device that would complement AutoDietary. The device, which is under development, would be activated once the necklace recognizes that the user is eating a general category of food.

The biomonitor would then determine the nutritional value of the food via blood sugar levels and other measurements. The system then gathers and presents this information on a smartphone, while providing suggestions on healthier eating.

The beauty of the system, Xu says, is that the user isn't overwhelmed by a continuous stream of information. The system is only active as food is consumed and immediately after.

>> Cory Nealon



Drug particles, minus excess surfactant, suspended in an injectable solution.

Making injectable medicine safer

Researchers remove excess additives from drugs, which could reduce the odds of serious allergic reactions and other side effects

Bring the drugs, hold the suds.

That summarizes a promising new drug-making technique designed to reduce serious allergic reactions and other side effects from anti-cancer medicine, testosterone and other drugs that are administered with a needle.

The innovative process removes potentially harmful additives—primarily soapy substances known as surfactants—from common injectable drugs. The breakthrough is described in a study, "Therapeutic Surfactant-Stripped Frozen Miscelles," published in *Nature Communications*.

"We're excited because this process can be scaled up, which could make existing injectable drugs safer and more effective for millions of people suffering from serious diseases and ailments," said Jonathan F. Lovell, assistant professor of biomedical engineering and the study's corresponding author.

Pharmaceutical companies use surfactants to dissolve medicine into a liquid solution, a process that makes medicine suitable for injection. While effective, the process is seldom efficient. Solutions loaded with surfactant and other nonessential ingredients can carry the risk of causing anaphylactic shock, blood clotting, hemolysis and other side effects.

Researchers have tried to address this problem in two ways, each with varying degrees of success.

Some have taken the so-called "top down" approach, in which they shrink drug particles to nanoscale sizes to eliminate excess additives. While promising, the method doesn't work well in injectable medicine because the drug particles are still too large to safely inject.

Other researchers work from the "bottom up," using nanotechnology to build new drugs from scratch. This may yield tremendous results; however, developing new drug formulations takes years, and drugs are coupled with new additives that create new side effects.

The technique under development at UB differs because it improves existing injectable drug-making methods by taking the unusual step of stripping away all of the excess surfactant.

In laboratory experiments, researchers dissolved 12 drugs, one at a time, into a surfactant called Pluronic. The dissolved drugs included cabazitaxel, an anti-cancer drug; testosterone; and cyclosporine, an immunosuppressant used during organ transplants.

Then, by lowering the solution's temperature to 4 degrees Celsius (most drugs are made at room temperature), they were able to remove excess Pluronic via a membrane, resulting in drugs that contain 100 to 1,000 times less excess additives.

"For the drugs we looked at, this is as close as anyone has gotten to introducing pure, injectable medicine into the body," said Lovell. "Essentially, it's a new way to package drugs."

The findings are significant, he says, because they show that many injectable drug formulations may be improved through an easy-to-adopt process. Future experiments are planned to further refine the method, Lovell said.

The research is supported by a National Institutes of Health grant.

>> Cory Nealon

Sandy Kicman

A team of researchers led by Jonathan Lovell has developed a new technique to make injectable medicine safer.

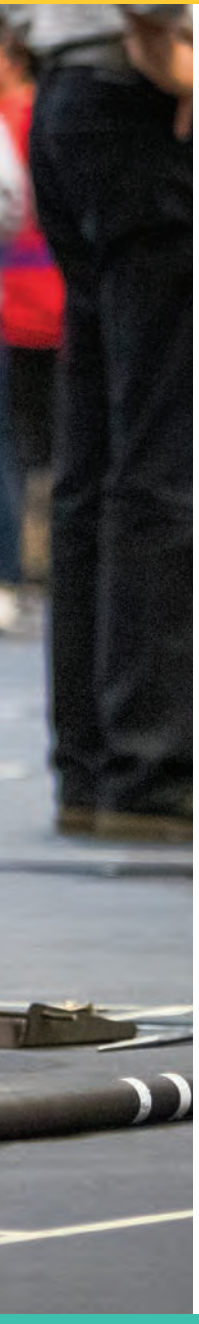
CIVIL COMPETITION

UB-ASCE student teamwork builds bridges—and more—to help reach career goals

From left to right, Mitchell Hares, Neil Ferguson and build captain Wil Nagengast assemble their bridge.

"I have made lifelong friendships with people who are passionate about the same things as me. I grew great relationships with professional engineers and each year as students graduated, my network with working civil engineers has grown." Adrianne Richardson, President, UB-ASCE Executive Board (pictured far left) .

By Jim Bisco and Sarah D'Iorio



Chad Cooper

There are no academic credits or grades. It can be a grueling, year-long effort of skill and sweat. And it's totally in the students' hands as to how much they put into the projects and what they get out of them.

Such are the team members of the University at Buffalo Student Chapter of the American Society of Civil Engineers (UB-ASCE), who have the passion and drive to design and build projects for regional competitions that hopefully score high enough to qualify them to go on to nationals.

"It's a vibrant group of civil engineering students who are really interested in their chosen line of study," says Todd Snyder, SEAS instructional support specialist, who has served as UB-ASCE's faculty advisor since 2008.

While the UB chapter has a long history of impressive results since its inception in 1964, the club has significantly increased its membership and its rankings under Snyder's watch. Last year, the chapter earned the ASCE Distinguished Chapter Award for Region I, which recognized UB as the most outstanding student organization among the 48 student chapters in its region, which includes New York, New Jersey, the New England states and Puerto Rico. The chapter was further recognized by the ASCE New York State Council with the 2014 Outstanding Student Chapter Award.

In the National Student Steel Bridge Competition, the UB team has finished in the top ten for the last three consecutive years out of over 200 competitors worldwide.

While the competition categories stay the same every year—steel bridge, concrete canoe and seismic design—the rules change, so even though the team can build on previous designs, there are always new challenges to overcome.

"They start talking about next year right after the previous competition ends," said Snyder. "On the way home (from the competition), they'll start debriefing to figure out what could have gone better and what went well."

The excitement builds throughout the year. Recent graduate Ryan O'Malley, who was a long-standing steel bridge team member, said, "The team's success correlates with the increased passion and dedication that each member has for the competition and the team."

"The project gives us an opportunity to take a given problem statement, and create a bridge that is designed, fabricated, and constructed by UB students. It provides a hands-on look at structural analysis, member fabrication, and construction concerns similar to what a practicing engineer may have to deal with," said Bryce Mazurowski, who served as a co-project manager on the 2016 steel bridge team.

The student teams work on their projects under the mentorship of experienced engineers such as Larry Mathews and John Gast, practitioner advisors of the steel bridge contingent. Both are members of the Association of Bridge Construction and Design, Western New York Chapter, which provides financial and additional support to the students.

Mathews, a 1969 SEAS graduate recently honored as SEAS Mentor of the Year, inspects bridges across New York State for Greenman-Pedersen, Inc. "I try to pass whatever I do on to the students," he says. "We sometimes run across unusual problems or issues while we are out in the field, so I bring them back and ask the students to analyze them and recommend creative solutions."

Onion Studio, Inc.

The UB team crosses the finish line and celebrates their speedy completion during the 2016 ASCE Upstate New York Region Student Conference. UB placed first and went on to fifth overall at the national competition.

Together with Gast, a steel bridge erection consultant, they help pave the way toward jobs for team members. "If you watch the students in action, you see their leadership ability or their intensity or commitment, and that's better than an interview," explains Mathews.

Gast says all the team members are very sharp and destined to become outstanding engineers. “They all do well, but the students who take on the team leadership usually stand out from the crowd. Contractors or engineering firms just grab these students after graduation—I call them first-rounders.”

Snyder says that the club consistently elects excellent student leadership year after year, most likely a result of outgoing officers actively working to identify future leaders and grooming them by sending them to the annual ASCE student leadership conference.

Francis Mahaney, a junior civil engineer with Clark Patterson Lee and a former concrete canoe team member, served as club president in his senior year, 2010-11. “I was working two jobs, one was an internship they wanted me to continue through the year (yep, the internship was thanks to ASCE, as is typical). We learned project management from the overall budgeting of $25,000 for the club, managing three design teams, and organizing attendance, logistics, and the experience of 30+ students at two major conferences not including a plethora of other events throughout the year.”

Mahaney, who is also a member of the SEAS Young Alumni Board and treasurer of the UB Engineering Alumni Association, continues to be fully engaged in ASCE activities as an alumnus. He is vice president of the Buffalo Section of ASCE and helps secure over $3,000 each year in funding for student scholarships and activities, volunteers at various ASCE-related events, and provides mentorship to students.

Timothy Van Oss, a Civil Engineer I at Mott MacDonald and a 2016 alumnus, served as treasurer and president of the club after participating on both the bridge and canoe teams. “The experience as an officer definitely helps in terms of people management, showing what employers look for in employees,” he said.

Van Oss has returned to the club as a practitioner advisor, providing mentoring and career advice to the students—inspired by his advisor, Jason Havens, who he says helped shape him to become the kind of leader he wanted to be.

UB ASCE steel bridge team members and advisors, Todd Snyder and John Gast, traveled to Provo, Utah in May to compete in the 2016 National Steel Bridge Competition.

"If you watch the students in action, you see their ability or their intensity or commitment, and that's better than an interview," said Larry Mathews, '69 graduate of SEAS. Mathews (left) and John Gast traveled with the team to the 2015 National Student Steel Bridge Competition in Kansas City, Missouri.

Former team member Havens, who is now a project engineer and manager with Clark Patterson Lee and president of Rusty Nickel Brewing Company, held nearly every office in the chapter. Since graduating in 2005, he has returned as a practitioner advisor, mentoring nearly 1,000 students over a decade, hiring just shy of a dozen for the firm where he works, and assisting in the placement of dozens more.

Havens, president-elect of the Buffalo section of ASCE, helped implement many initiatives over the years that have assisted in making the experience of ASCE student members more productive. “The golf tournament, resume review course, shadow program, PR training seminars, an elementary school outreach program, monthly section meetings, budget meetings, younger member outreach and exit counseling groups, collaborative projects and, most recently, the UB Bulls football tailgate, have evolved into staples of the annual program between the Buffalo Section and Student Chapter,” said Havens.

He passed the advisor torch to his former mentee Van Oss, who presented him with the SEAS Mentor of the Year award this past spring. Havens continues to stay involved with his alma mater by serving on the SEAS Young Alumni Board.

Much hiring happens through the club, notes Snyder, as he is contacted regularly by employers interviewing students who list ASCE among their activities. “By being active in these clubs, you’re self-identifying as somebody who is not just showing up for class but rather it’s an indicator that you are really actively involved in your chosen line of work,” he said, adding, “You get the best students for this—they totally want to do it.”

Canoe creations through the years

1981

UB-ASCE's concrete canoe team has been making news since the early 1980s. Local TV station WGR-TV interviewed students who were testing their canoe out in Lake LaSalle back in 1981. If you recognize the students or would like to share your memories of the competition, please email us at *ub-seas@buffalo.edu*.

2012

In 2012, UB's concrete canoe team placed second overall in the ASCE Upstate New York Student Conference with their canoe, "Monkey Business," which was embellished with colored concrete. Teams are typically judged on engineering design and construction principles, a technical design report, a formal business presentation, and the performance of their canoes and paddlers in five different race events.

2013

UB's 2013 concrete canoe "Onguiaahra" was designed in the theme of the Niagara Falls region from a Native American perspective. The interior of the canoe features a mini waterfall on either end, and the exterior depicts a thunderstorm scene. It is now on display at the Rusty Nickel Brewing Company in West Seneca, N.Y., owned by alumnus Jason Havens, BS '05.

2014

"Aldebaran" (2014) was named after the brightest star in the constellation Taurus, or the "Fiery Eye of the Bull." The students utilized glow-in-the-dark concrete to form Taurus and other constellations seen in the night sky. UB was the first team in North America to use the glow-in-the-dark aggregate in a canoe.

2015

"Calcestruzzo," which translates to concrete in Italian, was created by the 2015 concrete canoe team in the style of a Venetian gondola. The team successfully implemented a pretensioning system, eliminating all flexural cracks in the canoe.

2016

Members of UB's 2016 concrete canoe team paddle "Bulldozer" on Lake LaSalle during the ASCE Upstate New York Student Conference. UB qualified and attended the Concrete Canoe National Competition in Tyler, Texas.

Seven young engineers receive early career awards

Seven School of Engineering and Applied Sciences engineers recently received prestigious early career awards: five earned National Science Foundation (NSF) CAREER awards, and two were awarded young investigator awards from the U.S. Army Research Laboratory, an indication that the university is attracting some of the world's brightest young researchers to the Buffalo Niagara region.

The grants will support research and educational outreach in cyberinfrastructure, drug delivery, clean coal technology, improving safety in military operations, next generation Wi-Fi and how data mining can help improve various industries.

"These awards illustrate exciting and meaningful research underway at the University at Buffalo, with early-career investigators being recognized for innovative and promising approaches that address a wide array of society's most challenging problems."

— Venu Govindaraju, vice president for Research and Economic Development

Recipients of the grants come from six of the school's eight departments: biomedical engineering, chemical and biological engineering, computer science and engineering, electrical engineering, industrial and systems engineering, and mechanical and aerospace engineering.

"These prestigious awards recognize some of our finest early-career faculty for their outstanding and innovative research and educational work. These awards are highly competitive, and to have secured so many in a single round is a strong indicator of the excellence of our faculty," said Liesl Folks, dean of the School of Engineering and Applied Sciences. She added that these faculty members are each on a trajectory to have a profound impact on their field of expertise.

Paul Bauman

Faculty Position: Assistant professor
Department: Mechanical and Aerospace Engineering
Year joined UB: 2014
Award Type: National Science Foundation CAREER award
Award amount: $499,306

Computer models help researchers push the boundaries of science in weather prediction, materials science and countless other fields. But these models can be improved. For example, they are limited by their lack of ability to incorporate uncertain information from experimental data. Bauman's research addresses this problem by developing cyberinfrastructure that improves models and enables scientists to better design experiments.

Jing Gao

Faculty Position: Assistant professor
Department: Computer Science and Engineering
Year joined UB: 2012
Award Type: National Science Foundation CAREER award
Award amount: $500,613

With the proliferation of mobile devices and social media platforms, any person can publicize observations about any activity, event or object anywhere and at any time. Being able to harness this information and verify its accuracy is the focus of Gao's research, which has the potential to improve the efficiency and cost of transportation, healthcare and other systems.

Dimitrios Koutsonikolas

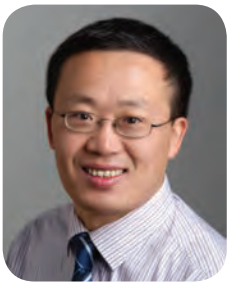
Faculty Position: Assistant professor
Department: Computer Science and Engineering
Year joined UB: 2011
Award Type: National Science Foundation CAREER award
Award amount: $555,385

With the increasing reliance on wireless devices, the telecommunications industry predicts a 1,000-fold increase in bandwidth demand by 2020. Networks in use are already stressed. The award will support Koutsonikolas' research, which focuses on developing next generation Wi-Fi and cellular networks that aim to solve wireless traffic jams.

Jonathan Lovell

Faculty Position: Assistant professor
Department: Biomedical Engineering
Year joined UB: 2012
Award Type: National Science Foundation CAREER award
Award amount: $400,000

Lovell's research focuses on developing safer and more efficient ways to control the delivery of medicine inside the body. The award will support research to develop tiny sacs that carry drugs to their intended destination and open up when triggered by light. The method shows great promise for delivering concentrated doses of medicine and limiting side effects.



Haiqing Lin

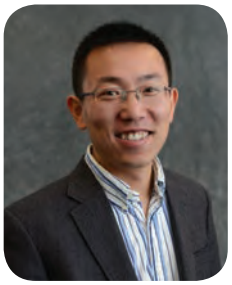
Faculty Position: Assistant professor
Department: Chemical and Biological Engineering
Year joined UB: 2013
Award Type: National Science Foundation CAREER award
Award amount: $500,000

The award will support Lin's research into clean coal technology. He is developing a polymer-based membrane to remove carbon dioxide, which makes up the vast majority of greenhouse gas emissions, from gasified coal before its combustion. The membrane could ultimately help lessen the impact of burning coal, an abundant natural resource in the United States and elsewhere, on climate change.

Matthew Bolton

Faculty Position: Assistant professor
Department: Industrial and Systems Engineering
Year joined UB: 2014
Award Type: US Army Research Laboratory Young Investigator award
Award amount: $100,000

Unanticipated human errors can contribute to failures in safety critical/complex systems, such as Army UAV operations and/or fire procedures. Bolton's research aims to develop a new human error modeling system that is based on where the person deviates from the instructions or plan of action. Engineers will be able to use these analyses to discover how human error could cause a system to fail so they can take corrective action.



Liang Feng

Faculty Position: Assistant professor
Department: Electrical Engineering
Year joined UB: 2013
Award Type: US Army Research Laboratory Young Investigator Award
Award amount: $149,946

Feng's research aims to improve information technology by investigating fundamentals of nanophotonics, exploring unique photonic materials and developing novel optoelectronic devices. The award will support his research to develop a novel light state in non-Hermitian optical materials. The technology offers great flexibility in effectively manipulating light transport on-demand, which will improve Army capabilities.

FACULTY HONORS AND AWARDS

Rajan Batta, a SUNY Distinguished Professor in the Department of Industrial and Systems Engineering, and Associate Dean for Faculty Affairs and Diversity in the School of Engineering and Applied Sciences, received the 2016 Award for Technical Innovation in Industrial Engineering from the Institute of Industrial and Systems Engineering (IISE). This is the third significant award Batta has received from the IISE—he was also honored with the David F. Baker Distinguished Research Award and Albert G. Holzman Distinguished Educator Award.

Michel Bruneau, a professor in the Department of Civil, Structural and Environmental Engineering, received the Raymond C. Reese Research Prize from the American Society of Civil Engineers (ASCE). Established in 1970, the Reese Prize is awarded to the author or authors of a paper that describes a notable achievement in research related to structural engineering, and that indicates and recommends how the research can be applied to design practice.

Venu Govindaraju, a globally recognized expert in machine learning and pattern recognition, has been named a Fellow of the National Academy of Inventors. The peer-nominated honor is given to academic researchers who have created or facilitated outstanding inventions that have made a tangible impact on quality of life, economic development and the welfare of society. Govindaraju is UB's vice president for research and economic development, and a SUNY Distinguished Professor of Computer Science and Engineering.

Jonathan Lovell was awarded the Rita Schaefer Young Investigator Award at the Biomedical Engineering Society annual meeting. The award recognizes a high level of originality and ingenuity in a scientific work in biomedical engineering. It is offered each year to stimulate research careers in biomedical engineering. It was created in honor of former BMES Executive Director Rita Schaffer in 2000.

Chunming Qiao, professor and chair of the Department of Computer Science and Engineering, received the 2015 Distinguished Technical Achievement Award from IEEE's Communications Society (ComSoc) Communications Switching and Routing (CSR) Technical Committee. The award recognizes Qiao's technical contributions in the fields of communication switching and routing.

Kui Ren has been named a Fellow of the Institute of Electrical and Electronics Engineers (IEEE). Ren, an associate professor in the Department of Computer Science and Engineering, was recognized for his "contributions to security and privacy in cloud computing and wireless networks."

Mark T. Swihart, UB Distinguished Professor in the Department of Chemical and Biological Engineering and Executive Director of UB's New York State Center of Excellence in Materials Informatics, has been named a Fellow of the American Association for the Advancement of Science (AAAS). The honor is bestowed on AAAS members by their peers for their efforts to advance science applications that are deemed scientifically or socially distinguished.

Andrew Whittaker, a professor in the Department of Civil, Structural and Environmental Engineering and director of MCEER, was recently elected a Fellow of the American Society of Civil Engineers (ASCE). Fewer than 3.5% of ASCE's more than 150,000 members hold this prestigious honor. Whittaker also advanced to Fellow of ASCE's Structural Engineering Institute, a grade that distinguishes members as leaders and mentors in the profession.

Teng Wu, assistant professor in the Department of Civil, Structural and Environmental Engineering, received the 2016 Alfred Noble prize from the American Society of Civil Engineers. The award recognizes a technical paper of exceptional merit whose first author is younger than 35. The award is made to a member of any grade of the ASCE, American Institute of Mining, Metallurgical, and Petroleum Engineers, Inc., American Society of Mechanical Engineers, Institute of Electrical and Electronics Engineers, or Western Society of Engineers, for a technical paper in any of their publications. Co-author Ahsan Kareem, Robert M. Moran Professor of Engineering, Department of Civil & Environmental Engineering & Earth Sciences at the University of Notre Dame, is a co-recipient of the award.

Jennifer L. Zirnheld, Maxwell Technologies Inc. Professor of Electrical Engineering, has been named by INSIGHT into Diversity magazine as one of 100 Inspiring Women in STEM. The national award recognizes women whose work and achievements are encouraging a new generation of women to consider careers in science, technology, engineering and math (STEM) while also providing support to others working in STEM fields.

Mollendorf named SUNY Distinguished Teaching Professor

A revered scholar, teacher and mentor in the Department of Mechanical and Aerospace Engineering, Joseph C. Mollendorf has made pioneering contributions to the field of service learning by providing generations of students with invaluable opportunities to take part in groundbreaking research on assistive device technologies.

During his 40-year tenure as a UB faculty member, Mollendorf has led more than 700 students on 450 projects, developing devices that improve the quality of life for hundreds of people with disabilities and their families. These devices include a wheelchair-accessible exercise station, a bicycle designed for an amputee, a shoulder-steerable tricycle and more. He holds seven U.S. patents—five of which were earned through his work with his students.

Joseph C. Mollendorf

Supervisor of the Engineering Machine Shop, Mollendorf is a recipient of the SUNY Chancellor's Award for Excellence in Teaching and is a Fellow of the American Society of Mechanical Engineers. He has amassed an impressive record of scholarship, including publishing more than 55 academic papers and 17 book chapters, and receiving more than $11 million in research grants, including 22 years of continuous National Science Foundation funding.

He received a doctorate and master's degree in mechanical engineering from Cornell University, and a bachelor's degree in mechanical engineering from Clarkson College of Technology.

Govindaraju named VP for research and economic development

Leading computer scientist Venu Govindaraju has been named vice president for research and economic development at the University at Buffalo. He has served as interim vice president for research and economic development at UB since September 2014.

Under Govindaraju's leadership, UB's research enterprise has made a number of significant strides. For example, UB has continued to build its ranks of world-renowned research faculty and significantly advanced interdisciplinary research through the launch of the Communities of Excellence initiative, the Creative Arts Initiative and other major endeavors.

UB also continues to distinguish itself among its peer research institutions nationally and globally, as exemplified by UB's leadership in National Science Foundation and National Institutes of Health research consortia, and the establishment of the UB Clinical and Translational Consortium, made possible by a prestigious $16 million Clinical and Translational Science Award.

A SUNY Distinguished Professor of Computer Science and Engineering, Govindaraju has been the principal investigator or co-principal investigator on more than $65 million in research funding. His work focuses on the application of machine learning and pattern recognition.

A native of India who came to UB in the late 1980s as a graduate student, Govindaraju has steadily advanced at the university as a researcher, educator and administrator.

A graduate of the Indian Institute of Technology in Kharagpur, India, Govindaraju received master's and doctoral degrees in computer science from UB.

Venu Govindaraju

Sudit to lead sponsored programs

Moises Sudit

Moises Sudit, an entrepreneur, professor and center director, has been appointed UB's associate vice president for sponsored programs.

In this role, Sudit will work with faculty, deans and others to manage UB's sponsored funding portfolio, and lead and participate in the university's efforts to attract and be awarded large-scale, interdisciplinary sponsored projects, as well as other high-profile awards that advance UB's mission across research, education and economic development.

Sudit will oversee UB's Sponsored Projects Services and the Office of Research Advancement. He has been affiliated with UB since joining the School of Engineering and Applied Sciences as an assistant professor in 1988. He currently is a professor in the school's Department of Industrial and Systems Engineering, and executive director of UB's Center for Multisource Information Fusion. He grew the center's research funds by nearly 2,000 percent—to $10 million yearly—during his decade-long tenure there.

Sudit founded Datumtech in 1989, growing the company from a startup to a recognized worldwide supplier of mobile data applications. Nine years later, the company merged with Veridian, which is now General Dynamics, a Virginia-based aerospace and defense company. He also partnered with Bell Mobility and the Lenbrook Group to co-found AirIQ, a Canadian wireless data company.

A native of Peru, Sudit has a bachelor's degree in industrial engineering from Georgia Institute of Technology, a master's in operations research from Stanford University and a doctorate from Purdue University.

Krishna Rajan named Chair of UB's new Department of Materials Design and Innovation

Onion Studio, Inc.

"A world-renowned scholar with an impressive record of research, teaching and service, Krishna will enhance UB's standing as a premier public research university while advancing important regional and national initiatives that will help Western New York grow as a hub for advanced manufacturing and biotechnology."

– Liesl Folks, Dean

Krishna Rajan, an internationally recognized expert on materials informatics, has been named the Erich Bloch Endowed Chair of the University at Buffalo's new Department of Materials Design and Innovation (MDI).

Rajan has authored or co-authored more than 300 publications and has delivered more than 270 invited lectures and presentations. He is the founding editor-in-chief of the new journal *Materials Discovery*, and serves on numerous national and international panels, including the National Academy of Sciences' Material Science and Engineering Panel at the Army Research Laboratory.

He has received numerous awards and recognitions, including most recently the Alexander von Humboldt Research Award. The award is given to researchers who have had a significant impact in their discipline—in this case, materials informatics—and are expected to continue producing cutting-edge achievements.

He received a doctor of science (ScD) in materials science, minoring in science and technology policy, from the Massachusetts Institute of Technology in 1978, and held post-doctoral appointments at MIT and Cambridge University. He was a staff scientist at the National Research Council of Canada and served on the faculties at Rensselaer Polytechnic Institute and Iowa State University.

The Department of Materials Design and Innovation is a unique collaboration between the School of Engineering and Applied Sciences and the College of Arts of Sciences. A generous donation from Erich Bloch, a UB alumnus who became a high-ranking executive at IBM and director of the National Science Foundation from 1984-1990, helped fund the newly formed department.

Four receive SUNY Chancellor's Awards

Chancellor's Award for Excellence in Scholarship and Creative Activities

Chang Wen Chen, a professor in the Department of Computer Science and Engineering, was recognized as "among the most highly respected leaders in the international image and video processing community." A prolific scholar and Fellow of IEEE and SPIE, he has garnered approximately $10 million in external research funding. He joined UB in 2008.

Jeffrey Errington, an expert in molecular simulation, was recognized for his contributions to molecular modeling methods and simulations that have resulted in advances in the understanding of numerous physical phenomena. He is a professor in the Department of Chemical and Biological Engineering and SEAS associate dean for undergraduate education. He joined UB in 2001.

Hui Meng was recognized as an expert and leader in two distinct fields: experimental fluid mechanics and cerebral aneurysm and hemodynamics. Meng joined the Department of Mechanical and Aerospace Engineering in 1999, and was named a research professor in the Department of Neurosurgery in 2004 and adjunct professor in the Department of Biomedical Engineering in 2010. Her work has provided the foundation for efforts to improve diagnostics, early detection, surgical management and treatment of brain aneurysms.

Chancellor's Award for Excellence in Adjunct Teaching

Paul Schifferle (BS '88, Aerospace, MS '04, Mechanical) has served as an adjunct instructor since 2002. With nearly three decades of industry experience, including Calspan Aerospace, where he currently is senior director of programs, Schifferle has taught more than 1,000 students over the course of his career at UB. His student evaluation ratings are consistently higher than the average for SEAS faculty.

Earthquake Engineering Giants: Constantinou joins elite group of Nathan M. Newmark medalists at UB

Onion Studio, Inc.

George C. Lee, Michael C. Constantinou, Tsu T. Soong and Andrei M. Reinhorn have been recognized by ASCE for their significant contributions to structural engineering and mechanics.

For almost 30 years, UB has been a leader in earthquake engineering. Recently, Emeritus professors George Lee, Tsu T. Soong and Andrei Reinhorn came back to campus, where they met with the most recent Nathan M. Newmark medalist, Michael Constantinou, in the Structural and Earthquake Engineering Simulation Laboratory.

The four have all been recognized by the American Society of Civil Engineers (ASCE) with the prestigious medal for their significant contributions to structural engineering and mechanics. UB is the only institution in the country where four medalists have been named within 15 years: Lee (2000), Soong (2002), Reinhorn (2011) and Constantinou (2015).

All four are affiliated with the Department of Civil, Structural and Environmental Engineering. Lee and Soong were instrumental in securing National Science Foundation funding for the first National Center for Earthquake Engineering Research in 1986, and all four have conducted ground-breaking research in the field of earthquake engineering.

Rae inducted into aviation hall of fame

William J. Rae, SUNY Distinguished Teaching Professor Emeritus in the Department of Mechanical and Aerospace Engineering, was inducted into the Niagara Frontier Aviation & Space Hall of Fame on May 13, 2016 in recognition of his long career in aviation. The annual ceremony has been a highlight for aviation and space enthusiasts in Western New York since its beginning in 1985.

William J. Rae

While teaching the fundamental properties of aerodynamic flight to students in his flight dynamics class, Rae began developing a theory that explains why a football doesn't fly like a missile or a bullet. His theory demonstrated that "the flight of a football is almost as complicated as the flight of an airplane."

Prior to joining UB in 1983, Rae worked for 30 years as a research scientist and engineer at the Cornell Aeronautical Laboratory, now known as the Arvin/Calspan Advanced Technology Center. In addition to teaching, he served as associate dean for graduate education of SEAS and chair of the mechanical engineering undergraduate committee. He retired in 2002.

Rapaport receives APA's Barwise Prize

William Rapaport, Associate Professor Emeritus, Department of Computer Science and Engineering, received the 2015 Barwise Prize from the American Philosophical Association (APA). The prize is awarded annually by the APA committee on philosophy and computers "for significant and sustained contributions to areas relevant to philosophy and computing by an APA member," according to the association's website. Rapaport was recognized for his life-long achievements in research and teaching in the field.

Rapaport, who joined the Department of Computer Science in 1984, has done research and written extensively in the areas of cognitive science, artificial intelligence, computational linguistics, knowledge representation and reasoning, contextual vocabulary acquisition, philosophy of mind, philosophy of language, critical thinking, and cognitive development. He is also interested in science educational theory and is a recipient of the SUNY Chancellor's Award for Excellence in Teaching.

He is well known locally for his interactive Buffalo Restaurant Guide, which before he closed it earlier this year, had over one million hits and included almost 3,100 reviews of nearly 900 restaurants.

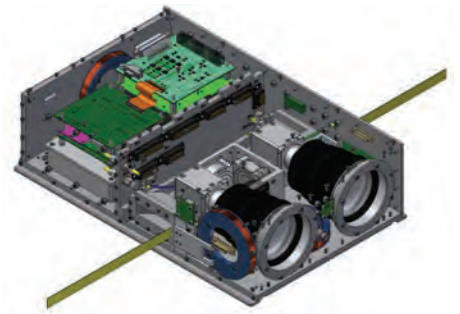
Nancy Parisi

William Rapaport

Looking to the sky: UB Nanosat

A new project has launched at UB that will extend the reach of the university's Nanosatellite Lab and help protect important space infrastructure, such as communication and GPS satellites, from orbital debris.

Spectrometry Observation for Reflectivity Analysis (SORA) is a new nanosatellite being developed by students in the UB Nanosat Lab under the advisement of John Crassidis, CUBRC Professor in Space Situational Awareness and Director of the Center for Multisource Information Fusion, Department of Mechanical and Aerospace Engineering. The 12U cubesat builds on the Glint Analyzing Data Observation Satellite (GLADOS), which has been in development in the Nanosat Lab for about five years.



GLADOS is a 6U cubesat that will be launched into low earth orbit to gather light data on space debris.

Thousands of pieces of space debris, also known as space junk, orbit the Earth and threaten to collide with and damage satellites. Like GLADOS, SORA will use light data to characterize the size, shape and material properties of space debris. SORA, however, will have the capability to use diffused light, which is a much more common source than the glint lighting used by GLADOS.

"It's an intense project that takes up a lot of our time, but it's very rewarding. To be able to say that something we designed and built will be in space in a couple of years is pretty cool," said Seamus Lombardo, an aerospace engineering major and project manager for GLADOS.

UB's premier space program

The UB Nanosat Lab is structured similarly to NASA, with divisions in software, integration and testing, and power systems. Most of the funding for the UB Nanosat Lab comes from the Air Force Research Lab, through the University Nanosat Program (UNP), which supports the development of space science research at U.S. universities. Five other universities are in UNP-8 with GLADOS while nine universities are part of UNP-9 with SORA.

Many students see the lab as an opportunity to get hands-on experience and learn skills that they wouldn't typically learn until they get to graduate school. Lab members have gone on to intern at SpaceX, NASA, Air Force Research Lab (AFRL), Lockheed Martin, Boeing and Moog.

Maura Sutherland, a sophomore double majoring in aerospace and mechanical engineering, greatly attributes her experience as a Nanosat Lab member to helping her obtain an internship at SpaceX.

"What you learn in the lab is so fundamental to what you are doing in the real world. The skills that I learned, I used at my internship. I would say my experience is what really got me that position," Sutherland said.

Building satellites from concept to launch

Working on SORA and GLADOS has provided these aspiring engineers with a hands-on experience that is rare at many universities.

"We are learning an incredibly broad range of engineering-related skills, such as soldering, wiring, working in the clean room — the list goes on," said Mara Boardman, a senior and Tennessee native serving as the project's chief engineer for GLADOS.

Boardman added that participation grew from about 60 students to almost 150 during the fall semester.

But, the lab isn't just about building a satellite; it's about building a community. Working on GLADOS for countless hours alongside fellow classmates has helped team members form a strong bond. Helping each other with homework assignments, tutoring one another or hanging out outside of the lab has become the norm among lab mates.

"The most important prerequisite isn't knowledge; it's motivation. If you come and start showing up, people will teach you how to do things so you can figure out how to do them by yourself. It's basically just showing us that you want to learn," Lombardo said.

With their passion and motivation intact, the students find themselves inching closer to their main goal. GLADOS is scheduled to go to the Air Force by mid-2017, in hopes that after a year of functional testing, it will be ready to launch by mid-2018. The students will continue to be responsible for it after launch, observing it from their own mission control ground station at UB.

Lab's SORA begins adventure

Mara Boardman, Chief Engineer of GLADOS, works in the lab's new digs in Hochstetter Hall. With more than 100 students now involved in the projects, the ever-expanding lab relocated after outgrowing its former space in Bell Hall.

Below: Rachel Suitor (Chief Engineer of SORA), Andrew Dianetti (Student Principal Investigator) and Seamus Lombardo (Program Manager of GLADOS) collaborate in UB's Nanosatellite Lab. Working on projects for countless hours alongside fellow classmates has helped lab members form a strong bond.

"Even though we are handing it to the Air Force, the project essentially doesn't end. Our de-orbit requirement is 25 years, so if everything goes according to plan, the satellite will be up there and functioning for a very long time," Lombardo says.

Leaving their mark in space

"The work we do is really going to play a big part in the future of spaceflight, because tracking all this debris is going to be important for putting up future satellites, and for efforts to go to Mars and other planets," Sutherland says.

As for the future of the UB Nanosatellite Lab, Lombardo hopes it will grow into a community that will make space more accessible.

"I see the lab growing into something where we have multiple satellites, can pay certain members of our staff and maybe even do in-house testing of certain things for people in industry," he says. "We want to market ourselves as an inexpensive way to get spacecraft built."

To learn more about the UB Nanosatellite Lab, visit *http://ubnl.space*.

Editor's Note: This story includes content from Laura Hernandez (UB Now) and Jenna Dombroski (EMERGE, UB's student magazine), and was updated for Buffalo Engineer by Sarah D'Iorio.

Shoe design gives UB students win in international 3-D printing competition

Dhruvay Jain traveled to Singapore last spring to collect some hardware after he and his team members took first place for their design of a custom-fit shoe in the 2016 International 3-D Printing Competition.

The competition, organized by the Singapore Centre for 3-D Printing at Nanyang Technological University, promotes awareness and adoption of 3-D printing technologies. This year's assignment required competitors to fabricate fashionable and functional eyewear or shoes.

Jain and fellow graduate students Priyanka Nikam, Hardik Gandhi and Anshika Chourdhary, all of the Department of Industrial and Systems Engineering (ISE), and Weihao Qu of the Department of Computer Science and Engineering (CSE)—got together to design and create a shoe tailored to a person's unique preferences and needs. The team was guided by ISE faculty members Chi Zhou and Lora Cavuoto, CSE faculty member Wenyao Xu and CSE research scientist Feng Lin.

The final product was a 2-in-1 shoe that is customized to the user's foot with added comfort, durability, functionality and aesthetics. The shoe is designed to be worn as a sandal or as a closed shoe with the use of a simple slide-in system.

The students say they selected "Peace—art meets technology to shape a better future" as the name of the shoe to project a message of world peace. The design features illustrations of a world map, a dove, olive leaves and the peace symbol to help convey that message.

"We feel it's extremely important to communicate a message through our products that resonates with the masses and has a social relevance, too," says Jain, who led the team effort.

Team members began working on the project in November, months ahead of its April 8 deadline, and spent much of their time engrossed in it. Their hard work paid off, as they won the competition, which includes a top prize of $10,000.

"What appears to be a simple shoe design actually involved extensive research and design challenges," says Jain. "We were motivated to add functionalities to the footwear and re-design the conventional, generic shoe designs."

As one of the group's mentors, Zhou watched the team take advantage of the unique features of 3-D printing, such as high flexibility, multi-functionality and high complexity, to construct their final product.

"The participation and success of the team not only enhanced the national and international visibility of UB in the emerging field of advanced design and manufacturing," says Zhou, "it also facilitated international education and promoted the innovation and creativity of the next generation."

Jain notes that the 3-D printing technology enables the students to "bring our creative thoughts to life. It brings together art and technology to produce some novel innovations that can pave the way for a better future."

Adds Zhou: "With this new technology, the only limitation is our imagination and innovation."

While in Singapore, Jain met with UB alumnus Andrew Tan (BS'15), who welcomed him on behalf of UB Alumni's Singapore Chapter.

>> Laura Hernandez

Members of the winning student team and their faculty advisors.

Tau Beta Pi recognizes outstanding underclassmen

Tau Beta Pi is the only national engineering honor society that represents the entire engineering profession. It recognizes junior and senior engineering students who are in the top 1/8 and 1/5 of their class, respectively. Members in this prestigious organization are eligible for numerous scholarships and fellowships, and many have become distinguished members of society and the profession.

UB is home to the New York Nu Chapter of Tau Beta Pi. The current officers have created a Young Scholar Award to recognize the top two sophomores (S) and one freshman (F) from each engineering discipline at UB who exemplify the values of the Tau Beta Pi organization. This year's recipients are:

Biomedical Engineering

- Jenna Dombroski (S)
- Ryan Rava (S)
- Kara Wilcox (F)

Chemical and Biological Engineering

- Matthew Chow (S)
- Andrew Scull (S)
- Kimberly Vaeth (F)

Civil and Structural Engineering

- Justin Bracci (S)
- Nicole Lynn Gerritz (S)
- Jiun Wen Seet (F)

Environmental Engineering

- Cody Manzanero (S)
- Jeremy Nyitrai (S)
- Anandharam Mourougassamy (F)

Industrial and Systems Engineering

- Adam Behrendt (S)
- Emily Belote (S)
- Paul Larson (F)

Mechanical and Aerospace Engineering

- Stephanie Hahn (S)
- Daniel Laccetti (S)
- Fatak Borhani (F)

Douglas Levere

Goldwater student engineers her own career path

Anna Smith never thought she'd be trying to figure out what kind of an engineer she wanted to be, let alone tasking an entire class of 5th graders with the same decision.

Smith's own transition into engineering was anything but traditional. She was working in the beauty industry in Paris, when she met an engineer who created a self-buffering skin peel that was easy on the skin—she's been hooked ever since.

Now an undergraduate student in the Department of Chemical and Biological Engineering, Smith's newly found passion is allowing her to make a big impact in the Buffalo community and inspire others to take an interest in STEM careers.

Through UB's National Science Foundation-funded Interdisciplinary Science and Education Partnership (ISEP), she has shared her enthusiasm for science and engineering by serving as a mentor to a classroom in Buffalo Public School #59. The experience motivated her to take things a step further in her efforts to get young children interested in engineering, and she organized a field trip to UB to allow the students to participate in interactive engineering projects.

Students took part in activities such as water filtration design, building computer games, and devices that aim to cure cancer.

"It was really exciting to see a sparkle in their eyes after they had such a great experience," said Smith, who asked the students to write down what type of engineer they wanted to be when they grew up at the conclusion of the field trip.

Smith's hard work and determination to be a successful engineer is starting to pay off. She was recently awarded the prestigious Goldwater Scholarship, and will receive up to $7,500 per year to help pay for the cost of her education to pursue a STEM career.

"I plan to launch my own company based on products developed from novel research ideas that I will work on during my PhD and beyond. In addition to my aspirations to make advancements in research and bring these ideas to fruition in industry, I am committed to serving the community by promoting the STEM fields through outreach and mentorship programs."

Smith is doing just that. Not only did she give the students a day filled with experiential learning, but a chance to decide what kind of engineer they would grow up to be.

>> Jashonda Williams

Students design inflatable heat shield for NASA Mars mission contest

A team of five student engineers developed plans for a massive inflatable heat shield designed to protect spacecraft—and potentially astronauts—from the white-hot heat that objects encounter upon entering Mars' atmosphere.

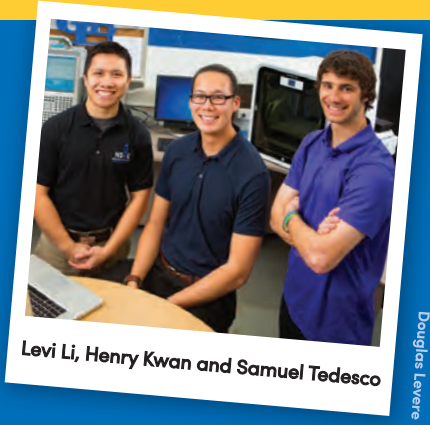
The team's work impressed NASA and partner organization, the National Institute of Aerospace (NIA), which called upon college students nationwide to submit proposals for a contest called the Breakthrough, Innovate, and Game-changing (BIG) Idea Challenge.

Contest organizers asked the teams to develop plans for a heatshield much larger than what NASA recently used to land the rover Curiosity on Mars. The contest dovetails with NASA's ongoing efforts to develop a new class of heatshields to carry vehicles that weigh up to 30 tons to Mars.

UB's was among the four top plans chosen by NASA and NIA, along with Georgia Tech, Purdue University and the University of Illinois Urbana-Champaign. The teams presented their plans to a panel of judges at NASA's Langley Research Center.

"To have NASA and the NIA evaluate our plan is really an honor," said Henry Kwan, a senior mechanical engineering major who helped create the plan.

Other team members were seniors Levi Li and Samuel Tedesco, and Anish Kumar and Anibal Martinez, who graduated in 2015. Kemper Lewis, professor and chair, was the team's faculty advisor. All are from the Department of Mechanical and Aerospace Engineering.



Levi Li, Henry Kwan and Samuel Tedesco

Douglas Levere

STUDENTS

Graduate students from the Department of Industrial and Systems Engineering, Dhruvay Jain, Omar A. Siddiqui, Piyush Nain, Amit Nanal, Aniket Khalekar and Abhishek Sarma, solved a difficult and ongoing problem for UB's Police Department related to providing the campus with adequate police coverage while still allowing officers to choose desirable schedules.

Cancan Yang from the Department of Civil, Structural and Environmental Engineering, earned first place in the 2016 Graduate Student Poster competition for her research work on ultra-high performance concrete post-tensioned segmental precast bridge piers for seismic resilience.

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For the fifth year in a row, UB's Space Bulls earned a place in the prestigious NASA and NIA RASC-AL Robo-Ops Planetary Rover Competition. The team's rover navigated the terrain at Johnson Space Center's Rockyard Facility in Houston, while being tele-operated from UB.

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Sarah Jo Crofts, biomedical engineering, and Charles Jones, chemical and biological engineering, were the student speakers at this year's commencement ceremony.

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Eight students received awards from the UB Engineering Alumni Association (EAA) during its Fall 2016 awards night. From left are: Ardeshir Raihanian Mashhadi, Matthias J. Schmid (Professor Howard Strauss Memorial Scholarship), Devashish Agarwar, Pedram Johari, Gina Nasca, Daniel Miller, John Coles (BS'09, PhD'14, EAA board member), Tyler Ocwieja and Wil Nagangast.

Nancy J. Parisi

Thiru Vikram, computer and electrical engineering, and Emilie Reynolds and Alexander Zhitelzeyf, both of mechanical engineering, won the 2016 Henry A. Panasci Jr. Technology Entrepreneurship Competition. Their company, Buffalo Automation Group, makes and sells self-piloting technology and automation tools to ship operators.

Yumiao Zhang received the Outstanding Chinese Student Abroad award from Qiyue Zhang, the Consul General of the People's Republic of China, at a ceremony held in New York City on April 29, 2016.

Jennifer Merckel received a Galactic Unite Flying Tigresses Scholarship, which supports women who are pursuing careers in aerospace and aviation.

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The UB Engineering Alumni Association awarded 9 scholarships this past spring. From left: Kurt Bessel (BS '07, MS '08, EAA president), Andrew Kroetsch, Andrea Martinez, Robert DeBortoli, Ava Chai, Steven Coffed, Mohammad Atif Faiz Afzal (Professor Howard Strauss Memorial Scholarship) and Robert Barnes (former EAA board member). Not shown are: Hillary Chiarella, Elise Martin and Eun Jin Shin.

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More than 50 UB students spent 24 hours this past summer dreaming up futuristic and convenient guest amenities to revolutionize the stadium experience at a hackathon sponsored by Delaware North, the School of Engineering and Applied Sciences, the School of Management and UB Athletics. The winning team, Ping Pro—Fans Experience Freedom!, poses with some of the judges, including engineering dean Liesl Folks (second from left in UB shirt and cap).

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Student organizers of the Spring 2016 Career Perspectives and Networking Conference with Keynote Speaker Dexter Johnson, Chief of the Structural Systems Dynamic Branch at NASA's Glenn Research Center. From left: Andrea Sacco, M. Atif Afzal, Matthew Whittaker, Dexter Johnson, Andrew Kroetsch and Mark Tomaszewski.

Sharma receives 2016 Distinguished International Alumni Award; signs doctoral fellowship agreement

Ashutosh Sharma (PhD '98, Chemical Engineering) returned to his alma mater in April 2016 to receive the 2016 Distinguished International Alumni Award from UB's Alumni Association.

Sharma is an internationally renowned scientist who was recently appointed Secretary of the Department of Science and Technology of India, a cabinet-level position in the government of Prime Minister Narendra Modi. He is currently on leave as Institute Chair Professor at the Indian Institute of Technology, where he was the founding coordinator of the Nanosciences Center and the Advanced Imaging Center at the school in Kanpur.

A student of the distinguished UB scientist Professor Eli Ruckenstein, Sharma also delivered the Eighth Annual Eli Ruckenstein Lecture during his visit, at the invitation of the Department of Chemical and Biological Engineering. Sharma spent part of his visit meeting with faculty and students of his home department and learning about their research and education endeavors. He also visited Professor Ruckenstein, a National Medal of Science recipient, to discuss current research activities.

The Distinguished International Alumni Award was presented during a dinner on April 15 honoring Sharma at the home of President and Mrs. Tripathi. Mary Garlick Roll, president of the UB Alumni Association, assisted by Wei Loon Leong, Director of International Alumni Engagement, presented the award on behalf of the association.

During his visit, Sharma and Tripathi signed a Memorandum of Understanding enabling UB to join a small group of elite U.S. universities participating in the new doctoral fellowship program offered by the Science and Engineering Research Board (SERB) of India. Sharma also delivered a presentation on the SERB Fellowship for interested faculty and students.

The SERB Fellowship provides funding support for up to five outstanding Indian students admitted to UB doctoral programs in STEM fields each year. UB was invited to participate for the first time this year, and nominated 10 excellent students admitted to six different doctoral programs at UB.

>> Wei Loon Leong

Nancy J. Parisi

Ashutosh Sharma exchanges signed SERB agreements with President Tripathi.

Annual SEAS awards night honors students, alumni, corporate partners and donors

Scott and Coleen Stevens (center) received the Delta Award. Also shown, from left, are: Tim Siderakis, Liesl Folks, Bethany Mazur and Kurt Bessel.

Giving back to the UB community was the theme of the School of Engineering and Applied Sciences Annual Awards Night.

About 60 people filled Davis Hall to celebrate the achievements of the school's students and the volunteers who support them in an evening event featuring an award ceremony, networking opportunities, student poster presentations, and dinner.

Kurt Bessel (BS '07 MS '08), President of the UB Engineering and Applied Sciences Alumni Association, served as emcee during the award presentations, which included five awards to exceptional members of the school's community, as well as scholarships awarded on behalf of the Engineering Alumni Association.

"Our mission is complex—we educate, do research, and serve our community—and the support we receive from our generous donors and volunteers enhances our ability to serve not only UB, but also the Western New York region, New York State, and beyond. We offer deep and profound thanks to our supporter for all they do for us," said Liesl Folks, dean of the School of Engineering and Applied Sciences.

Other awards included: Corporate Partner of the Year, National Grid; Volunteer Recognition Award, Gina B. Hammond, MS '73; Outstanding Young Alumnus Award, Dan Magnuszewski, BS '05; and Mentor of the Year, Jason Havens, BS '05.

The SEAS Annual Awards Night was held during the fall semester for the 2016-2017 academic year. Awards went to: Bird Technologies, Corporate Partner of the Year; Frank (BS'79) and Mary Puskar, Delta Award; Lawrence Mathews (BS'69), Mentor of the Year; Stephen Buechi (ME'95, BS'93), Volunteer Recognition Award; and Jorge Cueto (MS'13, PhD'16), Outstanding Young Alumnus Award.

See pages 24-25 for the Engineering Alumni Association student awards from both award nights.

Abrami named 2016 Engineer of the Year

Onion Studio, Inc.

Kurt Bessel presents Patrick F. Abrami (right) with the 2016 Engineer of the Year award.

"Continue to learn every day of your life and be willing to take risks," were some of the words of wisdom shared by this year's Engineer of the Year, Patrick F. Abrami (MS '75, BS '72, Industrial Engineering), in his address to a crowd of about 250 students, faculty and alumni of the School of Engineering and Applied Sciences during its annual Engineering Celebrations event.

Abrami was selected as Engineer of the Year by the UB Engineering Alumni Association in recognition of his dedicated service to the school, where he chairs the Industrial and Systems Engineering's Department Advisory Board (DAB), and serves as a member of the school's Dean's Advisory Council.

Abrami is a partner and consultant at Applied Management Systems (AMS), a Massachusetts-based health care operations consulting firm. He is also a member of the New Hampshire House of Representatives, where he serves as vice chair of the House Ways and Means Committee.

The award was presented by Kurt Bessel (BS '07, MS '08), President of the UB Engineering Alumni Association.

Boyce honored with 2016 Furnas Award from UB Alumni Association

Meherwan Boyce (MS '64 Mechanical Engineering) is this year's recipient of the Clifford C. Furnas award. The award recognizes alumni who have distinguished themselves in a field of science, thereby bringing honor to the university.

Meherwan Boyce (right) talks with SEAS students Joe Pace and Brianne Stasiak at UB's annual alumni awards night celebration.

Boyce pioneered online condition-based performance monitoring—a process which optimizes power plants, allowing them to run more efficiently, stay in compliance with emissions laws, maximize the turbine system, and run in a more cost effective manner. He has developed models for various power plants and petrochemical complexes that are used around the world.

He has 45 years of experience in turbo machinery in industry and academia. He is managing partner and chairman of the Boyce Consultancy Group LLC, an alliance of engineering and industrial consultants with keen knowledge and experience in power generation. As a mechanical engineering professor at Texas A&M University, Boyce founded the TurboMachinery Laboratories and Symposium, now in its 45th year.

After graduating from UB, Boyce earned his PhD from the University of Oklahoma.

Update your contact information to ensure you're invited to the next Insider's Look or other events in your area. Send updates and ideas for future events to *EngineeringAlumni@buffalo.edu.*

1 BUF: Students talk with Engineering Alumni Association board members at the annual football tailgate.

2 BUF: Lester (MS '64, PhD, '69 EE) and Karen Gerhardt pose with Ronita Bose, an electrical engineering undergraduate, who is one of the students assisted by the Gerhardt's scholarship. Gerhardt was honored as the Electrical Engineering Alumni of Year.

3 BUF: Chemical and Biological Engineering's Class of 1966 held a reunion this summer. Shown with some current students and department chair Stelios Andreadis are, from left, front row: Dave Andrews, Jerry Zakalik, John Lenczyk; back row: Keith Wilson, Michael Berg, Tom Marlin, George Kosanovich and John Mendrykowski.

4 DC: Alumni at SEAS pre-event at Mellon Aud in Washington DC.

5 ROC: CSE alumnus with President Tripathi at UB Night in Rochester, New York.

6 BUF: Young Alumni Board members (from left) Kevin Kerl, Eric Cichowski, Kurt Bessel and Jahmil Campbell share tips for finding a good job with students as part of the Career Perspectives and Networking Conference for SEAS graduate students.

7 BUF: Jeffrey Gritsavage, host of our Insider's Look at the Lockport canals.

8 BUF: UB Engineering Alumni Association board members enjoy a meal with Norman Hayes, this year's recipient of the SEAS Dean's Award, as part of the school's 2016 Commencement.

Pelino helps Toyota win NASCAR Sprint Cup

Mike Pelino (BS '12 Mechanical Engineering), self-proclaimed gear head, scored a big win last fall when driver Kyle Busch took home Toyota's first NASCAR Sprint Cup with an engine Pelino helped design.

While he isn't allowed to discuss exactly how they improved engine performance—and he mentions that racing engine design rules are very stringent—Pelino and his team worked on an exhaust development project that picked up some performance. When asked if it was the engine that helped clinch the Cup, he says, "There were many factors that came into play with that win. It's a balance because the car isn't going to win with a mediocre engine, a mediocre driver or a mediocre chassis."

Pelino serves as an engine development engineer for Toyota, assigned to the NASCAR Sprint Cup Series, and is involved in the design, manufacturing, testing and optimization of all aspects of the engines. His duties include meeting with designers, characterizing engines in state-of-the-art test cells, and analyzing data at the racetrack. "It's the racing atmosphere, so you're always busy. One day I'll be working on a new exhaust system, the next day I could be working on oiling systems or durability testing."

During his time at UB, Pelino completed an independent study with SUNY Distinguished Teaching Professor Joseph Mollendorf, regarding engine performance with various fuels. He was also involved with the ASCE Steel Bridge team, SAE Baja and Clean Snowmobile teams.

>> Rebecca Rudell

Li helps break world record at Alta Devices

In less than six months on the job at Alta Devices, Yanshu Li (BA '11 Math, BS '11, MS '14, PhD '16 Electrical Engineering) helped the solar power technology company break a world record.

Li was the project owner of the research type GaInP/GaAs dual-junction solar cell, in which he developed a new fabrication process and prototype design that reduced contact resistance and increased thermal endurance. His new designs and methods helped his employer break the world record for efficiency on GaInP/GaAs dual-junction solar cells.

At UB, Li was the Moog Fellowship recipient from 2011 to 2013. His PhD research topic was nanotechnology in GaAs solar cells, and his advisor was SUNY Distinguished Professor Vladimir Mitin.

"I gained a great deal of technical experience through my work at UB's state-of-the-art cleanroom facilities, which prepared me well for my position as an R&D engineer at Alta," said Li. "The professors in the electrical engineering department were very accessible and gave me a lot of guidance."

Li had a little additional help getting his job at Alta Devices. While attending the school's 2015 Order of the Engineer ceremony, Li met Richard Chang (MS '79 Nuclear Engineering), CEO of Zing Semiconductor Corp. and UB's Distinguished International Alumni Award recipient in 2013. The two men hit it off and Chang wrote a letter of recommendation for Li. Li started at Alta Devices just a few months later—and he is off to a great career!

>> Rebecca Rudell

Jorge Cueto, founder of Smart Walls Construction LLC, in the lab with his telescopic flood walls.

Telescopic walls could rise on demand to stop flood waters

Jorge Cueto was running a successful consulting and construction company in Bogota, Colombia, and teaching civil engineering in a university five years ago, but he felt the need to do more.

"I wrote on the application for the Fulbright scholarship what I was trying to do. I was looking for something new, but I didn't know what it was," he said.

He won the scholarship, and by coincidence — one of his favorite professors in Bogota had graduated from the University at Buffalo — he came to UB. After finishing his master's and PhD degrees, Cueto recently won the SEAS Outstanding Young Alumnus Award.

The award is a recognition of outstanding contributions to his career field and comes after a long struggle to win support for his invention: a telescoping structural system. Cueto devised a patent-pending system of telescoping rectangular fiber-reinforced concrete boxes that he hopes will be the basis for "rise on demand" flood walls. The walls can be installed below ground level, so as not to block any water views, and can be raised when the threat of flooding occurs.

His invention, called Smart Walls, won a $225,000 Small Business Innovation Research grant from the National Science Foundation. He had earlier won $8,000 from UB's Entrepreneurial Lab to get the project going.

In an interesting twist, Cueto's advisors, Andre Filiatrault and Amjad Aref, both professors in the Department of Civil, Structural and Environmental Engineering, are now consultants with his company. Filiatrault notes, "With this NSF grant, Amjad and I are working for him now."

The UB/National Grid Leadership Camp aims to introduce engineering concepts to under-represented high school students with an aptitude for STEM.

National Grid's Daniel Keating (left) and Natalie Terhaar show off their Corporate Partner of the Year award with UB's Tim Siderakis.

National Grid partners with SEAS to build an education pipeline

National Grid, a prominent multinational energy company, is in the process of developing a different type of pipeline in Western New York—one through which the energy of learning what it means to become an engineer flows freely. The company's considerable efforts in this area were recognized this spring when it was named UB Engineering's Corporate Partner of the Year.

National Grid's educational involvement was borne out of a recognized need to expand careers in engineering to include a more diverse population. So, five summers ago, the company partnered with UB to create a four-day engineering summer camp primarily for under-represented high school students interested in STEM careers.

"Our hope is that this camp will help build a level of interest for students with an aptitude for engineering but little or no exposure to it," said Dennis Elsenbeck, Director, New Energy Solutions Stakeholder and Policy at National Grid, and a member of the Dean's Advisory Council (DAC). "We want to help remove the barriers or challenges women and minorities face in STEM fields."

Campers live on the UB campus and participate in hands-on activities in engineering design, team-building and leadership skills, lab and computer exercises, field trips, and recreational activities. Students who successfully complete the program receive a scholarship to UB.

When research noted that decisions for STEM-oriented careers were being made as early as the sixth grade, National Grid's pipeline of education expanded further, adopting Science is Elementary, a K-12 program that SEAS Dean Liesl Folks brought from California to Westminster Community Charter School.

At UB, Elsenbeck and fellow DAC members talk directly with students, offer advice and guidance about their careers, and listen to learn how perceptions of engineering are changing. The company's support extends to attracting faculty with an endowed professorship, an initiative that helped to bring Quanxi Jia, a world-renowned scholar, back to his alma mater as part of UB's new Department of Materials Design and Innovation.

Electrical engineering faculty members Jennifer Zirnheld and Kevin Burke have worked on various projects with National Grid, the latest being a feasibility study for implementation of a microgrid that would allow the Buffalo Niagara Medical Campus and surrounding neighborhood to sustain power in the event of a catastrophic outage.

"There are enormous opportunities for our students to match the theory they are learning in class to applied research that accelerates their own learning," says Zirnheld.

Both faculty members are enthusiastic about their participation in the Science is Elementary program. Zirnheld, who volunteers as classroom lead, says that being able to encourage a child

nationalgrid
HERE WITH YOU. HERE FOR YOU.

while they struggle to accomplish a task and celebrate with them when they exceed their own expectations is the essence of discovery.

"National Grid is helping to foster the next generation of scientists and engineers," she states. Burke concurs. "Most of these kids are minorities. So it's important to see someone who looks like them in front of a room saying, 'You can be a scientist."

For National Grid, it's all about creating a pipeline of experiential learning to bring engineering to life. In Elsenbeck's view, "If young people are excited about what they're doing and are exposed early to what our industry is all about, we feel that's better for the university, for the potential engineer as they go forward, and for our company."

>> Jim Bisco

Onion Studio, Inc.

Students from SAE learned gas metal arc and gas tungsten arc welding techniques at the Praxair Technology Center's metal fabrication laboratory.

SAE students participate in welding training at Praxair

Inspired after talking with members of UB's Society of Automotive Engineers (SAE) at a recent event, Mike Sinicropi, director of global market development for metal fabrication at Praxair and a member of the School of Engineering and Applied Sciences' Dean's Advisory Council, wanted to find a way to help the club.

So in early December 2015, seven students visited Praxair Technology Center's metal fabrication laboratory for a one-day training session on gas metal arc welding and gas tungsten arc welding.

"The training gave us great insight into the industrial side of welding as opposed to our 'self-taught' hobby welding," said Spencer Heyden, president of SAE. "The techniques we learned will help us produce reliable and clean welds, which are key elements for both our snowmobile and Baja vehicles."

"We hope the skills they learned in this training will help them do even better in next year's competitions," Sinicropi said.

Sinicropi coordinated the training session with Heyden and Jeremy Neff, senior R&D manager for metal fabrication at Praxair. Praxair technologists Tom Matecki and Ken Jozwiak conducted the training.

Praxair was named the School of Engineering and Applied Sciences Corporate Partner of the Year in 2015.

Engineering students hear hiring tips from SEAS engineering partners

"We're looking for top talent, so we don't rely on job postings; instead, we partner with universities such as UB to find that top talent," said Patricia Hein of U&S Services.

"If I'm looking for an engineer, I need someone with strong subject knowledge, who has both good communication and technical skills, and is a good team player," said Cem Celik of Praxair.

These are just some of the many words of wisdom shared by School of Engineering and Applied Sciences' engineering partners with students during the SEAS Sponsor Panel, a special event held during Engineers Week.

In a Q&A format between engineering students and panelists, about 70 students had the opportunity to ask about the skillsets most important to employers, the experiences employers value most, the balance between grades and experiential learning, and other topics on professional development during an hour-long program moderated by Andrew Olewnik, SEAS Director of Experiential Learning.

In addition to Hein and Celik, Ashok Jain of Zodiac Aerospace, Nick Vandervoort of Unifrax, and Eric Barton of Gemcor served on the panel.

>> Jashonda Williams

Representatives from SEAS engineering partners gave students tips and techniques for finding a great job. Seated from left are: Ashok Jain, Patricia Hein, Nick Vandervoort, Cem Celik and Eric Barton.

2015-2016 Engineering Partners

To become an engineering partner, contact Todd Brooks, at *toddbroo@buffalo.edu.*

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New start-up company offers alternative treatment for cardiovascular disease

In the United States, 350,000 coronary artery bypass grafting procedures are performed annually, costing $26 billion in healthcare expenses. Two thirds of the cost comes from secondary contributors, such as extended hospital stays and readmissions resulting from donor site complications.

Angiograft LLC, a new company out of the University at Buffalo's Department of Chemical and Biological Engineering, seeks to reduce these costs by making bioengineered blood vessels for people with heart disease.

Sindhu Row, who earned her PhD in chemical engineering in February 2016, together with her advisor, Stelios Andreadis, professor and chair of the Department of Chemical and Biological Engineering, and Daniel D. Swartz, an expert in blood vessel grafting, surgery and pediatrics, are moving the product forward with clinical trials.

"The product is a self-regenerating blood vessel, available off the shelf, that once implanted, is capable of regenerating with the patients' own cells making it biologically functional," said Row.

"The acellular technology employs covalent chemistry to fortify the collagenous grafts with anti-clotting factors as well as growth factors, which attract the patients' own cells to the graft site. This enables A-TEV (acellular tissue engineered vessel) to be manufactured within just one day, and be available off the shelf, a tremendous advantage for clinical applications," she continued.

The company's A-TEV is designed as a replacement vascular graft, which is often required in coronary artery bypass grafting procedures. These procedures typically use the patient's own veins; however, people with conditions such as diabetes and hypertension often do not have viable veins and are thus unable to undergo the surgery. The technology could, therefore, offer these patients an alternative through its unique design.

The technology and product are protected under a provisional patent (62/254,347) with intellectual property rights belonging to Angiograft LLC.

The team was recently among 80 semi-finalists in the 2016 OneStart competition, the world's largest accelerator for startups that seek to improve human health. They were selected from a pool of 750 startups from over 50 countries.

They were also finalists in UB's Henry A. Panasci Jr. Technology Entrepreneurship Competition and Bright Buffalo Niagara's Entrepreneur Expo. More recently, Angiograft was named one of 142 semifinalists in 43North, a $5 million startup competition held in Buffalo, New York.

>> Jane Stoyle Welch

Onion Studio, Inc.

Angiograft, co-founded by Stelios Andreadis, Sindhu Row (shown above) and Daniel Swartz, is developing a way to make artificial blood vessels for people with heart disease that could help reduce the costs associated with coronary bypass surgery.

Douglas Levere

Middle schoolers immersed in electrical engineering

Marcia Torrico (center), a PhD candidate in electrical engineering, shows Paige Denman (left) from Kenmore Middle School, and Eve DiCarlo (right) from Veronica E. Connor Middle School in Grand Island, how sonar works. With the click of a switch, sounds rang out of a receiver. "It sounds like little dolphins communicating to each other," Torrico said. The middle school students are part of UB's Gifted Math Program, which was founded in 1979. Each year it enrolls up to 275 middle and high school students from throughout Western New York.

UB creates digital manufacturing and design online courses

UB is developing a "101" series of massive open online courses on the Coursera platform about digital manufacturing and design—the ability to connect different parts of the manufacturing lifecycle through data.

The Digital Manufacturing and Design Technology Specialization consists of nine courses and a project. Courses are for anyone interested in how manufacturing is evolving, from high school graduates exploring careers to operations managers intrigued by emerging technologies.

The project is an initiative of the federally funded Digital Manufacturing and Design Innovation Institute, of which UB is a member.

Kenneth English films an introduction to a course at Moog Inc. Behind the camera is J. Michael Vick, digital media producer at Full Circle Studios.

The project team includes:

- Program manager Timothy Leyh of TCIE
- Principal investigator Kemper Lewis of SMART and Chair of the Department of Mechanical and Aerospace Engineering (MAE)
- Instructors Kenneth English of SMART, Rahul Rai of MAE, Sara Behdad of MAE and ISE, Chi Zhou of ISE, and Shambhu Upadhyaya of CSE
- Staff from UB's Center for Educational Innovation and the SUNY Office of the Provost
- Partners Accu-Solve Group, Full Circle Studios, Buffalo Manufacturing Works, Moog, Lockheed Martin, Siemens Product Lifecycle Management Software, Society of Manufacturing Engineers, Association for Manufacturing Technology, SAE International, Commonwealth Center for Advanced Manufacturing and Commonwealth Center for Advanced Logistics Systems

The first three courses will launch in January, with the rest released one month at a time.

>> Tracy Puckett

UB spinoff Abcombi Biosciences lands spot in Johnson & Johnson's Toronto incubator

It has been quite a year for University at Buffalo spinoff company Abcombi Biosciences. Since forming last June, the biomedical startup has:

- Received a $323,000 grant from the National Institutes of Health.
- Completed preclinical trials for a promising pneumococcal vaccine.
- Been accepted into the START-UP NY economic development program.

In another indication of the company's fast-growing potential, it has been accepted into JLABS @ Toronto, a prestigious new biomedical research incubator spearheaded by Johnson & Johnson, the global medical devices, pharmaceutical and consumer packaged goods manufacturer.

"We're honored to be part of the inaugural group of startups at JLABS @ Toronto," said Abcombi CEO Charles Jones, who received a PhD in chemical and biological engineering from UB in February 2016. "Connecting our Buffalo-based headquarters to this one-of-a-kind incubator program will help us bring to market medical advancements that will alleviate suffering for millions of people worldwide."

JLABS bills itself as a "no-strings attached" incubator, meaning companies pay only rent and receive lab space, use of equipment, mentorship and other services at no cost.

Abcombi was formed to commercialize two innovations: a protein-based vaccine platform and a new drug delivery method, developed in the research laboratories of UB faculty members Blaine Pfeifer, associate professor of chemical and biological engineering, and Jonathan Lovell, assistant professor of biomedical engineering.

Both Pfeifer and Lovell are co-founders of Abcombi. The company is working with Lovell's "nanoballoon" innovation, which uses modified liposomes that, upon being struck by a red laser, pop open and deliver concentrated doses of medicine.

Abcombi, which recently won first place in the biotechnology category of the New York Business Plan competition, gained acceptance in JLABS @ Toronto with the help of UB's Office of Science, Technology Transfer and Economic Outreach (STOR). It will remain in its headquarters at 73 High St. on the Buffalo Niagara Medical Campus and move the bulk of its laboratory work to Toronto this summer.

Earlier this year, the company was voted the $20,000 winner in the Bright Buffalo Niagara entrepreneur expo business plan competition, and was one of 16 finalists in this year's 43North competition, a $5 million Buffalo-based business plan competition.

The company is developing a stable of products, but its initial emphasis is on developing a new vaccine for pneumococcal disease, which is an infection that causes pneumonia, meningitis and bloodstream infection.

>> Cory Nealon

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Charles Jones (left) and Blaine Pfeifer of Abcombi Biosciences.

CSE Kid's Day highlights computer science and engineering

Nancy J. Parisi

PhD student Razieh Fathi works with students to program a dancing robot.

An enthusiastic crowd of about 500 people filled Davis Hall for a night of fun and games designed to celebrate and promote computer science.

Dubbed "CSE Kid's Day" and hosted by UB's Department of Computer Science and Engineering (CSE), the event featured robot demos, games designed to teach programming concepts and kid-friendly interactive projects led by UB students.

The most popular spot for families with younger children was the third floor of Davis Hall, where youngsters could program robots to do fun things like follow a line, navigate a maze or dance.

"We got the kids excited by showing them various ways to write code and program a computer. Getting one of our robots to dance to music was very exciting for the kids," said Bob DeBortoli, a computer engineering major.

In another activity, kids played games that taught programming and computer science concepts without using a computer. Large squares were taped on the floor, and the children moved around the squares by following a series of prompts to sort numbers in increasing order.

Kid's Day, which was part of UB's celebration of National Computer Science Education Week, aims to get more students learning how to code, program, script, design and harness the power of computing to solve new challenges.

"I know that when I was growing up, I had no idea what computer science was all about," said computer science major Meg Arnold. "By opening up our department to the community, we can educate kids about computer science and hopefully spark their interest."

Arnold's colleague, Gela Malek Pour, added: "We also hope to encourage more girls to explore careers in computer science by exposing them to the field at younger ages."

The event was organized by the CSE Undergraduate Student Advisory Board, which included Arnold, DeBortoli, Malek Pour and Wendy Jansson, as well as Atri Rudra, associate professor of computer science and engineering.

>> Jane Stoyle Welch

Machinery manufacturer recognized for partnership with SEAS

The UB Center for Industrial Effectiveness (TCIE) recognized Ttarp Co. of Buffalo for being a "Partner in Engineering Excellence" at the 2016 Small Business Luncheon. The event was hosted by the U.S. Small Business Administration, Buffalo Business First and SCORE Buffalo Niagara.

Ttarp designs and manufactures fabricating and converting machinery. Since 2007, it has partnered with TCIE to receive technical assistance from students and faculty of the UB School of Engineering and Applied Sciences. Project work has been partially funded by the Strategic Partnership for Industrial Resurgence (SPIR) grant, which helps companies in New York State remain competitive.

Pictured, from left, are: Chet Pulaski and Michele Agustin of Ttarp, Gary Simon of TCIE, and Joe McNamara and John Burkhardt of Ttarp.

>> Tracy Puckett

WNY nonprofits reduce waste by learning the Lean way

Maureen Brown has held a number of procurement roles over the last 30 years. Each has revealed numerous inefficiencies, prompting her to voice concerns about wasted time, money and resources.

A certification course from UB's Center for Industrial Effectiveness (TCIE) is empowering Brown to move beyond asking questions. The director of purchasing at Baker Victory Services (BVS) is now equipped with data-driven, problem-solving tools to derive and implement solutions.

Brown and 13 employees from various departments of BVS, Community Services for the Developmentally Disabled (CSDD) and People Inc. came together as part of a non-profit consortium to learn the Lean methodology and how its approach to reducing waste can better serve clients.

UB's 39-hour Certified Lean Professional (CLP) course featured theory, reality-based examples, class interactions and networking opportunities. Certification required passing an exam and successfully completing an individual improvement project. Projects ranged from reducing the time of preparing a room for a new resident to eliminating paperwork errors and subsequent rework.

"The return on investment in this partnership has been invaluable," said Lindsay Goodenough, CSDD's vice president of administrative services. "We see a change in how our managers work together, a change in problem solving and how we address challenges in our field."

Such challenges include an ever-shifting landscape where every penny counts, a reduction of government funding, and a bevy of mandated regulations, all while maintaining—if not elevating—services. These forces are encouraging the non-profit sector to increasingly adopt a corporate business mindset and embrace continuous improvement techniques like Lean.

Cognizant of financial limits, TCIE introduced the agencies to the Workforce Development Institute of Western New York. BVS and CSDD received a grant from the institute to partially cover training costs. People Inc. incurred the full expense, and added more participants upon reviewing curriculum and considering the course's potential.

"The industry is changing and resources are growing tighter," said Bonnie Sloma, senior vice president at People Inc. "We have to find creative ways to do things to improve the lives of the individuals we serve."

>> Tracy Puckett

Participants in TCIE's Certified Lean Professional program included employees of Baker Victory Services, Community Services for the Developmentally Disabled, and People Inc.

New R&D business friendly programs at UB

UB's Office of Research and Economic Development is offering two new business friendly programs to help businesses easily tap into UB's technical expertise while reducing the risk and cost associated with licensing intellectual property (IP) and sponsored research.

UB SWIFT is a streamlined approach to sponsored industry contracts designed to reduce transaction time by addressing inventions and licensing in advance. It establishes business-friendly terms upfront, granting companies an exclusive worldwide license to the resulting IP. Companies control all patent filings associated with the technology developed during the research project. Benefits include:

- Exclusive worldwide rights to the technology resulting from a research project
- One-time upfront fee
- For exclusive license: royalties of 1 percent apply only if cumulative net sales exceed $20 million ($50 M if human trials are involved)

The UB Small Business Innovation Research (SBIR) award provides matching funds to companies subcontracting at least 30% of a Phase I SBIR or STTR award to a UB principal investigator. The matching funds are an incentive for more small business partnerships and expand the research funds available to the UB PI for the project.

For more information on UB SWIFT and UB SBIR, visit *http://www.buffalo.edu/research/ubswift* or contact Jennifer Mandina, JD, MS, Associate Manager of Contracts at 716-645-8952 or *mandina@buffalo.edu.*

DELTA SOCIETY

We thank our donors for their support in fiscal year 2015–2016 (July 1–June 30)

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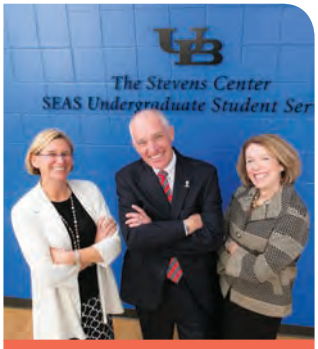

Scott ('79) and Coleen Stevens ('79) pose with Liesl Folks at the opening of the Stevens Center.

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Dr. David L. Anderson, DDS '94, BA '90
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Steven Still ('79) talks with graduate students during the Annual SEAS Graduate Student Poster competition.

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Hratch Kouyoumdjian ('70) (left) catches up with his mentor, George C. Lee, during the 20th anniversary of the Delta Society celebration.

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Mr. Brian J. Peer, '05
& Dr. Rachel E. Peer, '08

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Bethany Mazur and Kurt Bessel present Gina Hammond ('73) (right) with the Volunteer Recognition Award.

Dr. John V. Pilitsis, '75, '70
Mr. Frank J. Puskar, '79
& Mrs. Mary F. Puskar
Mr. John R. Pustulka, BS '74
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Dr. Raghu Ram, '90, '85,
& Dr. Pavani K. Ram

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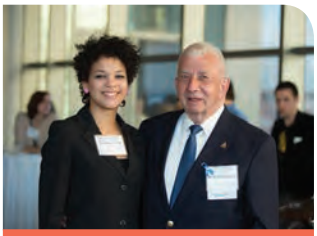

Richard Garman poses with Jess Turner, a recipient of the Garman Scholarship, which assists civil engineering students.

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Mr. Kent T. Yen, '93
Mr. Jingdong Yu, '99
Dr. Syeda Fazila Zafar
Dr. Atif Zafar, '94, '89

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Norman Hayes ('80) with Liesl Folks at the school's 2016 commencement ceremony. Hayes received the 2016 Dean's Award for Achievement.

Mr. Benyuan Zhang, '97
Mr. George Z. Zhu, '97
Mr. Mark J. Zirnheld, '90
& Dr. Jennifer L. Zirnheld, '04, '97, '93

The General Edmund Hayes Society

The General Edmund Hayes Society, established in 1991, recognizes all bequest intentions and deferred gifts to any UB program. Membership in the Hayes Society is granted for life. Below are the members who have made bequests or deferred gifts to the School of Engineering and Applied Sciences. For more information on becoming a member of the Hayes Society, please contact Patrizia Porcari at 716-645-2133 or porcari@buffalo.edu.

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Russell Agrusa ('76) offers advice to graduate students during the Career Perspectives and Networking Conference.

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CLASS NOTES

SWE names UB Alumna Marca Lam Outstanding Faculty Advisor

As a dedicated educator, it's no surprise that Marca Lam (BS '91, MS '94 Mechanical Engineering) was honored by the Society of Women Engineers (SWE) with the Outstanding Faculty Advisor Award. A senior lecturer of mechanical engineering in the Rochester Institute of Technology's Kate Gleason College of Engineering, as well as the faculty advisor of the RIT-SWE student section, she was quite surprised to learn that she won the prestigious international award.

Lam increased student attendance from 20 to 50 (actually 70, since non-organization members also participated). She also introduced the idea of keeping club records online and helped students develop a system for organizing RIT-SWE finances and fundraising. But most importantly, she's an incredible mentor.

She fully supports her students and encourages them to support each other, and her office door is always open. Lam attends to the smallest details—such as helping young students develop their "elevator speeches" for career fairs—which has most certainly made a difference for countless young women in the highly competitive field of engineering.

"SWE is about more than just the technical stuff because there are so many flavors of engineering involved," she explains. "It's more about learning how to be a more confident person who can advocate for herself."

Aside from her remarkable abilities as a faculty advisor, Lam is also an expert in materials science and engineering design tools. She teaches courses in system dynamics, engineering vibrations and optimal design. She earned her PhD from Virginia Polytechnic Institute in 1997.

>> Rebecca Rudell

DID YOU KNOW?

Quadgen Wireless Solutions, located in King of Prussia, Pa., near Philadelphia, has been hiring our recent Master's level graduates from the Department of Electrical Engineering's communications and networking research group. At least nine graduates from the Class of 2015 have started their careers as network engineers and related roles at the company.

[1970s]

James Devald (BS Chemical Engineering 1970) has retired from the Niagara County Health Department, where he was the director of environmental health since 1988. He started with the agency on June 1, 1970 as a junior engineer.

Hratch Kouyoumdjian, SE (MS Civil Engineering 1970) joined the University at Buffalo's School of Engineering and Applied Sciences (SEAS) Dean's Advisory Council. He is the founder, president and CEO of the KPA Group, a well-respected small engineering and architectural consulting practice headquartered in the San Francisco Bay Area.

Norm J. Hirschey (BS Mechanical Engineering 1977) was elected to the board of the Engineering Society of Buffalo. He is currently a professional engineer at An-Cor Industrial Plastics in North Tonawanda, New York.

Richard J. Kotecki, P.E. (BS Civil Engineering 1977) received the Basinski-Wohler Distinguished Service award from the Erie Niagara Chapter of the New York State Society of Professional Engineers (NYSSPE). He is the immediate past president of the American Society of Civil Engineers Buffalo Chapter and recently retired from the New York State Department of Transportation.

Joseph S. Frandina, P.E. (BS Civil Engineering 1978) received the Engineering Manager of the Year award from the Erie Niagara Chapter of the New York State Society of Professional Engineers (NYSSPE).He is the director of construction management for the Buffalo Bills and his most recent project consists of overseeing the recent $130M upgrade to Ralph Wilson Stadium (now New Era Field).

Ronald C. Kraemer (BS Civil Engineering 1978) has been promoted to senior vice president of National Fuel Gas Company. He will also continue in his role as president of Empire Pipeline, Inc.

[1980s]

C.L. Max Nikias (MS/PhD Electrical Engineering 1980/1982) received the 2016 Diversity Award from the Electrical and Computer Engineering (ECE) Department Heads Association at its Annual Conference and ECExpo. The award recognizes his efforts to boost diversity across USC's student population. Nikias is president of the University of Southern California.

Daniel D'Angelo, P.E. (BS Civil Engineering 1983) joined the University at Buffalo's Department of Civil, Structural and Environmental Engineering's Advisory Board. He is a deputy chief engineer with the New York State Department of Transportation and currently serves as a member of the project executive management team and designated NYSDOT project liaison for the Tappan Zee Bridge replacement project.

Sung Ho Lee (BS Chemical and Biological Engineering 1984/1987) was appointed as the new pastor at Trinity United Methodist church.

Steven W. Smith (BS Civil Engineering 1985) was named head of Highways and Bridges at WSP | Parsons Brinckerhoff in the United Kingdom. He is responsible for operations and financial performance of the business, which focuses on highway, bridge (rail & highway), civil infrastructure projects and ground/tunneling engineering.

Joseph Bracci (BS/MS/PhD Civil Engineering 1987/1989/1992) joined the University at Buffalo's Department of Civil, Structural and Environmental Engineering's Advisory Board. He is a professor in the Zachry Department of Civil Engineering at Texas A&M University.

[1990s]

John Hubert, P.E. (BS/ME Civil Engineering 1991/1998) was elected to the board of the Engineering Society of Buffalo. He is assistant vice president with WSP | Parsons Brinckerhoff, with 25 years of experience in the engineering field. He leads the civil and highway group in Buffalo, New York.

Alejandro Rivera Becerra (MS/PhD Industrial Engineering 1993/2001, ME Civil Engineering 1998) is now the Deputy Chief of Mission at the Mexico Embassy in Berlin, Germany.

Kevin R. Drozynski, P.E. (ME Mechanical Engineering 1996) received the Engineer of the Year award from the Erie Niagara Chapter of the New York State Society of Professional Engineers (NYSSPE). He is a customer facilities engineer with National Grid and has held numerous technical engineering positions with the firm spanning over 33 years.

Todd Snyder (ME Civil Engineering 1996) co-founded the recently opened Niagara Craft Spirits Distillery and Tasting Room, and was featured in the Gusto section of the Buffalo News on January 3, 2016. Snyder is an instructional support specialist in UB's Department of Civil, Structural and Environmental Engineering, and faculty advisor to UB's ASCE student chapter.

Matthew B. Kahn (BS Chemical and Biological Engineering 1998) co-founder and president of the Big Ditch Brewing Company in Buffalo, NY, was featured in the Gusto section of the Buffalo News on March 27, 2016.

Diego Lopez-Garcia (MS/PhD Civil Engineering/ Structural and Earthquake Engineering 1999/2004) was named chairman of the Department of Structural and Geotechnical Engineering at Pontifical Catholic University of Chile. During his time at UB, he was advised by SUNY Distinguished Professor Emeritus T.T. Soong and participated in earthquake engineering research through MCEER.

[2000s]

Jonathan K. Watts (BS/BS Industrial and Systems Engineering/Civil Engineering 2000/2003) was promoted to vice president of Watts Architecture & Engineering, P.C. in Buffalo, NY. He rejoined the firm after spending five and a half years with Pure Technologies US.

Lesley Weitz (BS Mechanical Engineering 2002) was named an Associate Fellow of the American Institute of Aeronautics and Astronautics. Weitz is a Principal Simulation Modeling Engineer at The MITRE Corporation, Center for Advanced Aviation System Development, in McLean, Virginia.

Rosaleen B. Nogle, P.E. (BS/MS Civil Engineering 2005/2007) received the Young Engineer of the Year award from the Erie Niagara Chapter of the New York State Society of Professional Engineers (NYSSPE). She is an associate engineer with the Buffalo Sewer Authority and is currently responsible for direction and supervision of storm and wastewater construction projects.

Justin Yates (MS/PhD Industrial Engineering 2007/2008) joined Francis Marion University as an assistant professor of industrial engineering.

Dapeng Cao (MS/PhD Industrial Engineering 2009/2014) was promoted to manager of healthcare analytics by Catholic Medical Partners.

[2010s]

Viralkumar A. Patel (BS/BS Electrical/Electrical Engineering 2012/2015) joined Iconics in Foxborough, Massachusetts, as an application engineer.

Dalton J. Barksdale (BA Computer Science 2015) joined CPR (Cell Phone Repair) of Tonawanda as a small electronics repair technician.

Ajeya Gupta (MS Electrical Engineering 2015) joined Ford Motor Company in Dearborn, Michigan, as a research engineer. He is a member of the advanced networking research team, which is developing high speed networking protocols and electrical architecture in Ford-based vehicles.

Rahul Sindhu (MS Electrical Engineering 2015) joined Juniper Networks in Sunnyvale, California as a software engineer. He is working with the DevTest team in the routing business unit to develop, test and support CD 45 minute test suites for JUNOS.

Sreya Harshad Vedant (MS Electrical Engineering 2015) joined Intel Corporation as a platform application engineer, where she enables Intel hardware and software based platforms to support customer IOT applications.

Connor Brown (BS Mechanical Engineering 2016) is working at John W. Danforth in Tonawanda, N.Y., as a design build engineer, where he designs HVAC systems for buildings in Buffalo and throughout New York State including the First Niagara Center, the M&T Center, and Conventus. He was president of Engineers for a Sustainable World.

Jeffrey T. Scott (BS Mechanical Engineering 2016) was elected to the board of the Engineering Society of Buffalo. He is an aspiring controls engineer who teaches STEM topics and computer skills at the Valley Community Association in Buffalo, New York.

Tyler Szczesniak (BS Mechanical and Aerospace Engineering 2016) is an Industrial/Manufacturing Engineer 1 at PCB Piezotronics in Depew, N.Y. He was president of the American Institute of Aeronautics and Astronautics (AIAA).

Keep in touch and network with fellow alums from our school. Join your department's LinkedIn group.

Obituaries

Richard Schad (BS Engineering Science 1969) passed away on July 25, 2015 at the age of 93. He was the vice president and chief engineer at Rigidized Metals Corporation for over 30 years.

Allen Scott Pleban (BS Aerospace Engineering 1987, MS Mechanical Engineering 1992) passed away on December 15, 2015. He was employed by the Navy to work on weapon systems in California and Virginia. He won two bronze medals in World Masters ski orienteering competitions, a winter endurance sport that combines navigation and cross-country skiing, often over extremely rough terrain. He was 51.

Gloria Koontz passed away on August 13, 2016. She worked in the School of Engineering and Applied Sciences for 17 years, and retired in 1999 after serving as secretary to the chair of the Department of Computer Science.

Class of 2016: Off to a great start!

"I work with an amazing team of engineers and software developers in the Runtimecore team, which builds the core API for all the products Esri offers."

Gela Malek Pour (BS Computer Science 2016), product engineer, Esri, Redlands, Calif. and former president of Scientista.

"I am responsible for the entire development life cycle of the Infotainment software, which includes the screen in the center console and the instrument cluster."

Nolan Foster (BS Computer Engineering 2016), software engineer, General Motors, Warren, Mich. and former president of the National Society of Black Engineers.

"I am assigned to the Schenectady City School District School Capital Project, which is a $70 million multi-school renovation project. I am onsite every day working with the contractors to solve problems and manage the project so that it is completed on time, on budget, safely, and in accordance to the contract documents."

Brianne Stasiak (BS Civil Engineering, 2016), field engineer, Turner Construction Company, Albany, N.Y. As a senior, she was the engineering clubs coordinator for UB's Student Association, and as a junior, she was president of the Society of Women Engineers.

"I'm working in plant operations while also being trained in other facets of Praxair's business including project planning and execution, plant start-ups or shutdowns, maintenance, project management, sales and planning."

Joe Pace (BS Mechanical and Aerospace Engineering 2016), Leadership and Technical Orientation Program engineer, Praxair, Deer Park, Texas. Joe is a former engineering clubs coordinator and treasurer for UB's Student Association.

"I am working on a project to develop a mobile application for biomedical engineering technicians in developing countries to help them troubleshoot and repair hospital equipment."

Katherine Czerniejewski (BS Biomedical Engineering, 2016), graduate student at Johns Hopkins University Center for Bioengineering Innovation and Design, Baltimore, Md. and former president of Tau Beta Pi.

"I work on large capital projects for the HVAC industry, specifying, selecting, and pricing pumps, heat exchangers, and other equipment as well as traveling to meet with contractors and engineers to discuss technical details of projects."

Robert Pettitt (BS Chemical Engineering 2016), integrated project engineer, Armstrong Fluid Technology, North Tonawanda, N.Y. and former president of the American Institute of Chemical Engineers.

SUNY Chancellor's Awards for Student Excellence winners Steven J. Coffed, BS in mechanical and aerospace engineering, (left) and Timothy Van Oss, MS in civil engineering, (right) pose for a photo with Dean Liesl Folks before the 2016 SEAS commencement ceremony. Missing from the photo is Mingcong Zhang, BS in computer science.

Chimere Alozie was born in Brooklyn, NY, and moved to Nigeria as a teenager. "I claim both countries, depending on where I am and who asks," says Alozie, who chose to attend UB to study civil engineering. This past summer, he was one of a group of UB undergraduates investigating microbial pollution at Western New York beaches. UB RENEW (Research and Education in eNergy, Environment and Water), an institute that focuses on the social and economic ramifications of complex energy and environmental issues, funded the project. He was thankful for a donor-funded scholarship he received, which helped him support himself while gaining valuable research experience. Alozie, who says he is most interested in skyscraper construction, hopes to someday work at a firm with a sustainable development focus.

Gifts to the UB Fund have an immediate impact on students.

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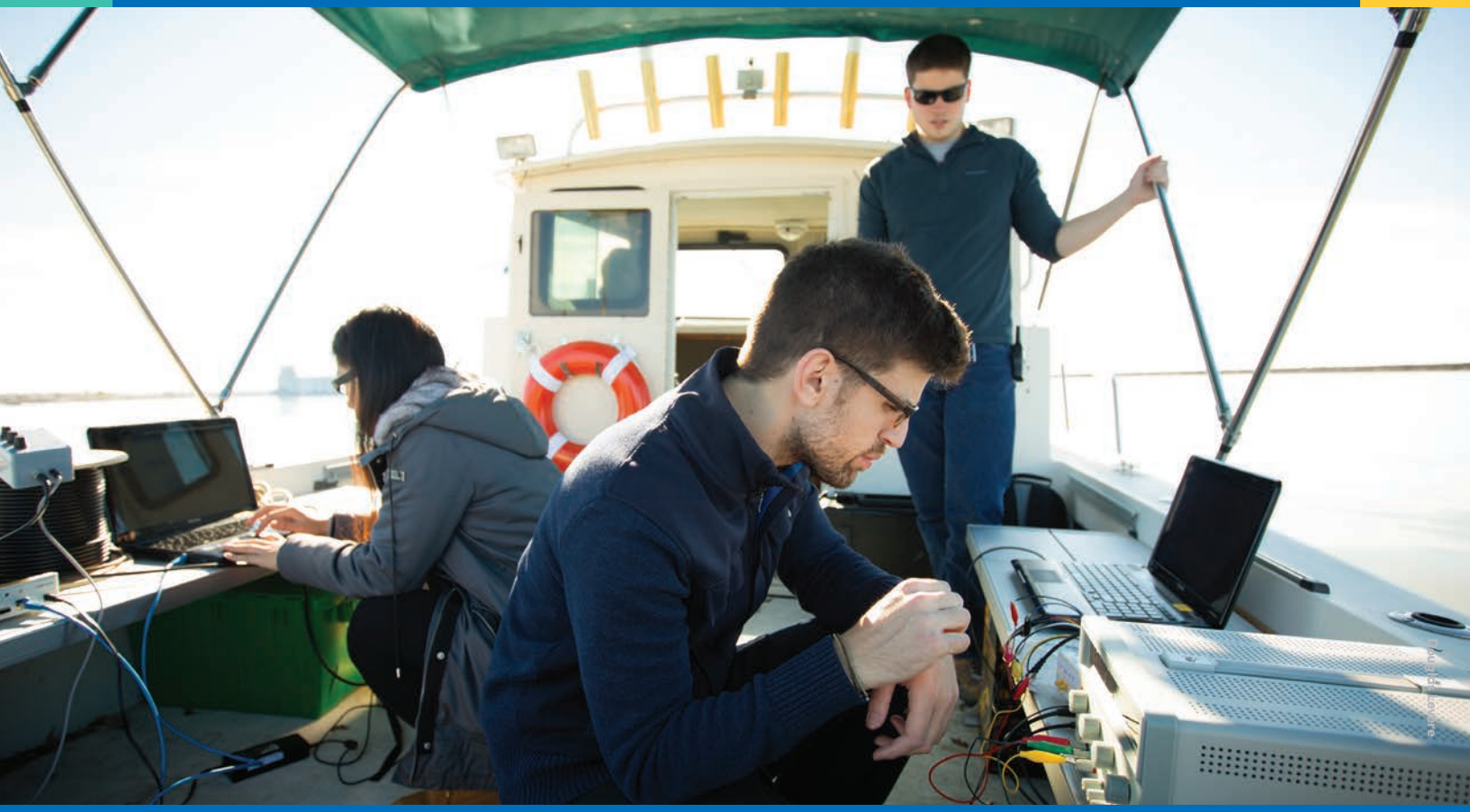

UNDERWATER WI-FI? PROJECT AIMS TO SPEED UP VITAL COMMUNICATIONS NETWORKS

A team of UB electrical engineering students is out on Lake Erie as part of a project to develop hardware and software tools to help underwater telecommunication catch up to its over-the-air counterpart.

They are part of a research team led by Dimitrios Pados, Clifford C. Furnas Professor of Electrical Engineering, to develop hardware and software—everything from modems that work underwater to open-architecture protocols—to improve underwater sensing networks. Of particular interest is merging a relatively new communication platform, software-defined radio, with underwater acoustic modems. The Lake Erie experiments proved that the new modems could boost data transmission rates by 10 times over today's commercial underwater modems.

Potential applications include monitoring pollution, walkie-talkies for scuba divers, and search and rescue work.

The research is sponsored by the National Science Foundation.