BUFFALO Engineer

UB SCHOOL OF ENGINEERING AND APPLIED SCIENCES | 2013 – 2014

ENGINEERS OF THE FUTURE

New partnership between National Grid, Westminster Community Charter School and UB stimulates students' interest in STEM

Onion Studio, Inc.

Ken Smith

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

MESSAGE FROM THE DEAN

Dear friends of UB's School of Engineering and Applied Sciences,

You have before you the first edition of our re-engineered magazine, and I hope you will find it to be the perfect summer page-turner! Our Director of Communications, Jane Stoyle Welch, has led this transformation, and deserves full credit for the final product. Documented on these pages is but a taste of the many activities and impacts of our terrific students, staff and faculty, and our wonderful, planet-changing alumni. These stories give you a flavor of who we are and what we strive for through delivery of our education, research and service programs.

The new-look *Buffalo Engineer* is one element of our plans for a broader engagement with all our stakeholders. Shortly we will be debuting a new website, following a major makeover. It will be a place to highlight the achievements of our faculty, staff and students, and a place where we can collect stories, ideas and feedback, incorporating a range of tools to stay in touch with our alumni and friends.

For me, a highlight of the year has been watching our students grow their skills as engineers through experiential learning projects. Across the full spectrum, from tinkering to internships, from senior design projects to community engagements, we see the concrete changes that these activities impart to our students; professionalism, confidence, deeper technical understanding, team skills and so forth. In alignment with UB's goals, we plan to continue to expand the range of opportunities for experiential learning available to our students in the coming year, including building out our maker spaces to encourage more hands-on creativity, design and fabrication.

As we say, "the best public schools have the strongest private support," and I want to take this opportunity to personally thank all the alums and friends of SEAS who have made financial contributions, large and small, to enable us to deliver on our mission. As our world becomes more technologically complex, it is more important than ever that we raise funds to deliver a great education to the next generation of engineers. Our current undergraduate and graduate students will be changing the planet before we know it, thanks to your ongoing support!

Sincerely,

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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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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Michael Singletary and Peter Casey, electrical engineering undergraduate students, work with kindergarten students in the classroom of Mr. Steve Koch at Westminster Community Charter School. They are presenting a *Science is Elementary* lesson to demonstrate the concept of load using a sheet of paper between two tissue boxes. Each student in the group added a penny until the "bridge" failed. Above, Sharece Blake and Nicole Varble use marshmallows and toothpicks to demonstrate that a structure constructed of triangles is stronger than one constructed of squares.

DEPARTMENTS

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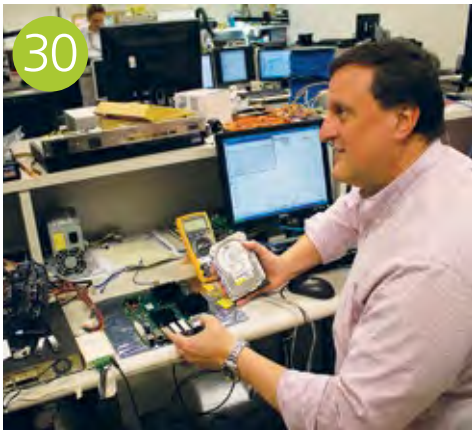
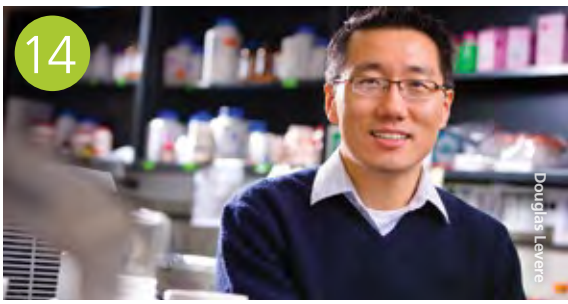




Douglas Levere

FIGHTING CANCER

WITH LASERS AND NANOBALLOONS THAT POP

Jonathan Lovell is developing a new drug delivery method that targets cancer cells – not the entire body – and limits the side effects of chemotherapy.

Douglas Levere

Chemotherapeutic drugs excel at fighting cancer, but they're not so efficient at getting where they need to go.

They often interact with blood, bone marrow and other healthy bodily systems. This dilutes the drugs and causes unwanted side effects.

Now, researchers are developing a better delivery method by encapsulating the drugs in nanoballoons – which are tiny modified liposomes that, upon being struck by a red laser, pop open and deliver concentrated doses of medicine.

Described April 3 in the journal *Nature Communications*, the innovation could improve cancer treatment, reduce its side effects and boost research about the disease, which annually kills millions of people worldwide. The paper, "Porphyrin-phospholipid (PoP) liposomes permeabilized by near-infrared light," is available here: *http://bit.ly/1q0kXFf*.

On April 22, 2014, Dr. Francis Collins, Director of the National Institutes of Health, featured the work on the NIH Director's Blog (*http://directorsblog.nih.gov/2014/04/22/creative-minds-targeting-cancer-with-lasers-and-nanoballoons/*).

"Why PoP-liposomes, or nanoballoons, open in response to an otherwise harmless red laser is still a bit of a mystery to us, but we have definitely unearthed a new and unique phenomenon," said corresponding author Jonathan Lovell, assistant professor of biomedical engineering. "Its potential for improving how we treat cancer is immense."

Additional authors include Kevin A. Carter, Shuai Shao, Dandan Luo, Wentao Song, Haoyuan Huang, Guojian Zhang, Jumin Geng and Blaine A. Pfeifer, all of the University at Buffalo; Vladimir M. Grigoryants and Charles P. Scholes, University at Albany; Ravindra K. Pandey, Roswell Park Cancer Institute; Matthew I. Hoopes and Mikko Karttunen, University of Waterloo; and Bilal Ahsan and Joaquin Ortega, McMaster University.

Lovell will continue fundamental studies to better understand why the treatment works so well in destroying tumors in mice, and to optimize the process. Human trials could start within five years, he said.

The work is supported by the National Institutes of Health, which last year awarded Lovell grants from the National Institute of Biomedical Imaging and Bioengineering, as well as its Early Independence Award program, which funds high-risk, high-reward research.

– Cory Nealon

Douglas Levere

"This advancement could lead to major breakthroughs in energy harvesting and conversion, security and other areas that will benefit humankind." Qiaoqiang Gan, assistant professor of electrical engineering

A CAVITY THAT YOU WANT

Engineers are developing an optical nanocavity to boost light absorption in semiconductors

Typically associated with unhappy visits to the dentist, "cavity" means something else in the branch of physics known as optics.

Put simply, an optical cavity is an arrangement of mirrors that allows beams of light to circulate in closed paths. These cavities help us build things like lasers and optical fibers used for communications.

Now, an international research team pushed the concept further by developing an optical "nanocavity" that boosts the amount of light that ultrathin semiconductors absorb. The advancement could lead to, among other things, more powerful photovoltaic cells and faster video cameras; it also could be useful for splitting water using energy from light, which could aid in the development of hydrogen fuel.

The team, comprised of faculty and students from UB and two Chinese universities, presented its findings Feb. 24 in the journal *Advanced Materials*. The paper, called "Nanocavity enhancement for ultra-thin film optical absorber," is available here: *http://bit.ly/1bGGIbO*.

"We're just scratching the surface, but the preliminary work we've done is very promising," said Qiaoqiang Gan, lead author and assistant professor of electrical engineering. "This advancement could lead to major breakthroughs in energy harvesting and conversion, security and other areas that will benefit humankind."

Gan's research group is collaborating with Alexander Cartwright, professor of electrical engineering and vice president for research and economic development, and Mark Swihart, professor of chemical and biological engineering, to develop ultrathin energy-harvesting devices.

Gan is also working with Hao Zeng, PhD, associate professor of physics, to study its effect on photocatalysis.

In addition to Gan, the paper's other authors are: UB PhD candidates in electrical engineering Haomin Song (lead author), Dengxin Ji, Kai Liu, Xie Zeng and Nan Zhang; Suhua Jiang, associate professor of materials science, and Luqing Guo and Zhejun Liu, both PhD candidates, Fudan University in China; and Haifeng Hu, assistant professor, Northeastern University in China.

The research is supported by the National Science Foundation.

Gan is a member of the optics and photonics research group, which includes electrical engineering faculty Alexander Cartwright, Edward Furlani, Pao-Lo Liu, Natalia Litchinitser and Liang Feng. The group carries out research in nanophotonics, biophotonics, hybrid inorganic/organic materials and devices, nonlinear and fiber optics, metamaterials, nanoplasmonics, optofluidics, microelectromechanical systems (MEMS), biomedical microelectromechanical systems (BioMEMs), biosensing and quantum information processing.

– Cory Nealon

Staying cool in the nanoelectric universe by heating up

As smartphones, tablets and other gadgets become smaller and more sophisticated, the heat they generate while in use increases. This is a growing problem because it can cause the electronics inside the gadgets to fail.

Conventional wisdom suggests the solution is to keep the guts of these gadgets cool.

But a new research paper hints at the opposite: that is, to make laptops and other portable electronic devices more robust, more heat might be the answer.

"We've found that it's possible to protect nanoelectronic devices from the heat they generate in a way that preserves how these devices function," said Jonathan Bird, professor of electrical engineering. "This will hopefully allow us to continue developing more powerful smartphones, tablets and other devices without having a fundamental meltdown in their operation due to overheating."

Douglas Levere

Jonathan Bird

The paper, "Formation of a protected sub-band for conduction in quantum point contacts under extreme biasing," was published Jan. 19 in the journal, *Nature Nanotechnology.* It is available here: *http://bit.ly/1ikkkHg*.

Bird is the co-lead author along with Jong Han, an associate professor in the department of physics. Contributing authors are Jebum Lee and Jungwoo Song, who both recently earned PhDs, and Shiran Xiao, PhD candidate, all from UB's department of electrical engineering; and John L. Reno, Center for Integrated Nanotechnologies at Sandia National Laboratories.

The research was supported by the U.S. Department of Energy.

Okumus Sett Stavridis Tessari

IBE awarded FHWA contract through Genex Systems, LLC

New CSEE faculty join IBE team

The Institute of Bridge Engineering (IBE) and MCEER are collaborating with Genex Systems, LLC as part of a new Federal Highway Administration (FHWA) contract. The UB team will conduct research and engineering on topics such as geotechnical foundation and subsurface investigations, field instrumentation of bridges, wind load effects and aerodynamic behavior of bridges, seismic design and retrofitting, and material testing, among others. The contract, part of the FHWA's Hazard Mitigation program, is for up to $9,900,000 over a five year period.

Subject experts in the Department of Civil, Structural and Environmental Engineering include IBE Executive Director Jerome O'Connor, and Professors Amjad Aref, Michel Bruneau, Michael Constantinou, Andre Filiatrault, George Lee, Pinar Okumus, Salvatore Salamone, Kallol Sett, Mettupalayam Sivaselvan, Andreas Stavridis, Anthony Tessari, and Andrew Whittaker, and SEESL Technical Services Manager Mark Pitman. The work will be carried out on a task-order specific basis.

Ying receives SUNY Technology Accelerator Fund grant

Leslie Ying, associate professor in the departments of biomedical and electrical engineering, received a $50,000 grant from the SUNY Technology Accelerator Fund (TAF) to work on magnetic resonance imaging (MRI). The project will focus on MRIs with massive phased array coils, which have the potential to significantly reduce the scan time and enable non-invasive imaging of patients in real-time.

Leslie Ying

One of the existing challenges that prevent massive array coils from being used clinically is the long processing time of such a large size of data. Ying and her team have developed a fast algorithm to process the large data and reconstruct high quality images in only 1/200th of the time taken by the existing commercial algorithm, when the same computational hardware is used.

The project is enhanced by additional funds from GE, for a total budget of $114,000. The technology is of interest to a number of MRI manufacturers, including GE.

Douglas Levere

Adel Sadek

UB team receives grant to mine 'big data' for transportation improvements

UB's transportation systems engineering research group, led by Adel Sadek, professor in the department of civil, structural and environmental engineering, recently received a $1.4 million University Transportation Center grant to develop high-tech solutions for our nation's transportation issues.

Awarded by the U.S. Department of Transportation, the grant will fund multidisciplinary research that utilizes data fusion to improve the safety and efficiency of highways, transit systems and other transportation system components. Partner universities include Rensselaer Polytechnic Institute, George Mason University and the University of Puerto Rico-Mayaguez.

The grant is a significant boost for the Institute for Sustainable Transportation and Logistics, which, under the direction of Sadek, will unite faculty groups in transportation and logistics at UB and add seven new faculty members over the next three years. A new Master's program integrating transportation engineering and management will be a cornerstone of the institute.

Adapting handwriting recognition technology to help fight HIV in Zimbabwe

Douglas Levere

Venu Govindaraju

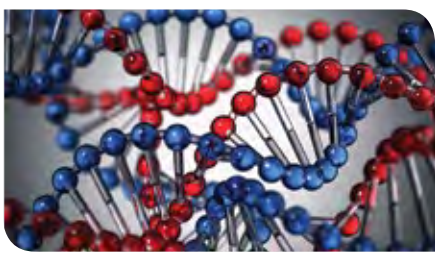
Venu Govindaraju, SUNY Distinguished Professor of Computer Science and Engineering, is part of a UB team of researchers who are collaborating with the University of Zimbabwe to establish training programs for scientists and citizens in an ongoing effort to study, reduce and treat the incidence of HIV in Zimbabwe. Govindaraju is planning pilot implementation research projects that will employ the handwriting recognition technology he developed at UB to create legacy records from paper medical charts that can be incorporated with growing electronic medical records use.

UB to co-lead efforts to make NYS national leader in genomic research

UB will receive $50 million to partner with the recently opened New York Genome Center in Manhattan to accelerate recent advances in genomic medicine directly into clinical care.

The initiative is modeled after the governor's successful blueprint for nanotechnology innovation in Albany, which has produced groundbreaking research, attracted significant private investment to the region and created thousands of new jobs.

The investment is expected to spur the development of companies on the Buffalo Niagara Medical Campus that support genomic medicine, especially those that focus on diagnostics and information technology essential to breakthroughs in personalized medicine.



Douglas Levere

Dimitrios Pados

Making wireless 10 times faster

Dimitrios Pados, professor of electrical engineering, is the principal investigator of a four-year, $2.72 million grant awarded to UB by the U.S. Air Force Research Laboratory to develop cognitive radio, a type of wireless communication that uses the radio spectrum more efficiently.

The technology, while still under development, could make wireless communication 10 times faster. For example, it would take three minutes instead of 30 to download a movie.

Pados, along with co-investigators Stella Batalama, Tommaso Melodia and Weifeng Su, all from the Department of Electrical Engineering, will develop algorithms that optimize (as well as model and simulate) how the platform would work. Then, working with Rome, NY-based ANDRO Computational Solutions, they will conduct actual tests of the technology using small unmanned aerial vehicles.

The grant will support four graduate students who will work as research assistants, and four undergraduate researchers.

DESIGN. ENGINEER. BUILD.

SEAS Engineering Machine Shop undergoes major renovation

Onion Studio, Inc.

It is a busy Friday afternoon in the SEAS Engineering Machine Shop. Graduate students Xinnan Peng, industrial engineering, and Mara Boardman, aerospace engineering, are busy using a lathe to make a customized retaining ring for a boiler as part of a research project on biomass fuel.

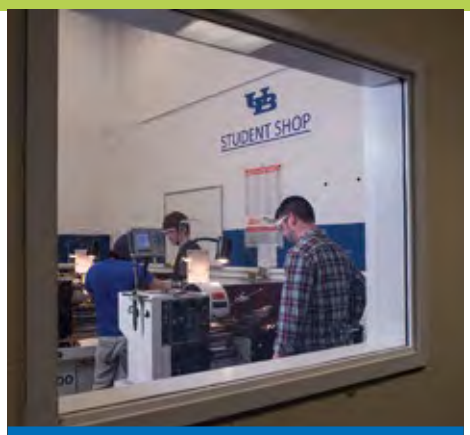
Meanwhile, Matt Duggan, mechanical engineering, is in the student shop area to fabricate parts for use in a senior design class project. George Melero and Courtney Scott, mechanical engineering, are working on designing and building parts for the Society of Automotive Engineer's Baja competition.

All this activity is nothing new to the popular machine shop, the largest and most comprehensive shop on UB's campus. What is new is that since last summer, the shop has been thoroughly cleaned, painted and reorganized, and boasts a brand new CNC lathe and CNC milling machine, as well as three new engine lathes with digital readouts.

In addition to these high tech machines, a new window allows visitors to see into the shop from the north hallway. Safety and informational signage has also been added throughout the shop.

Next on the list is the renovation of existing space to make a modern conference room and the purchase of a TIG welder and 3-D printer.

"Our vision is to offer students a state-of-the-art work space for designing and fabricating equipment needed for experimental research and course requirements,



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A new window allows visitors to see into the shop, where students design parts for research projects, class assignments and student club competitions.

as well as club space to build equipment for national and international competitions," said Joseph Mollendorf, interim machine shop supervisor and professor of mechanical and aerospace engineering.

The improvements are part of a three-year project to upgrade and modernize teaching facilities/ laboratories in the School of Engineering and Applied Sciences, funded by an award from the SUNY High Needs Program.

– Jane Stoyle Welch

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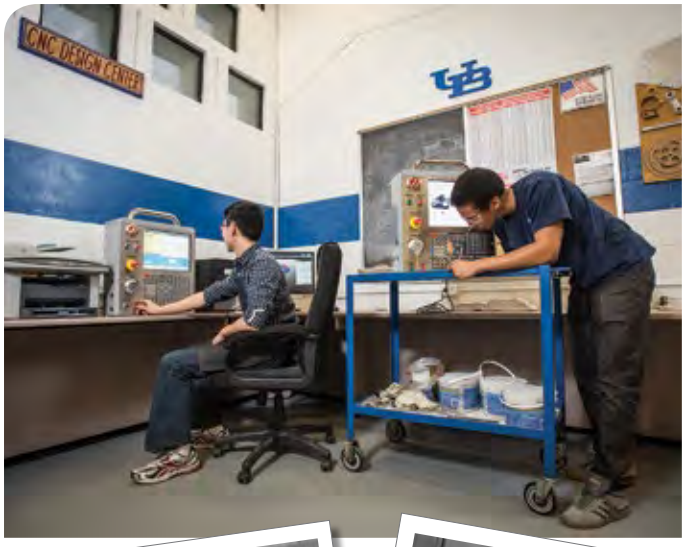
Xinnan Peng and Mara Boardman are fabricating a part for a boiler as part of their research project on biomass fuel.



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LEFT: Xinnan Peng and Courtney Scott utilize new digital CNC simulators, which replaced the analog instrumentation used to control the milling machines.

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ABOVE: Machine shop staff member Gary Olson (center) demonstrates the new CNC milling machine to students (on left) Xinnan Peng and Matthew Burge and (on right) Mara Boardman, Courtney Scott and Jeremy Krol.

LEFT: Archive photos show machine shop staff demonstrating vertical milling (right) and using analog instrumentation (left).

Nancy J. Parisi

Engineers Zap Bridges with Electricity to Test for Corrosion

New testing method could replace expensive, time-consuming visual inspections

Rust is a civil engineer's nightmare.

Motorists in the United States make more than 200 million trips across bridges rated structurally deficient or in need of significant maintenance and yearly inspection. Of the more than 17,000 bridges in New York, 12.5 percent are structurally deficient and 27 percent are considered functionally obsolete.

One major culprit: corrosion of reinforcing steel.

Now, however, a research team led by Salvatore Salamone, assistant professor of civil engineering, believes they can detect corrosion before the damage becomes severe by sending a jolt of electricity between opposite ends of steel cables. A reduction in the strength of the charge would alert them that the cable is suffering from corrosion and the bridge is in danger of failing.

The new technique could do away with time-consuming and expensive visual tests, which often rely on drilling through concrete to inspect the cables or spot cracks in the concrete caused by increased stress on the weakened wires.

"The No. 1 priority of all civil engineers is the safety of the public," says Tresor Mavinga, a senior civil engineering and mathematics major involved in the research. "Corrosion can affect any structure, not just bridges, and we don't want that to happen. We need to be as accurate as possible to save money, time and lives."

Professor Salamone, Mavinga and Alireza Farhidzadeh, a PhD student in civil engineering, embedded piezoelectric transducers — devices that convert a signal from one form of energy to another — onto each end of a wire.

They then fired one volt of electricity through the metal using ultrasonic guided waves, which can travel a long distance with little loss in energy, while monitoring the charge received at each end. The experiment was then repeated with the same wire after it was rusted with a saltwater mixture. When cables are corroded, most of the energy from the electrical charge will be lost during the transfer between transducers.

Since the sensors and transducers are permanently attached to the cable, engineers can test the wires remotely off-site.

According to the Federal Highway Administration, corrosion problems have increased significantly over the last three decades and are likely to continue. The increase is in part due to the rising use of road de-icing salts, which are extremely corrosive to the protective films on metals.

Above: Tresor Mavinga, Alireza Farhidzadeh and Salvatore Salamone are developing a method to detect corrosion in bridges by sending a jolt of electricity between opposite ends of steel cables. A reduction in the strength of the charge would mean the cable is suffering from corrosion.

The research project was profiled in the January 2014 issue of ASCE's *Civil Engineering* magazine.

– Marcene Robinson

The steel cable tendon, which is found in most bridges, is suspended above a saltwater mixture with ultrasonic sensors attached at both ends for corrosion monitoring.

Using Mind-Controlled Robots in Manufacturing, Medicine

Worried that machines will someday control the human race? If so, relax.

UB researchers are helping to advance technology that will allow people to control robots with their minds. Projects focus on how to apply brain-computer interface (BCI) devices to manufacturing, medicine and other fields.

BCIs are recent developments in alternative technologies of human-computer interaction. "These interfaces aim to interpret the brain's activity as user intentions or emotions and translate it for computer systems," said Ehsan Esfahani, the director of the Brain Computer Interface Laboratory and assistant professor of mechanical and aerospace engineering.

Esfahani's research group has already developed methods that enable users to create, manipulate and modify different 3D shapes.

Ehsan T. Esfahani

"Before designing a 3D model, we have a mental representation of its shape. This technology uses the brain activity of a subject to interpret geometrical features of this mental representation. You can move and modify the shapes just by imagining these operations," said Esfahani.

In collaboration with Dr. Khurshid Guru at Roswell Park Cancer Institute, Esfahani's group has analyzed the brain activity of surgeons during training and robotic assisted surgery. This first-of-its-kind study shows that cognitive scores can be the true measure for distinguishing between surgeons based on their skills and experience. The research is published in the *British Journal of Urology* and was featured in *Nature Reviews Urology* (*http://bit.ly/1qBMpuL*), February 2014.

In the Virtual Reality Laboratory, another group is working on using BCI for manufacturing. "The technology has practical applications that we're only beginning to explore," said Thenkurussi "Kesh" Kesavadas, associate professor of mechanical and aerospace engineering and director of the Virtual Reality Laboratory. "For example, it could help paraplegic patients to control assistive devices, or it could help factory workers perform advanced manufacturing tasks."

While it sounds like something from X-Men and other science fiction stories, BCI technology has been available to the public for a few years. The potential advantage, Kesavadas said, is that BCI-controlled devices could reduce the tedium of repetitious tasks and improve worker safety and productivity. The devices can also leverage the worker's decision-making skills, such as identifying a faulty part in an automated assembly line.

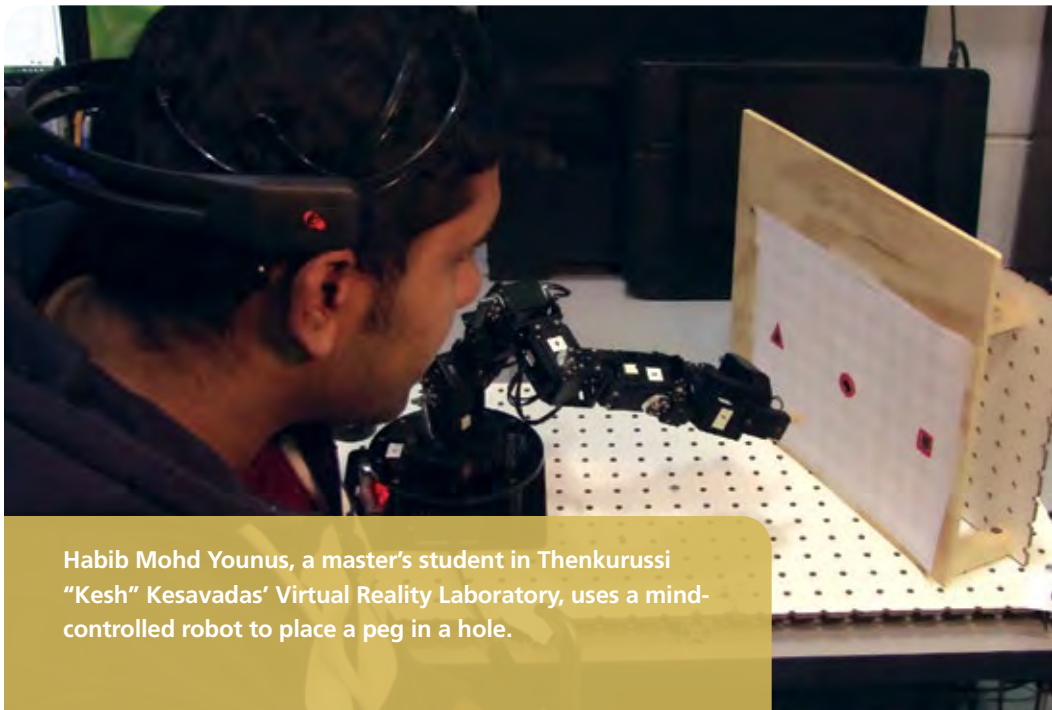
Thenkurussi Kesavadas

For a video demonstration of the technology, visit: *http://bit.ly/1aErYTx*. The video shows that a simple set of instructions can be combined to execute more complex robotic actions, Kesavadas said. Such robots could be used by factory workers to perform hands-free assembly of products, or carry out tasks like drilling or welding.

Kesavadas, a leader in developing virtual reality tools, plans to continue studying BCI technology. For more examples of Kesavadas' work, visit *www.vrlab.buffalo.edu*.

Esfahani is a pioneer in the application of BCI in CAD systems. For more information on his work, visit *http://www.buffalo.edu/~ehsanesf*.

– Cory Nealon



Habib Mohd Younus, a master's student in Thenkurussi "Kesh" Kesavadas' Virtual Reality Laboratory, uses a mind-controlled robot to place a peg in a hole.

ENGINEERS OF THE

New partnership between National Grid, Westminster Community Charter School and UB stimulates students' interest in STEM

Onion Studio, Inc

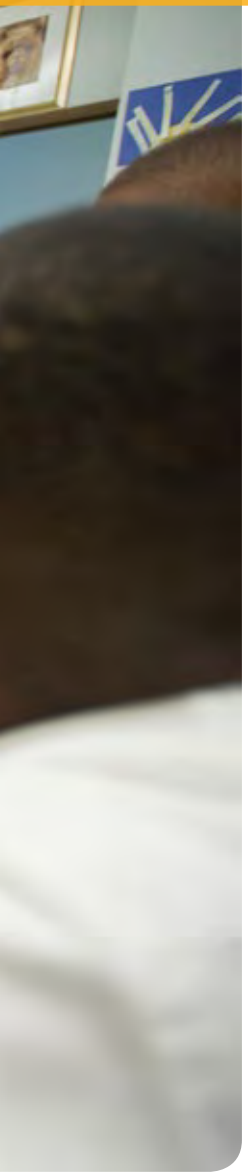
TOP: Graduate student Naveen Kumar Sankaran (center) and Kevin Burke, teaching assistant professor of electrical engineering (right), use colorful blocks to demonstrate to students how larger bases improve the stability of taller buildings.

RIGHT: Liesl Folks, dean, School of Engineering and Applied Sciences, observes students using marshmallows and toothpicks to build structures.

FUTURE

By Jim Bisco

Ken Smith



Onion Studio, Inc.

The youngsters are enthusiastically building model bridges. The executive from National Grid is cheering them on, helping them craft these small but meaningful examples of the types of structures engineers design to span roads, rivers and canyons. High fives all around as the kids step back to admire their work. The executive smiles. "All this untapped potential is amazing," he says. "We need to step up as a community and as individuals to show these kids how science is used in our everyday lives."

The scene is the Westminster Community Charter School in Buffalo. Dennis Elsenbeck is the regional executive of National Grid's Western Division. UB's School of Engineering and Applied Sciences has set the stage for this unique learning experience.

The chemistry behind the partnership mixes the enthusiasm of Dean Liesl Folks, who brought the California-based program, *Science is Elementary*, to Buffalo; UB engineering faculty and students who volunteer their time to work one on one with the youngsters; Elsenbeck and National Grid, who embrace and sponsor the program; and the Westminster students, kindergarten through eighth grade, who are eager to absorb every experiment and demonstration of engineering ingenuity, of which there have been many.

The idea is to stimulate the student's interest in science, technology, engineering, and mathematics (STEM) and to encourage their curiosity in the world around them. And so, the seeds of STEM are brightly sown.

IT'S ELEMENTARY

It was a cold January day when Dean Liesl Folks announced to Steve Koch's kindergarten class, "Today we are going to be scientists." With that, *Science is Elementary* was underway with a group of UB student and faculty volunteers, whose science experiments dazzled the wide-eyed audience.

Mike Singletary, an undergraduate in electrical engineering, demonstrated the concept of load bearing, using a sheet of paper between two tissue boxes. Each student in the group added a penny until the paper bridge failed. Mechanical engineering graduate student Nicole Varble assisted the kids in building structural shapes using marshmallows and toothpicks.

Ken Smith

TOP: Westminster first graders watch as Natalia Litchinitser, associate professor of electrical engineering, demonstrates optics by experimenting with lenses and waveguides made of Jell-O.

LEFT: Undergraduate biomedical engineering student Olivia Licata shows first graders the effects of static electricity with a small Van de Graaff generator and a wimshurst machine.

Onion Studio, Inc.

Dennis Elsenbeck, National Grid, celebrates success in building a bridge with a student in Lauren Casillo's first grade class.

Basic science concepts presented in a fun way were the order of the day. The UB team is visiting Westminster classrooms once a month to perform structured, hands-on science experiments that are aligned with the Common Core curriculum. The spring semester of *Science is Elementary* began with kindergarteners and first graders, and will expand to higher grades with each subsequent school year.

Then, like a reciprocal visit to your friend's house after a sleepover at yours, Westminster was invited to UB, this time in the form of the school's span of K-to-8 students, to experience campus life and take in even more dramatic examples of the engineered world.

RAISING DAVIS HALL

A makeshift hovercraft cruising around the first-floor hallway. Upstairs, aluminum foil boats being built and tested for their buoyancy in a water tank. Elsewhere, a hair dryer powering ping-pong balls balancing in the air; an optics demonstration involving Jell-O; a flower being "magically" frozen by liquid nitrogen; a lesson in "gak," or how to make brains.

Davis Hall, SEAS young research center, was rocking with creative abandon.

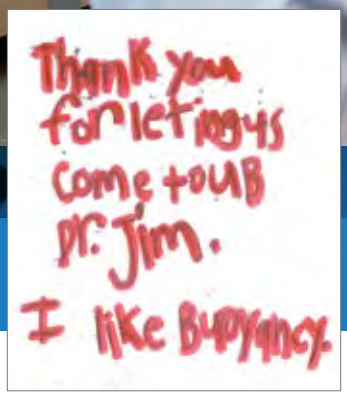
A contingent of scientists and engineers, faculty and students, took delight in involving their young visitors in hands-on experiments, all in the hope of igniting their interests in the STEM fields. Because studies have shown that the U.S. lags behind other countries in STEM education, dedicated efforts to combat this pattern have been initiated by UB and partners like National Grid.

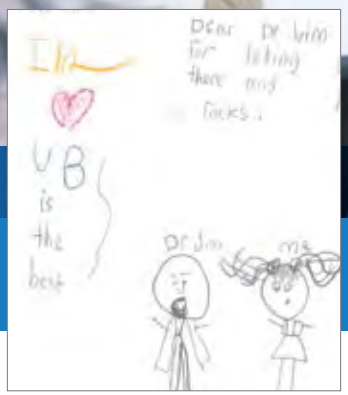
Sponsorship of this program is part of the company's larger initiative of providing funding support to address STEM

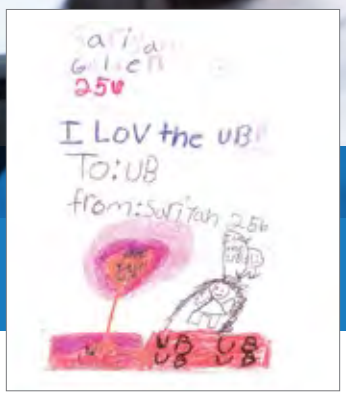
Onion Studio, Inc.

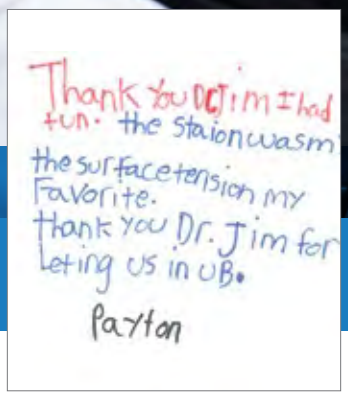
Pierre Gautreau, a civil engineering adjunct professor, discusses the day's lessons with Steve Koch's kindergarten class.

Jim Jensen, professor of environmental engineering, and Na Rong, graduate student in chemical and biological engineering, demonstrate buoyancy using paper clips and foil boats. Also pictured are several of the "thank you" letters sent to Jensen following the lesson.









Onion Studio, Inc.

needs and inspire engineers to develop tomorrow's energy networks. "My hope is to have this program make a difference, even if it impacts one child's future," Elsenbeck said.

Meanwhile, floor-to-floor fun was being had, transforming Davis Hall into a veritable Sesame Street of science.

REACHING STUDENTS BIG AND SMALL

More than 60 graduate and undergraduate students, faculty and staff in SEAS and the College of Arts and Sciences have participated in the partnership. Akeem Francis, an electrical engineering junior, thought it was a great way to impact the local community. "I personally wished I had this kind of experience when I was growing up," he related. "So, to give back to the kids like this is very enjoyable to me."

Elsenbeck keeps a keen eye on the students' volunteer involvement. "Participating in community outreach activities like this program demonstrates the roundness of the student," he explains. "We need engineers who can relate to people and are willing to take an active role to better their community."

An impact is being made on the elementary students being introduced to engineering, according to Sarah Infante, project administrator of Westminster. "To hear a first grade student refer to a UB volunteer entering the classroom for a second visit as the 'Electron Lady' brings a smile to my face," she says. "That the students recall specific details of their time with their friends from UB is nothing short of amazing."

Perhaps Dean Folks' greeting, "Today we are going to be scientists," may be transformed into an earnest career statement, "Tomorrow we are going to be scientists." Kindergarten teacher Koch overheard one eighth grader express such a desire after the field trip. Elsenbeck's ...even if it impacts one child's future" comment echoes.

One child and counting.

– Jim Bisco

SYNTHETIC PROTEINS

Results could dramatically cut the time needed to develop drugs for treatment of cancer, other illnesses

Douglas Levere

Sheldon Park arrived at UB in 2006 with a plan.

He knew there was no simple and effective way to study proteins on the surface of live cells. He wanted to change that. Doing so could open new frontiers in research and, possibly, shed light on diseases linked to protein mutations.

Never mind that others tried to accomplish this without success for the past 20 years. Never mind that he was just starting his research career. Never mind it would require more than six years of work.

Park stuck with the plan and developed a synthetic protein called monomeric streptavidin that scientists worldwide are using for everything from HIV research, drug delivery and the molecular analysis of peptides, proteins and other cellular components.

Park's ingenuity caught the attention of the National Science Foundation, which in 2011 awarded him a $400,000 CAREER award, the foundation's most prestigious honor for young investigators. In August, NSF committed another $300,000 to Park so he could expand his research into protein engineering.

"Proteins are the workhorse of everything going on inside our bodies," he says. "They appeal to me because of the diversity of their function. These molecules are made with simple chemical building blocks, yet there doesn't seem to be any limit to what they can do."

Park studies how natural proteins function in order to make synthetic proteins with biotechnology applications. For example, synthetic proteins could be useful in determining causes as to why certain genetic mutations, such as cancer, chronic inflammation and neurodegenerative diseases, develop.

He is also investigating a cure for Crohn's Disease, a form of inflammatory bowel disease that affects roughly 500,000 people in the U.S. Scientists have known since 2001 that a defective protein contributes to the disease, Park says, but no one understands why.

He engineered a peptide which has shown promise in reversing the effects of the mutation. He is conducting additional studies with University of Michigan and Cleveland Clinic researchers to confirm the finding in animal models and patients.

Park, an associate professor of chemical and biological engineering, earned a PhD in biophysics from Harvard University.

– Cory Nealon

Rabideau Named Research and Economic Development Leadership Fellow

UB recently launched RENEW (Research and Education in eNergy, Environment and Water), an ambitious, university-wide, interdisciplinary research institute that will focus on difficult and complex environmental issues, and the social and economic issues with which they are intertwined.

Alan Rabideau, an environmental engineering professor with a track record of interdisciplinary research, will serve as the first Research and Economic Development Leadership Fellow. Under the fellowship, Rabideau will focus on preparing the RENEW institute to tackle problems associated with energy, the environment and water. He was appointed by Alexander N. Cartwright, vice president for research and economic development.

Rabideau was chosen for the fellowship because of his educational background, research pursuits and ability to work across disciplines. He holds a PhD in environmental science and engineering from the School of Public Health at the University of North Carolina at Chapel Hill.

– Cory Nealon

Douglas Levere

CUBRC FUNDS 5-YEAR PROFESSORSHIP

Crassidis named CUBRC Professor of Space Situational Awareness

Buffalo-based research and development firm CUBRC has pledged $250,000 to support Professor John L. Crassidis' efforts to track dangerous space debris. The gift creates the CUBRC Professor in Space Situational Awareness for a five-year period.

Crassidis, professor of mechanical and aerospace engineering, will use the money to support his research. He works with NASA, the Department of Defense and other agencies to monitor space debris, also known as space junk, which threatens satellites and future space missions.

There is no cost-effective way to remove space debris, so researchers like Crassidis are developing ways to better track the thousands of manmade objects that orbit Earth. His latest project is LANSAT, or Lightcurve Analyzing NanoSATellite, a U.S. Air Force-funded project that NASA plans to send into space in two years.

"We are increasingly reliant on satellites for a number of important things in our everyday lives, such as weather prediction, navigation and communications. However, even a tiny piece of space junk the size of a golf ball can destroy a multimillion dollar satellite and create yet more space junk in the process," Crassidis said. "We are working on techniques to track the locations and movements of all the pieces of space junk so that satellite positions can be adjusted to avoid them."

In addition to teaching and conducting research at UB, Crassidis serves as associate director of the Center for Multisource Information Fusion (CMIF), an organization operated by UB and CUBRC that works to streamline massive amounts of data into useful information for government agencies, business and other partners.

Michael Moskal, vice president and chief information officer at CUBRC, said Crassidis' research is improving the security of the nation's communication and weather satellites, as well as helping to ensure that future space missions are less threatened by debris.

Liesl Folks, dean of the School of Engineering and Applied Sciences, said the named professorship is indicative of the great working relationship that UB has long enjoyed with CUBRC.

"We'd like to thank CUBRC for its continued support of our school. It is partners like CUBRC that help us conduct research that will ultimately make the world a smarter and safer place," Folks said.

– Cory Nealon

The ever increasing population of space junk threatens vital satellites used for weather, vehicle navigation and earth science missions.

Batta and Zhang appointed SUNY Distinguished Professors

Appointment is the highest faculty rank in the SUNY system

Rajan Batta, Associate Dean for Faculty Affairs and a faculty member of the Department of Industrial and Systems Engineering, joined UB in 1984. Batta uses industrial engineering techniques, such as operations research, to develop and analyze mathematical models of systems critical to society. His research interests range from transportation planning and analysis of urban crime patterns to military logistics, telecommunications and homeland defense.

Aidong Zhang, Chair of the Department of Computer Science and Engineering, is an internationally recognized expert in the fields of databases, multimedia databases and bioinformatics. She has been instrumental in forging new research directions in the information retrieval (IR) community, and has pioneered novel techniques for semantic clustering and querying that are widely accepted as the standard in image database design. She joined the UB faculty in 1994.

FACULTY HONORS AND AWARDS

Ann Bisantz was elected Fellow of the Human Factors and Ergonomics Society, which "recognizes outstanding achievement, consistently superior professional performance, exceptional contributions, personal service to the Society, and other meritorious accomplishments by Society Members." She received the honor during the 57th HFES Annual Meeting in San Diego, California on October 1, 2013. Bisantz is professor and chair of industrial and systems engineering.

SPIE, the international society for optics and photonics, has named **Alexander Cartwright** a Fellow "for achievements in nanostructured optoelectronic devices used in photovoltaics and chem- and bio-sensing." He received the award at the SPIE Photonics West conference on February 3, 2014 in San Francisco. Cartwright is a professor of electrical engineering and vice president for research and economic development.

John Crassidis was elected Fellow of the American Astronautical Society "for outstanding contributions in spacecraft attitude estimation and space situational awareness applications." Crassidis is CUBRC Professor in Space Situational Awareness in the department of mechanical and aerospace engineering, and is associate director of the Center for Multisource Information Fusion.

Thenkurussi "Kesh" Kesavadas was elected Fellow of the American Society of Mechanical Engineers (ASME). His ASME activities include serving as chair of the Material Handling Division and the Futures Team, and as a Leadership Development Intern (LDI) from 1997-1998. Kesavadas is an associate professor of mechanical and aerospace engineering.

David Kofke was elected Fellow of the American Institute of Chemical Engineers in recognition of his contributions to chemical engineering research on molecular modeling and simulation as well as software development; development of educational modules to teach students the methods of molecular simulation; and service to the profession in multiple roles. He is a SUNY distinguished professor of chemical and biological engineering.

Murat Kurt received the 2014 Pritsker Best Doctoral Dissertation Award from the Institute of Industrial Engineers. Kurt's dissertation, "Dynamic Decision Models for Managing the Major Complications of Diabetes" addresses a significant national and international health problem. The research was completed in 2012 at the University of Pittsburgh. Papers resulting from this research have earned the INFORMS Service Science Section's Best Paper Award in 2010 and 2011. Kurt is an assistant professor of industrial and systems engineering.

Hui Meng was inducted as a Fellow into the American Institute for Medical and Biological Engineering (AIMBE) on March 24, 2014 during the Engineering and the Future of Healthcare conference in Washington, D.C. Meng is a professor of mechanical and aerospace engineering, and research professor of neurosurgery in the School of Medicine and Biomedical Sciences.

Alan Rabideau received the 2014 NYSSPE Contribution to Education Award, a state-wide award from the New York State Society of Professional Engineers. Rabideau is a professor in the department of civil, structural and environmental engineering.

Kui Ren was appointed as a Distinguished Lecturer by the IEEE Vehicular Technology Society (VTS). The program provides expert speakers to local VTS chapters throughout the world on topics of interest to its members. Ren's topics are cloud data security and privacy, securing emerging short-range wireless communications, and mobile crowdsourcing applications. He is an associate professor of computer science and engineering.

Mark Swihart was awarded the 2013 Jacob F. Schoellkopf Medal from the Western New York section of the American Chemical Society. The award recognizes his fundamental discoveries in the field of nanoparticle synthesis and processing. Swihart is a professor of chemical and biological engineering.

TWO RECEIVE NSF CAREER AWARDS

Prestigious award provides five years of funding to support junior faculty who have shown exceptional promise in teaching and research

Changhyun Kwon | Industrial and Systems Engineering

Changhyun Kwon, assistant professor in the department of industrial and systems engineering, received a 2014 NSF CAREER Award for his proposal, "Advancing Routing Methods in Hazardous Materials Transportation."

Kwon's research will mitigate the risk of hazmat accidents by improving routing methods currently used in the transportation of hazardous materials. Most current hazmat routing methods rely on the average risk level of routes, and are vulnerable to catastrophic consequences of hazmat accidents. Spectral risk measures can be used to balance between the average risk level and the worse risk level and to make risk-averse routing decisions.

A web-based simulation system will be developed to visualize and test the theories and algorithms, as well as to train practitioners and students.

The methodologies can be broadened for use in other hazmat transportation problems such as gas-emission reduction, supply-chain disruption management, humanitarian logistics and the design of reliable networks.

"Professor Kwon's work to reduce the risk of hazardous materials transportation will improve the safety of communities nationwide. We are very excited that his important work has been recognized with this award," said Ann Bisantz, professor and chair, industrial and systems engineering.

Kwon joined UB in 2008. His research interests include transportation systems analysis and service operations problems. He leads the Laboratory of Service and Transportation Operations Management (STOM lab), and is a core faculty member of the Institute for Sustainable Transportation and Logistics (ISTL), the Transportation Informatics University Transportation Center (TransInfo UTC), and the UB 2020 Strategic Strength in Extreme Events. He received his PhD in industrial engineering from The Pennsylvania State University in 2008.

Steven Ko | Computer Science and Engineering

Steven Ko, assistant professor and member of the networked systems research group, department of computer science and engineering, received a 2014 NSF CAREER award for his proposal, "Systems for Transparency in Personal Devices and Services."

Ko aims to answer the many "why" questions we ask about our smartphones, tablets and social network services, such as "why am I seeing this online ad?", "is my application sending my contact information somewhere else?" or "why is my device not lasting even a day?"

His goal is to make these personal devices and services transparent so that they reveal their inner-workings, which would enable us to inspect and understand why they are doing what they are doing. Once we understand this, we can either adjust our behavior or think about ways to rectify it.

Ko joined UB in 2010. His research interests include distributed systems, networking and operating systems. He received his PhD from the University of Illinois at Urbana-Champaign in 2009 and was a postdoctoral researcher at Princeton University for a year prior to joining UB.

Cheating in Chess? CSE Professor Part of a Team Developing New Anti-Cheating Rules

Kenneth W. Regan, associate professor of computer science and engineering, is using human decision-making theories to develop a model that will detect cheating in chess.

As an international master at chess himself, Regan began researching the model about seven years ago, following accusations of cheating at the 2006 world championship match between Vladimir Kramnik of Russia and Veselin Topalov of Bulgaria.

Regan's model is now part of a proposed set of anti-cheating rules under development by a joint commission of the World Chess Federation (FIDE) and the Association of Chess Professionals (ACP). Members of the commission visited UB on April 21-23, 2014 to finish up a draft of proposed changes to the Laws of Chess and procedures for chess tournament directors. They included Israel Gelfer, Commission leader from FIDE, of Israel, ACP liaison Yuri Garrett of Italy, Konstantin Landa of Russia, Laurent Freyd of France, and Klaus Deventer of Germany. The commission also includes Shaun Press of Australia and George Mastrokoukos of Greece.

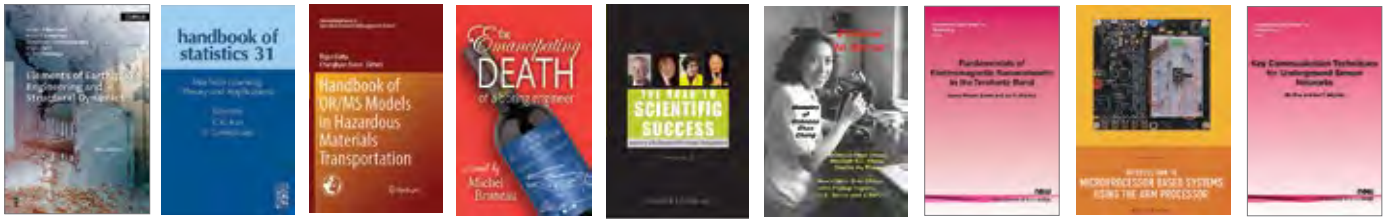
Freyd was Chief Arbiter of the 2014 Tradewise Gibraltar Chess Festival, now the world's most prestigious open tournament, and Landa is a Grandmaster, the highest title a chess player can attain.

Their proposal will be voted on at the 85th FIDE Congress concurrent with the Chess Olympiad in Tromso, Norway, on August 1-14, 2014.

An article about Regan and his work is featured on the cover of the June 2014 issue of *Chess Life* magazine, available here: http://bit.ly/UxrQ8A.

– Jane Stoyle Welch

11 From Engineering Recognized in UB Tribute to Authors



Rajan Batta and **Changhyun Kwon**, Industrial and Systems Engineering, editors, "Handbook of OR/MS Models in Hazardous Materials Transportation."

Michel Bruneau, Civil, Structural and Environmental Engineering, "The Emancipating Death of a Boring Engineer."

Deborah D.L. Chung, Mechanical and Aerospace Engineering, "Piloted to Serve" (English version) and editor, "The Road to Scientific Success: Inspiring Life Stories of Prominent Researchers, Vol.2."

Andre Filiatrault, Civil, Structural, and Environmental Engineering, "Elements of Earthquake Engineering and Structural Dynamics, 3rd Edition."

Venu Govindaraju, Computer Science and Engineering, editor, "Handbook of Statistics 31."

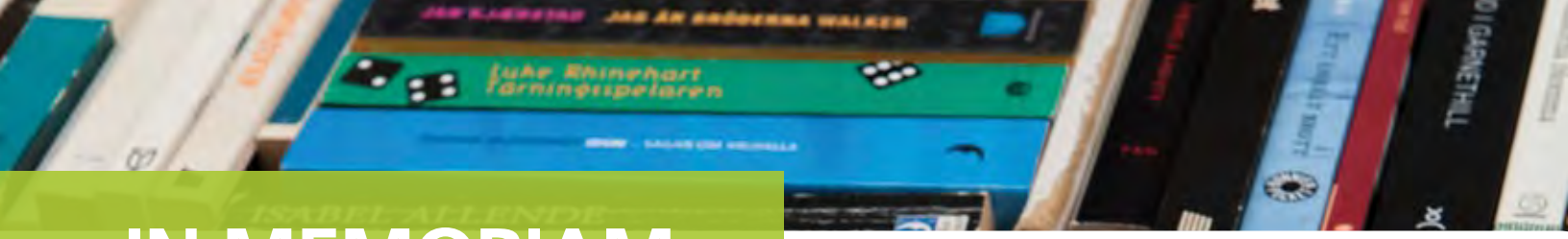
Josep M. Jornet, Electrical Engineering, "Fundamentals of Electromagnetic Nanonetworks in the Terahertz Band."

Tevfik Kosar, Computer Science and Engineering, author and editor, "Data Intensive Distributed Computing: Challenges and Solutions for Large-scale Information Management."

Kris Schindler, Computer Science and Engineering, "Introduction to Microprocessor Based Systems Using the ARM Processor, Second Edition."

Zhi Sun, Electrical Engineering, "Key Communication Techniques for Underground Sensor Networks."

Mark Voisinet, Civil, Structural and Environmental Engineering, "Solidworks Tutor."



IN MEMORIAM

Professor Emeritus

HOWARD E. STRAUSS

Howard E. Strauss, 92, professor emeritus and former associate dean in the School of Engineering and Applied Sciences, passed away November 13, 2013.

Born in Buffalo, Howard earned his bachelor's degree in mechanical engineering from the University of Michigan and his master's degree from UB. He joined the UB faculty in 1947, where he taught courses in thermodynamics and energy systems. He was appointed assistant dean in 1966, and served as acting dean for the following academic year. He was promoted to associate dean for student services in 1978.

Howard received several honors for teaching, including a pair of Instructor of the Year awards from the Engineering Student Honor Society, Educator of the Year in 1984 from the Professional Engineering Society of Western New York and the Dean's Award for Academic Achievement when he retired from UB in 1985.

He was chairman of the Buffalo Section of the American Society of Mechanical Engineers and was active for many years with the Engineering Society of Buffalo.

Howard's wife of 67 years, Harriet Doig Strauss, died November 4, 2013. He is survived by his children, John, Roger, Robert and Carol; a brother, Roger; 16 grandchildren and seven great-grandchildren.

Professor Emeritus

PRASANTA BANERJEE

Professor Emeritus Prasanta K. Banerjee, who served as a faculty member in the Department of Civil, Structural and Environmental Engineering at the University at Buffalo for 32 years, passed away on April 11, 2014 in Arizona. He was 73.

Professor Banerjee served as an active member of the CSEE faculty from September 1980 to June 2012, during which time he advised nearly 50 graduate students. He is known worldwide for his contributions in Boundary Element Method (BEM) and pioneered many of the first developments in the BEM areas of elastoplasticity, viscoplasticity, transient dynamics and transient thermoelastic and thermoplastic analyses as well as thermoviscous flow, convective heat transfer and structural acoustics.

He and his colleagues were responsible for the development and distribution of several public domain BEM codes, including BEST3D, BESTCMS, BESTFSI and GPBEST. He is also known for his work on static and dynamic behavior of pile foundations and on constitutive behavior of saturated granular medium.

He is survived by his wife of more than 40 years, Barbara, and three daughters Nina, Sara and Lisa.

2014 SUNY Chancellor's Awards for Excellence

SUNY Chancellor's Awards for Excellence honor and recognize consistently superior professional achievement and encourage the ongoing pursuit of excellence

EXCELLENCE IN FACULTY SERVICE

Li Lin, Professor and Director of Graduate Studies, Industrial and Systems Engineering

EXCELLENCE IN FACULTY SCHOLARSHIP AND CREATIVE ACTIVITY

Stylianos Andreadis, Professor and Chair, Chemical and Biological Engineering

EXCELLENCE IN TEACHING

Gary Dargush, Professor, Mechanical and Aerospace Engineering and Associate Dean for Reseach and Graduate Education


Nancy J. Parisi

Entrepreneurial engineering students off to good startups

Team led by CSEE PhD student Hosein Kerdar Wins Panasci Technology Entrepreneurship Competition

Clockwise from top, Hosein Kerdar, John Fraczek, Travis West and Conor Flynn celebrate their victory; below, Elena Ramona Stefanescu.

It takes more than a great idea to start a business. Two engineering graduate students, Hosein Kerdar, civil engineering, and Elena Ramona Stefanescu, mechanical engineering, took advantage of several UB resources this spring to help move their entrepreneurial ideas toward reality.

Kerdar led a team that took first place in UB's Henry A. Panasci Jr. Technology Entrepreneurship Competition in April for a startup called EMVISS (Electromagnetic Vibration Isolation and Stabilization System). He and his fellow team members, Conor Flynn, JD '15, John Fraczek, JD/MBA '16, and Travis West, BS '14, will share $25,000 in prize money and about $27,000 in related services to enable them to manufacture the system.

Kerdar, who will serve as president and CEO of EMVISS, drew upon his background in earthquake engineering to develop a patent pending invention that removes problematic vibrations in high-precision devices such as microscopes, cameras and lasers. The technologies are primarily for use in research centers and hospitals.

"The cash prize and donated services should be more than enough for Kerdar to build the prototype," said Martin Casstevens, Business Formation and Commercialization Manager at UB's Office of Science, Technology Transfer and Economic Outreach (STOR). "We expect great things from him."

Fellow engineering student Stefanescu's startup, Earth Risk Systems, comprises software that estimates the cost of damage to property and the areas of people affected by natural disaster. With these estimates, engineers, governments and clients in the insurance and construction industries can better prepare for the catastrophes.

While not a winner in the Panasci competition, Stefanescu has embarked on an intensive seven-week National Science Foundation-funded program called Innovation Corps. This very selective nationwide competitive program is designed to help researchers explore the commercialization potential of NSF-funded science and technology. Particular emphasis is placed on developing the "entrepreneurial leads"--a PhD student or doctoral fellow involved in each project team.

"We are in the cohort that includes universities from all around the U.S. We are the only one from Western New York. The training includes meeting close to a hundred potential partners," explains Stefanescu. "We are now at the stage of customer discovery, talking with people in the insurance and reinsurance industry, and risk modeling companies to see where my project can fit within their work process."

The process for both teams began during a UB winter session course recently established by STOR and the School of Management called Entrepreneurship Lab (eLab), which is a small business boot camp for students looking to advance a pre-existing entrepreneurial idea. Kerdar and Stefanescu won awards of $8,000 and $5,000, respectively, in seed funding, mentorship and shared space in the UB Technology Incubator after pitching their startups to a panel of local business leaders and investors.

The Henry A. Panasci Jr. Technology Entrepreneurship Competition was created and is managed by UB's School of Management and STOR.

– Jim Bisco


Douglas Levere

From left: Katie Czerniejewski, Julie Fetzer and Dana Voll presented their perspectives on how to attract female students to engineering at IEEE's Integrating STEM Education Conference.

Nancy J. Parisi

Encouraging More Women to Pursue Careers in STEM

Three UB engineering sophomores share their views and win "Best Paper" at IEEE conference

Many universities today are actively involved in developing programs and opportunities to attract under-represented students to STEM majors. In a unique and enlightening paper, three female engineering students aimed to shed light on this issue by sharing their own experiences about what inspired them to pursue an education in engineering.

The project started in December, when Julie Fetzer, civil engineering, Katie Czerniejewski, biomedical engineering, and Dana Voll, electrical engineering, all sophomores in the School of Engineering and Applied Sciences at UB, met with Dean Liesl Folks as part of a focus group to discuss ways to balance the ratio of men to women in STEM. The group discussed problems and stereotypes high school girls face about engineering and what colleges like UB could do to encourage more girls to study engineering.

With the encouragement of the Dean, the three decided to write a paper for presentation at the IEEE Integrating STEM Education Conference. The paper identifies common societal misconceptions about women in STEM disciplines that girls and young women must face as they make decisions about their future career paths, such as "engineering does not benefit humanity," "you must be a genius," and "there are no women in engineering."

"As Caucasian, middle class women growing up in suburban areas, we never looked at ourselves as outside the majority. But the moment we decided to enter the field of engineering, we became part of a minority: women who pursue degrees in STEM."

The paper also describes their experiences in college recruitment activities for STEM programs, and as incoming students in engineering; reviews activities by colleges that positively influenced their degree path decisions or served as deterrents; and compares their experiences with the recommendations of other authors.

"Perceptions of University Recruitment Strategies by Female Students in STEM," FC 109, received the "Best Paper" award and will be available through the IEEE database, IEEE Xplore. The conference was held at Princeton University on March 8, 2014.

– Jane Stoyle Welch


Jerome O'Connor

Students Visit "The New NY" Bridge Construction Site

UB's Institute of Bridge Engineering (IBE) arranged for a hands-on tour of "The New NY Bridge" construction site this past spring. Led by Anthony Tessari, assistant professor of civil, structural and environmental engineering, and Jerome O'Connor, executive director of the IBE, the trip gave the students an opportunity to see a major design-build project in progress.

The structure, known as "The New NY Bridge" is being designed and built by a joint venture called Tappan Zee Constructors. The bridge project will cost about $3.9 billion and take five years to build, but it is designed to give over 100 years of service.

By the end of the project, over 400 engineers will have worked on the mega-project, according to O'Connor.

In the photo above, the group is shown on a work platform that is underneath the existing 60-year-old bridge that crosses 3.1 miles over the Hudson River near Tarrytown, NY. The piling for the new foundation can be seen in the background.

Shown in the photo above are: (front row) Suk Hee Hyun, Chao Huang, Nashwan Alshuwaili, Craig Teepell (project staff), and Sathvika Meenakshisundaram; (middle row) Youngtae Han, Joe Colletti , Ranganath Chandra; (back row) Daniel Baron, Gary Worden, Victor Odili, Gustavo De Andrade, Josh Rodems, Logan Besel, Anthony Tessari, Dan Weller (project staff), Tim Kaiser (project staff).

2014 SUNY Chancellor's Awards for Student Excellence

SUNY Chancellor's Awards for Student Excellence honor State University of New York students who have best demonstrated and been recognized for their integration of academic excellence with other aspects of their lives, which may include leadership, campus involvement, athletics, career achievement, community service or creative and performing arts.

COURTNEY E. KODWEIS

Biomedical Engineering

Courtney Kodweis has served as a teaching assistant for freshman-level Engineering Principles and Forensic Anthropological Osteology courses. She gave two poster presentations at the national OMICS conference and National Conference on Undergraduate Research. She published an article in the Proceedings of the National Conference of Undergraduate Research and also conducted research in Hyderabad, India, through a National Science Foundation-sponsored program.

ANDREW N. LYONS

Mechanical and Aerospace Engineering

Andrew Lyons has served in various roles as a co-op intern at Moog Inc., a company that develops aircraft flight controls. He was president of the UB Robotics Club and managed Space Vision 2012, a national student-run conference hosted by the UB chapter of Students for the Exploration and Development of Space (SEDS).

ELISE J. MARTIN

Biomedical Engineering

Elise Martin has served as president of the Student Association club Impulse Dance Force. She is the Imagine It Recycling project leader for UB's chapter of the Biomedical Engineering Society. Martin is also a member of Tau Beta Pi, the engineering honor society representing undergraduate students in the top eighth of their engineering class.

PHILLIP M. TUCCIARONE

Chemical & Biological Engineering

Phillip Tucciarone is the recipient of the Marshall Scholarship, which awards young Americans an opportunity to study for a degree in the United Kingdom. He also received the Barry M. Goldwater Scholarship, as well as the Association of Council Members and College Trustees of the State University of New York Scholarship, which recognizes students for excellence in their academic performance and extraordinary commitment to their campus and/or community.

When You Wish Upon A Star

UB Student lands dream internship at Disney

When Georgia Cruz moved to Clarence, NY from Rio de Janeiro, Brazil as a high school student, she had a dream to dance on stage with Mickey Mouse. Six years later, while not exactly dancing with Mickey, she is instead working as an Industrial Engineering intern at Walt Disney World Resort in Orlando, Florida.

Georgia started to discover her interest in engineering during her junior year of high school. When she found out her passion for Disney and career goals could align, she knew that being an industrial engineer at Disney was the career for her. From that point forward, every decision she made during her college years was focused on what Disney would like to see on her resume.

As an intern in the project development team, Georgia is involved with evaluating new features and attractions coming to Disney. For example, she is conducting a capacity and demand analysis in the Animal Kingdom, where the Lion King show had to be temporarily closed during construction to expand the park. This involves a lot of data collection and analysis, such as observing and counting areas in the park to see where guests went instead of the closed exhibit (guest flow and behavior), as well as the number of people in the area, where they went instead, and how long they had to wait at neighboring attractions. This data is then used to qualitatively and quantitatively evaluate how the changes in the park impacted guest behavior. Georgia is often called upon to present her results to fellow team members and sometimes executive-level managers.

Georgia's data collection and analysis at Disney, combined with an experiential learning engagement at a Buffalo print services firm, were the foundation for her pursuit of the Lean Six Sigma methodology. Through completing continuous improvement projects and fulfilling other requirements of a program administered by UB TCIE and the industrial and systems engineering department, she earned her Six Sigma Black Belt certification.

Georgia plans to apply for a full-time position at Disney once her internship ends in May. She has already passed her "mid-term" evaluation, and is hopeful that she can put her skills to work as a permanent employee.

The industrial and systems engineering degree program requires every student to participate in an internship during his or her senior year.

– Jane Stoyle Welch

From Graduation to Gridiron

Derek Brim, electrical engineering, and Colby Way, computer engineering, have signed with the NFL's Buffalo Bills and are participating in mini camp with the hopes of earning a spot on the team. Both engineering students were starters on the 2013 UB Bulls football team.

As of press time, both Derek and Colby are still listed on the Buffalo Bills roster.

SAE Clean Snowmobile Competition

The Society of Automotive Engineers' student chapter placed second overall among 14 universities and colleges in the 2014 Clean Snowmobile Challenge. The team took home top honors in two categories: Best Lab Emissions and Best In-Service Emissions.

The team modified a 2011 stock snowmobile to improve its handling and performance. They installed a turbo-charged diesel engine which, along with other adjustments, reduced the amount of environment-damaging emissions that the sled produces. It also helped reduce the sled's noise and improve its fuel economy from 12 mpg to 28 mpg.

The fuel-efficiency boost came in handy because a component of the competition was a 100-mile ride in Michigan's chilly Upper Peninsula. The contest was held March 3-8 at Michigan Technological University.

Pictured with the snowmobile (from left) are Noor Jariri, Nate Sutorious, Pat O'Byrne, Matt Egan, Dave Stedman, Anthony Marchesiello, Peter Casey and Nick Lanzano.

UB Hacking 2014

About 70 college students descended on Davis Hall over the weekend of April 5-6, to compete in UB Hacking 2014, a 24-hour competition to see who could complete the best hacks. Developers, entrepreneurs and designers joined forces to create projects that were judged on their technical difficulty, polish, creativity and usefulness.

First place went to Redtooth, created by Nathan Burgers. The hack is an iPhone/iPad app that combines the computing power of Bluetooth-enabled devices in a room into one "virtual" computer. The prize - $1,000 and two TimBuk2 backpacks.

Burgers is seated in the photo below, where he is surrounded by Gradfly software engineer Bojan Percevic and GradFly CTO Joe Peacock (both in gray shirts), UB students Joel Little, Pat Jameson and Nick DiRienzo, Facebook software engineer Tom Occhino, and visiting student Nick Sargente.

The Hackathon was organized by UB's chapter of the Association for Computing Machinery. Sponsors included Gradfly and Bloomberg, as well as Synacor, InfoTech Niagara, Facebook, Softrek Corp., Advance 2000 and UB's Department of Computer Science and Engineering. Nick DiRienzo, Pat Jameson and Isaac Reath, all UB computer science and engineering students, coordinated the event.

ASCE/AISC National Student Steel Bridge Competition

UB-ASCE's steel bridge team placed tenth overall at the 2014 ASCE/AISC National Student Steel Bridge Competition. Fourteen students traveled to Akron, Ohio to compete in the nationals, based on their second place finish at the ASCE Regional Student Conference held at Cornell University in April.

The teams were challenged to design and fabricate a one-tenth scale steel bridge in accordance with structural specifications and construction regulations.

The UB Bridge featured an 8.25" deep beam design. The top and bottom chords were custom sections of folded sheet metal designed and constructed specifically for the design forces. Both the width of the chords and thickness of the material varied along its length, based on the design forces.

Four builders assembled the 136 lb. bridge, with a final time of just over 8 minutes, compared to about 11 minutes at Regionals. This was the fifth fastest time of the competition and earned the team fourth place in Economy.

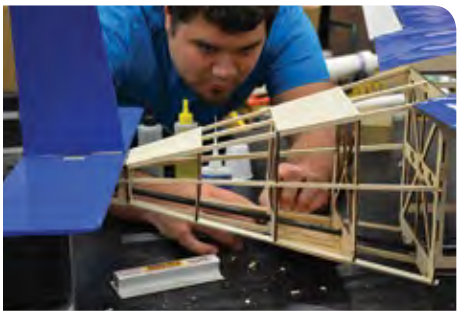
This year's team included Ed Almeter (UB-ASCE Treasurer and 2015 team captain), Steve Coley, Greg Congdon (builder), Lindsey Devito (builder), Zeb Hoffmann, Sara Mantas, Duncan Mcauley, Caitlin O'Leary, Ryan O'Malley (builder), Andrea Sacco, Josh Schmid, Sean Terry (builder), Tim Van Oss (UB-ASCE President), and Nic Vesely (2014 team captain). The team was also accompanied by Practitioner Advisor John Gast and Faculty Advisor Todd Snyder.

This event was held on May 23-24, and included 49 teams from colleges and universities across the U.S., Canada and Puerto Rico.

Design, Build, Fly Competition

UB's team placed 23rd overall out of 80 teams at the AIAA/Cessna/Raytheon Missile Systems Student Design/Build/Fly international competition. The event attracted approximately 700 students, faculty and guests, and was held in Wichita, Kansas on April 11-13.

The teams designed, fabricated and then demonstrated the flight capabilities of



an unmanned, electric powered, radio controlled aircraft. The aircraft had to be able to carry two payloads of differing size and weight, and complete a set of four missions: one ground taxi mission and three flight missions.

Shown in the group photo are (front) Zachary Fisher, Nathan Guterry; (middle) Priya Narang, Megan Cheney, Victoria Zenker, Taylor Kieffer; (back) Caleb Saathoff, Matt Butler, Tyler Szczezniak, Christian Worst. Not Pictured- Corinne Hutchinson, Marc Volpe.

IEEE Micro Mouse Competition

The IEEE Student Chapter placed second of 11 teams in the MicroMouse competition, which was one of the events at this year's IEEE Region 1 Student Conference. The UB "MicroBull," an autonomous maze-solving robot, successfully completed the maze in just over two minutes. The showing was a big improvement over last year's entry, which placed fourth. The event was held on March 28-29 at the New Jersey Institute of Technology.

Participants included Mack Ward, Jimmy Mazur, Scott Will, Dave Kishlar, Mike Szymkowski, Kyle Thompson, Carly Schulz, Bill Dell'Anno, Tomasz Pietruszka, Tim Coulter, Tim Rogers, Joe Materski, Jon Goodrum and Jordan Hoeber.

ASCE Concrete Canoe Competition

UB earned sixth place overall in the concrete canoe competition, which was part of the ASCE Upstate New York Regional Student Conference hosted at Cornell University on April 24-26.

The team's entry, "Aldebaran," was named for the brightest star in the constellation Taurus. By using glow-in-the-dark concrete for the stars in the constellation on the vessel's design, the team is the first in North America to use the aggregate in a canoe.

The steel bridge team placed second and was invited to participate in the ASCE/AISC national competition in Akron, Ohio (see p. 24).

UB Robotics Club

Wednesdays were anything but typical this year in Anna Martinick's grades 5-8 science class at the Kadimah School of Buffalo. That's because it's the day when Andrew Lyons, Maureen West, Michael Esswein and other students from the UB Robotics club visited the class to make robots.

Onion Studio, Inc.

The project began when Kadimah's principal Einav Symons called UB in search of information about robotics. Andrew and Megan, both officers in the UB Robotics club, were seeking an outreach activity for the club.

The result? Albert the dancing elephant, a "she" puppy, Otis the robotic arm, tank bots that can drive over shoes, and a "spinner" factory that can collect spinners by color and deposit them on a spindle.

On May 15, the proud middle schoolers presented their robots to the class, parents and principal, as well as the UB students and club advisors, Kevin Burke and Jennifer Zirnheld, both members of the electrical engineering faculty.

Onion Studio, Inc.

While not all the robots worked as expected, all the students were enthusiastic and anxious to perfect them. Many of the groups credited the UB students with helping them to problem solve on their own.

"We focused on troubleshooting programs, testing ideas and teaching the kids not to give up," said Michael Esswein, a freshman mechanical engineering major who will lead the club next year. "The final projects are pretty good!"

Five Engineers Honored

with UB Alumni Association Achievement Awards

Clifford C. Furnas Award

Jeffrey Umland is a Fellow at the Jet Propulsion Laboratory, a NASA field center operated by the California Institute of Technology. Since 2005, Umland has been chief mechanical engineer for NASA's Mars Science Laboratory mission and the rover *Curiosity*, which successfully landed on Mars on Aug. 6, 2012. He led all of the project's technical development, including mechanical hardware, surface systems, sampling systems, thermal systems and propulsion systems. *Curiosity's* design will serve as the basis for a planned Mars mission in 2020. The success of both the lab and the rover are due in large part to Umland's leadership and technical contributions.

JEFFREY **UMLAND**
PhD '91 & BS '85
MECHANICAL ENGINEERING

Distinguished Alumni Award

Tamara Brown's impact on the world goes beyond her accomplishments in the medical device design and regulatory field. In 2004, she developed a program called Tech Savvy, which introduces STEM fields to middle school-aged girls. The program launched nationally with the support of the Praxair Foundation, and its focus has been expanded to include 10th- to 12th-grade girls interested in STEM subjects. In 2011, Brown was honored by the White House as one of 12 "Champions of Change" for her efforts. She is currently leader of community engagement at Praxair, Inc.

TAMARA **BROWN**
ME '03,
CHEMICAL ENGINEERING

International Distinguished Alumni Award

Kuo-Chun Chang is a distinguished professor in the Department of Civil Engineering at National Taiwan University, as well as director general of the National Center for Research on Earthquake Engineering in Taiwan. His research focuses on the impact of earthquakes on structures, and much of his research has been implemented in practical applications. He also developed design codes and guidelines for buildings, bridges and highways in Taiwan. Chang is past president of the Chinese Structural Engineering Society and Chinese Taiwan Society for Earthquake Engineering.

KUO-CHUN **CHANG**
PhD '85 & MS '80,
CIVIL ENGINEERING

Dr. Richard T. Sarkin Award for Excellence in Teaching

John Crassidis' students benefit not only from his aerospace industry expertise, but also his connection outside the classroom. He has presented at K-12 schools to inspire young adults to pursue science and technology fields. He is vice chair of the American Institute of Aeronautics and Astronautics Niagara Frontier section and serves as liaison to an education partnership between UB and the Air Force Research Laboratory. Crassidis is the CUBRC Professor in Space Situational Awareness in the Department of Mechanical and Aerospace Engineering, and associate director of the Center for Multisource Information Fusion.

JOHN L. **CRASSIDIS**
PhD '93, MS '91& BS '89,
AEROSPACE ENGINEERING

George W. Thorn Award

Lesley Weitz is a lead simulation and modeling engineer for the MITRE Corporation's Center for Advanced Aviation System Development, a federally funded R&D center that supports the mission of the Federal Aviation Administration. Her current research is in the area of advanced avionics for next generation air traffic systems, from concept development and design to analysis of avionics that leverage advances in communication, navigation and surveillance technologies. Weitz is a member of the American Institute of Aeronautics and Astronautics and serves on the Department of Mechanical and Aerospace Engineering's Advisory Board.

LESLEY **WEITZ**
BS '02,
MECHANICAL ENGINEERING

Engineering Celebrations

Kessler Named 2014 Engineer of the Year; Over 175 Students Inducted into the Order of the Engineer

Joseph F. Kessler, PE (BS EE '93, MEng EE '00, MBA '10) was named 2014 Engineer of the Year by the UB Engineering Alumni Association (UB EAA).

Kessler was recognized for his continuous support to UB engineering over the past 15 years, which includes hosting internships for UB students and donations to the school.

Kessler used a quote from the late Fred Rogers, "Imagining something may be the first step in making it happen, but it takes real time and real efforts of real people to learn things, make things, turn thoughts into deeds or visions into inventions," as he addressed the engineering students in attendance. He encouraged them to always be lifetime learners and congratulated them on their achievements to date.

Nancy J. Parisi

2014 Engineer of the Year, Joseph F. Kessler (second from left), with Jeffrey W. Dudek, Liesl Folks and Matthew Sceusa.

Kessler is senior vice president of power generation for the New York Power Authority (NYPA), the largest public power organization in the country. He is a senior member of the IEEE, a director of the Erie-Niagara Chapter of the New York State Society of Professional Engineers (NYSSPE) and has been an active member of the Electric Power Research Institute's (EPRI's) Research Advisory Council for the past year.

The award was presented by Dean Liesl Folks and UBEAA President Jeffrey W. Dudek (BS CivE '00).

The Order of the Engineer ceremony followed, where John Van Benschoten, professor and associate dean for undergraduate education, traced the origins of the Order, which began in Canada as the "Ritual of the Calling of the Engineer." The students then took the "Obligation of the Engineer" oath together, and each received a ceremonial ring.

Nancy J. Parisi

Jennifer Tompkins and Jordan Gaisser read the "Obligation of the Engineer" oath

The event was held at UB in Agrusa Auditorium, Davis Hall, on February 17, 2014.

– Jane Stoyle Welch

NEW FACES, NEW ROLES IN UB ALUMNI AND SEAS DEVELOPMENT OFFICES

Living in the Buff Studio

Bethany Mazur moved to a new role as SEAS Director of Constituent and Alumni Relations, where she will focus on developing programs and activities for our school's 28,000+ alumni. Bethany joined the UB Engineering Development team in 2011 as an assistant development officer.

Todd Brooks joined the School of Engineering and Applied Sciences development team as annual giving officer. Todd is a professional fundraiser with five years of experience in campaign politics. In his new role, he will take the lead on the overall management of annual gift activities with the primary responsibility of securing leadership annual gifts.

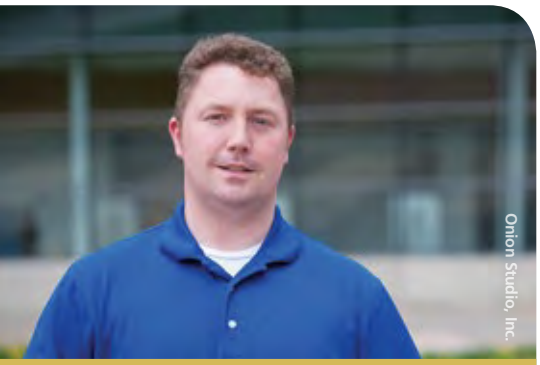
As UB's first director of international alumni relations, Wei-Loon Leong (MBA '05, BS '03) is charged with developing a comprehensive program to engage the university's 8,000 alumni who live overseas. He returns to UB from Beijing, China, where he was most recently a senior manager for business administration at Beijing BISS International School.

ALUMNI STORIES

We want to hear from you! Submit an alumni story with a paragraph or two telling us what you are doing and include a recent photo to feature on our website. Send submissions to ub-seas@buffalo.edu; our redesigned website will also include a submission form.

Alumnus Joins Mentoring Network as a Way to Give Back to UB

During my undergraduate studies, I would walk between South Campus classes across a well beaten path on the lawn between Acheson and Diefendorf halls. I found it amusing and interesting to walk in the footsteps of the UB predecessors who created this trail, proving that the shortest distance between two points is a straight line.



Matthew Surowiec, GP Strategies Corp.

Later, I learned that one's college career does not always follow a well-worn path or a straight line. During one particularly difficult semester, I recall reading an encouraging poem carved into the wall of a study booth at the Lockwood Library. Whenever possible, I tried to return to that desk, if available. That poem encouraged me to stay the course. It also helped me decide that when I was able to, I would give the same encouragement to fellow UB students.

After beginning my career at GP Strategies Corporation in 1998, I began my UB mentoring activities through the Department of Technical Communications, led by the late Dr. Pneena Sageev. I began to mentor students from both a technical and writing perspective. I took Dr. Sageev's class as an undergraduate student, and it was the first exposure I had to the real world, as we were challenged to develop our own engineering business plan.

In 2012, I joined the UB Mentoring Network, following the suggestion of a student at CareerFest. Whenever a student who has been struggling approaches me, I try my best to encourage them to finish their course of studies and earn their degree. It was the same advice offered to me during my time as a student. I am a firm believer that a degree creates opportunities.

My involvement in the UB mentoring program has also helped me to prepare for my current supervisory duties at GP Strategies Corporation. The University at Buffalo has helped me to grow as a person and a professional, and I enjoy helping students in their journey.

– Matthew Surowiec,
BS Chemical Engineering, '97; MBA '06

Engineering Alumnus Gives $500,000 to Support Professorship

A graduate of the University at Buffalo's doctoral industrial engineering program has given $500,000 to help establish a professorship in the UB School of Engineering and Applied Sciences.

The donor, who wishes to remain anonymous, intends the gift to help the school hire a faculty member in operations research and related fields in the Industrial and Systems Engineering (ISE) department.

Ann Bisantz, ISE chair, said the department—whose graduates go on to careers in industry, health care, logistics and manufacturing, among others—is very grateful for the gift.

"Gifts such as this one are important for the future of ISE because they allow us to recruit and retain excellent faculty," Bisantz said. "ISE works hard to provide its students with a high quality, meaningful education, and it is gratifying to know that alumni can be so supportive of the department."

UB's ISE program was recently ranked 25th out of 91 ISE and related programs nationwide, according to the *U.S. News and World Report* graduate program rankings. Among programs at public universities, it is ranked 18th.

– Mary Cochrane

Over 250 Students Recognized at 29th Annual Scholarship Reception

Four awarded scholarships from the Engineering Alumni Association

Tom Albrechcinski

William Dell'Anno, electrical engineering, received the Engineering Alumni Association's Professor Emeritus Howard Strauss Memorial Scholarship.

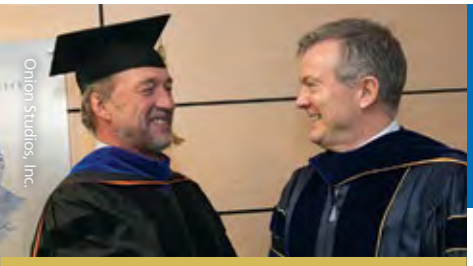
It was a special night for over 250 students, parents, family, friends, alumni, industry partners and friends of the School of Engineering and Applied Sciences, who gathered at Classics V banquet facility to celebrate the achievements of this year's scholarship winners.

The event, the largest to date in the school's history, awarded 63 scholarships to 253 recipients, with a collective value estimated to be nearly $1 million.

The reception, sponsored by LPCiminelli, was held on April 4, 2014. A complete list of scholarships and award winners is on the school's website.

Tom Albrechcinski

Andrew Lyons, mechanical and aerospace engineering, Laura Godly, chemical and biological engineering, and Nicholas DiRienzo, computer science and engineering, received the 2014 Leaders in Excellence Scholarship from the Engineering Alumni Association (EAA). Pictured from left are: Robert Barnes (EAA), Lyons, Godly, DiRienzo, and James Boyle (EAA).



Onion Studios, Inc.

Stephen Still (left) is congratulated by Andrew Whittaker, professor and chair of civil, structural and environmental engineering.

Dean's Award for Achievement

Stephen Still, Seabury APG, LLC

Each year, the School of Engineering and Applied Sciences gives its highest honor, the Dean's Award for Achievement, to someone who has made a substantial contribution to the practice of engineering or the applied sciences and/or has had an exceptional professional career. This year, the award was given to Stephen E. Still (BS CSEE '76), a lifelong professional in transportation planning.

Dr. Still co-founded two companies in airline planning and information technology. Seabury APG, LLC is a highly specialized advisory firm focusing on airline network planning, fleet planning and revenue management. Diio, LLC is a leading IT firm providing rapid web-based access to key aviation data needed by airline planners.

Dr. Still credits UB for nurturing his early passion in transportation planning and analysis. UB's transportation program has been vibrant in defining the importance of transportation on society, and the program continues to flourish in its research and teaching.

A current member of the Dean's Advisory Council and the department of Civil, Structural and Environmental Engineering (CSEE) Advisory Board, Dr. Still has been a longtime supporter of the school. He has given philanthropic gifts to support students and professors in the area of transportation engineering as well as support through his company, Seabury Airline Group, to sponsor the School of Engineering and Applied Sciences' Open House.

After graduating from UB, Dr. Still continued transportation studies at Princeton University with additional focus on economics and operations research. He received a MSE in 1978 and a PhD in 1985. Dr. Still then pursued analytical modeling, planning and management roles at United Airlines and US Airways from 1986-1997. Based those experiences, he co-founded the aforementioned firms specializing in aviation.

Urban transportation planning remains a passion as well. Dr. Still was the 2013 Chairman of the Citizens Advisory Committee for the Washington DC region's Transportation Planning Board, and continues to serve roles in local transportation advocacy.

ATTO Technology Receives Entrepreneurial Champion Award

ATTO Technology is the 2014 recipient of the Entrepreneurial Champion Award, given by UB's Office of Science, Technology Transfer and Economic Outreach (STOR).

The award recognizes an exceptional entrepreneur or company who, through either championing a UB technology or graduating from a UB Incubator program, has created a highly successful company and whose products and services will create a major impact in their ability to benefit the public good worldwide. The award was presented at STOR's Inventors and Entrepreneurs Reception on March 3, 2014.

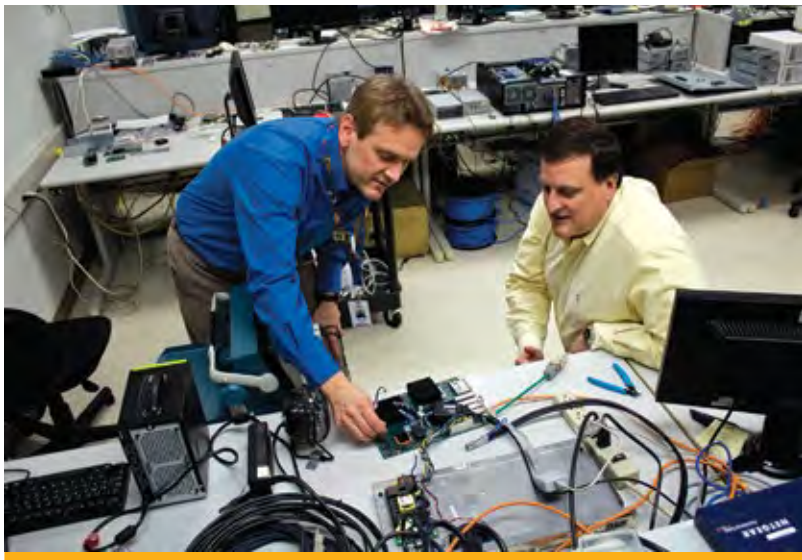
ATTO Technology, Inc. was founded by Buffalo, NY natives Timothy J. Klein, a UB engineering alumnus (BS EE '84), and David A. Snell, in 1988. Tim specialized in hardware while Dave's expertise was in writing software. The young entrepreneurs joined forces to develop, build and sell their first product, the industry's first solid state storage disk, SiliconDisk™, which allowed computers to process data transfer tens to as much as hundreds of times faster than a standalone computer system. This groundbreaking technology was quickly adopted by new OEM partner, Eastman Kodak®.

"Over 25 years later, we still look to UB for the brightest young talent to add to our ever-growing ATTO team as we continue to drive ground-breaking innovations in the high-tech industry globally."

– Timothy J. Klein, President, CEO and co-founder of ATTO Technology, Inc.

As demand for their exciting new product increased, it was apparent that they were in dire need of the infrastructure necessary to grow. Tim was aware of a new UB technology incubator managed by the Western New York Technology Development Center (TDC), which offered promising young entrepreneurs the tools and resources necessary to help bring high-tech product ideas to market. This program is known today as the UB Technology Incubator, which falls under the administration of STOR. It was here in 1989 that they were introduced to engineers, testing labs, office space and, most importantly, interested investors who recognized the potential of their vision.

Success came quickly for Klein and Snell, experiencing triple digit growth over the first five years of operation. As their product lines grew, so did the customer base. Their products were used by Apple®, Siemens®, 3M®, Data General and Avid Technology. In 1995, they were awarded the Mac "Eddy," the industry's Oscar®, by *MacUser* magazine. The company celebrated its 25th anniversary in November 2013.



Daniel Howe (left), principal hardware engineer (BS EE '85, MS EE '87), discusses improvements to a network storage interface board with Tim Klein (BS EE'84). 42% of ATTO's engineers are UB graduates.

Klein and ATTO's leaders have remained connected to UB, with 42% of their employees coming from the School of Engineering and Applied Sciences. ATTO supports the school's internship program and Klein actively participates on the Dean's Advisory Council.

Manufactured in Western New York, ATTO's products are sold in over 60 countries worldwide. Its customers encompass a wide range of prestigious media and entertainment companies that produce blockbuster films, award-winning television shows and global broadcasts of live news and sports. ATTO products are sold by industry leaders, such as Apple®, Dell®, EMC®, HP®, IBM®, and NetApp®, driving the transformation to Big Data, virtualized and cloud computing environments.

– *Kristopher Johnson, ATTO Technology*

New website provides entrepreneurs with business development resources

UB and Launch NY have debuted a new website connecting current and would-be entrepreneurs to upstate New York resources that offer assistance in starting, growing and sustaining a business. The Upstate NY Resources website features an entrepreneur toolkit, overview of the stages of business and affiliated activities, and an integrated search tool for immediate access to regional expert resources.

Upstate NY Resources is a cooperative effort between the University at Buffalo Innovation Hub (iHub) Accelerator, which operates under the auspices of UB TCIE, and Launch NY, a non-profit venture development corporation. Both iHub and Launch NY are partially funded by the US Economic Development Administration (EDA).

The site is located at *www.upstatenyresources.org*.

– Tracy Puckett

Grant money subsidizes technical assistance at companies

UB Engineering faculty and graduate students are available to provide expertise to businesses in need of technical assistance.

The Strategic Partnership for Industrial Resurgence (SPIR) grant helps subsidize the cost of bringing innovations to the next level, upgrading or introducing new technologies, addressing the challenges of product development and testing, and more.

SPIR allows companies in New York State with up to 500 employees to tap into the UB School of Engineering and Applied Sciences. The grant may fund engineering R&D projects, re-engineering business processes, facility layout and workflow analysis, access to shared instrumentation laboratories, and graduate student intern employment.

Contact Gary Simon at 716.645.8837 or ggsimon@buffalo.edu for more information.

– Tracy Puckett

Jingxiao "Sean" Li makes a presentation at Harlequin Distribution Center, where he conducted an improvement project as part of the Student Black Belt Certification Program.

Engineering students available for corporate improvement projects

Western New York companies that don't have adequate manpower, time or expertise to rectify a recurring issue or pursue a technically based aspiration may find just the help they need in a UB Engineering student.

UB TCIE – a center that connects the business community with the expert resources of UB Engineering – is seeking corporate partners of all types and sizes for two student engagement programs beginning in fall 2014.

The one-semester TCIE Student Fellows Program provides an outstanding master's degree or PhD candidate dedicated to completing one to three engineering projects identified by the company.

The two-semester Student Black Belt Certification Program, offered in conjunction with UB's Industrial and Systems Engineering department, is focused on operational excellence by employing the Lean Six Sigma problem-solving approach to eliminate process variation.

For more information on how your company could benefit from one or both programs, contact Gary Simon at 716.645.8837 or ggsimon@buffalo.edu.

Onion Studio, Inc.

Taylor Ferguson, Matthew Forrest and Cory Mikida show the proof-mass damper they designed for an F-S Elliot Co., LLC compressor as part of their senior design project.

UB Engineering Senior Design Expo

The first UB Engineering Senior Design Expo featured information on nearly 80 projects, and involved over 100 students, industry partners, alumni, faculty and others from the local community.

The posters and prototypes on display included a device that a Lockport company uses to move hazardous chemicals and a tool that was developed to help an Olean-based manufacturer reduce production costs. All the projects were part of the senior design course offered during the spring semester.

Increasing Employment Opportunities for People with Disabilities

TCIE/ISE form partnership with The Resource Center

The Center for Industrial Effectiveness (TCIE), the Department of Industrial and Systems Engineering (ISE) and The Resource Center (TRC) recently wrapped up a successful partnership that will result in increased employment opportunities for people with disabilities.

The Resource Center, a company that provides employment opportunities that support individuals with disabilities in assembly, janitorial, manufacturing and sewing operations, partnered with the UB team to reconfigure the ways in which people are trained to work on the various machines located at TRC's Work and Employment Centers in Dunkirk and Jamestown.

TRC performs work for the U.S. government through the AbilityOne program. Federal guidelines specify that 75 percent of AbilityOne labor hours must be maintained and performed by people with severe disabilities. By improving the training protocol and operational efficiencies, TRC will give more people with disabilities the opportunity for gainful employment while also enhancing its ability to secure future government contracts and attract new manufacturing customers.

Ted Zrimsek works on a modified, hand-operated bar tacker at TRC's Work Center in Dunkirk. A hand lever was added to Ted's sewing machine because he cannot operate a foot pedal.

"It was very rewarding to partner with TRC and provide the expertise of UB's industrial and systems engineering department for the greater good of the organization," said Tim Leyh, TCIE's executive director. "It is fulfilling to assist one of Chautauqua County's largest employers in remaining competitive, which only strengthens its ability to serve and support individuals with disabilities."

In the summer of 2012, Victor Paquet, associate professor of industrial and systems engineering at UB, assessed TRC's manufacturing processes. This included everything from industrial sewing to the manufacturing and assembling of items such as air cargo bags and first-aid kits for U.S. troops serving overseas.

Kimberly Burdic assists a worker in learning to operate a sewing machine at TRC's Work and Employment Center in Jamestown.

As part of his assessment, Paquet looked at TRC's AbilityOne processes, and reviewed job descriptions and training manuals at Jamestown and Dunkirk to assess the range of physical and cognitive work demands at the sites.

Paquet made several recommendations to help improve TRC's workflow, attract new customers and increase productivity:

- Create a formal system to facilitate, support and require communication among those who design the jobs, those who operationalize the jobs and those who train the employees on the jobs
- Develop standard operating procedures for all production jobs
- Build equipment infrastructure to better support jobs performed
- Develop quality assurance aids for workstations and training facilities
- Code each job based on the required skills necessary to complete the job successfully
- Develop a two-tiered training approach that focuses on developing fundamental skills and preparing employees for specific jobs
- Focus training on industrial sewing jobs and assembly jobs
- Reconsider the production standards for employees with disabilities

(continued on p.33)

CNC Machine Shop Retains Customer with Assistance from TCIE

When a key customer of Modern-Tec Manufacturing required that its suppliers be certified in the ISO 9001:2008 Standard, the CNC machine shop based in Cambria, New York, turned to The Center for Industrial Effectiveness (TCIE) for assistance.

Company President Christopher Matyas engaged TCIE's quality management expertise to pinpoint the missing pieces at his company, which was founded in 2010 as a precision machining solutions provider serving numerous industries. With growing business in medical manufacturing, Matyas also learned what it would take to fulfill quality standards of the medical device sector through an ISO 13485 gap assessment.

The outcome was ISO compliancy, resulting in a continued business relationship and a door opening to other client opportunities.

TCIE is an extension program of UB Engineering that serves the business community. Read more about TCIE's projects and programs at *www.tcie.buffalo.edu*.

– Tracy Puckett

Modern-Tec Manufacturing President Christopher Matyas tapped UB TCIE for guidance in the ISO 9001:2008 Standard.

(continued from p.32)

Victor Paquet

Shweta Agarwal

Timothy Leyh

In a report to TRC, Paquet wrote, "These recommendations will translate into jobs that are more accommodating not only for consumers but for all; higher work efficiencies; savings in space that can reduce overhead and/or increase capacity; and training practices to which all individuals can apply their specific abilities, that are most accommodating."

"It was nice to see our business from the viewpoint of someone not connected with what we do for individuals with disabilities. I feel that it was very helpful to have a different perspective, especially from people who have specific knowledge as to operating procedures, ergonomics and efficiency," said Kimberly Burdic, trainer at TRC.

To help implement the recommendations, TRC, through UB TCIE, hired Shweta Agarwal, an industrial and systems engineering graduate student, in the summer of 2013 to develop standard operating procedures (SOPs) and provide specific recommendations for training for many of the manufacturing jobs in the plants.

"One of the recommendations from the Buffalo collaboration was to help the trainers look at different ways to adapt machines and work to help make it accessible to individuals with disabilities," said Rebecca Hamlet Kapple, Rehabilitation Services Administrator at TRC's Mary Andrews Center. "Also, they helped us with writing the curriculum to train on all of the machines, by giving suggestions and trying to link them to skill sets identified in the standard operating procedures Agarwal helped to develop."

To help pay for the engineering assessment, TRC received financial support from the Chautauqua Region Community Foundation and the Strategic Partnership for Industrial Resurgence program, a grant of the State University of New York administered regionally through UB TCIE.

Note: This article is based on a TRC story published April 6, 2014, http://resourcecenter.org/trc-university-buffalo-partner-increase-employment-opportunities/.

HONOR ROLL

Delta Society Chair:
Mr. Norman Hayes '80

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Alumnus gives back to help future engineering grads

Thanks to the generous gifts of donors to UB's Engineering and Applied Sciences School, every year hundreds of engineering students are given scholarships to aid them in paying for their education. One scholarship though, the Engineering Cooperative Society Award, is particularly unique and stands as a shining example of just how connected UB's alumni are to their alma mater.

Every year since graduating, Barnard Onyenucheya (MS '10, BS '07) rallies his fellow UB engineering alumni and friends to help give back. With gentle arm-twisting and humorous email appeals, Barnard solicits contributions to help fund the Engineering Cooperative Society Award. The award recognizes undergraduate students who show academic growth, improvement and leadership abilities. As a recipient of financial aid himself while at UB, this is Barnard's unique way of paying it forward.

"Hopefully one of the people we affect can become one of the torchbearers," Onyenucheya said.

Tom Albrechcinski

Barnard Onyenucheya (left) with this year's Engineering Cooperative Society Award recipients Peter Casey and Sharece Blake.

Since graduating from UB with his master's degree in 2010, Barnard continues to be heavily involved in the betterment of UB as a member of the Engineering School's Delta Society. He currently works at General Electric Transportation in Erie, PA as a propulsion design engineer.

– *Todd Brooks*

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Thanks to you,
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Shawn Evilsizor played with Lincoln Logs and took things apart as a child. Math and science were his favorite subjects, and while driving on family trips, he would study how a bridge had been constructed rather than look at the river below. When Parkinson's disease forced his father to stop working, Shawn decided to pay his own college expenses. "I knew it would push me to complete my goals." Even so, he was grateful for two UB scholarships because "finishing my master's degree wouldn't have been possible without them." Shawn now appreciates how his UB education prepared him for working in the high seismic zone around Portland, Ore., where he works as a structural engineer. "The challenge of engineering keeps me going," he says. Gifts to UB help students build their lives.
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ENCOURAGING MORE WOMEN TO PURSUE CAREERS IN STEM

Page 21: Three UB Engineering sophomores share their views and win "Best Paper" award at IEEE conference