A Novel Approach to Cybersecurity
Better Mud Bricks
First ChemE Endowed Professorship
Rugby at UIC
Alumnae Talk about Rewarding Careers
College Updates
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Professors Ranganathan Chandrasekaran (College of Business) and Venkat Venkatakrishnan (College of Engineering) team-teach a graduate seminar in electronic security and privacy.

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My first job was a paper route delivering the *Everett Herald*. As a kid, being responsible for sales, collections, and delivery (basically running your own small business) is a great learning experience. What I didn’t appreciate then were the key lessons in perseverance, initiative, and time management the job also provided, lessons that broadened and deepened with more experience. Getting your feet wet (literally, at times) with that first job as a kid is important. But landing that first professional position—the one that will lead to a career—is even more critical. And it often seems to involve a catch-22: you need experience to get experience.

We believe strongly in internships as the way for our students to get the experience that prepares them to land that first professional job. To assist them, we are piloting a guaranteed internship program for freshman enrolling in 2013. If they meet criteria that include completing twenty-four UIC semester hours with a 3.0 GPA or greater and participating in our Engineering Student Success Program during the 2013–14 academic year, we will guarantee them an internship.

Our goal is for all of our incoming freshman to qualify for an internship following their freshman year. We will help place them in private industry or a UIC research lab, where more than 153 projects funded by $65 million in grants are currently underway. Our experience shows that students who graduate having completed two or more internships greatly increase their chances of employment soon after graduation. But it is the first internship that is the hardest to get and we are confident this program will help them earn the experience they need. Last year, we placed students and graduates in positions with more than 275 companies and organizations; some companies hired ten, twenty, or more students.

In the College of Engineering, we have long been committed to educating students for careers as leaders and innovators, whether they go on to positions in technology, business, research, medicine, teaching, law, or any of the many exciting places an engineering degree can take you. We see the guaranteed internship program as a natural outgrowth of that commitment.

As the articles in this magazine demonstrate, engineers help solve many of society's most pressing problems while pursuing productive, interesting, and gratifying careers. We will continue refining the educational experience we provide so that our graduates can achieve their personal career goals while driving changes that benefit people locally, regionally, and around the world.

Best regards,

Pete Nelson, PhD
Dean and Professor of Computer Science
educating tomorrow’s cybersecurity leaders

is someone using a “backdoor” in your laptop’s computer chip to spy on you? How about in the machines comprising your company’s network? How do you know an overseas chip manufacturer hasn’t been paid to allow, or coerced into building, a gateway to surreptitiously gather information about your personal finances or your company’s intellectual property?

Science fiction? Xenophobia? Venkat Venkatakrishnan, PhD, doesn’t think so. Venkatakrishnan serves as associate professor of computer science and director of UIC’s Center for Research and Instruction in Technologies for Electronic Security. “There’s considerable evidence that there are countries developing cyberweapons and engaging in cyberwarfare,” he said. Long before recent headlines and President Obama’s February 2013 State of the Union address raised awareness of computer security issues among the broader public, Dr. Venkatakrishnan and other experts have been concerned about these developments.

Dr. Venkatakrishnan sees the genesis of our current computer security challenges similarly to the weaknesses now acknowledged in the U.S. electric power grids. The Internet, like our power grid, was built ad-hoc. The question now is how to retrofit the systems we have. In both cases, these are hard engineering questions, requiring deep scientific and technological knowledge to take on, but, he noted, “computer security is a problem where solving the technical side doesn’t just solve it: you have to understand human behavior and address all dimensions—technological, human, social, enterprise, and legal—to be part of the solution.”

Confronting these new challenges begins with a new sort of education, Dr. Venkatakrishnan believes. A $3.2 million federal grant to UIC’s Department of Computer Science will help to address complex computer security and privacy issues through an innovative interdisciplinary graduate-level program. Dr. Venkatakrishnan is the principle investigator for the grant, called ESP-IGERT: Electronic Security and Privacy Integrative Graduate Education and Research Traineeship. Under the
program’s auspices, doctoral students from engineering, business, and the humanities will come together, often in team-taught classes, to tackle the multifaceted challenges inherent in combatting computer viruses, botnets, trojans, worms, and identity theft.

The goal is to produce between twenty and thirty graduates ready to become leaders in their fields—people capable of solving large, complex research problems that transcend traditional disciplinary boundaries. Each student will receive a $30,000 annual stipend plus a tuition waiver for two years, taking five required multidisciplinary courses as part of their departmental course load. “Even during the general economic downturn of the last few years, the need for skilled professionals to address these problems has gone up threefold,” Dr. Venkatakrishnan said. “Since the average cost of a cybersecurity incident in an organization is $1–2 million, adding up to billions in damages every year, the return on investment in training the students is really good.” The program will run for five years and includes four co-investigators [see side bar] and fifteen associated faculty from around the university.

Current plans call for creating a concentration that would allow communication, engineering, business, and other doctoral-level students to earn a degree in their field while focusing on electronic security and privacy issues. In addition, as part of creating a robust UIC program in this arena at all levels, Professor Venkatakrishnan and Robert Sloan, PhD, professor and head, Department of Computer Science, wrote another National Science Foundation grant proposal. They were awarded $1.96 million over five years to underwrite scholarships for undergraduate and master’s-level computer science students pursuing information-assurance studies.

The United States is a global leader in electronic security and privacy work, and U.S. universities are critical in educating the people needed to do the work. Corporations today heavily rely on university scientists to lay the groundwork for commercial solutions by doing the initial phases of research, noted Professor Sloan. “There are some big research players like Google and Microsoft Research Lab, but most corporate R & D is heavily oriented toward the last stages of applied research before marketing products,” he said. "The IGERT grant allows UIC to develop a presence in privacy and security research to address this reality."

Training students at all levels in a collaborative approach to security is key to producing solutions that will actually work. Tapping social science and communication experts to learn how people approach and use software, for instance, can help engineers identify problems before they’re problems or create workable solutions to current challenges.

As a boy, Dr. Venkatakrishnan’s parents played chess with him and he developed a fascination with the adversity thinking required to win at the game. He sees a parallel in his scholarship and teaching. “Security work is all about adversity thinking—making your system resistant to an opponent’s attack. I believe we can impart that to our students and pass on the thought to producing solutions that will actually work. Training students at all levels in a collaborative approach to security is key to producing solutions that will actually work. Tapping social science and communication experts to learn how people approach and use software, for instance, can help engineers identify problems before they’re problems or create workable solutions to current challenges.

Chess, a game based on military strategy, seems a useful background for a professor creating a novel way to educate a new generation of cyberwarriors. ▶

ESP-IGERT Co-principle Investigators

Ranganathan Chandrasekaran, PhD, Associate Professor, College of Business, Department of Information and Decision Sciences. Research interests: enterprise risk analysis; security economics; e-business transformation and information systems strategies; IT adoption; assimilation; diffusion and organizational impacts of information technology.

Steve Jones, PhD, Distinguished Professor of Communication, UIC College of Liberal Arts and Sciences, and Adjunct Research Professor, UIUC Institute of Communications Research. Research interests: user attitudes towards online privacy; the social history of communication technology; health and new media; virtual environments and virtual reality; popular music studies; internet studies; media history.

Robert Sloan, PhD, Professor and Head, Department of Computer Science. Research interests: computer security, especially privacy, legal, and policy issues; computer science education; application of computer science theory and algorithms to problems from artificial intelligence.

Annette L. Valenta, PhD, Professor, College of Applied Health Sciences, Department of Biomedical and Health Information Sciences. Research interests: assessment of social-behavioral issues in health informatics; user perspectives on health-care technologies; the role of information technology in patient safety.
“Collaboration” and “synergy” describe working relationships that are often sought after, if less commonly achieved. But these words perfectly describe what happened when UIC doctoral student Adam Tennant approached assistant professor Craig Foster for input on research Tennant was seeking to fund through a Fulbright Scholarship.

Tennant, a civil engineering student, wanted to study the flexural properties of cement stabilized soil block (CSSB) masonry to improve its structural safety. He planned to do experimental and analytical work at Bangalore’s Indian Institute of Science under the direction of Professor B. V. Venkatarama Reddy, PhD, on these cheap and “green” mud bricks, used in various forms around the world.

As it happened, Dr. Foster, whose specialty is finite element modeling, was himself interested in studying sustainable materials like CSSB. Initially, he wrote and was awarded a separate National Science Foundation (NSF) travel grant to visit Bangalore and explore the potential for collaboration. Foster’s visit helped convince him to sign on to Tennant’s project.

Dr. Foster subsequently wrote and was awarded a $255,000...
Since the building sector in India produces 22 percent of the country’s greenhouse gases, and creating CSSB masonry uses up to 70 percent less energy than traditional fired brick, CSSB could significantly reduce greenhouse gas generation there. In addition, the excellent thermal properties of the material help reduce heating and cooling costs, further contributing to energy savings.

Both Dr. Foster and Adam Tennant hope that their projects will improve prospects for international research collaborations in general and for UIC specifically. Foster’s second NSF grant included funding to underwrite international student exchanges, to recruit an underrepresented student to conduct doctoral research, and to fund undergraduate study of computer modeling. With this support, UIC doctoral and undergraduate students visited Dr. Reddy’s research lab in the summer of 2012 and have returned to work with Dr. Foster.

“Collaboration” or “synergy”? Whatever the words used to describe what has unfolded from one student’s desire to better understand the physical properties of cement stabilized soil blocks, the results promise to be far-reaching.

In a world necessarily concerned with the escalating costs and environmental effects of energy use, CSSB offers great promise given its sustainable properties. It can be made from local soils, requires very little cement for bonding, and is formed through compaction rather than firing (like traditional brick) which means much less energy is used—and, thus, less pollution created—in its production. It is also far more easily recycled, reducing landfill or the energy generation needed to reuse other building materials.
Help Wanted: **Women Strongly Encouraged to Apply**

Top to bottom: Kimberly Viloria ('16), Melissa Wardlow ('14), and Waltz Tsang ('13)
Looking at enrollment statistics for students in engineering programs, it is pretty hard not to conclude that engineers must be among the few, the proud, and the brave.

This is especially true for women. The Higher Education Research Institute’s 2007 statistics indicated that just 2.5 percent of female college freshman (compare 14.5 percent of males) indicated an intent to major in engineering. Overall, according to the American Society for Engineering Education, 40 percent of students enrolled in science, technology, engineering, and mathematics leave their programs after the first year.

But the dearth of women engineers isn’t the best use of human capital, notes alumnus and businessman Bill Unger (BA ’71). “Given that over 60 percent of product buying decisions are made by women, I’d like to have more choice about how to solve problems based on all the talent available,” he said. To help address the need, he started and supports the Unger Scholars Program at UIC, which has provided funding for sixty-two scholarships for women.

At UIC, where the national trend is born out—14.8 percent of the freshman class in the College of Engineering is made up of female students—support programs and scholarships are in place to help address the disparity. The Chancellor’s Committee on the Status of Women, the Society of Women Engineers, and Women in Science and Engineering all exist to promote the professional, educational, and career development of women. The college’s Minority Engineering Recruitment and Retention Program also focuses significantly on female students.

A number of advances have been achieved in financial support for women engineering students. In addition to the Unger Scholarship in engineering, the university-wide President’s Award Program funds scholarships for underrepresented populations, including women, and faculty have recently written and received National Science Foundation grants to fund scholarships for women in chemical engineering and computer science.

But there’s also a larger societal issue to consider, says Carmen Lilley, PhD, professor of mechanical and industrial engineering, who has been teaching and conducting research at UIC for ten years on the properties of nanoscale materials. “We can educate them, but they have to be here first,” she said. “National numbers suggest that, as a culture, we’re still not doing enough to address bias and stereotypes that prevent girls from thinking of themselves as engineers in the first place.”

Interviews with women engineering alumnae suggest, given their high level of satisfaction with their jobs, that there is every reason for undergraduate women to pursue an engineering degree—or several. In this article, we highlight two women who have made places for themselves in the multifaceted world of engineering.
Nidhal Bouaynaya  
(MS ’07 LAS, PhD ’07)  
Assistant Professor, University of Arkansas at Little Rock, Department of Systems Engineering

Dr. Bouaynaya is straightforward about what it takes to be a successful academic: hard work. With teaching, research, the ticking tenure clock, and family responsibilities, this often means working nights and weekends, but she is happy to be where she is. “It is challenging, but I love what I do and will continue to work at the same pace after tenure,” she said, adding with a laugh, “I have never left any opportunity for people to criticize me.”

Before completing her degrees in mathematics and engineering at UIC, Dr. Bouaynaya, a native of Tunisia, won a highly competitive scholarship to France’s École Nationale Supérieure de l’Electronique et de ses Applications, where she completed bachelor’s and master’s degrees in electrical and computer engineering. Following her studies at UIC, she and her husband wanted to return to Tunisia and contribute what they could after the recent revolution, but their two small children, the unstable political environment there, and the good opportunities in the U.S. convinced them to stay.

Dr. Bouaynaya uses electrical engineering, specifically signal processing and communication tools, to study biological systems. Her work draws significantly on mathematical biology and genomic signal processing for biomedical applications. Currently, she is teaching a variety of classes from freshmen-level (Introduction to Telecommunications) to graduate-level courses (Stochastic Processes) where only a handful of her students are women. And, she notes, all her research collaborators are men.

Has she encountered unfairness as a woman engineer? Never, she said, in her education, but she is the only woman in a department of eighteen men where, she discovered, she was the lowest-paid faculty member despite bringing in major grant money. The reason, she was told, was that she didn’t negotiate when she was hired. So she negotiated. Her salary was adjusted within a week.

As for the challenge of having children while pursuing an academic career, she thinks that, in fairness, tenure-clock adjustments ought to be considered to allow for flexibility around needs for parental leave. Especially given that academic research is founded on external grant money and pursuing funding is, she noted, “like having your own business. But I like academia very much. I have the freedom and flexibility to work on whatever interests me.”

Lucia Valbonesi  
(MS ’01, PhD ’05)  
Principal Staff Engineer, Cambium Networks

“I always thought, even as a little girl, that I wanted to be an engineer, and I’ve never found that being a woman was an issue when I showed people what I could do,” said Lucia Valbonesi, who serves as principal staff engineer at Cambium Networks in suburban Chicago. The company is a spinoff of Motorola. Her work world is overwhelmingly populated by men, and it would be nice if there were more female engineers, she noted—but it isn’t a surprise. “You know the landscape the first time you walk into an engineering class,” she said.

Dr. Valbonesi’s road to a doctorate in electrical engineering and a satisfying career started in Italy, where she attended the Politecnico di Milano. An arrangement that allowed her to simul-
I like academia very much. I have the freedom and flexibility to work on whatever interests me.”

Nidhal Bouaynaya, PhD

Satisfying and productive careers for women in engineering are out there, agree Dr. Lilley and Laurie Florence (BS ’80; BS in engineering ’90). Ms. Florence is principal engineer at UL (formerly Underwriters Laboratories).

Both note that business, industry, and academe would only benefit from getting women into the profession and keeping them in. “Women bring a different perspective in how to solve problems,” said Ms. Florence, “and in my experience, women may be more apt to be collaborative.” Dr. Lilley noted that the history of seatbelt design, which failed to account for pregnancy, demonstrates clearly that women bring an important perspective to product engineering.

Once women are enrolled in engineering programs, Dr. Lilley also sees definite opportunities for more effectively retaining them. To promote students’ success, it’s important to encourage women and minority students to join both traditional student professional organizations as well as women-only and minority-only networking organizations. Groups like the Society of Women Engineers and the Society of Professional Hispanic Engineers help foster collegiality and reduce the isolation some students feel so they stay engaged. At the same time, she believes, students need also to be pushed outside their comfort zones to really achieve—attending conferences, giving presentations, and taking on leadership roles.

Whether in the academic or business world, for each of these women, engineering has been a good run so far. “I was always drawn to science and research. I’m very satisfied with my choice—it is truly what I want to be doing,” said Dr. Lilley. It looks like she could be speaking for a quorum.

Ms. Florence (whose dad strongly encouraged her to pursue engineering) affirms the proposition that grooming women to be engineers needs to start earlier, marketing the idea in high schools so that young women appreciate the diverse things they can do as engineers and think of it as a choice. She has found that an engineering education is invaluable, even if graduates don’t end up working in engineering. In her experience, it opens lots of doors, technical and otherwise. She also noted that to recruit and retain women, companies could develop a greater acceptance of flexible schedules.
When he arrived at the University of Maryland from Calcutta as a research associate in 1956, Satish Saxena, PhD, found the work very much to his taste but the cuisine quite challenging. A vegetarian at the time, he subsisted at first on a lot of cookies and apples in his lodgings. “Unless I went into Washington with friends, where there were Chinese places that served egg fried rice, the best I could do in a restaurant was an egg salad sandwich, french fries, and a vanilla milkshake,” he said. So he got an apartment and cooked for himself but quickly decided it was more convenient to become a non-vegetarian.
Fifty-seven years later, following a long and distinguished career at UIC’s College of Engineering, Dr. Saxena is retired and lives with his wife, Asha, in Skokie, Illinois, surrounded by myriad photos of their four children and nine grandchildren—with whom he spends as much time as he can. A founding member of one of the oldest Hindu temples in Chicago, Hindu Society of Metropolitan Chicago, he describes himself as a religious and conservative man who loved teaching, research, and guiding his students.

Recently, he and his wife have created the Dr. Satish C. Saxena Professorship in Chemical Engineering Fund through a $500,000 endowment pledge. “I believe very, very much that UIC is a good place to invest,” he said about the genesis of their gift. The income from the fund will help support the first endowed faculty position in the Department of Chemical Engineering.

This sort of private support is critical to help the department recruit and retain outstanding faculty, noted Sohail Murad, PhD, who heads the department. “We plan to recruit several new faculty members over the next few years, and the ability to offer an endowed professorship will help us attract them. Strategic hires can raise the department’s ranking, attract talented students, and boost the morale of current students and faculty, who can be proud of their department and its influence,” he said.

“It is tremendously meaningful to have one of our emeritus faculty passionate enough about the college’s mission to support it with a major gift like this,” said Pete Nelson, dean of the college. “Success builds on success, and we hope the Saxenas’ commitment will inspire others to follow their lead.”

While at UIC, Dr. Saxena’s research focused on applying the fundamental principles of physics and chemistry to important chemical engineering problems. Some of those areas included hydrodynamics and heat transfer in fluidized beds; coal liquefaction to develop alternate fuels; and solid-waste management. He also taught a wide variety of graduate and undergraduate courses, serving as advisor to twenty-two doctoral and fifty-seven master’s degree students. “I wasn’t an undergraduate engineering major, so this was a challenging job for me,” he said. “But to learn a subject well you need to teach it: the student’s questions make you think properly.”

An undergraduate physics major, Dr. Saxena was awarded his PhD from Calcutta University in 1956 at the age of 22. Subsequently, he spent three years as a research associate at U.S. universities before returning to India, where he did pioneering atomic research at Bhabha Atomic Research Centre, Mumbai, before joining the physics faculty of Rajasthan University, Jaipur. Dr. and Mrs. Saxena married in India in 1964, following her completion of a master’s degree in Indian history. In 1966, he accepted a position in the Thermophysical Properties Research Center and the physics department at Purdue University, where he spent two years before joining the energy engineering department at UIC.

During his tenure at UIC (1968 – 1998) Dr. Saxena served as professor and director of the Multiphase Reactor Research Laboratory. In the course of his career, he was an active researcher on the national and international stage and a consultant to Fortune 500 companies, NASA, and the U.S. Department of Energy. He is the author of more than 500 research papers, five books, and twenty-five book chapters.

Although he loved both his teaching and his research at UIC, he is satisfied to be enjoying his retirement, full of travel, writing, and family. And he is pleased and proud to be part of the college’s future. “It was always my ambition for students to get very good professors who would inspire them, as I was at Columbia and Yale. I hope this gift will help do that since whatever I am is because the university supported me and gave me the facilities I needed to do my work.”

Satish Saxena, PhD
A Passion for Rugby

“Once you fall in love with it, it’s in your blood forever.” Rugby, that is. Not long after he said it, engineering alumnus Jon Mesik (BS ’01) was stomping around a UIC playing field on a blustery November day, hands in pockets. He was there in his role as a volunteer assistant coach to UIC’s club rugby team for the season’s final game against Eastern Illinois University. Unfortunately, fellow engineering alumnus and occasional volunteer assistant coach George Plackmann (MS ’95) was unable to join Mesik. After a long time-out in the first half to deal with an opposing player’s fractured leg and dislocated ankle, followed by a near comeback in a hard fought second half, UIC lost 29-22.

Plackmann played rugby for UIC from 1992 to 1996, Mesik from 1997 to 2001. For these two alumni, rugby seems to function as a complement to the work of engineering. Where the latter is about intellectual inquiry, collaboration, and crafting long-term pragmatic solutions, the former is about physicality, competition, and the intensity of the here-and-now.

Rugby at UIC is today, and always has been, very much a grass-roots undertaking, attracting players with a passion for the sport and little concern for recognition and coaches who coach solely for love of the game. As at many schools, it’s a club sport. At UIC that means it’s part of the recreation department and the head coach, Charlie Ryan, volunteers his time. The team’s best year was 1997; in fall 2000, they went to the playoffs and won the conference and have been to the playoffs three times since but have had no wins there.

An intensely demanding game, physically and mentally, Mesik and Plackmann value rugby both for the on-field challenges and satisfactions of the game (“An entire week of frustration can be taken out in one game,” said Plackmann) and for the off-field camaraderie among teammates. (Rugby players are famous for their postgame hospitality to the opposing team and a bit infamous for the intensity of the party.) They also note that, despite the reputation of rugby players as being either big, dumb, or both, the reality is quite different.

“Lifting in the line-out” restarts play after the ball goes out of bounds. L-R: Robert Miller (BS ’14), James Kennedy (BS ’14), Branden Myers (BS ’13); lifted: Camil Machaj (BS ’14)

For more action shots of the UIC vs. NIU game, go to flickr.com/photos/uic_engineering/sets/
“I think that stereotype is an extension of how many times gridiron football players are portrayed as big and dumb animals, but worse, because we must be crazier since we don’t wear pads or helmets,” Mesik observed. But, Plackmann noted, since rugby players “play both sides of the ball”—that is, both offense and defense—playing well requires a pretty high degree of mental agility.

UIC’s 2012 team included mostly average-sized guys studying in a variety of fields: eight engineering majors, plus guys in accounting, biochemistry, biology, neuroscience, chemistry, graphic design, directing and design, architecture, kinesiology, nursing, and psychology. Like both Plackmann and Mesik, 75 percent of the UIC team members have discovered rugby as undergraduates and are first-time players; the remainder have some experience, either here or abroad. Perhaps the most resounding contradiction to the “big/dumb” stereotype is that the UIC team has the distinction of counting among its alumni a Rhodes Scholar, Rudyard Sadleir (LAS ’98).

These days, both Mesik and Plackmann play “old guy” rugby. “We play ‘hockey style’: five minutes in, then call in the substitutes,” Mesik said. Both men have endured their share of injuries over the years. Plackmann has undergone three surgeries to repair a snapped left arm, bone spurs and torn cartilage in his ankle, and a thrice-broken nose, and Mesik admits that his knees are “kind of shot” and one shoulder isn’t in the best shape. But he seemed to speak for both when he said, “So far, the injuries have been worth it.”

Now that actual play isn’t his focus, Plackmann is the backs coach for the Chicago Riot, a Division 3 men’s rugby club founded by UIC rugby alumni. Mesik watches happily as his 2-year-old son plays with a rugby ball and is proud of his wife, who cofounded a women’s club team about seven years ago with UIC, Loyola University Chicago, and Northern Illinois University alumni.

When they’re not watching, coaching, or playing rugby, Mesik and Plackmann hold down jobs of some responsibility. Plackmann, who earned an MBA from Northwestern’s Kellogg School of Business, uses his business and engineering training to run the phenolic materials division of Resinoid Engineering Corporation, a private plastics company in Skokie, Illinois, that makes thermoset plastics. Mesik is senior mechanical engineer with Ketchmark & Associates, Inc., a full-service consulting firm in Burr Ridge, Illinois.

Because Plackmann and Mesik both found rugby such a formative part of their UIC experience, they are beginning to look at ways to support the team, perhaps by raising money to offset club dues, perhaps, someday, through an academic scholarship. In the meantime, they both plan to play in the UIC alumni game in June. How could they not? It’s in the blood.

Editor’s Note: The UIC Alumni Rugby game is slated to be played at Chicago Hope Academy Field, 2433 West Roosevelt Road, on June 1. ★

Around the College

SpiderSuit Helps User Avoid Dangers

Victor A. Mateevitsi, PhD candidate in UIC’s Department of Computer Science and research assistant in UIC’s Electronic Visualization Laboratory, has created SpiderSense, a group of sensor modules strategically placed on the wearer’s body to help “see” hidden dangers. The modules emit ultrasound waves, which are then translated into tactile signals that stimulate the wearer’s skin. Applications may include helping the visually impaired navigate their environments and assisting firefighters in smoke-filled buildings, among others. Mateevitsi’s invention grew out of the college’s human augmentics course created by professors Jason Leigh and Robert Kenyon. News of SpiderSense has generated worldwide media interest; it’s widely featured on the Web and in publications ranging from New Scientist to Forbes.

CAVE2 Makes Science Fiction a Reality

The UIC Electronic Visualization Laboratory (EVL), which introduced the CAVE™ virtual-reality display in 1992, recently premiered the next-generation CAVE2™ system, a hybrid environment that combines the benefits of both 2D tiled display walls and 3D virtual reality, at ten times the resolution. Academics, researchers, and people in industry all rely on computers to capture, filter, analyze, and visualize data. But imagine standing inside train tracks to observe distortion as trains roar past, seeing blood flow through the brain’s vasculature, or traveling to Mars, all in the same space. CAVE2’s virtual world enables people to change their size and perspective, make observations, and gain insight and knowledge unavailable in any other way. CAVE2 videos can be viewed at YouTube: youtube.com/user/evltube

(continued on back cover)
UIC’s Engineering Design Team entered three robots, winning first-place with robot Thanatos and the demolition round with robot Lamashtu. Also representing UIC with five other robots were teams from the Society of Hispanic Professional Engineers and the Institute of Electrical and Electronics Engineers. In total, more than sixty UIC students prepared over a six-month period for the two-day event.

Faculty Members Named Campus Research Stars

Two engineering professors were recognized in February at UIC’s Researcher of the Year Awards for 2012. Natasha Devroye, PhD, assistant professor, electrical and computer engineering, was named a campus Rising Star and Bing Liu, PhD, professor, computer science, was named a Distinguished Researcher. Dr. Devroye’s research in information theory focuses on determining the limits of how fast and how much data we can reliably communicate over networks. She also pioneered the information theoretic study of the “cognitive radio channel model,” which may have significant impact upon the future of wireless technologies. Dr. Liu is a pioneer in sentiment analysis (opinion mining) and considered a world leader in research on detecting opinion spam (fake reviews), which has broad implications for our ability to distinguish truth from fiction in online data.