

We're Honored

>> Professor **John Iacono**, Instructor **Özgür Özkan**, and Post-Doctoral Fellow **Pooya Davoodi** received the best-paper award at the European Symposium on Algorithms in Wrocław, Poland, this September. The highly competitive award was given by the European Association for Theoretical Computer Science for *Cache-Oblivious Persistence*, which they co-wrote with Jeremy Fineman of Georgetown University. (Persistence, a term first introduced in 1989, is the ability to go back and look at the state of a computing system at any point in the past.)

>> Assistant Professor **Justin Cappos** is the recipient of generous grants from the National Science Foundation for three research projects.

- Helping Home Network Research to SOAR, which received almost \$700,000 in funding, is aimed at improving the ability of researchers to understand smartphone and future network environments as they exist in the Internet today, so that they may improve the Internet and design better networks in the future.
- EAGER: Collaborative: Using

Cognitive Techniques To Detect and Prevent Security Flaws, whose Co-PI is Yanyan Zhuang of the University of British Columbia, aims to build a rigorous understanding of how humans think about code to eventually help dramatically reduce bugs by building more human understandable programming languages and programs.

- CRI: CI-New: An Open Observatory for the Internet's Last Mile, for which Cappos is serving as Co-PI, along with PI Nick Feamster of Georgia Tech, seeks to develop an infrastructure to gather reliable, repeatable measurements from vantage points that reflect the connectivity experienced by home Internet users.

>> **Justin Cappos** is also PI for the project Harnessing the Power of Smartphones for Risk Mitigation, which has received an AIG grant of \$183,000.

>> Associate Professor **Katherine Isbister** is a recent recipient of a Jacobs Excellence in Education Award. This semester she was also named a fellow of Stanford University's Center for Advanced Studies in Behavioral

Science (CASBS), which has been described as a place where "great minds are brought together to confront the problems of the day."

>> Eight Computer Science and Engineering papers were accepted for IEEE VIS 2014, the premiere conference for data visualization. These papers were coauthored by 7 CSE faculty members (**Enrico Bertini, Arita Dasgupta, Harish Doraiswamy, Juliana Freire, David Koop, Claudio Silva, and Huy T. Vo**) and 5 of our doctoral students (**Nivan Ferreira, Josua Krause, Anshul Vikram Pandey, Jorge Poco, and Bowen Yu**).

>> Members of our department won 2nd place in the ACM SIGMOD Programming Contest. Faculty member **Huy T. Vo**, in conjunction with the **Center of Urban Science and Progress (CUSP)**, joined with PhD students **Fernando Chirigati, Tuah-Ahn Hoang-Vu, and Kien Pham**.

>> **Juliana Freire** has received a multi-million-dollar grant through the Defense Advanced Research Projects Agency (DARPA).

ALUMNI REPORT



In a coincidence that could well have inspired an episode of *Seinfeld*, when Moshe Kaplan (with a K) arrived at the NYU Polytechnic School of Engineering, he

bumped into Moshe Caplan (with a C), a fellow student who happened to be working in the Information Systems and Internet Security (ISIS) lab. Kaplan, previously undecided about his area of specialization, was hooked. If life was, in fact, a television show, there'd now be a montage: Kaplan winning a scholarship from the CyberCorps: Scholarship for Service (SFS) program, doing an internship at the Center for Cyber Defenders at the Sandia National Laboratories, developing a framework for testing Android applications,

earning a Master's degree in 2013, moving to the Washington, D.C. area, accepting a position with the Federal Energy Regulatory Commission (FERC), and, not incidentally, meeting and marrying the love of his life.

"Attending the School of Engineering and studying cybersecurity in the Department of Computer Science and Engineering set a course for my life," Kaplan says, pointing out that had he not been here, he might not have discovered the SFS program, an NSF-funded initiative aimed at educating experts who will protect the government's critical information infrastructure. (Only students from colleges certified by the National Security Agency as Centers of Academic Excellence for Information Assurance Education are eligible to participate.) Without the scholarship, which requires recipients to work for the federal, state, or local government for two years after graduating, he might never have

considered a job in Washington. And, of course, had he not moved to that area to work for FERC—a government agency that regulates the interstate transmission of natural gas, oil, and electricity to ensure that consumers can obtain reliable, efficient and sustainable energy at a reasonable cost—he might never have met his wife.

Kaplan now works in FERC's Office of Energy Infrastructure Security (OEIS), which guides the Commission in finding solutions for protecting FERC-jurisdiction facilities from cyber attacks and physical threats. While the SFS program requires that he remain in a government post for two years, he feels fully equipped for any cybersecurity job his future may hold. "I learned from wonderful professors," he says. "From studying Java with John Sterling to researching my master's thesis with Justin Cappos to working with Nasir Memon at the ISIS lab, I received a very solid education."



BYTES FROM brooklyn

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WELCOME TO THE DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



As we settle into the fall semester, I am pleased to tell you about the many great things that are happening at the NYU Polytechnic School of Engineering. One

may think that the summertime is a slower part of the academic year, but our latest developments would tell you otherwise!

Within this newsletter, you'll find stories about PhD candidate Bowen Yu and his team, the Debuggers, who competed in Russia at the International Collegiate Programming Contest this year; Team Atlas, a group of engineering students who competed in NASA's 5th Annual Robotic Mining Competition; and PhD candidate Anshul Vikram Pandey, whose company, Accern, is growing by leaps and bounds. Faculty members Katherine Isbister, Claudio Silva, and Julian Togelius take us deeper into their research, while stories about alums Moshe Kaplan and Devorah Kletenik show us the success stories that come from a rich education here.

Further, I am excited to announce the brand-new Entrepreneurs in Residence program. Our new faculty additions, Ali Heron and Lucas Nelson, are seasoned entrepreneurs who are here to coach, educate, mentor, and network with our students. Ali Heron is currently the Director of Technology Program Management at HBO and the Chief Technology Officer and cofounder of Kwivo. She is an experienced

product strategy consultant and product manager. Lucas Nelson is a Principal at Gotham Ventures. Previously, he was the Senior Manager for Product Security at Adobe and an Investment Associate at US Venture Partners. Please join me in welcoming these important additions to our faculty.

This year, faculty member John Iacono is affiliated with one of NYU's global partners as he teaches at NYU Shanghai. I have had the pleasure of working with NYU's second partner—NYU Abu Dhabi. The Center for Interdisciplinary Studies in Security and Privacy (CRISSP), a multidisciplinary group of students interested in building new approaches to cybersecurity and privacy, is a program I am personally involved in as a professor who specializes in security. I, along with faculty Ramesh Karri and Jay Chen, also work with the Abu Dhabi branch of CRISSP. We are thrilled to have this opportunity to bridge our two communities together.

I hope this gives you an idea of the kind of exciting work that continues to brew here! Please continue to check back—with our talented professors, faculty, and students, there are sure to be more announcements and honors coming up. In the meantime, please feel free to contact us, drop by, or visit us on the Web.

Nasir Memon
Department Head
Computer Science and Engineering

A TRIFECTA OF NSA HONORS

There was good reason to celebrate early in August, when the NYU Polytechnic School of Engineering was officially honored as a National Center of Academic Excellence (CAE) in Cyber Operations by the National Security Agency (NSA). The school was the first in New York to earn that prestigious designation, which will be limited to just 25 institutions across the country, and it is now one of only a handful to have earned all three CAE designations, having been previously named a CAE in Information Assurance Education and a CAE in Information Assurance Research.

The newest laurel, signaling that a school boasts a deeply technical, interdisciplinary program with extensive opportunities for hands-on learning, was presented at a celebratory luncheon by Steven LaFountain, the Distinguished Academic Chief for Information Assurance and Cyber in the Associate Directorate for Education and Training (ADET) at the NSA.

Speaking to the attendees following the presentation, Professor Nasir Memon excitedly outlined his vision for the future of cybersecurity studies at NYU. "We're thinking of instituting an undergraduate cybersecurity degree in addition to our graduate program," he explained, "and one day we plan to have industry leaders in residence, much like some schools have artists or writers in residence." He also stressed the need for industry to partner with academia. "Businesses will need the next generation of experts we are educating," he asserted. "There is a strong case that now is the time for collective action."



GIRL POWER!

According to the Computing Research Association, a group comprised of members from across academe and industry, women represent only 8 to 13 percent of the cybersecurity workforce. The Department of Computer Science and Engineering is doing its part to close that gender gap, running an intensive two-week summer program introducing female high school students to the field. (So popular was the first two-week session that a second was added.) Run by Professor Linda Sellie, who acknowledges the support of the Alfred P. Sloan Foundation, the program touched upon programming, digital forensics, and more.

Among the highlights of the program were visits to the New York Offices of Google and Facebook, where the young women had a chance to network with accomplished female engineers, among them Eleni Gessiou, a Facebook security expert and former School of Engineering student, who not only arranged the visit to the social media giant but returned to the MetroTech Center during the program to teach UNIX

commands and, not incidentally, serve as an incomparable role model. "They were a very talented group with tons of potential, and they now know that they can reach out to me in the future if they ever need to," she says. The visit to her employer, she explains, was as enjoyable for her as it was for the students: "It was so much fun to see the girls interacting with different Facebook employees and asking questions," she recalls. "I can already imagine them applying that curiosity to the technical problems of the future."

Sellie asserts that cybersecurity is a fantastic career path for women, saying, "Women tend to want to do jobs that help the world," and Gessiou firmly concurs. "Working in cybersecurity is equivalent to protecting millions or even billions of people at the same time," she says. "Doing the job well requires a certain level of empathy and compassion toward people, and I believe women can be just as capable if not more so in bringing those qualities to their work. Protecting people has been my motivation every day, and although there are always challenging times, it's completely worth it."

Taking the Byte Out of the Data Deluge



Data scientists have pointed out that we live in the "Age of the Petabyte," soon to become "The Age of the Exabyte," and those bytes have the potential to radically transform how business, government, science, and healthcare work.

Professor Juliana Freire is playing a pivotal role in that transformation: she has been named Director of Graduate Studies at NYU's new Center for Data Science. Enjoying the support of the Gordon and Betty Moore Foundation and Alfred P. Sloan Foundation since 2013, the Center is currently home to a well-regarded master's degree program in Data Science. Its graduates, Freire and other teachers predict, will be uniquely equipped to gain practical insights from the deluge of data being generated in every facet of modern life.

CSE@MAGNET

NYU's Media and Games Network (MAGNET) is typically a beehive of activity, and many of those drawn there (like bees to honey, as it were) hail from the School of Engineering's Department of Computer Science and Engineering. That might be surprising if you've never considered computer scientists to be a particularly playful or game-loving lot.

Professor John Sterling remembers a long-ago time when gaming did, indeed, receive somewhat short shrift within the department. "Students kept asking for a course, though," he says. "Because I was a programmer who happened to be interested in games, I was charged with creating one. That's how 'Intro to Game Programming' came into being." Later, in 2009, the establishment of the Game Innovation Lab generated enormous buzz in the department. "Things really took off then," Sterling recalls. (The success and popularity of the Lab is widely thought to have been one of the catalysts for the formation of MAGNET here at the MetroTech Center, and the Lab's director, Associate Professor Katherine Isbister—see profile on page 4—now represents the School of Engineering on the MAGNET Presidium.)

To see the spirit of playfulness that pervades CSE's contributions to MAGNET, look no further than such interdisciplinary projects as Fidget Widgets, small, programmable

devices (one of which mimics the action of popping bubble wrap) to help researchers gain a better understanding of the playful, tactile experiences people engage in while at work. Or consider the development of gesture-based passwords by students of Isbister and other professors. (More than just fun, the passwords provide serious security; users move their fingers over the screen instead of entering letters or numbers, and the computer remembers the hand and gesture—as individual and hard to hack as a fingerprint.)

Andy Nealen is another member of the Department of Computer Science and Engineering who has made a major impact at MAGNET—and even brought, some might say, a modicum of fame, since his award-winning computer game *Osmos* was featured in an episode of *The Simpsons*. (In the episode, the award-winning game proves hypnotic to one of the characters.)

Working with teachers and researchers like Nealen, who are at the forefront of gaming, means that students are learning what's actually going on in the industry, and the option for CSE students to minor in game engineering means they just might be there at the forefront themselves one day. As the editors of *Game Developer* magazine pointed out in a recent career guide, "Programmers make the (game) world go round," and their salaries reflect that.



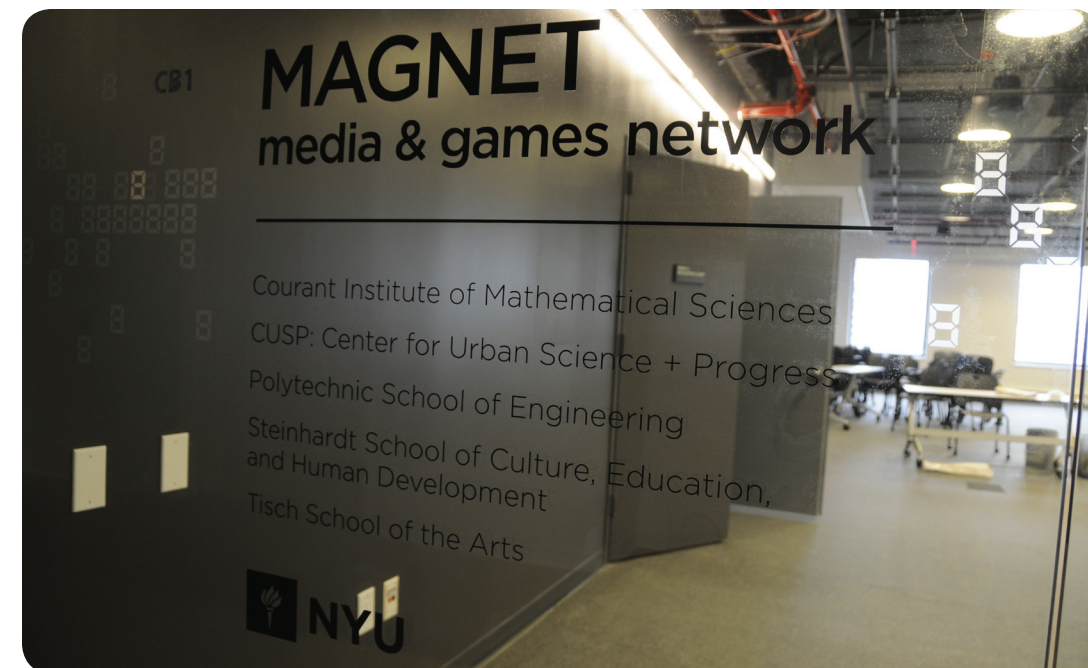
LIGHTS, CAMERA, HACK-TION

Everyone has heard of telethons, but if you're not part of the tech community, you may never have heard of a hackathon, a multi-day event during which teams work intensively and collaboratively to solve an engineering challenge.

In May, the NYU Polytechnic School of Engineering was the site of Hack NYU, and more than 20 groups tested their skills in programming, design, time management, and teamwork to develop apps aimed at making life at NYU better.

Sponsored by the Department of Computer Science and Engineering and the student club Patent Pending, Hack NYU resulted in several innovative ideas, including VChronos, an app that would help students pick an optimal class schedule, and (on the other end of the spectrum) Unplastered, a personalized app that would calculate blood alcohol level and text a friend for help if the user became incapacitated.

One app, NYU Events, which has already launched officially, uses crowdsourcing to consolidate events from all NYU schools and student groups, making it easier to RSVP to organizers and maintain a jam-packed calendar. "[That one won] best design because it was built over the course of 48 hours and it was surprisingly well-designed, which I think was pretty fantastic," Earl Co, the School of Engineering student who helped organize the hackathon, said. "It was an app that I would use myself; I admin several groups on Facebook and saw it personally as an app that I could use to tag specific things." Users should definitely start thinking of their own ideas and make sure to tag the 2015 hackathon once it's announced.



Power Play



When journalists at National Public Radio are preparing a story about the social and emotional aspects of gaming, Associate Professor Katherine Isbister is one of their go-to experts. Isbister, who also directs the School of Engineering's Game Innovation Lab in addition to her work in the Department of Computer Science and Engineering, could be heard, for example, on a segment of the program *Science Friday* entitled "Can Gaming Make Us More Social?"

During the show, Isbister described to host Ira Flatow one of her latest projects—*Pixel Motion*, a movement-based game built to explore the premise that surveillance cameras, now widely used by law-enforcement agencies in many public areas, could be

used by ordinary people to play games, make souvenir photos, and for a variety of practical, daily purposes. The game, which has been displayed at New Jersey's Liberty Science Center, among other venues, calls upon players to join in "wiping" pixels off a video feed by moving around within camera range—waving their hands, jumping, or any other active gestures they prefer. *Pixel Motion*, which was created with the sponsorship of Bell Labs, encourages the type of collaborative play that Isbister sees as the future

of gaming. "The beauty of face-to-face interaction is that we're [naturally] social creatures," she told Flatow.

On the horizon for Isbister is an upcoming book from MIT Press, *Gut-Wrenching: How Games Move Us*, and a highly competitive fellowship at Stanford University's Center for Advanced Studies in Behavioral Science (CASBS), awarded to those deemed the world's most promising, provocative, and productive scholars.

Isbister—who worked in Japan and Sweden, among other locales, before coming to Brooklyn—plans to return from Stanford with a myriad

of new curriculum ideas and networking possibilities. After that, who knows what the next big thing to emerge from her research might be? Her students are already working on a wide variety of exciting projects, from opening doors with gesture authentication to creating wearable game controllers to designing more intuitive and playful work environments. "Technology is meant to make our lives better," she says. "And the School of Engineering is a major part of that movement."

Take Me Out to the Ball Game (We Can Go by Taxi)



In 1910 a sportswriter named Hugh Fullerton and Johnny Evers, the second baseman for the Chicago Cubs, collaborated on a book they called *Touching Second: The Science of Baseball*, which promised to examine how the game developed into an "exact mathematical sport." "As a problem in geometry," they wrote, "baseball, in all of its departments, may be reduced to exact figures."

The pair would no doubt be amazed and impressed by the work of Claudio Silva, a professor

of computer science and engineering and the head of disciplines for the Center for Urban Science and Progress, who has taken that assertion to a whole other level. Along with independent visualization researcher Carlos Dietrich, Silva has developed a visual analytics system dubbed Baseball4D, which provides for the first time the ability to analyze each and every play on the field and allows both fans and industry officials to answer previously unanswerable analytics questions: are the best fielders really those who make dramatic and graceful-looking catches or are seemingly mundane players actually watching the ball and anticipating its trajectory better? Where should an infielder be positioned to best catch a ball traveling at a particular velocity?

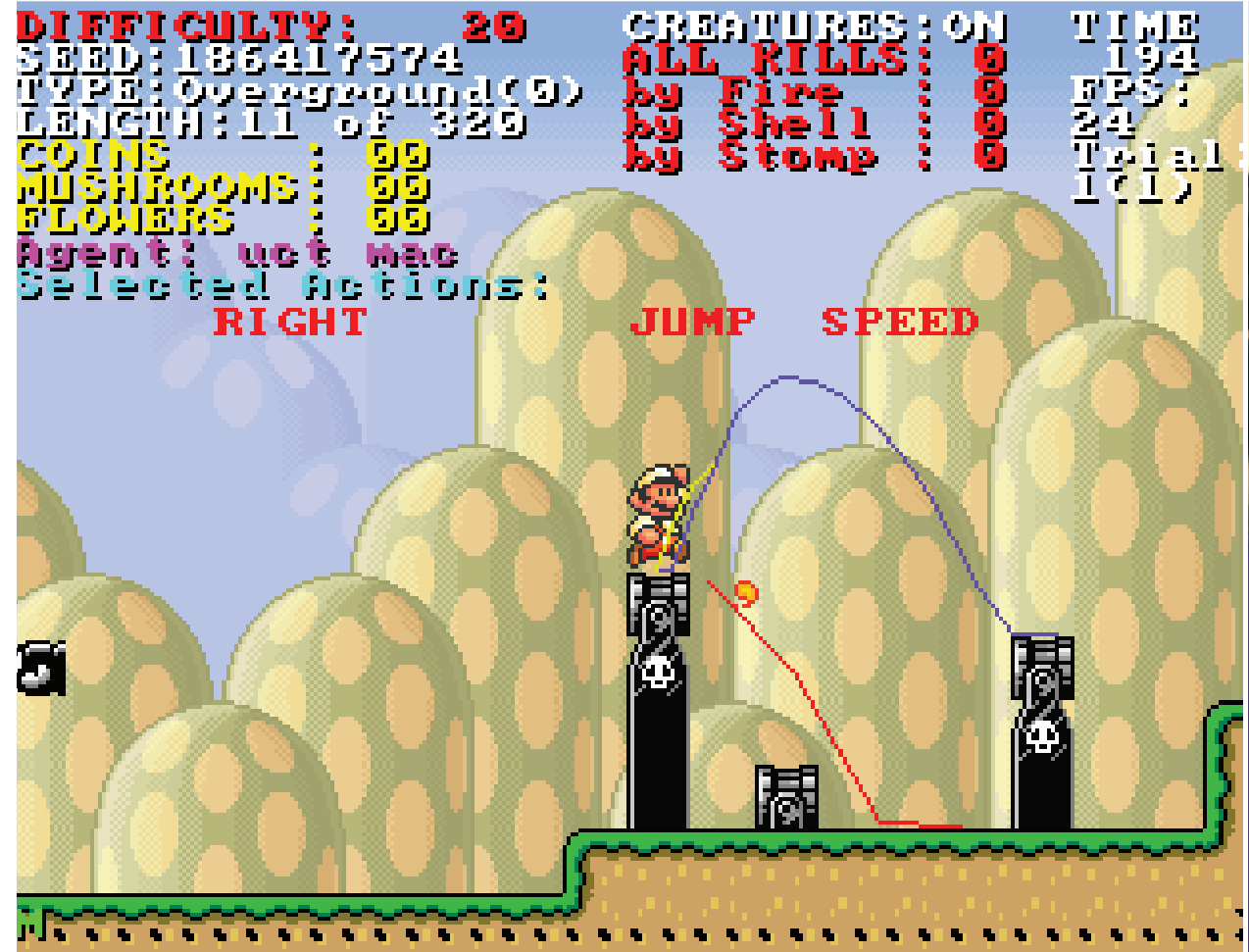
Dietrich and Silva have been collaborating with MLB Advanced Media on the development of the system—which involves groups of high-performance cameras installed throughout the ballpark along with software that produces highly interactive visualizations of the game in unprecedented detail. It is expected to be of particular benefit to coaches and scouts, who can use the new data stream to decide which players to recruit and how best to leverage their abilities. It is also being seen as a possible boon to amateur sabermetricians—those dedicated fans

who delight in endlessly analyzing every aspect of gameplay. (The term *sabremetrics* is derived from the acronym SABR—short for the Society for American Baseball Research, a group founded in the early 1970s whose statistics-crunching approach to the game was popularized by sportswriter Bill James.)

The system is now being deployed at Miller Park in Milwaukee, Target Field in Minnesota, and Citi Field in New York, with plans for it to be operational in every major-league ballpark in the nation by Opening Day in 2015.

Silva's paper, "Baseball4D: A Tool for Baseball Game Reconstruction & Visualization," will be presented in November at the IEEE (Institute of Electrical and Electronics Engineers) VIS 2014 conference, which will bring together the world's top researchers and practitioners in the field of visualization.

Baseball4D is just one of the exciting projects in which Silva is involved. Another is TaxiVis, which focuses on another fascinating data set: taxi trips, which he asserts can serve as valuable sensors. The information associated with taxi trips, Silva and his co-researchers show, can provide unprecedented insight into many different aspects of city life, from economic activity and human behavior to mobility patterns.



NYU's MAGNET Attracts— Even from 4,000 Miles Away



It's a long way from the IT University of Copenhagen to the NYU Polytechnic School of Engineering, but Julian Togelius is undaunted by the move. "New York is becoming the center of the indie game development community," he says, "and I'm excited to have the chance to work with

NYU faculty members like Katherine Isbister, Andy Nealen, and Frank Lantz. I think some great collaborative gaming projects are in store."

Togelius, a new member of the Department of Computer Science and Engineering, is at the forefront of the study of procedural content generation (PCG)—the process of creating game content (such as levels, maps, rules, and environments) by employing algorithms, rather than direct user input. Specifically, he has pioneered the use of evolutionary algorithms for such tasks. (Evolutionary algorithms are inspired by biological functions like reproduction, mutation, and natural selection.) These algorithms can work in tandem with other algorithms that recognize the player's skill and preferences to change the

game on the fly. "We try to determine what you, as a gamer, are good at and what you enjoy doing within the game," he explains. "When the game adapts to you as an individual player, it's going to be more fun."

In addition to creating customized games, PCG has the potential to make game development less costly (by eliminating the need for human designers) and more creative (because with intelligent design tools, even small teams or hobbyists could realize their visions without hundreds of hours of drudge work).

He and a group of colleagues in Denmark recently developed an artificial intelligence system that generates new card games from scratch, taking into account the number of players and their skill levels, winning conditions, and actions that can be completed each round. That type of system, he says, could have applications well beyond gaming and may one day have the potential to optimize turn-based processes like traffic lights.

With computing becoming pervasive, Togelius sees potential for such collaboration everywhere—in the past, he has collaborated with ubiquitous-computing researchers on recommender systems for surgeons in operating rooms—and that carries over to a large, diverse university like NYU. "I've lived and worked in Sweden, Denmark, Switzerland, and the United Kingdom," he says. "I'm really excited to add New York City to that list."



FROM STUDENT TO TEACHER

Devorah Kletenik knew when she arrived here to earn her doctoral degree that she had found her niche. Big enough to be a world-class center of research and scholarship yet small enough to inspire personal attention and mentoring, the School of Engineering struck her as an ideal place to study computer science. It is also, as she has discovered, an ideal place to teach.

Kletenik, who earned her PhD in January 2014, now teaches the undergraduate course "Intro to Programming and Problem Solving." Her own research, which focuses on machine learning, straddles the line between the theoretical and the applied; she is exploring how to reduce the costs of using Boolean classifiers. It's a pleasure, she says, to work with young computer science majors, a category into which she would have fit not too long ago. "They are eager and enthusiastic," she says, "and ready to make this department their own niche."

NYU Engineering Students Design to the Moon and Back Again

You may never have given much thought to regolith, the layer of powdery substance that covers virtually the entire surface of the moon, much of Mars, and some asteroids—unless, that is, you work for NASA or happen to be an engineering student.

This year a team of NYU Polytechnic School of Engineering students took part in the Fifth Annual NASA Robotic Mining Competition to design and build a robot capable of traversing Martian terrain (known for its chaotic crags, craters, and hills), excavating as much simulated regolith as possible, and depositing it in a collection bin within 10 minutes.

While fun, the contest has a serious purpose: advances in Martian mining have the potential to significantly contribute to our nation's space-exploration operations.

The NYU School of Engineering team, which dubbed itself "Team Atlas," was comprised of Eason Smith, an electrical and computer engineering major, who served as captain; Nicholas Reid, who is majoring in computer science and physics; Kevin Veerasammy, an electrical engineering major; Devon Simmons and Pawel Sawicki, both mechanical engineering majors; Sam Huang, a computer science major; and Elizabeth Syso, who is majoring in mathematics with a computer science minor. Each was a sophomore, making Team Atlas among the youngest groups at the competition, which drew many seniors and graduate students from other universities to NASA's Florida headquarters.

Under the guidance of Haldun Hadimioglu, a faculty

member in the Department of Computer Science and Engineering, the team built the Atlas4, which at just over 26 kilograms was one of the lightest robots competing. The Atlas4 used its unique wheels, each made of several interlocking 3D-printed pieces, to dig into the regolith and deposit the material into a bin in its midsection. Once that bin was full, the robot traveled over the rough terrain—designed to resemble the punishing surfaces of Mars—to the official dumping bin and tipped the soil it had collected, via a conveyor belt. The entire process—which team members directed by means of a repurposed Xbox 360 controller—was repeated until the 10 minutes had elapsed.

Teams were scored on the amount of regolith collected by their robots, which were required to be not only light but dust resistant, agile, and as autonomous as possible.

The contest—formerly known as the Lunabotics Mining Competition—is always a compelling spectacle: Because the material used to mimic real regolith is an exceptionally fine powder, participants don full hazmat suits and protective respiratory gear before entering the arena and readying their robots.

Team Atlas is now looking forward to NASA's sixth annual competition. "We are actively seeking to recruit new members, and we want to attract the best, most motivated students at the school," Smith explained, adding that donations from several dedicated alumni had made the Atlas4 possible. "We're proud of what we accomplished this past year, and I think we can do even better next year."

RUMOR HAS IT

Anshul Vikram Pandey admits that it can be difficult to attend school and develop a business at the same time, but the PhD candidate is making it work. "Everyone in the Department of Computer Science and Engineering is very supportive of entrepreneurial efforts," he says. "They helped me to realize after I spent several months writing code on the weekends that what I was doing was much more than a hobby. It was a serious enterprise that was going to require a major investment in time."

That enterprise, which he launched in mid-2013, is Accern, which uses advanced natural language processing, event detection, filtration, and machine learning algorithms to mine deeper regions of the Internet in order to provide institutional investors with news that hasn't yet been picked up by major sites. These "actionable rumors," as Pandey calls them, might include information about important events, such as lawsuits and takeovers, and they can have appreciable effects on a company's stock prices and market share. Accern combs more than seven million sources daily, most ignored by large search engines because they don't generate enough traffic.

So how does Accern determine if a site is reliable? Pandey explains, "Say you have a blog where you write about a particular financial topic. Maybe you don't have a lot of readers and maybe you don't show up high in any search results. But suppose your content is repeatedly picked up, or contextually similar content is re-posted at some point by Bloomberg or CNN, even if it's too late to be of actionable use by



investors. Our proprietary algorithms will rank you as a good source and we'll get that information out to investors in a more timely way."

Accern—which has been included on industry watch lists of the "Top 150 Technology Startups" and "Global Hot Technology Startups"—is now working with a number of major hedge funds—a welcome,

but exhausting, turn of events. "We have an office on Wall Street, and I go there and work for several hours when I'm done with school," Pandey says. "But even if I made a million dollars tomorrow, I'd still continue to focus on my graduate studies too. Professors like Nasir Memon and Enrico Bertini have a way of inspiring you to great heights."

A GLOBAL VISION



Bowen Yu was a student at Peking University, earning an undergraduate degree and working with the school's Visualization and Visual Analytics Group, when he heard that Claudio

Silva would be teaching at the NYU Polytechnic School of Engineering. Suddenly, the choice of where to study for his doctoral degree became plain. "In addition to the chance to study with Professor Silva, the School of Engineering is a great choice for anyone interested in data visualization, simply because of the enormous amount of data available in New York City," he explains.

Yu arrived here in 2012 and later began working on developing software that will aid biologists studying the gene regulatory network, which determines how genes interact with one another and plays an important role in every crucial life process, including cell differentiation and metabolism. He collaborates with members of the NYU Center for Genomics and Systems Biology. Yu is the lead author of a paper, "Genotet: An Interactive Web-based Visual Exploration Framework to Support Validation of Gene Regulatory Networks," that has been accepted for presentation at the next IEEE VAST conference, a premier gathering for those interested in Visual Analytics Science and Technology.

The 2014 meeting is being held in Paris, but his work has already taken him even further afield.

This past summer, he and teammates Fabian

Gundlach and Danilo Neves Ribeiro, both NYU Courant exchange students, traveled to Ekaterinburg, Russia, to participate in the Association for Computing Machinery's International Collegiate Programming Contest (ACM-ICPC), an annual multi-tiered programming competition for university students from around the world. Bagel-Flavored Debugging, as they dubbed the team, triumphed in the competition and was named the North American champion. Professor Nasir Memon, the head of the Department of Computer Science and Engineering, said of the victory, "This is another in a long line of exciting news coming out of the department. We were proud to have Bowen representing us in Russia, and being chosen to present at IEEE VAST 2014 is another great accomplishment for him."

Yu has no doubt that he made the right decision when he came to Brooklyn. He is grateful to be associated with not only Claudio Silva, but with his colleagues in the genomics lab, his fellow "Debuggers," and Harish Doraiswamy, a supportive postdoc in his research group. "Overall, the School of Engineering has provided me with the opportunity to work with these outstanding people, so that I can learn, think and improve," he said.