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Mary Levin / UW

The winning team for the National Collegiate Cyber Defense Competition, posing in their makeshift training room in Sieg Hall. Rear: Karl Koscher (co-captain), Conrad Meyer, Ian Finder, Mary Pimenova, Cullen Walsh, Alexei Czeskis (holding trophy, captain), Melody Kadenko (team adviser). Front: Mark Jordan, Baron Oldenburg.

CSE Security and Privacy Research

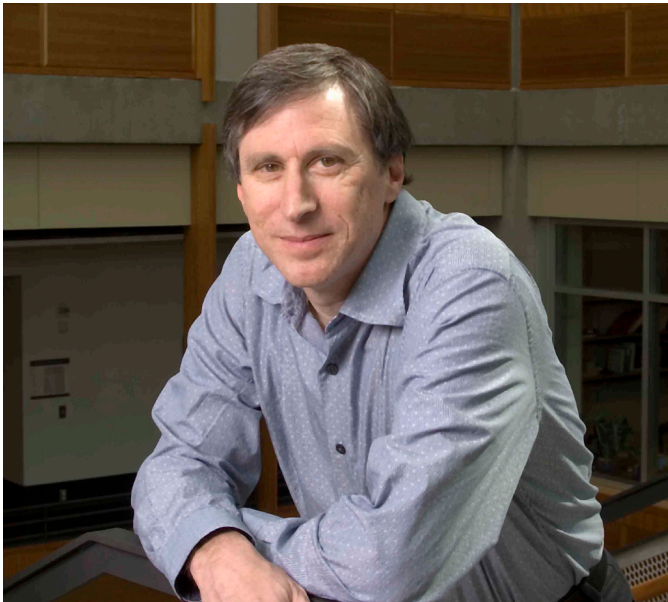
Computer security and privacy are important issues for everyone. Individuals want to be protected against identity and personal data theft. Corporations make huge efforts to protect customer information and intellectual property and keep services running in the face of adversaries. Governments try to protect national secrets and safeguard critical infrastructure. UW CSE is having widespread impact on the computer security and privacy landscape. Below, we hit a few of the highlights. Learn more at: <http://seclab.cs.washington.edu>.

UW CSE Cyber Defense Team wins top national prize

Each year since the inception of the Pacific Rim Collegiate Cyber Defence Competition in 2008, UW CSE has fielded a team. Each year, UW CSE's team has taken first place in the regional competition and gone on to represent the department, the university, and the region in the national competition. And each year at nationals, the UW CSE team has fallen just shy of placing.

This year, though, was different! This year, the UW CSE Cyber Defense Team came out on top, winning the National Collegiate Cyber Defense Competition (NCCDC). The eight team members were graduate students Alexei Czeskis and Karl Koscher, and undergraduate students Conrad Meyer, Ian Finder, Mary Pimenova, Cullen Walsh, Mark Jordan, and Baron Von Oldenburg. Melody Kadenko served as team adviser.

From where I sit...



The end of the academic year is a chance to reflect on recent accomplishments of the UW CSE community. For example, just a few months ago, two of our newer faculty received prestigious Sloan Research Fellowships, bringing CSE's nation-leading Sloan total to 17! Anup Rao received the award for his research in theoretical computer science, and Georg Seelig (who has a joint appointment with Electrical Engineering) for his work in programming DNA and RNA molecules. Shwetak Patel (also joint with EE) received the 2011 UW College of Engineering Junior Faculty Innovator Award. Stuart Reges received UW's Distinguished Teaching Award — the fifth CSE faculty member to receive this highest award given at UW for teaching. James Landay was recently elected to the CHI Academy for his contributions to Human-Computer Interaction, and Dieter Fox was elected a 2011 Fellow of the Association for the Advancement of Artificial Intelligence, our fourth AAAI Fellow (most recently preceded by Pedro Domingos, who received this honor in 2010). Our students, too, continue to do amazing things — in this issue of MSB you'll learn about the national champion Cyber Defense Team, two new Google Anita Borg Scholars, graduate student Yaw Anokwa's UW Graduate School Medal, undergraduate student Mark Bun's Goldwater Scholarship, high school student Akash Badsha's "Best of CHI" award, and many other phenomenal accomplishments.

We continue to have lots of interaction with many of our former students. For the second year, we will honor two of our most successful alumni at our graduation ceremony with the CSE Alumni Achievement Awards. This year's honorees are Anne Condon (PhD '87), head of computer science at the University of British Columbia (as of July 1), and Jeremy Jaech (MS '80), one of Seattle's most successful entrepreneurs, and co-founder of Aldus, Visio, and Trumba. As well, Ed Lazowska

ran a terrific Leadership Seminar Series this spring that featured alumni and friends, who shared their career path experiences with CSE undergrads. It's been great catching up with so many of these talented people and learning about all they've accomplished. Seminar guest speakers included Greg Badros (Facebook), Wayne Yamamoto (founder of Charity Blossom), Brad Fitzpatrick (Google), Crystal Hoyer (Microsoft), Tam Armstrong (Bungie), Lauren Bricker and Hélène Martin (CS teachers at Seattle's Lakeside and Garfield High Schools), Jeremy Jaech (entrepreneur), and Brett Helsel (Isilon Systems). We are looking forward to meeting many of our Bay Area alums at an event to be held at Pixar on June 30th; for information, please contact Kay Beck-Benton (kbeck@cs.washington.edu).

Finally, UW will soon have new leadership. Mark Emmert resigned as UW president last year to become president of the NCAA. Just a few weeks ago, at a press conference held in the Allen Center, Michael Young was introduced as UW's new president by Herb Simon, chair of the Board of Regents. President Young, who has been president of the University of Utah since 2004, immediately won us over by displaying a deep knowledge of Utah's many ground-breaking accomplishments in computer graphics! We are excited to welcome President Young and are looking forward to having his experience, talent, and interest in computer science in the university's top leadership post.

Wishing all of you a happy, healthy, and fun summer!

Henry M. Levy
Chairman and Wissner-Slivka Chair

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Stuart Reges: Distinguished Teaching Award

More than a third of UW undergraduates will have an opportunity to take a class designed by Stuart Reges, winner of this year's University of Washington Distinguished Teaching Award. Some of them may be surprised to leave the course considering a career in computer science.

About eight years ago, UW CSE decided to follow Stanford, Berkeley, Carnegie Mellon, and other universities in making coordination of the introductory programming course a specialty to be handled by an expert.

CSE chair Hank Levy characterized the UW's introductory programming class at that time as "a disaster."

"We placed that disaster in Stuart's hands," Levy wrote.

The turnaround was dramatic. A chart of undergraduate enrollment in computer science at the UW shows a sharp inflection point when Reges was hired in 2004, and a steady increase ever since. In 2009, Reges became the first member of the UW's College of Engineering promoted to the rank of principal lecturer.

"The reason that I want to teach 1,650 students a year is that I find the ones who are talented and enthusiastic, and then I ask them: 'Why aren't you considering computer science?'" Stuart Reges

"There were high numbers before," says Reges, pointing to the dot-com peak in the late 90s, "but we're setting records."

Last year more than 1,600 students took CSE 142, "Introduction to Computer Programming." More than 500 women enrolled, which is also an all-time high. A former student describes Reges' lectures as "a mixture of clear concepts, useful examples, and interesting facts." Evaluations from hundreds of students enrolled in an introductory programming course last fall were a perfect 5.0.

Among the reasons for Reges' popularity is what he calls "nifty assignments" — coding assignments that illustrate a concept, but are also fun. One has students create a program where you can type in any name and it calculates all the words that can be formed using the same letters. Another programming assignment has users complete a standard personality questionnaire and then maps the results along four personality dimensions. Reges has written a book on "nifty assignments" that is now used in more than 100 colleges and universities across the country.

Reges is a late convert to computer science who encourages others to consider all their options. As an undergraduate, Reges majored in math, but he also won university-wide awards for English and poetry. He pursued graduate research at Stanford in artificial intelligence only to discover that his real love was teaching. Students who flock to his classes discover a passionate evangelist for his discipline.



"The reason that I want to teach 1,650 students a year is that I find the ones who are talented and enthusiastic, and then I ask them: 'Why aren't you considering computer science?'"

Many of the students in this category are women; award nominators credit Reges for helping the department recruit and retain a record number of female students.

"Stuart is the master of captivating and organized lectures, well-scooped assignments, and fair grading," says Hélène Martin, a UW CSE alum who now teaches computer science at Seattle's Garfield High School, "but what sets him apart from other teachers is his ability to inspire students individually and develop their passions." Hélène is among many former students who credit Reges with their career choice.

Key to Reges' success is what has been referred to as a "phalanx of undergraduate teaching assistants." He used a similar strategy in previous positions at Stanford and the University of Arizona. Reges works to create a community among the TAs, holding a weekly meeting where they cover course updates but also share food and discuss their different approaches to teaching the material. The TAs can decide how to run their sections and have input into the course as a whole. Last year, the department had 98 applications for nine TA positions, and for the first time could not interview all the applicants.

On top of lecturing, Reges also holds an optional honors section, a separate class where top students meet once a week for small-group discussions. Sometimes that time takes him well beyond the standard workday. Reges notes that on a recent evening, he held an honors section from 7 to 9 p.m., then stayed later to talk with students. What makes it worthwhile, he says, is seeing what a difference an outstanding teacher can make.

"To be able to have this kind of impact on people's lives is just incredible."

(Continued from first page)

Security and Privacy

The competition

The NCCDC competition is a three-day event during which teams must defend, administer, and maintain the computer systems of a fictional small company in the face of real attacks. The company network has all the typical small business components: a web server, email, network switch and firewall, a DNS server, customer data and personally identifiable information, intellectual property, workstations, servers, and so on. The types of systems vary (from versions of Windows to different distributions of Linux to Solaris), and the teams know nothing about these prior to the start.

The previous "administrators" of the company were not security minded and left the company systems unpatched, misconfigured, vulnerable, and potentially running intentionally malicious programs. As teams enter the competition area and sit behind their monitors, the red team (professional hackers from the Air Force, Navy, and various consulting firms) begins attacking each company's network. Adding to the pressure, competing teams have to perform standard business operations in the midst of these attacks: setting up VPNs, adding user accounts, performing password audits, adding portals to the company e-commerce website, and more. During the competition, the teams are allowed to bring only paper notes or books with them; no staged resources (online or otherwise) are allowed.

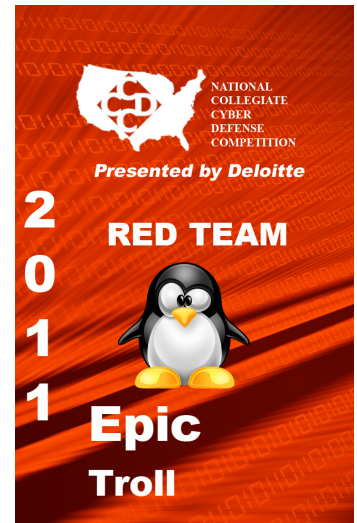
There are no breaks or down-time. Tensions run high and the adrenaline keeps pumping. Services go down. Websites get defaced. Customer data gets lost. There is always more to do than there is time. If a team unplugs its network in order to patch, it loses the competition. This year, one team had all of its computers wiped: all of the company data (and operating systems) gone; none of their machines would boot. In other words, the competition is brutal.

The UW CSE team

The UW CSE team was a bit rag-tag compared to the competition. The team trained on refurbished hardware (pulled from one of the team member's basements) in a makeshift lab in Sieg Hall (which, as alums know well, has seen better days). Unlike the teams from many other schools, they were not sponsored by a company. Administrative staff member Melody Kadenko volunteered as team adviser when it was discovered at the last minute that a rule change required an adviser to accompany each team to the national competition. In the best CSE tradition, though, the team had a lot of spirit, pride, energy, and ability! Part of the team's strength was its ability to innovate, react quickly, and create ad hoc solutions on the spot. For example, one team member wrote a network service monitoring program from scratch that let the team know the instant a service (e.g.,

HTTP[s], POP/SMTP, DNS) went down. This helped the team catch attacks the instant they happened and prevent them from spreading further. And another member came up with a non-standard egress traffic firewall that made it much more difficult for attackers to maintain a persistent threat on the team's systems.

The team's ingenuity was not limited to just the competition environment. While competition rules forbade tampering with other teams and attacking the red team, the rules did not prevent practical jokes regarding the physical access control of the competition. Having read the competition rules ahead of time, the UW CSE team came prepared with a card printer. On the first night, the team created fake red team badges and proudly paraded with them during the second day. The actual red team enjoyed the UW CSE team's badges so much that they traded a real red team badge for one of the UW CSE fake badges.



CSE team's fake red team badge

When tensions ran high during the competition, the UW CSE team came up with humorous ways to bring the atmosphere back to normalcy. The team would break out in song (the Angry Birds theme song) to mimic the Angry Birds peace treaty. This would signal to everyone that it was time to relax and that everything would be okay.

The results

The UW CSE team hoped to finish in the top three, but didn't expect to win — they had enjoyed themselves and performed well, which is what mattered. When another team was announced as the third place winner, UW CSE team members were disappointed — maybe they hadn't made the top three. When another team was announced as the second place winner, hearts sank. Then the winning team was announced: UW CSE! The screaming team members were presented with a huge trophy, which now graces the Allen Center front office. (It's too big to fit in any of our display cases!) Everyone on the team received multiple job offers after the big win (but just about everyone already had plans).

To learn more about the team or to read interviews given by the team to various media outlets, visit the team page:

<http://www.cs.washington.edu/homes/aczeskis/ccdc/>.

For more information, to sponsor the team, donate hardware, or join, contact Alexei Czeskis at aczeskis@cs.washington.edu.

Security and privacy of modern automobiles: Opening new research directions

UW CSE is known for opening up new security and privacy research directions (e.g., the security of implantable medical devices: <http://www.secure-medicine.org/>). Recently, UW CSE security and privacy researchers partnered with University of California San Diego (UCSD) to form the AutoSec (automotive security) group; together they have once again given the security and privacy research community something new to think about. In their first work, the AutoSec group experimentally found that an attacker who is able to infiltrate virtually any electronic control unit (ECU) of an automobile can leverage this ability to completely circumvent a broad array of safety-critical systems. In their second work, the group showed that an attacker is able to do so remotely. The AutoSec group's findings have not only impacted the scientific community, their efforts have also given rise to new policies at the corporate and legislative level.

The AutoSec group

The AutoSec group is composed of researchers at UW and at UCSD (some of whom are UW CSE alums). The UW CSE team members are PhD students Alexei Czeskis, Karl Koscher, and Franzi Roesner, undergraduate Conrad Meyer, Professor Shwetak Patel — all led by Professor Tadayoshi (Yoshi) Kohno. You can find the full list of the AutoSec members at:

<http://www.autosec.org/people.html>.

Computers in cars — Some background

Modern automobiles are pervasively monitored and controlled by numerous computers (50-70 in luxury sedans) coordinated via internal vehicular networks. Many of these computers help increase the overall automobile safety, efficiency, and comfort (think anti-lock brakes, airbag sensors, the infotainment system, and lots more). Additionally, automobiles are increasingly becoming connected to the external environment. Many modern cars not only have a radio with CD/AM/FM/XM/USB capabilities, but also have complex telematics systems (e.g., BMW's ConnectedDrive, Ford's Sync, GM's OnStar, and others). Most of these systems can connect to a phone through Bluetooth for hands-free calling, to satellites through GPS for in-car navigation, to the cellular network for data services (e.g., map data or on-demand help), and some telematics systems are even deploying app-stores. The AutoSec group formed to investigate (both theoretically and experimentally) what could happen if a malicious person attacked these systems.

What the AutoSec group did

The team bought two mid-range 2009 sedans — one to be used at UCSD, the other at UW — to replicate and validate experiments. Next, the AutoSec group analyzed, researched, and investigated how various car electronics worked. They did

not have access to any manufacturer tools or information other than was publicly available. During their investigation, the AutoSec group developed sophisticated firmware and software for analyzing and auditing the automotive environment. Many of the initial tests were performed in the laboratory and were verified with the car on jack stands. Finally, after the group had uncovered many potentially alarming vulnerabilities, the findings were validated on live road tests on a decommissioned airport runway.



Road testing on a closed course (a de-commissioned airport runway). The experimented-on car, with our driver wearing a helmet, is in the background; the chase car is in the foreground. Photo by Mike Haslip.

What the AutoSec group found

The group found that an attacker who was able to compromise any one of the car's many computers, could fully control almost every other computer in the car. For example, the AutoSec group showed full control of the lights, windows, doors, radio, dash, heating and cooling. They could also enable or disable any or all of the brakes, start or kill the engine, release the shift solenoid, or reverse the brake pedal function. Furthermore, they were able to replicate all of these capabilities both at rest and at speed. Some tests were not performed because of safety concerns (like deploying the airbag). These findings, a detailed analysis of how and why these issues occurred, along with recommendations as to what could be done, were presented at the 2010 IEEE Symposium on Security and Privacy in Oakland, California.

While the paper was well received by members of the automotive industry, others considered the possibility of a remote compromise of a car somewhat far fetched. In response, the AutoSec group conducted more research and published a follow-up paper showing that remote attacks are possible. For example, the group created a file that would play normally on a PC, but when burned on a CD and inserted into a car, would exploit the radio, causing arbitrary code to execute. The demo CD had a benign payload that would unlock the car doors. In other attacks, the group showed that they were able to remotely exploit the car (over an arbitrarily long distance)

Continued on page 9

Datagrams

Dieter Fox elected AAAI Fellow

CSE's Dieter Fox has been elected a Fellow of the Association for the Advancement of Artificial Intelligence for his substantial contributions to this specialty and the transfer of artificial intelligence to the fields of robotics and ubiquitous computing. Dieter is the fourth CSE faculty member to receive this honor; he joins CSE professors Pedro Domingos, Oren Etzioni, and Dan Weld, and former CSE professor Henry Kautz (now at the University of Rochester).



ODK in use on the international space station



Open Data Kit (ODK), now in use on six continents, has learned just how far its reach extends. In early May, the UW Change group received an email from Carbon For Water, explaining that the organization is using 4,000 ODK-

enabled phones to collect data that is being used to support Vestergaard Frandsen's campaign to distribute LifeStraw Family water treatment units to 4 million people in Western Kenya. Evan Thomas of Manna Energy wrote: "ODK has enabled us to easily train 4,000 community health workers in how to use the smartphone application, and we are now getting records in at a rate of about 50 per minute [about 40,000/day]. We expect a total of over one million records by June 1, 2011. This project has broad reach. We even have an astronaut on the International Space Station who is monitoring the project via the ODK database." As of May 16, Carbon For Water has accumulated ~370,000 forms. More information about ODK may be viewed here: <http://opendatakit.org/>.

Richard Ladner honored with UW Undergraduate Research Mentor Award

CSE's Richard Ladner is one of five UW faculty members honored with an Undergraduate Research Mentor Award. Every year, students who present their work at UW's Undergraduate Research Symposium are invited to nominate their mentor for special recognition. A committee then selects a few awardees from those nominated to honor at the annual symposium, traditionally held in late spring. More information about the Undergraduate Research Symposium may be viewed here:

<http://exp.washington.edu/urp/symp/index.html>.



Shwetak Patel receives 2011 UW COE Community of Innovators, Junior Faculty Innovator Award

Shwetak Patel, a faculty member in CSE and EE, received a 2011 College of Engineering "Community of Innovators" Award for his research, student mentorship, and teaching. Each year, these awards recognize college faculty, students, and staff who have gone "above and beyond." Shwetak shares the Junior Faculty Innovator Award with EE's Brian Otis.



James Landay elected to CHI Academy



The CHI Academy is an honorary group of individuals who have made extensive contributions to the study of Human Computer Interaction and who have led the shaping of the field. CSE's James Landay was elected this year for his research over the past two decades, which has included contributions in

the areas of automated usability evaluation, demonstrational interfaces, ubiquitous computing, user interface design tools, and web design. As his citation notes: "But James' most lasting legacy will be his outstanding ability to create communities of HCI researchers (Berkeley, Intel Research Seattle) with international prominence and lasting impact."

Anup Rao and Georg Seelig win Sloan Fellowships

CSE's Anup Rao and Georg Seelig have been selected to receive 2011 Alfred P. Sloan Research Fellowships, among the most selective awards for young scientists. Rao and Seelig are the 16th and 17th UW CSE faculty members to be honored with Sloan Research Fellowships.

Rao, an expert in the theory of computation, joined CSE in 2010. His interests include finding mathematical explanations for why some computational problems are fundamentally harder than others, and discovering the limitations of efficient computational processes.



Seelig, a synthetic biologist, joined CSE and EE in 2009. He is interested in understanding how biological organisms process information using complex biochemical networks, and how such networks can be engineered to program cellular behavior. Engineered circuits and circuit elements are being applied to problems in disease diagnostics and therapy.



James Fogarty wins 2011 NSF CAREER Award

CSE's James Fogarty has won a coveted NSF CAREER award. He explores human-computer interaction, user interface software and technology, and the obstacles to widespread adoption of ubiquitous sensing and intelligent computing technologies. James is the 29th CSE faculty member to receive a CAREER award.



Oren Etzioni, Yoky Matsuoka named Entrepreneurial Fellows



CSE's Oren Etzioni and Yoky Matsuoka were honored as inaugural UW Entrepreneurial Faculty Fellows.

The honorees

have achieved success in translating their research into products and therapies or started ground-breaking programs for translation or collaboration with industry. Fellows will mentor colleagues with entrepreneurial aspirations, advise the UW Center for Commercialization on its programs, and provide input on UW policies and programs related to entrepreneurship.

Warren Jessop Retires!



It's official! April 29th marked Warren Jessop's last day in CSE. Not many of us were around when Warren joined CSE as a

grad student in the early '80s. Starting in 1982, he worked for the VLSI Consortium (including working with a replica of the VAX-11/780 museum piece in the Atrium) and later joined the CS Lab staff to provide broader departmental support for Sun workstations. In 1999, he assumed the management of the Lab's Support Group, which at the time he termed "grabbing the third rail of the lab." Warren created a high-functioning operation, which keeps the trains running on time and the services humming. Our thanks to Warren for 3+ decades of dedication and contributions to CSE!

Hank Levy Elected to NAE

CSE's Hank Levy is the newest member of the National Academy of Engineering. Levy, who holds the Wissner-Slivka Chair of Computer Science & Engineering, has been department chair since 2006. He was among 68 new members and nine foreign associates elected this year for the highest professional distinction accorded an engineer. NAE honored Levy for his contributions to design, implementation, and evaluation of operating and distributed systems, and processor architectures.



In February, CSE colleagues surprised Levy with the news at what he thought was an "emergency" conference in Gates Commons with COE's Dean O'Donnell and the department executive committee. Instead he was greeted with the sound of champagne bottles being uncorked.

Levy has authored two books and over 100 papers on computer systems design and has supervised 23 doctoral students and 17 masters students. He has also co-founded two companies, Performant, and Skytap, and serves on the advisory boards of Isilon Systems, Zillow.com, Corensic, and Madrona Venture Group. He joins Susan Eggers and Ed Lazowska as CSE's members of NAE.

2011 Discovery Days



Nearly 4,000 K-12 students visited the UW for Engineering Discovery Days, held April 22-23. In this photo, attendees check out the Interactive 3D Visualization of Maps with Kinect Depth Cameras in the Atrium.

Second Annual CSE Alumni Achievement Awards

CSE honored Anne Condon and Jeremy Jaech during its June 11th graduation ceremony and at a dinner the prior evening. These awards reaffirm to CSE graduates (past, current, and future) that each contributes to a long, successful line with impact far and wide.

Anne Condon (PhD '87)

Computer science theoretician, leader, and mentor

"The Unbounded Power of Randomness" is the intriguing title of a blog article one of Condon's research colleagues wrote about their theoretical work on the power of randomness



and nondeterminism in finite state machines. Condon is a computer science theoretician whose research has moved in a purposeful direction from complexity theory to DNA computing and algorithms for biology.

Condon becomes head of the Department of Computer Science at the University of British Columbia on July 1, the next step in a career of nonrandom, unbounded opportunity.

Her journey began in 1978 at University College Cork in Ireland, where she was among a pioneering group of students, about 35 percent women, who double majored in mathematics and computer science. "The women were a strong group academically who could have gone into any field, but we chose a nontraditional path at that time," Condon said.

She says she was "very lucky" to be accepted into the UW CSE doctoral program. "I had no idea where Seattle was until I bought my plane ticket. Then I was blown away by the beauty and the unbelievable mountains. The department was so friendly, and I felt immediately at home." CSE, of course, is equally lucky to count her as an alumna.

Condon had little experience in the applications and systems side of computer science, but was excited by the questions raised and intellectual challenges of tackling problems that are difficult to solve on a computer and then finding a way no one had considered. Her doctoral work, advised by professor Richard Ladner, was recognized in the ACM Doctoral Dissertation Award competition.

After joining the faculty at the University of Wisconsin - Madison, Condon began research on DNA and RNA computing and earned

a National Science Foundation Young Investigator Award. She returned to the Pacific Northwest in 1999 to join the faculty at UBC, where she held a chair endowed by NSERC/General Motors. She has also served the university as associate dean for faculty affairs and strategic initiatives.

Condon's current research uses thermodynamic energy models to predict the secondary structure of nucleic acids from the base sequence, and prediction tools to design biomolecules. She's also collaborating with researchers at the British Columbia Cancer Agency, on alignment of next-generation sequencing data. "I'm really enjoying this research. Our aligners are the first step in an analysis pipeline that is yielding important insights as to how cancer evolves and can lead to new approaches for detection, treatment, and prevention," she said.

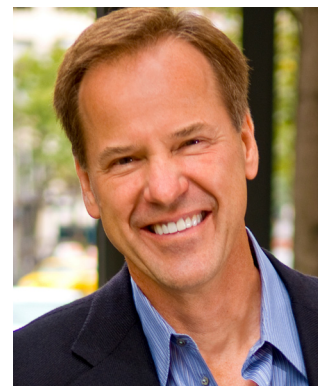
Condon's other passion is creating research experiences for undergraduate women so they will become excited about the potential for careers in this arena. The Computing Research Association honored her with the 2010 A. Nico Habermann Award for her "long-standing and impactful service toward the goal of increasing the participation of women in computer science research." In receiving the Habermann Award, she follows in the footsteps of her PhD advisor Richard Ladner, who was honored in 2008.

UW CSE celebrates a star academician rising high in our field.

Jeremy Jaech (MS '80)

Entrepreneur, technology disrupter, paradigm changer

Each year UW CSE spins graduating students out into the world to launch their careers. It's hard to imagine achieving greater success than Jeremy Jaech, who, following his UW CSE Masters degree (advised by Alan Shaw) became a cofounder of three software companies that have earned him status as a serial entrepreneur and leadership in the community as chair the Washington Technology Alliance.



Early career stops were a Boeing computer-aided design research group and Atex, a maker of industry-changing computer systems for newspaper and magazine production.

Jaech has made his greatest impact through graphics software that has "disrupted" the technology status quo. In 1984 Jaech

(Continued from page 5)

and four Atex colleagues dove into entrepreneurship by founding Aldus Corporation, which invented desktop publishing (in the form of its PageMaker software) for the new Apple MacIntosh platform, then the most sophisticated graphical interface of any personal computer.

"Good timing and luck play an important role in entrepreneurial success, and I've been very lucky," Jaech said at a talk to CSE students in May. "Apple had just developed a \$7,000 laser printer with a graphical interface, but had no software to attract potential users. When Apple learned about PageMaker, they bundled our \$500 software with \$15,000 worth of hardware and both PageMaker and MacIntosh took off and revolutionized the publishing and printing industry."

"I believe success is all about being disruptive and creating opportunities," Jaech said. "The best new products have no competition because they do things that are not possible with existing technology."

After five years at Aldus, Jaech retired for the first time at age 35, but soon eager for a new challenge, he and two former Aldus colleagues founded Visio in 1990 and scored another spectacular success with paradigm-changing technical drawing, flow chart, and diagramming software that filled a big need in the business world. Microsoft purchased Visio for \$1.3 billion in 2000 and marketed the software worldwide as a stand-alone MS Office application. Jaech entered retirement number two, focusing his energies on service to community organizations and corporate boards.

The pleasure of collaborating with creative people and the entrepreneurial itch led to the founding of Trumba in 2003, a small but successful company that provides web services to organizations promoting events on their websites. Jaech added yet another challenge to his portfolio in late 2008 when he became CEO of Verdiem, a young IT company developing energy-saving power management software for PC networks.

After turning the company around financially, Jaech embarked on "retirement" number three in March, which includes spending time at the UW, the alma mater he admires for its ground-breaking research, friendly culture, and excellent basketball team. CSE has given him a fifth floor office in the Allen Center as a base for exploring the early-stage innovations emerging from CSE labs.

"The UW is such a rich environment, and I enjoy talking with faculty and students about what they are up to. Spending time here is an experiment. I don't have an agenda, but am just opening my mind to whatever may happen next."

If history repeats, that "whatever" is bound to disrupt his retirement and the technological status quo.

Security and Privacy

by calling it (the car's telematics system has a publicly callable number), playing a specially crafted sequence of sounds, and again causing arbitrary code to execute. The group found a variety of mid-range attacks as well — i.e., via Bluetooth. The results were presented to the National Academy of Sciences Committee on Electronic Vehicle Controls and Unintended Acceleration in March 2011 and will be published at the USENIX Security Symposium in August 2011.

AutoSec group impact

The group's findings have had tremendous impact upon industry and in research communities. Automotive manufacturers, law enforcement officers, and the government are taking this work seriously. Multiple working groups and workshops have been organized to investigate automotive safety and security more fully. The National Highway Traffic Safety Administration (NHTSA), the Society of Automotive Engineers (SAE), and other safety/standards organizations have noted these results and have contacted the AutoSec group for advice.

For more information, please visit the AutoSec groups page at: <http://www.autosec.org>

Recent UW CSE security and privacy accomplishments

- PhD student Roxana Geambasu accepted a tenure-track faculty position in the Department of Computer Science at Columbia University. Congratulations Professor Geambasu!
- Postdoc Justin Cappos accepted a faculty position at NYU Poly. Congratulations Professor Cappos!
- "Keypad: An auditing file system for theft-prone devices" by Roxana Geambasu and John P. John, and UW CSE faculty members Steve Gribble, Yoshi Kohno, and Hank Levy won the Eurosys 2011 Best Student Paper award.
- UW CSE Security Lab member Karl Koscher won the College of Engineering Ford Motor Company Fellowship. Congratulations Karl!
- Alexei Czeskis and Iva Dermendjieva, along with faculty collaborators, won the Multidisciplinary Privacy Award at the 2011 Computers, Privacy & Data Protection conference in Brussels, Belgium. Tamara Denning won the award's honorable mention. This work was done in collaboration with the UW Value Sensitive Design Lab.

Two grad students win Anita Borg Scholarships

The Google Anita Borg Memorial Scholarship was launched in 2004 when a group of Googlers decided to establish a program that would honor the work of their friend and colleague Dr. Anita Borg. UW CSE graduate students Janara Christensen and Katie Kuksenok have been named 2011 recipients.



Janara's advisor is research assistant professor Mausam. Her current research focuses on identifying entities for relationships in Web text. This summer, she will intern at Google where she will work with Marius Pasca on building ontologies from natural language.

Katie works with James Fogarty and is interested in the intersection of human computer interaction and natural language processing, particularly in the domain of machine translation. This summer she will work with Srinivas Bangalore at AT&T Labs on building and studying a novel interactive machine translation system to explore avenues for translation in the absence of parallel corpora and expert bilingual speakers. In addition to being an Anita Borg Scholar, Katie also is an AT&T Labs Fellow, a Microsoft Research Graduate Women Scholar, and a recipient of an NSF Graduate Research Fellowship award.



2011 Competitive Graduate Fellowships and Award Winners

CSE's PhD students have scored some prestigious fellowships and awards for the 2011-12 year. Congratulations to our exceptional students!

- NSF Graduate Research Fellowship: Katelin Bailey, Waylon Brunette, Katie Kuksenok, Yun-En Liu, and David Rosenbaum
- National Defense Science & Engineering (NDSEG) Graduate Fellowship: David Rosenbaum
- Microsoft Research Fellowship: Morgan Dixon
- Intel Graduate Fellowship: Joe Devietti
- Google Anita Borg Scholar: Janara Christensen, Katie Kuksenok
- AT&T Research Fellowship: Katie Kuksenok
- Yahoo Key Scientific Challenges Award: Elisa Celis, Emad Soroush, and Michael Toomim
- Ford Motor Company Fellowship: Karl Koscher
- Bhasin Fellowship: Sidhant Gupta
- Osberg Fellowship: Kristi Morton

Digital Design Capstone

Students in this year's hardware capstone class are building outdoor autonomous drones. CSE's Shwetak Patel first used the Parrot AR Drone platform as a teaching tool for his introduction to embedded systems in EE (which he taught winter quarter). In spring quarter, he had students build custom sensor packs, navigation algorithms, and user interfaces for deploying these drones in an outdoor environment. Teams either build their own drones from quadcopter kits or modify the commercially available ones. Each team worked on a slightly different application. For example, one team built a "tour guide," where the drones lead you to various parts of the campus. The user simply selects a location on a smart phone and then follows the drone to that spot. Another team built an autonomous drone that maps radiation levels as it sweeps a field. The radiation levels can be visualized from a ground control station.



Examples of autonomous drone in test flight for digital design capstone.

Yaw Anowka named UW Graduate School Medalist

CSE PhD student Yaw Anokwa has been named the 2011 recipient of the University of Washington Graduate School Medal. Awarded annually to a PhD, DMA, AuD, DNP, DPT, or EdD candidate who displays an exemplary commitment to both the University and its larger community, the Graduate School Medal recognizes "scholar-citizens" whose academic expertise and social awareness are integrated in a way that demonstrates active civic engagement and a capacity to promote political, cultural and social change.



Yaw, advised by Gaetano Borriello and Tapan Parikh, builds technologies for low-income regions and runs the Change group at UW. His current project is Open Data Kit (ODK). He has been working on ODK Clinic, a tool that helps clinicians in sub-Saharan Africa get a better sense of how a patient is doing by summarizing and analyzing all available patient data and presenting it in a clear user interface. This summer, he will study how ODK Clinic could impact clinical care at USAID-AMPATH — a hospital network in Kenya with over 100,000 active HIV patients. Information about ODK Clinic may be viewed here:

<http://code.google.com/p/opedatakit/wiki/ODKClinic>

Yaw is the third CSE recipient of the Graduate School Medal: the 2010 medal was won by Anna Cavender (now at Google) and the 2004 medal by Vibha Sazawal (now at U. of Maryland).

Mark Bun awarded a Goldwater Scholarship



CSE's Mark Bun, a junior who entered the UW through the early entrance program, has been awarded a 2011 Goldwater Scholarship. Goldwater Scholarships are the premier award for undergraduates majoring in engineering and the sciences. Bun has been a student researcher since

2009 and has also worked as a teaching assistant and tutor in the Mathematics Department. He has received a Mary Gates Research Scholarship, a Washington NASA Space Grant award, and a National Science Foundation Research Training Grant. He plans to pursue a PhD in theoretical computer science, with a career in research at a university or a technology company.

High school student wins "Best Paper" at CHI 2011

Akash Badshah has scored a triple first! Akash is the first high school student in the nearly 30-year history of the CHI conference (human factors in computing) to serve as lead author, present a paper, or win a "Best of CHI" award.



Akash presented his paper on a self-powered haptic feedback device to a huge crowd at CHI 2011 in Vancouver, BC in mid-May. The session was standing-room-only, and the organizers even had to set up an overflow room and pipe video to it. The talk was fantastic. Akash, a high school junior from Bellevue, worked with CSE professor Shwetak Patel last summer as a part of Shwetak's summer high school research program, where high school students carry out intense 10-week long research projects. Akash is now completing his senior year at Phillips Exeter Academy in New Hampshire.

More information about Akash's research may be viewed here:
<http://ubicomplab.cs.washington.edu/wiki/InGen>

Jesse Dodge wins slots in competitive workshops

Jesse Dodge, a double major in computer science and statistics, has been awarded two slots in nationally competitive summer research workshop programs. The first is the Explorations in Statistics workshop, held at Columbia University and jointly hosted by Columbia University and UC, Berkeley. The second is an eight-week program at Johns Hopkins Center for Language and Speech Processing, which is well known for producing researchers in natural language processing. He was one of six students selected (from more than 120 applicants).



Jesse is the recipient of the InfoSpace Endowed scholarship for this year. He will apply to PhD programs this fall, for entry in fall 2012.



most significant bits

newsletter of uw computer science & engineering

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university of washington

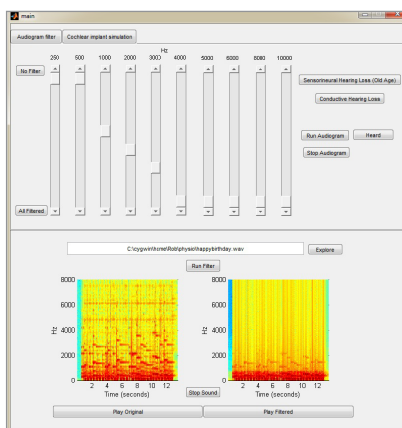
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Audio Capstone

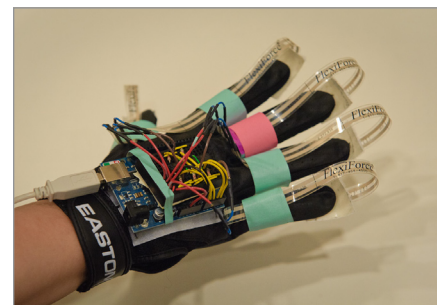
The audio capstone, taught winter quarter by CSE's Bruce Hemingway, started with a brief survey of computer audio techniques for sound recording and playback, encoding and decoding, synchronization, sound synthesis, recognition, and analysis/resynthesis. Students worked in teams to design, implement, and release a software project utilizing some of the techniques surveyed. See project descriptions to the right.



Physio-acoustic Simulator: Emulates how hearing-impaired people hear sounds by filtering out certain frequencies.



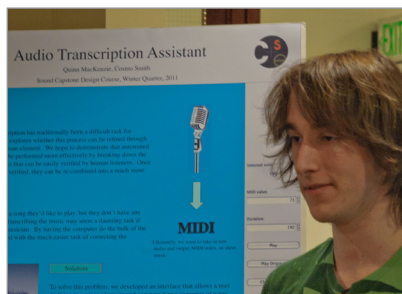
Virtual Drum Kit: Mimics real-life drumming experience by using consumer human interface devices (Kinect™ 3D camera, Wiimote™ Bluetooth gaming controller) to capture a user's drumming motions and to provide haptic feedback.



A Glove That Sings: Device lets anyone play and create layered music using sequencers. A user wearing the glove taps a finger, and a sensor reads the pressure and duration of the tap. Music proficiency not needed.

UW CSE Bay Area event at Pixar
June 30, 6 p.m.

Contact Kay Beck-Benton,
kbeck@cs.washington.edu,
for information.



Audio Transcription Assistant: Explores refining the audio transcription process through the introduction of a human element.