

In the Loop
@CIS



Professors Steve Zdancewic, Benjamin Pierce, and Stephanie Weirich

Photo by Felice Macera

Chair's Perspective

This fall ushers in a bumper crop of students in our introductory computer programming course as well as in our Master's programs (both up about 50% from last year). There are many theories about the origins of this huge increase in interest in our programs – continued strong growth in industry jobs, the gradual infiltration of computational ideas across a range of other disciplines and society at large, and of course the “Social Network effect.” I don't know the cause, but am happy to embrace the change!

We are fortunate this year to welcome Aaron Roth as a Raj and Neera Singh Assistant Professor of CIS. With expertise in database privacy, game theory and mechanism design, and learning theory, Aaron adds strength to our theory group as well as to our new program in Market and Social Systems Engineering. His new course, *Algorithmic Foundations of Data Privacy*, is appreciated by students and faculty alike.

In this issue, we focus on our programming languages group (the “PL Club”), led by Benjamin Pierce, Stephanie Weirich, and Steve Zdancewic (pictured above). This dynamic trio has not only placed their graduates at top institutions (Kyoto University; University of Maryland, College Park; Cornell University; and Microsoft Research), but is talented in multiple dimensions: Benjamin is an accomplished singer and photographer (his *Secrets of the Eniac* have been featured in earlier issues of the newsletter), and husband and wife team Stephanie and Steve have made getting tenure while starting a family look easy.

Our undergraduates continue to make us proud, as highlighted in this issue through their summer projects as well as their organizing and running the PennApps data hackathon again this fall (see back cover).

Alums, we are proud of you too! Stay in touch by giving us updates through Facebook, or volunteering for one of our Alumni activities, such as being on our Alumni Panel (usually held in early December) or acting as a Senior Project Competition Judge (usually held in April). Contact Jackie Caliman for details of these and other activities, jackie@cis.upenn.edu.

Read on to hear more about Penn CIS, and check us out on Facebook! <http://www.facebook.com/CISatPenn>

Susan B. Davidson
Weiss Professor and Chair, Computer and Information Science Department

Research in Programming Languages Continues Tradition of Excellence

CIS boasts a long history as a worldwide hub for research in programming languages. The current “PL Club” consists of Professors Benjamin Pierce, Stephanie Weirich, and Steve Zdancewic, 17 students and postdocs, and collaborators across the department. The group’s interests run the gamut from theoretical foundations to practical applications, and from traditional core topics to crossover projects building bridges with software security, databases, hardware architecture, operating systems, and networking. This article sketches a few of the projects ongoing in the group.

CRASH/SAFE: The CRASH/SAFE project is working to design a new computer system that is highly resistant to cyber-attack. This interdisciplinary project offers a rare opportunity to rethink the hardware/OS/software stack starting from a completely clean slate, with no legacy constraints of any sort. Specifically, it aims to build a new suite of modern OS services, running on novel hardware and written in a novel programming language, embodying fundamental security principles—separation of privilege, least privilege, and mutual suspicion—down to its very bones, without compromising performance. Achieving this goal demands a co-design methodology in which all critical system layers are designed together, with a ruthless insistence on simplicity, security, and verifiability at every level.

Trellys and Dependently Typed Haskell: Most modern programming languages use static type checking to eliminate errors from programs. However, the type systems that underlie these checkers are conservative and reject many useful, correct programs. In particular, the techniques of generic programming, which optimize data structures, generalize interfaces, and eliminate boilerplate in program development, are difficult to type check. The Trellys project is designing a new, dependently typed programming language from the ground up. At the same time, Penn PL researchers are collaborating with Microsoft Research, Cambridge UK, to augment the Glasgow Haskell Compiler (GHC) with dependent types. Both projects will dramatically improve the utility of expressive type systems in practice.

SoftBound and Vellvm: Memory safety flaws in C programs are the root cause of vulnerabilities exploited by viruses, worms, and other malicious software. The SoftBound project has created practical techniques and tools for eliminating those vulnerabilities, while retaining compatibility with existing software. To gain high assurance that the SoftBound tools are correct, the Vellvm project has developed a machine-checked model of the

Low-Level Virtual Machine (LLVM), a popular intermediate language used in many industrial and research compilers. This model, built using the Coq interactive theorem prover, gives a detailed semantics of LLVM programs, allowing researchers to prove correctness properties about compilers and program transformations such as those used in the SoftBound tool. The end result of this ongoing work will be powerful tools for building secure software.

Innovation in Teaching: The PL group has also played a central role in the department’s redesign of its core undergraduate programming courses. Last year saw the rollout of a completely revamped CIS 120 (“Programming Languages and Techniques”) focusing on design as a fundamental skill. This innovative course uses both functional and object-oriented languages as vehicles for learning the foundations of software design.

“What makes the Penn PL Club such a fun place to work is the incredible range of experts and enthusiasts – language designers, logicians, system builders, theorem prover gurus, compiler and architecture jockeys – all working together on common problems.” -Benjamin Pierce

About the faculty: Benjamin Pierce joined CIS in 1998. Previously, he was on the faculty at Indiana University and held research fellowships at Cambridge University, the University of Edinburgh, and INRIA-Roquencourt. He received his Ph.D. in Computer Science at Carnegie Mellon University in 1991. His books include the widely used graduate text *Types and Programming Languages*. He is also the lead designer of the popular *Unison* file synchronizer.

Stephanie Weirich and Steve Zdancewic joined CIS in 2002, having received their Ph.D.s in Computer Science at Cornell University, and were tenured in 2008. Stephanie received an NSF CAREER Award in 2003, and became a member of the Institute for Defense Analyses Computer Science Study Panel in 2007. Steve received the NSF CAREER Award in 2004, and the Alfred P. Sloan Research Fellow Award in 2009. He currently serves as Undergraduate Chair for CIS.



A weekly meeting of the PL Club. For more information, visit: <http://www.cis.upenn.edu/~plclub/>.

Photo by Felice Macera

Spotlight on PhD Alumni in Programming Languages



Atsushi Igarashi
Visiting PhD Student
1998-2000
PhD, 2001
University of Tokyo
Advisor: Benjamin Pierce
Associate Professor
Kyoto University

Dr. Atsushi Igarashi received the first Microsoft Research Japan New Faculty Award in 2009, and the Dahl-Nygaard Junior Prize in 2011. The Dahl Nygaard committee recognized Dr. Igarashi's seminal contributions to the foundations of object-oriented languages with his paper "Featherweight Java: A minimal core calculus for Java and GJ", co-authored with Benjamin Pierce, and Philip Wadler. The paper addressed the issue of type soundness of Java generics, and presented an elegant, succinct calculus, called FJ, which captured the salient features of Java-based languages. FJ has since served as the basis of innumerable studies of object-oriented features.



Michael Hicks
PhD, 2001
Advisor: Scott Nettles
Associate Professor
University of Maryland,
College Park

Dr. Michael Hicks received the ACM SIGPLAN Doctoral Dissertation award in 2002, and an NSF CAREER award in 2004. Dr. Hicks' research focuses on using programming languages and analyses to improve the security, reliability, and availability of software. Noteworthy among his research accomplishments is the development of analysis and compilation tools for enabling software to be safely updated without shutting it down. He has explored the design of new programming languages and analysis tools for automatically discovering or remediating software flaws and security vulnerabilities. He has also conducted studies on the utility of defect detection tools according to outcomes of human users, and explored distributed systems design and evaluation, particularly when adaptivity and security are system goals. Dr. Hicks is also well known for his management methods in which he employs "agile" software development methodology to solving problems encountered in managing a research group. Based on Scrum (Agile Development Methods Inc.), Dr. Hicks and his col-

leagues developed SCORE, which is "Scrum for Research." Some of the benefits of SCORE include greater time efficiency for faculty, improved productivity for students, and a more cohesive and collaborative research group.

Software development is dominated by the iterative process of debugging and testing. Although automated tools can help, it may be hard to test against all program inputs or environments in which programs may execute. An alternative approach is the static verification of program properties. **Dr. Dimitri Vytiniotis'** work at Microsoft Research and previously at Penn revolves around programming languages technology, compiler design, and programming techniques that enable the development of code that is statically verified against its specifications, and hence is correct by construction. His long-term objective is to extend and apply the results of his work, drawing ideas and motivation from different areas of computer science, such as logic, algorithms, and systems, in order to improve the quality and robustness of software, and to help programmers better understand, predict, and control software behavior.



Dimitrios Vytiniotis
PhD, 2008
Advisor: Stephanie Weirich
Researcher
Programming Principles
and Tools Group
Microsoft Research
Cambridge, UK



Nate Foster
PhD, 2009
Advisor: Benjamin Pierce
Assistant Professor
Cornell University

As a PhD student, **Dr. Nate Foster** worked with his advisor Dr. Benjamin Pierce on problems at the intersection of programming languages and databases, focusing especially on issues related to replicated data. These problems will be familiar to anyone who has tried to synchronize a calendar on their smartphone with one on their computer. His dissertation proposed a language-based solution to the classic view update problem from databases. There are many situations where one wants to define an updatable view of a larger data source, but doing so requires being able to compute in two directions- from

source to view and from view back to source. To meet this challenge, Dr. Foster developed a language called Boomerang, in which programs can be run both forwards and backwards. The main features of Boomerang were later incorporated by RedHat Linux into their Augeas tool, which bridges the gap between messy, low-level system configuration files and more structured representations that are easily manipulated by system administrators. Dr. Foster's current work is on a new class of programming languages that could help cloud computing by making computer networks more reliable and efficient.



Jeff Vaughan
PhD, 2009
Advisor: Steve Zdancewicz
Postdoctoral Researcher
University of California,
Los Angeles

Dr. Jeff Vaughan's research lies at the intersection of computer security, programming languages, and formal methods. Dr. Vaughan suggests that information-flow analysis is an appealing way of specifying and enforcing security policies in software systems. Here, security labels specify confidentiality and integrity constraints on a program's inputs and outputs, and static analysis ensures that the labels are consistent with the program's code. Such analyses can be highly expressive and precise, yet traditional approaches have been costly for developers to use. The inference of fine-grained human readable security policies is a step towards providing security guarantees that are proportional to a programmer's effort: the programmer should receive weak (but sound) guarantees for little effort, and stronger guarantees for more effort. Dr. Vaughan is also interested in how to enforce coarse-grained information-flow policies using Android manifests.

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Aaron Roth Joins CIS Faculty



Aaron Roth

Consider the following conundrum: You are the administrator of a large data set at a hospital (or search engine, or social network, or phone provider, or...) The data you hold is very valuable, and you would like to make it available to researchers with expertise in statistics and machine learning so that you can better make use of it. However, the data is also highly sensitive! It consists of patient medical records, and although you would like to make aggregate statistics available, you must do so in a way that does not compromise the privacy of any individual who may (or may not) be in the data set. What can you do?

Dr. Roth works at the intersection of privacy and game theory in addition to studying foundational issues in data privacy.

This is the problem that Aaron Roth, who joined Penn as the new Raj and Neera Singh Assistant Professor of Computer and Information Science in August, spends much of his time thinking about. Specifically, he explores the power and limitations of a recently defined formulation of privacy, known as differential privacy, which for the first time provides strong, provable guarantees to individuals whose data is being used.

In addition to studying foundational issues in data privacy, Dr. Roth works at the intersection of privacy and game theory. Once you have the ability to perform powerful private data analyses, how can you incentivize individuals to make their data available for these studies? How do the basic rules of auction theory and mechanism design change when individuals experience costs not just through their allocations, but as a function of their privacy loss itself?

After receiving his PhD in computer science from Carnegie Mellon University in 2010, Dr. Roth spent a year as a postdoctoral researcher at Microsoft Research's New England lab in Cambridge, Massachusetts. He is affiliated with the new joint CIS/ESE program in Market and Social Systems Engineering.

Faculty Awards & Notable Grants



Ani Nenkova



Ben Taskar



Andreas Haeberlen

Ani Nenkova will be one of the presenters at the 17th annual Frontiers of Engineering Symposium held by the National Academy of Engineering.

Ben Taskar was awarded an NSF CAREER Award for his project, "Computation and Approximation in Structured Learning".

Andreas Haeberlen was awarded an NSF CAREER Award for his project, "Evidence in Federated Distributed Systems."

Andre DeHon, Jonathan Smith, Matt Blaze, Steve Zdancewic and Andreas Haeberlen were awarded \$2.5M from the DARPA Mesh of Resilient Clouds program for their project, "SOUND: Safety On Untrusted Network Devices."

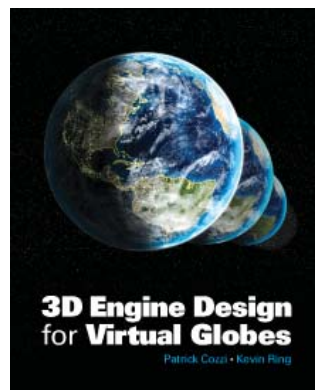
Oleg Sokolsky, Insup Lee, Zack Ives and Andreas Haeberlen received a DARPA grant for \$750,000 for their project, "TrustForge: Flexible Access Control for VehicleForge.mil Collaborative Environment."

Steve Zdancewic received an NSF CCF Medium grant for \$808,961 for his project, "Validating Program Transformations in a Mechanized LLVM."

Insup Lee and Oleg Sokolsky were Program Co-Chairs of ACM/IEEE Second International Conference on Cyber-Physical Systems (ICCCPS), which was held as part of CPS Week 2011 in Chicago, IL on April 12 - 14, 2011.

Michael Kearns and Aaron Roth (CIS), Mallesh Pai (Economics), and Sham Kakade (Statistics; secondary appointment in CIS), received an NSF grant for \$997,993 for their project, "The Economic Foundations of Digital Privacy."

Mark Liberman (Linguistics; secondary appointment in CIS) gave the Henry Sweet Lecture at the Linguistic Society of Great Britain's 2012 annual meeting. Dr. Liberman will also give the annual Baggett Lecture at the University of Maryland.



Stephanie Weirich received an NSF CCF award of \$496,785 over three years for her project, "Dependently-typed Haskell".

Rahul Mangharam (ESE; secondary appointment in CIS) is co-chairing the 18th IEEE Real-Time and Embedded Technology and Applications Symposium (IEEE RTAS), Beijing, and the IEEE Analytic Virtual Integration of Cyber-Physical Systems Workshop in Vienna.

CRC Press has published CIS alumnus and lecturer **Patrick Cozzi's** book, "3D Engine Design for Virtual Globes" (left).

What I Did Last Summer

Summer Research: The undergraduate summer research program in CIS encourages Penn students to get involved in research with faculty mentors early in their careers. Students work with a faculty member and a graduate student mentor throughout the summer with the goal of producing an identifiable research result. In addition, faculty and PhD students give undergraduate researchers workshops on topics such as technical writing, applying to graduate school, and Matlab. This program culminates in a poster session in September. Thirty-one undergraduates participated in the CIS Summer Research experience for Undergraduates in Summer 2011.



Winners of the CIS Summer Research Poster Contest for Undergraduates from left: **Casey Davis** (3rd Place), **Yonas Solomon** (2nd Place), **Kaitlin Pollock** (1st Place), with PhD candidate **Joe Kider Jr.**

Kaitlin Pollock Takes 1st Place: A busy year for Kaitlin Pollock culminated in her taking first place in the 2011 Summer Undergraduate Research poster contest. She also was co-winner of the 2010 Diane Chi Summer Research award, was elected co-president of the University of Pennsylvania's ACM-SIGGRAPH chapter, and was awarded an ACM-W scholarship to attend SIGGRAPH and the Symposium for Computer Animation (SCA). Pollock won an Honorable Mention award at the SCA for a paper she co-authored with PhD candidate Joe Kider, Jr. and Professor Alla Safanova, "A Data-Driven Appearance Model for Human Fatigue." Kaitlin Pollock has been nominated by CIS faculty for a prestigious Computing Research Association Outstanding Undergraduate Researcher Award.



85 girls learned more about computing at WICS High School Day in April. WICS (<http://www.seas.upenn.edu/~wics>) holds monthly TechNights for high school girls.

Internships: Last May over 100 CIS undergraduates left Penn bound for internships throughout the US, Europe and Asia. Google internships were the most sought after with 19 CIS majors landing a spot. Eight of these interned in the Google Building Opportunities for Leadership & Development (BOLD) program, designed to provide exposure into the technology industry for students who are historically under-represented in this field. The Bold program is an 11 week experience which includes a work assignment at Google, weekly professional development seminars, mentorship and fun. Google hosts supervised the interns' work assignments, while mentors introduced interns to other employees throughout Google and gave career advice.

The Penn Google Bold interns were assigned to a variety of projects. **Fannie Liu** worked on the Google Web Server team in Cambridge. Using Google App Engine with Python, Fannie implemented Google engineers' ideas on crowd-source learning. **Dan Knowlton** worked in Seattle on the Google Trends product. **Connie Ho** worked as a Software Engineer in Mountain View on Infrastructure Cluster Management with the Midas Package Manager, which distributes binaries for production servers. Connie's job was to collect information and useful statistics for packages, such as metadata and signatures scattered among various information servers and tools, and put them into one browseable place. **Cynthia Mai**, also in Mountain View, worked on building an uploading system for file attachments on Google Sites.

Rupi Sureshkumar's experience dramatically altered her previously held notions of what software engineers do. Rupi expected this to be the summer that she would program all day in a cubicle. At Google, Rupi's cubicle housed six other people. "I could access help from my teammates anytime that I needed it, or put on my Google sound blocking headphones so I could concentrate on my own code." What surprised Rupi the most was how much she enjoyed the experience. "My work was actually enjoyable! I had a lot of time to spend on my code, and I was proud of it at the end of the day," she reported. Rupi was on the Ads team working with Google's Conversion Optimizer Product. She used App Engine, Python and C++, and incorporated machine learning to create a dashboard for the ads team, and make recommendations regarding the use of Google products in ad campaigns. This year she is taking courses in Web Design and iPhone App development, and plans to participate in Penn Hackathons because "companies such as Google are looking for these types of experiences," noted Rupi.



Google BOLD Interns in Mountain View, CA. (Left to right) **Connie Ho**, **Kanchalai (Yui) Suveepattananont**, **Ayaka Nonaka**, **Jiali Sheng**, **Rupi Sureshkumar** with their host's pet, **Cooper**.

Diversity Initiatives in CIS

Over the past ten years, CIS has developed a number of initiatives to support systemic change in recruiting and retaining underrepresented students. A recent analysis of our recruiting and retention practices aimed at women, performed in collaboration with the National Center for Women & Information Technology (NCWIT), shows that these initiatives have been successful: Women's participation has steadily increased and is now 26% of the undergraduate CIS major. This is significant since women's enrollment in undergraduate

computer science programs in the top 100 research universities is currently less than 14%. In addition, attrition from our CIS major is less than 2%, with women persisting at the same rate as men. NCWIT identified several CIS practices and initiatives in recruiting, pedagogy, curriculum, student support, evaluation and tracking, and institutional policies and support (shown in the diagram below) that have contributed to this success. Penn CIS has worked with NCWIT ES-UP since 2006 to develop and measure the success of our diversity initiatives.

Recruiting

- CIS uses multiple pathways to recruit students into the computing major.
- An introductory course for students with no previous programming experience introduces students to the major.
- Faculty reach out to students that are undecided about their major, recruit them into the introductory course, and provide information on career opportunities and the nature of computing work.
- Students and faculty act as ambassadors for the major at admissions events.
- CIS widely publicizes the major and the minor throughout first and second year computing courses, and in brochures and on the web.
- Conducts K-12 outreach via the Women in Computer Science (WICS) High School Day for Girls, and the Advancing Women in Engineering (AWE) program for middle school girls (Penn GEMS).
- Provides continuing skills training and information to K-12 via the Guidance Counselors and Teachers Day and Google CS4HS@Penn workshops

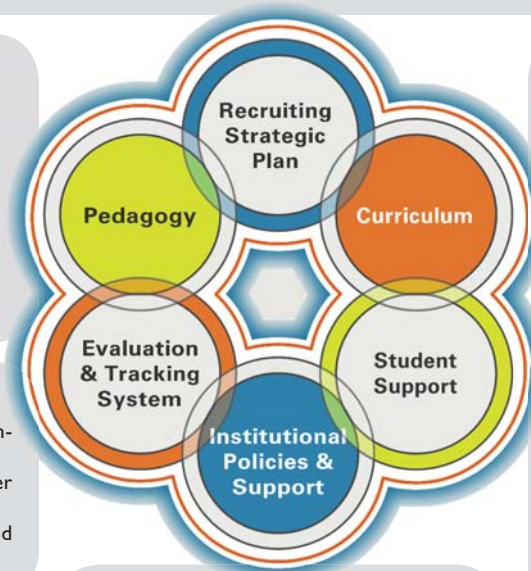
Pedagogy

- Uses pair programming, problem solving groups in class, peer-led team learning
- Employs relevant assignments meaningful to students and examples with broad appeal to explain concepts
- Communicates relevance of CS to different work environments
- Actively encourages women and minorities to major in computing

Evaluation & Tracking

- Monitors progress in recruitment and retention (using NCWIT tracking tool)
- Tracks course outcomes by student gender and race
- Evaluates individual teaching, curricular, and student interventions

For more information, please see Women in Computer Science, our undergraduate organization, at www.seas.upenn.edu/~wics/, CISTers, our graduate women group, at www.seas.upenn.edu/~cisters/, and Advancing Women in Engineering, a SEAS organization, at www.seas.upenn.edu/awe.



Institutional Policies and Support

- Provides funding for faculty and student outreach, as well as student groups
- Includes faculty diversity activities in annual reports for performance appraisal

Curriculum

- Offers an intro course for students without prior programming experience (CIS110)
- Makes the introductory course sequence available each semester (CIS 110, 120, 121, 160) to make scheduling easy for students
- Provides multiple programs (CSCI, DMD, MKSE, CMBE, ASCC, ASCS, ASCB, CS in the College) that align to student interests

Student Support

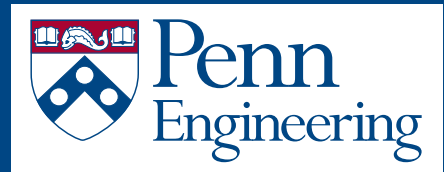
- Provides collaborative and peer learning opportunities in early courses
- Involves CIS alumni in career panels for students
- Offers peer, faculty-student and industry-student mentoring
- Encourages student participation in conferences
- Promotes Research Experience for Undergraduates (REU)
 - Supports student groups, e.g. Women in Computer Science (WICS), Dining Philosophers (DP) and Minority Students Association
- Sustains a lively faculty-student and peer community

2011-2012 Annual Outreach Events

Visit www.cis.upenn.edu for details!

- AWE Sleeping Bag Weekend for prospective women engineering students: November 6-7, 2011
- Guidance Counselors and Teachers Day: November 18, 2011
- WICs TechNights for High School Girls: 7 – 8:30 PM on selected Mondays
- The Dining Philosophers PClassic Programming Contest for High School students: a Saturday in February
- WICS High School Day for Girls: April 12, 2012
- Boot-Up! Camp for Philadelphia public and charter high school students: June 25-29, 2012
- Penn Gems, Girls in Engineering, Math and Science camp: one week in August
- Google CS4HS@ Penn, a technology workshop for teachers: three days in August
- AWE Pre-Orientation for women freshmen: August 27-30, 2012

About Our Alumni



High School students in summer Boot up! camp with teachers Kristin Searle and Deborah Fields take to the runway with their creations fashioned with the e-textiles lily pad arduino technology.

Alumni Bits

Matthew Feczko, CSE '10/MSE '10, received a promotion at Microsoft and a Gold Star Award.

Jordan Kay, CSE '10, started at Twitter as a mobile engineer this past July.

Noir Nigmatov, CSCI '10, now works in Sberbank Rossii in Kazakhstan (Savings Bank of the Russian Federation) as a senior analyst in the Department of Informational Technologies.

Thpearit Peerasathien, MSE '10, is studying for his PhD in Robotics at Osaka University. He also works with the Gemanoid robot at the Advanced Telecommunications Research Institute.

Magnus Rinnan Gaarder, MSE '09, works in healthcare investment banking at Leerink Swann in New York. Magnus also founded Level Dance School in Manhattan.

Jeffrey Weinstein, CSE '09/Econ '09, recently joined fellow Penn alum Doug Petkanics (CSE '06) to build a Hyperpublic, a local data startup in NYC.

Benjamin Ashpole, MSE '08, is the founder of Bashpole Software, Inc. and Bashpole Inventions, Inc. and has recently launched new products with grants from the federal government and the state of Indiana.

Alwyn E. Goodloe, PhD '08/MSE '01, recently joined NASA as a Research Computer Engineer at the NASA Langley Research Center in Hampton, VA. Alwyn is a researcher in the formal methods group of the Safety-Critical Avionics Systems Branch.

Danny Panzer, ASCS '07/WH '07, co-founded the iPhone app, ScanBizCards, and recently won the 2011 MOBI award for Best Mobile App for OCR, Imaging, and Camera.

Eric Pierce, CSE '07, is working at a small startup called Extrahop Networks.

Brian Silva, MSE CGGT '06, worked on *Inception*, which won the Oscar for Best Visual Effects earlier this year. He also worked on *Harry Potter 7 Part 1*, which was nominated for the same Oscar.

Sachin Rekhi, CSE '05/WH '05 and **Ada Chen, WH '05**, who met as Penn undergraduates and later married, had a startup called Connected that was recently acquired by LinkedIn.

Dmitry Koltunov, CSE '03/Econ '03, recently became the CTO and Partner of a swiftly growing NYC-based startup called Novus Partners.

Alexander Morgovsky, CSE '03, recently joined Aavalor Consulting as a Senior Java Build/Deployment Specialist. Morgovsky received his MBA from La Salle in 2011.

Michail Volodarskiy, CSE '03, started LeanServer, a green tech firm in the Philadelphia area that builds web performance technology.

Pranav Gupta, CSE '02/WH '02, recently joined the Restructuring Group at Evercore Partners.

Luke Stokes, CSE '01, works full-time at FoxyCart, which he started with a friend in 2007.

Vincent Marshall, CTE '00, has 3 TV specials which recently premiered on the National Geographic Channel. The specials involve flying a house, exploring deep ocean by ROV, and flying a home-made rocket the size of a telephone pole to over 50,000 ft.

Pradyut Shah, CSE '00/WH '00, joined Insignia Capital, a San Francisco Bay Area based private equity fund, as Principal.

Brian Kravitz, CSE '99/WH '99, recently started at Google in NY as a Product Manager.

Evan Witt's, CSE '99/Econ '99, software company, Eximo, merged its subsidiary, Back9Links, with ClubSoft in July. ClubSoft is now the fastest growing company in the private club industry.

Student Awards

Sandy Clark, Travis Goodspeed, Perry Metzger, Zachary Wasserman, Kevin Xu and Matt Blaze won the **Outstanding Paper Award** at the 2011 Usenix Security Conference for "Why Special Agent Johnny Still Can't Encrypt: A Security Analysis of the APCO P25 Secure Radio System."

Doctoral students **Roy Anati, Benjamin Gojman, Joe Kider, and Alex Roederer** were recipients of the University of Pennsylvania Prize for **Excellence in Graduate Student Teaching**.

EMBS student **Harsh Jain** and Precise lab doctoral student **Miroslav Pajic** were **2011 winners of the Honeywell OneWireless Competition** for their research in modeling the operation of wireless control networks.

Doctoral student **Andrew West** won **co-Best Paper** at the 8th Annual Collaboration, Electronic messaging, Anti-Abuse and Spam Conference (CEAS 2011) in Perth, for "Link Spamming Wikipedia for Profit," authored by **Andrew G. West, Jian Chang, Krishna K. Venkatasubramanian, Oleg Sokolsky, and Insup Lee**.

Doctoral student **Wenchao Zhou**, advised by Boon Thau Loo, received **second place in the ACM Student Research Competition** held at SIGCOMM'11 for his work on the Formally Safe Routing (FSR) toolkit.

Joe Kider, Kaitlin Pollock and Alla Safonova won an **Honorable Mention award** for their paper, "A Data Driven Model for Human Fatigue" at SCA, ACM/Eurographics Symposium on Computer Animation 2011.

"Fruit Senescence and Decay Simulation" authored by **Samantha Raja, Joe Kider and Norm Badler** was published in the International Journal Computer Graphics Forum (CGF) as part of the Eurographics 2011 Proceedings.

Kaitlin Pollock and Kelsey Hurley were awarded **ACM-W scholarships** to attend SIGGRAPH 2011.

Computer Engineering students **Eric Berdinis and Jeff Kiske** are **Google Zeitgeist Young Minds 2011** award winners for their haptic belt with Kinect for assisting visually impaired persons.

Graduate students **Mabel Mengzi Zhang and Sneha Jha** were awarded scholarships by Yahoo to attend the Grace Hopper Celebration of Women in Computing 2011 Conference.

**Keep in touch and stay involved with Penn!
Contact Jackie Caliman at jackie@cis.upenn.edu.**

PhDs in 2010-2011

Tingting Sha

Exploiting Memory Dependence Prediction to Reduce Complexity of the Store-Load Datapath, May 2011
Advisor: Amir Roth
Processor Architect, Nvidia
Santa Clara, CA

Praveen Srinivasan

Holistic Shape-Based Object Recognition Using Bottom-up Image Structures, May 2011
Advisor: Jianbo Shi
Software Engineer, Video Surf Inc.
San Mateo, CA

Alex Toshev

Shape Representations for Object Recognition, May 2011
Advisors: Kostas Daniilidis, Jianbo Shi, Ben Taskar
Research Scientist, Google
New York, NY

Nicholas Taylor

A Distributed Storage and Query Subsystem Collaborative Data Sharing, August 2010
Advisor: Zack Ives
Software Engineer, Google
New York, NY

Qihui Zhu

Shape Detection by Packing Contours and Regions, May 2011
Advisor: Jianbo Shi
Associate, Goldman Sachs
New York, NY

Andrew Hilton

Efficient Load Latency Tolerance: Single-Thread Performance for the Multi-core Era, August 2010
Advisor: Amir Roth
Modelling & Analysis Researcher, IBM
Research Triangle Park, NC

Jinsong Tan

Strategic and Secure Interactions in Networks, May 2010
Advisor: Michael Kearns
Research Associate, Goldman Sachs
New York, NY

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PennApps Rules!

The third PennApps data hackathon was held September 16th-18th (<http://pennapps.com>). During 48 grueling hours, Penn undergraduates collaborated to build “awesome things”. Event winners included:

- **uWave** (1st place, pictured to the left), a microwave hacked to play YouTube videos while your food cooks and sends text when food is done
- **ClassGrapher** (2nd place), a ratings visualizer for Penn Course Review
- **Beer Snob** (winner, Audience Choice), making recommendations for brews based on Facebook profiles

Thanks to our panel of judges, including Jason Kincaid of TechCrunch, Zach Weinberg of Invite Media, and Dave Jagoda of Andreessen Horowitz.

*The uWave team, left to right: **Varun Sampath, Ben Shyong, Kevin Conley.** Not pictured: **Teddy Zhang.***