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UW core team (clockwise from lower left): Tom Daniel (Biology), Andy Connolly (Astronomy), Bill Howe (CSE), Ed Lazowska (CSE), Randy LeVeque (Applied Mathematics), Tyler McCormick (Statistics + Sociology), Cecilia Aragon (Human Centered Design & Engineering), Ginger Armbrust (Oceanography), Sarah Loebman (Astronomy). Missing: Magda Balazinska (CSE), Josh Blumentstock (iSchool), Mark Ellis (Geography), Carlos Guestrin (CSE), Thomas Richardson (Statistics), Werner Stuetzle (Statistics), John Vidale (Earth & Space Sciences).

Big Data, Enormous Opportunity

Every credit card transaction, embedded sensor stream from sea floor or smartphone, web click on a social media site, or DNA sequencer adds to the petabytes of heterogeneous, noisy datasets now available to researchers. Figuring out how to extract value from this Big Data lies at the heart of 21st century discovery.

On November 12, 2013 as the featured talk at a White House Office of Science and Technology Policy (OSTP) event, a five-year, \$37.8 million award from the Gordon and Betty Moore Foundation and the Alfred P. Sloan Foundation was made to the University of Washington, the University of California at Berkeley, and New York University. The award aims to dramatically accelerate the growth of data-intensive discovery in a broad range of scientific fields. "In order to remain at the forefront," said Ed Lazowska, Bill & Melinda Gates Chair in Computer Science & Engineering and Founding Director of the UW eScience Institute, "UW must be a leader in advancing the methodologies of data science and in putting these methodologies to work in the broadest imaginable range of fields."

Lazowska led the UW's team of more than a dozen faculty members from across the campus in winning this prestigious award. Berkeley's team, led by Nobel laureate

From where I sit...



We approach graduation 2014 with extreme excitement about the department, the field, and our future. The entire campus has become aware of the importance of computing to every field — from social science to physical science to medicine and law. Therefore, interest in our classes across UW has grown and continues to grow at a dizzying rate. This year we are teaching nearly 4000 students in our two-course introductory programming sequence, 142/143. Demand for our major is high as well and beyond our capacity to meet it. Over the last few years we have increased the size of our undergraduate program by 55 percent. By next year we will be approaching 800 students in our bachelor's program, graduating approximately 250 bachelor's students per year. And we expect even more growth on the horizon at every level, e.g., our PhD program now exceeds 200 students!

Our biggest challenge for the future is space. The Allen Center, now 10 years old, continues to be an outstanding facility, but it is full, which limits our ability to grow and handle the numbers of students and faculty we expect in the future. For this reason, we have carried out a feasibility study to look at the amount and types of spaces we would need in a new building, which we hope to begin designing more seriously in the very near future. A key part of that building would be new classrooms of all types — something we were unable to provide in the current building. As well we'll need research labs for the kinds of increasingly interdisciplinary and collaborative research projects that now bring together a broad range of scientists from both inside and outside the campus. We feature several of these projects in this issue.

Hiring is key to our future as well as we broaden and deepen our research and teaching portfolio. Last year we added four exciting new faculty members to our roster. These included assistant professors Maya Cakmak, Zack Tatlock, and Shayan Oveis Gharan, who brought new strength in robotics, programming languages and verification, and theoretical computer science, respectively. In addition, Matt Reynolds, formerly of Duke University, joined us as associate professor and became the fourth hire in our joint ExCEL ("Experimental Computer Engineering Lab") initiative with EE; Matt's research is in low-power and ubiquitous computing. This year we have already announced two exciting new hires in security and natural language processing — Franzi Roesner and Yejin Choi — who we describe in this issue as well. I hope to announce several more hires over the next month or so.

To all of our graduating students, we're very proud of what you've achieved already and expect much more from you in the future.

Have a great summer and keep in touch!

A handwritten signature in purple ink, reading "H. Levy".

Henry M. Levy
Chairman and Wissner-Slivka Chair



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Two rising stars join UW CSE faculty

UW CSE is delighted to announce our first two hires of the 2014 faculty recruiting season.

Yejin Choi, currently Assistant Professor at SUNY Stony Brook, will be joining UW CSE this fall. Yejin is a rising star in Natural Language Processing (NLP), with a focus on studying non-literal and contextual language understanding. Her work on automatically analyzing writing style — e.g., to detect deceptive online reviews or predict the success of a novel — has gained significant academic and media attention.



Text understanding is not just about what is written. We also want to understand why it is written (i.e., intent), and whom it is written by (i.e., identity). Through the analysis of writing style, Choi is building statistical models that can perceive various aspects of the intent and identity of the author, even when those are not explicitly mentioned in the text.

Choi is also a leader in combining NLP and computer vision — studying the automatic captioning of photographs — and was a co-recipient the 2013 David Marr Prize for this work.

"The web today is increasingly multi-modal, with hundreds of billions of photographs contributed by online citizens along with textual descriptions. This creates new challenges and opportunities for researchers to integrate NLP with computer vision," Choi notes excitedly. Tapping into this wealth of multi-modal web data, she is investigating data-driven approaches to learn and reason about the visual world and everyday human lives.

Choi received her PhD in Computer Science from Cornell University and her BS in Computer Science and Engineering from Seoul National University.

Franzi Roesner, a researcher in security and privacy with a strong focus on system design, will be joining UW CSE as a faculty member in the fall.

Her research has included a comprehensive study of third-party tracking on the Web and the creation of ShareMeNot, a novel defense against "personal" web trackers like the Facebook "Like" button. She has also explored a new approach to permission granting in modern operating systems (particularly mobile devices, such as smart phones), user-driven access control. In this approach, the operating system is able to extract a user's intent to grant a permission (such as allowing an application to access the camera or send an SMS) from the way he or she naturally interacts with any application. Her work on user-driven access control won the Best Practical Paper Award at the 2012 IEEE Symposium on Security and Privacy. Most recently, she has begun focusing on security and privacy for emerging augmented reality technologies.



Roesner will receive her PhD from UW CSE in June. She received her BS in Computer Science at UT Austin, where she worked on research in computer architecture.

"UW CSE is a really exciting place, and I'm thrilled to join the department as a faculty member!" says Roesner.

Be in the know!

Subscribe to CSE news: Additional new faculty hires will be announced as they happen on CSE's news page: news.cs.washington.edu

Follow CSE's Facebook page: www.facebook.com/uwcse



UW CSE Alumni Achievement Awards

CSE honored two extraordinarily accomplished alumni — Jeff Dean and Gail Murphy — during its June 14th graduation ceremony. UW CSE's Alumni Achievement Awards have two purposes: to celebrate alums such as Jeff and Gail, and to affirm to new graduates that they are joining a community of UW CSE alums who have changed the world.

Jeff Dean (PhD '96)

Google Senior Fellow, and software engineer extraordinaire

In an Internet giant with more than 50,000 employees in more than 70 offices around the world, Jeff Dean holds special status. He joined Google in mid-1999, less than a year after its founding. The staff of 20 were crammed into a second-floor office above a store on University Avenue in Palo Alto.



"When we needed to leave, we had to discuss who would stand up and roll their chair back first," Dean recalls. After the store below closed for the night, they amused themselves by projecting scrolling images of Google query words on the sidewalk below, to the puzzlement of passers-by and patrolling police officers.

Among his early assignments were design and implementation of Google's first advertising serving system and Google News. He also co-designed and implemented the early generations of Google's crawling indexing and query retrieval systems. His reputation as a blazingly fast coder and developer of highly efficient systems made him the "go to" engineer to develop scale-up systems to handle exponentially larger data sets as traffic to the site boomed.

Along with his close colleague Sanjay Ghemawat, he designed and built MapReduce, which quickly became an industry standard and the basis for the open-source framework Hadoop. It also allowed other Google programmers to be more experimental and productive. Other key innovations were Big Table and Spanner, large-scale storage systems.

Internal April Fool's Day jokes are a tradition at Google, and Dean, reportedly Google's "most popular engineer ever," was the unwitting target of a 2007 mass internal email of at least two dozen Chuck Norris style exploit zingers titled "Jeff Dean

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Facts," among them: "The speed of light in a vacuum used to be about 35 mph. Then Jeff spent a weekend optimizing physics." and "Compilers don't warn Jeff Dean. Jeff Dean warns compilers."

The blazing speed reputation dates back to high school in Atlanta when he did an internship at the Centers for Disease Control and Prevention. He wrote a program that analyzed epidemiological data faster than anything in use. CDC adopted it and translated it into 13 languages. That led to summer internships at the World Health Organization in Geneva while he was earning his BS in computer science and economics at the University of Minnesota.

At UW CSE, Dean took the first class taught by then-new faculty member Craig Chambers, an expert in parallel computing. "It was a great class, and he became my doctoral advisor," Dean says. "We've remained friends, and ironically, in 2007 I hosted him for lunch on the day he interviewed at Google for the position he now holds in Google's Seattle office."

These days Dean has the freedom to set his own agenda and pull together Google teams to work on whatever projects spark his interest. In recent years he has branched into "deep learning," a form of machine learning. His team is developing large-scale computing systems to train large neural networks that are being applied to speech recognition, object detection, text understanding, and user prediction tasks.

Dean's achievements have earned high recognition through election to the National Academy of Engineering and fellowship in the Association for Computing Machinery, both in 2009. In 2012 he won the ACM-Infosys Foundation Award. UW Engineering honored him with the Early Career Diamond Award in 2006, and this June he receives the CSE Alumni Achievement Award.

"It's quite an honor and tribute," Dean says. "I loved CSE, especially because grad students were not separated by discipline. In my office in the Chateau, a long trailer outside crammed Sieg Hall, my six officemates and I had great chats about all sorts of subjects."

He appreciates a similar cross-disciplinary atmosphere at Google, and the chance to see his work implemented rapidly and used daily by hundreds of millions of people, which he simply sums up as "lots of fun."

Gail Murphy (PhD '96)

Software innovator, researcher, educator, administrator

As a software innovator, Gail Murphy's focus is "people first." The tools come second, whether she is developing complex but easy-to-use software systems for the business world or more efficient tools for developers with a goal to decrease the tedium and increase the fun component in their work.



Her people-centric focus also infuses her classes at the University of British Columbia, where she has taught since 1996 and built a world-class software engineering science program from the ground up. She wins plaudits like "best prof ever," "spends tons of effort helping students," and "really cool ... one of the nicest profs." She also serves UBC as associate dean for research

and graduate studies. Plus, she is an entrepreneur and co-founder (2003) and chief scientist at Tasktop Technologies, headquartered in Vancouver.

Murphy has accrued a long list of honors since her UW graduate student days. Recent ones include the 2013 International Conference on Software Engineering award for "Most Influential Paper 10 Years Later," the 2011 ACM SIGSOFT Retrospective Impact Paper Award, and a 2010 double header with the ACM Distinguished Scientist and ISCE Distinguished Paper awards. UW Engineering recognized her early career achievements with a 2008 Diamond Award. Now she is receiving CSE's highest honor, the Alumni Achievement Award.

"It's a special honor for me when so many alumni are deserving," Murphy says. "CSE is a truly amazing place and made such a lasting impression."

She especially appreciates the department for providing students with "huge exposure to wide-ranging issues" and feels lucky that David Notkin was her advisor — someone who was "always there and incredibly good at instilling confidence and guiding students to be successful."

CSE's open culture also inspired her. "It really was a home, and I've tried to bring a bit of that to UBC. We even have several other CSE graduates on the faculty," she says.

A native of Edmonton, Murphy earned her CS degree at the University of Alberta, then worked as a software developer for five years. She loved creating products but felt frustrated doing the same tedious tasks over and over. Her next mission: make computers do the routine tasks and give people more time to do the creative work by structuring efficient development tools.

"A big challenge today is connecting the people involved in large software developments," Murphy says. "When people are not connected, software development lags and problems get introduced into the software."

From a research project in the lab, Murphy and her then PhD student Mik Kersten, founded Tasktop Technologies. Tasktop, which today has about 70 employees, meets this mission by integrating the many different kinds of application lifecycle management products used in large organizations. Tasktop is defining a new category of practice called software lifecycle integration. As a hybrid academic researcher and entrepreneur, Murphy likes understanding where industry is going and producing products.

"We've bootstrapped Tasktop for seven years, and our ambition is to continue to grow one step at a time," Murphy says. "Customers are interested in how we are solving problems and connecting people."

Human centric is the key, from Murphy's teaching to research to the business world.

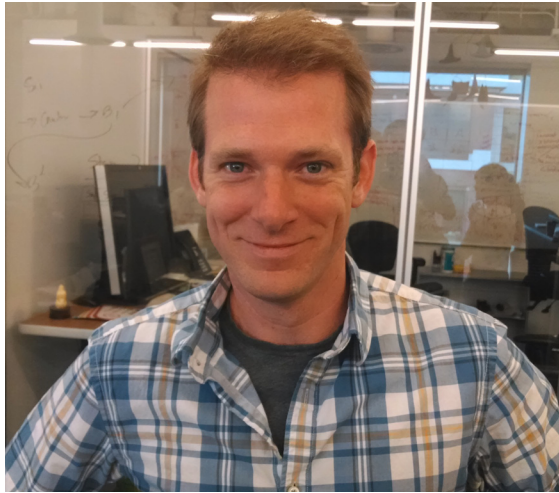
UW CSE Alumni Achievement Awards

Several years ago, we established the tradition of honoring two outstanding UW Computer Science & Engineering alumni each year as part of our graduation ceremony. In doing this, we have three objectives:

- To honor some of our most distinguished alumni by recognizing their extraordinary achievements.
- To ensure that graduating students know that they are part of a long tradition of excellence and accomplishment.
- To inspire current members of the UW CSE graduating class.

Information on previous honorees may be viewed at:
www.cs.washington.edu/alumni/achievement_awards/

2014 Diamond Early Career Award honors open source wizard Brad Fitzpatrick



After Brad Fitzpatrick (BS '02) received word of UW Engineering Diamond Award recognition, he joked with friends that Early Career must mean "I can't retire yet." He could rest on his laurels if he wished, because since graduating from the UW he has accomplished more than many software engineers do over four decades.

Fitzpatrick's professional career goes back much further than most. He started programming a few months short of age 6 when his father started him on a few lines in Basic. In middle school he created and sold video games to classmates and also converted a DOS program to Windows, which produced royalties for 14 years. Another youthful hit was Voting Booth, which allowed users to create opinion polling sites on anything from political candidates to jokes. From the early days of the Internet he's been ahead of the curve in seeing potential applications and "obvious" solutions to problems before anyone else caught on to them.

Fitzpatrick came up with the idea for LiveJournal in spring 1999 as an interactive way to keep in touch with friends after he graduated from high school — ten years before Facebook. Usage boomed in 2001 after he made the LiveJournal server code open source. While still a CSE student, he formed a company that he ran full time after graduating, thus skipping a job hunt. When he didn't have enough servers to handle the rapidly growing site use, he developed memcached, software that speeds up access to back-end servers.

"I did a quick hack. The idea was so obvious that I knew no one would pay for it, so I made it open source," Fitzpatrick says. Today memcached is used by all major web services including YouTube, Facebook, Twitter, Flickr, Wikipedia, Craigslist, Blogger, and Google Plus.

LiveJournal had reached 5 million users when he sold it and his company, Danga Interactive, to Six Apart in January 2005. LiveJournal ultimately grew to about 13 million users and is especially popular in Russia. Fitzpatrick was Chief Architect at Six Apart, where he developed OpenID, a standard authentication system that allows users to consolidate their digital identities across different sites. Some 9 million sites offer integrated OpenID user support, and enabled accounts total more than one billion.

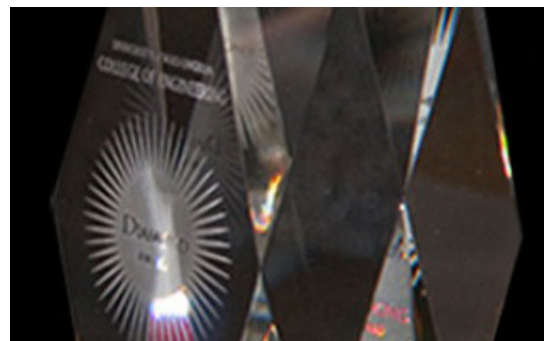
By mid 2007 Fitzpatrick was ready to leap into a bigger company, and the door was open at Google. "I thought I'd give it a try for six months, and now it's been six and a half years," he says. He likes working with smart people, being able to find an expert on any topic, and Google's culture. "I love that I can land in any city in the world with an office, walk in, and make connections," he says.

Fitzpatrick recently took on the rare opportunity to work full time on his 20 percent special interest Google project. It's a life-long data storage system, Camlistore, designed to be independent of any company providing the service. "All companies would have to fail for the archives to fail. Your archive should be alive for 80 years, especially if you are," he says. For the future, he wants to continue developing open source products and do his part to keep the Internet as decentralized as possible.

Fitzpatrick is the youngest of 15 programmers profiled in the 2009 book *Coders at Work* by Peter Seibel. It's also made its way around the world, and Fitzpatrick even found a copy on a bookshelf in a cabin in the Australian woods. Twice during his time at Google, Fitzpatrick has sat across the hall from another superstar programmer, Jeff Dean (page 4), also an Early Career Award winner. "Jeff is awesome," Fitzpatrick says. "He's an urban legend at Google."

Brad is the 11th CSE alum to be honored with a Diamond Award since the award's inception in 2006. Previous Diamond Award winners may be viewed at:

www.cs.washington.edu/alumni/UW_recognition/



Alum entrepreneur: Innovation plus culture are drivers for Przemek Pardyak and Usermind



Przemek Pardyak bluntly notes there are 500 ways for startup companies to fail. Yet, he co-founded and sold two successful startups and is now one year into his third company, Usermind, which launched in spring 2013. The 14 person staff is developing software that

helps sales, marketing, and business teams better manage their processes across multiple Software as a Service platforms (SaaS).

Pardyak was smitten by computer science as a teenager in Poland. At a time when few people had home computers, he first taught himself to program by writing code on paper.

Pardyak earned BS and MS degrees in Poland, but did his master's research in distributed systems in Copenhagen with UW CSE PhD alum Eric Jul. Jul convinced him that the USA was the best place for further graduate study, and urged him to apply to CSE. While at a conference in Paris, Pardyak met Hank Levy. "I was like 'Wow.' If this is the level of people I can work with at the UW, I'm coming."

Pardyak also visited Carnegie Mellon, where Brian Bershad was "an up and coming star." "I was fascinated by his work on operating systems, so I accepted admission to Carnegie, a tough decision because I was very attracted to UW," Pardyak says. Fate intervened when Bershad emailed to say he was moving to the UW and Pardyak still had an option to enroll. "Coming to the UW and working with Brian was the absolute ideal situation," he says.

After his fifth year at CSE, the SPIN operating systems project wrapped up, and he got involved with classmate Ashutosh Tiwary's research, which they thought had commercial potential. They took a CSE-Foster School entrepreneurship course, and their presentation pitch to VC funders sparked interest. "We quit school in 2000 and founded Performant, just when the dot com bubble burst," Pardyak recalls. Despite several tough years, they raised funding and marketed Performant's application performance monitoring products. After they sold the company to Mercury Interactive in 2003, Pardyak spent about a year and a half as its chief diagnostics architect, followed by a year and a half at Microsoft.

Pardyak and Tiwary hooked up again to found Doyenz in 2007. They knew that virtualization and cloud were going to change the

world and decided to build a business around those technologies. Persistent Systems bought their cloud-based disaster recovery service for small to medium businesses in late 2012 with the goal to take the product to the enterprise market. After he left Persistent and spent time mulling his next options, Pardyak again felt pulled to entrepreneurship.

Usermind's Innovation Empowers Users

Usermind, co-founded with a colleague from Mercury Interactive, began not with an idea, but with extensive research on 40 companies with a goal to identify the biggest pain points in how businesses operate when faced with opportunities and challenges of using SaaS services. The key turns out to be business operations: the people and the processes that organize and constantly optimize teams like sales, marketing or finance, and which ultimately determine how successful a business is in the market. Usermind's approach is an alternative to old school top down software processes. Their product gives marketing, sales, and business staff the ability to be creative and easily adapt processes to adjust rapidly to constant feedback from the customers and market. "It helps teams experiment and innovate and find better ways to drive their businesses," he says.

Their thorough market research and product targeting set them apart and quickly drew \$7.6 million in series A funding from top VC firms Andreessen Horowitz, Charles River Ventures, and SVAngel. They are now in beta testing with a few select potential clients and expect to have a product on the market soon.

Pardyak as CTO and his co-founder and CEO Michel Feaster believe they have increased the odds for startup success by focusing intently on the company's culture from day one. They both have seen the difference that the right culture can make and agree with Peter Drucker that "culture eats strategy for breakfast." Pardyak had enjoyed CSE's environment, which he describes as rigorous, creative, and where everyone "cooperated with ease, worked hard, and had a lot of fun together."

"At Usermind we didn't want a mission and vision statement. We wanted to create an environment where people are having fun, creating value for customers, and can have a life outside work," Pardyak says. "Founders invent the original product, but it's the entire team that innovates and executes after that. The right culture is the difference between a team that can do very well or not at all." They hire staff who will both embrace and help shape the culture. The company byword is CCREAD: creativity, courage, respect, empowerment, action, and delight. As the website notes: "Your work is going to fill a large part of your life, and the only way to be truly satisfied is to do what you believe is great work. And the only way to do great work is to love what you do."

Continued from page 1

Big data (cont'd)

astrophysicist Saul Perlmutter, and NYU's team, helmed by neuroscientist and computer scientist Yann LeCun, partnered with the UW group for the six-month, intense collaboration that led to the grant.

At UW, the funds will pay salaries for data science experts who will work with researchers across campus on data analytics and methodologies, for postdoctoral data science fellows pursuing interdisciplinary research agendas, and for research scientists stationed in other departments and centers. A dedicated "data science studio" in the Physics/Astronomy Building will offer meeting areas and drop-in workspaces to encourage collaboration across the UW's colleges and schools.

According to OSTP director John Holden, "America is rich with institutions that are expert at generating data, but as a nation we have not fulfilled our potential to make the most of these data by merging pre-competitive resources, partnering on analytics, and sharing lessons learned." UW, Berkeley, and NYU are now paving the way in defining and organizing efforts to fulfill this potential.

Core Goals

Representatives from the three schools have defined core goals to achieve over the five-year grant duration:

(1) To support meaningful and sustained interactions and collaborations between methodology fields and science domains to define what it takes to move all fields forward. Methodology fields include machine learning, data management, statistics, sensors, data visualization, scalable hardware/software systems, and more.

(2) To establish new data science career paths that are long term and sustainable and to create new generations of multi-disciplinary scientists in data-intensive fields and data scientists focused on tool development.

(3) To build an ecosystem of analytical tools and research practices that are sustainable, reusable, extensible, easy to learn and translatable across research domains. This will help researchers spend more time exploring their research questions and less wrestling with enabling technologies and practices.

The Moore/Sloan award encourages cross-disciplinary cooperation in an academic world that can erect barriers to research and discovery. Methodology specialists often lack the discipline-specific knowledge needed to adapt and invent tools to investigate complex scientific problems. And domain scientists cannot realize the full potential of their research if they lack varied data science tools and know-how.

Big Data Sponsors

While the Moore and Sloan Foundations are the largest funders of UW's Big Data initiative, many others are contributing critical pieces to the puzzle:

The State of Washington provides \$500K per year as core funding, which launched and maintains the eScience Institute — a key foundation upon which recent successes have been built. (Microsoft, the Moore Foundation, and the National Science Foundation also provided critical early support.)

The Provost has provided funding for faculty positions to incent departments to hire people with dual strengths in their specific discipline and in data science methodology — "II-shaped" scholars with one foot firmly planted on each side of the divide that must be bridged.

The Washington Research Foundation (WRF) recently contributed \$9.3 million to the eScience Institute to remodel its data science studio and recruit faculty members and postdoctoral fellows.

The National Science Foundation awarded UW \$2.8 million to develop a novel, interdisciplinary graduate program in data science. Six UW departments are currently involved in this Integrative Graduate Education and Research Traineeship (IGERT) Initiative, which aims to educate an interdisciplinary corps of scientists and develop and release open source tools and cloud services.

Further, many individual grants help to conduct the science itself.

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Furthermore, 'brain drains' occur when students or post-docs walk away from universities for corporate life, leaving tools and methods undocumented and unshared and new opportunities unexplored. Incentives are needed to keep them in the academic setting. "These data scientists are coveted in industry as well as academia. One of the missions we have in this effort is to provide competitive career paths that allow these experts the freedom to remain in academia and apply their skills to the most important problems in science," says Bill Howe, co-lead of the eScience Institute and Affiliate Assistant Professor of Computer Science & Engineering.

UW: Investing in "Big Data" Since Before It Was Cool

The University of Washington has already assumed a leadership role in addressing such problems and directing Big Data discussions. Its eScience Institute (eScience.washington.edu) — created in 2008 as the brainchild of visionaries Ed Lazowska, Tom Daniel (Professor of Biology), Werner Stuetzle (Professor of Statistics and Divisional Dean, Arts & Sciences) and others — has collaborated with the UW's Center for Statistics and the Social Sciences (CSSS), now more than a decade old, to become a national leader in advancing the techniques and technologies of data-intensive discovery. Said Lazowska, "UW has been investing in 'Big Data' since long before it became cool. The eScience Institute, CSSS, and our partners across the entire campus are creating the intellectual infrastructure needed to ensure UW's continued leadership in learning and discovery."

Work in Progress

At the eScience Institute, researchers from many UW disciplines are already at work with statisticians, applied mathematicians and computer scientists to solve problems involving complex, massive-scale datasets. "This has enabled scientists to 'self-serve,'" states Bill Howe, so "they no longer feel 'locked out' of their data (and) required to tap on the shoulder of some resident programmer just to do their science."

Ongoing collaborations include work in fields such as oceanography, astronomy, biology, neuroscience, sociology, earth sciences, and global health. Two scenarios are highlighted in article sidebars: (1) collaborative work on SQLShare, a tool that helps marine biologists with only rudimentary knowledge of database systems use them to integrate and analyze tabular science data, and (2) joint work to advance database architectures for next-generation survey astronomy.



The Data Science Incubation Program

The success of these one-off collaborations, further powered by Moore/Sloan funding, spurred the eScience Institute to scale up their work to reach more people and projects. One result is the Data Science Incubation Program (data.uw.edu/incubator/). This program solicits proposals on data science projects around campus where "a little bit of hands-on assistance can go a long way," according to Howe.

Researchers send the eScience Institute short proposals describing their data analysis problem and identifying a scientist who will work closely with data science professionals in the Institute to solve it. The Institute then chooses the proposals that can make the strongest impact, and joint work begins in the data science studio. "There is a multiplicative effect because data science is the great unifier for the next decade," notes Lazowska, "where people discover that, despite being in different fields, they have similar problems that admit similar solutions."

The five projects chosen in the first round of Incubation applications include students, postdocs and faculty as project leads and span the fields of statistics, astronomy, seismology, economics, sociology, and health metrics.

What the Future Holds

"Data science is the rising tide that lifts all boats," says Lazowska. "If UW doesn't lead in data science, we won't lead in any other field. We have smart homes, smart cars, smart robots. It's time to put the 'smarts' into discovery."

For more information on collaboration scenarios, see page 12 ("Digital Exploration of the Microscopic Marine Ecosystem") and page 14 ("Advanced Database Architectures for Analyzing a Universe of Data").

Alum entrepreneur: WibiData expands access to the big data universe



A visionary CSE alumnus has navigated successful entrepreneurial launch into the tech universe, not just once, but twice in the last six years. The latest venture for Christophe Bisciglia ('03) is WibiData, a San Francisco-based startup founded in 2010 to build real-time big data

applications for customers across a variety of sectors from retail to the finance industry. Bisciglia is at the forefront of a revolution in how companies use data to drive more personalized interactions with customers.

Bisciglia joined Google upon graduating from UW CSE in 2003. In 2008 he left Google to launch Cloudera with three partners who had worked for Facebook, Yahoo, and Oracle. Cloudera is a Palo Alto company and the leading provider of open-source, Apache Hadoop-based software and services run on banks of networked computers. Cloudera today has more than 500 employees and counts eBay, Expedia, J.P. Morgan Chase, Nokia, and Walt Disney Company among its many customers.

Bisciglia left Cloudera in 2010, though. Why leave a company you founded that's on a clear path to success, only two years after its establishment? "In founding Cloudera, I had an application focus, but supporting the platform on the business side as the company grew was a huge job," Bisciglia explains. "The application side has always been the most motivating for us, and I wanted to get back to our roots and figure out how to take the powerful Hadoop platform and offer application level solutions to a range of larger companies."

Bisciglia, as CEO, and about 35 employees are doing so at WibiData by leveraging big data infrastructure like Hadoop, HBase, Cassandra and the Kiji Project, and tools for data scientists like Scala and R, to help customers deliver real-time, personalized applications across the web, mobile, and other channels. WibiData's applications collect, store, and analyze data from many sources, ranging from real-time application logs, to data warehouses and other offline data. These data sources then

power the real-time predictive models that deliver the types of application experiences consumers have come to expect from companies like Google, Amazon, and Netflix.

"To date we have attracted \$23.5 million in venture funding. It gives us running and breathing room to focus on customers and technology while we market our products and services. Fund-raising is one of the ways that I get to justify my existence as CEO," Bisciglia cheerfully notes.

Early investors included Google's current Executive Chairman Eric Schmidt, then-CEO of Cloudera Mike Olson, and angel investors Ron Conway and David Lee. Series A funding in early 2012 and Series B funding in May of 2013 brought in additional funding from New Enterprise Associates, Canaan Partners, and Schmidt. Among the company's early customers are Opower, a leading energy software company, one of the largest SaaS CRM providers in the world, as well as Fortune 150 companies in retail and media.

Introducing Cloud Computing at CSE

While working as a senior software engineer at Google, Bisciglia returned to CSE in January 2007 to launch Google 101, a series of classes on cloud computing. Bisciglia had hatched the idea to use his 20 percent independent project time at Google to develop a course to introduce UW students to programming at the scale of the cloud. CEO Schmidt gave it his personal blessing, and Bisciglia worked with Professor Ed Lazowska and students to implement the concept. Google funded a cluster of 40 networked computers for CSE's server room.

Bisciglia organized a team of UW students to help plan the curriculum and recruited volunteers from Google's Kirkland office to help teach the first course. It focused on Hadoop, an open source version of MapReduce, the methodology that allows Google to analyze so much data at scale. (The co-creator of MapReduce is UW CSE PhD alum Jeff Dean, now at Google (see page 4); the co-creator of Hadoop is UW CSE PhD alum Mike Cafarella, now on the faculty at the University of Michigan.)

"One of Christophe's many strengths is that he doesn't always color between the lines," said Lazowska. "Need a cluster of computers? No problem. Buy a few racks on eBay with your credit card, and submit for reimbursement. Christophe landed on the

"We didn't know exactly what we'd do when we started WibiData, but the journey is half the fun. At the end of the day, I feel humbled and lucky for the opportunity to inspire others and help tell the story they create." Christophe Bisciglia

cover of *Business Week* as Google's 'cloud guy,' and the course drew a flood of students to Google."

Google 101 went national after Google and IBM teamed up to build an academic data center, administered by the National Science Foundation, to support the scale-out. The project expanded from 20 percent time to full-time for Bisciglia. A year later, with Schmidt's blessing, Bisciglia left Google to found Cloudera.



View of WibiData headquarters

Entrepreneurial Spirit

Bisciglia, who grew up in Gig Harbor, credits his entrepreneurial spirit to his father and grandfather, who owned their own businesses. As a teenager, he plunged into business by buying, raising, and selling Icelandic horses in the Northwest and to customers as far flung as Colorado and New York. He taught himself programming and built an interactive website and database to promote his business, which sparked his interest in computer science. As someone who has trouble fitting into molds, he especially appreciates the encouragement he received at CSE.

"Ed was so incredibly understanding of the challenges I faced," Bisciglia says. "And CSE has an entrepreneurial spirit. The faculty didn't just teach us programming and fundamentals, but posed questions as to why technology matters and how it can help solve big problems."

Bisciglia's Google 101 and Cloudera initiatives won him recognition as "Smartest Engineer" in *Fortune*'s 2010 list of "the 50 smartest people in technology." Other good company on that list included Steve Jobs, Jeff Bezos, Mark Zuckerberg, Sergey Brin, and Larry Page.

The Vision for WibiData

Bisciglia wants to take the time to focus on product R&D and develop the platform the right way to develop a powerful core technology with vertically integrated solutions for users, and then ramp up marketing and their customer base. He feels fortunate

to have recruited smart people to WibiData, and puts heavy emphasis on creating a great work environment and culture where people collaborate around shared goals.

"WibiData is packed to the gills with CSE graduates. These people are defining the future of big data," Lazowska says. "The reputation of UW CSE is based almost entirely on the accomplishments of our alums. A million thanks to Christophe and so many others for making us look good!"



UW CSE's Annual Donor-Scholar Luncheon



CSE's annual donor-scholar luncheon brings together the generous individuals and corporations whose gifts make scholarships and fellowships available to our students, and the outstanding students who are the beneficiaries of this generosity. Scholarships enable great students to attend UW CSE regardless of means, allowing us to fulfill the traditional role of the nation's great public universities as tuition rises to offset dramatic reductions in public support. Fellowships help attract the very best graduate students to UW CSE, and provide flexibility during their first year as they discover the research area that excites them the most.

At this year's event, graduate student Laurel Orr and undergraduate student Karolina Pyszkiewicz spoke, representing their peers. Watch their talks here:

www.cs.washington.edu/news/video/2014_donor_lunch/

Many thanks to our donors, and congratulations to our students!

Learn more about our endowed scholarships and fellowships, the donors, and the recipients here:

lazowska.cs.washington.edu/2014.Luncheon.Booklet.pdf

Digital Exploration of the Microscopic Marine Ecosystem

Virginia Armbrust studies marine microbes, whose microscopic stature belies their importance to the planet. As Armbrust, Director of UW's School of Oceanography, explains, "These microorganisms recycle the elements and drive critical biogeochemical ocean processes. By studying the temporal and spatial distribution of these microbes, their genes and DNA sequences, we can see how ecosystems are responding to environmental changes and how they might respond to future ocean conditions."

Like most research scientists today, Armbrust has had to develop new ways of thinking in order to accommodate the massive flow of data now available. She notes that oceanography has gone from being a "very data-poor science, gathering data with a few research cruises, to a very data-rich science, with sensors throughout the ocean, relaying data back to computers 24 hours a day." The SeaFlow instrument developed in her lab, for example, analyzes 15,000 cells per second continuously during a multi-week research cruise — potentially 5-15 GB of data/day.



SeaFlow instrument

This scale of data required a new approach to analysis. She explains: "I was trained to plot all the data points, and look at the data in different ways. But suddenly we couldn't look at all the data, which meant that we couldn't figure out which questions to ask. We literally couldn't even see the data that was coming in. I had a lot of people with great, interesting questions to ask, and they couldn't ask them."

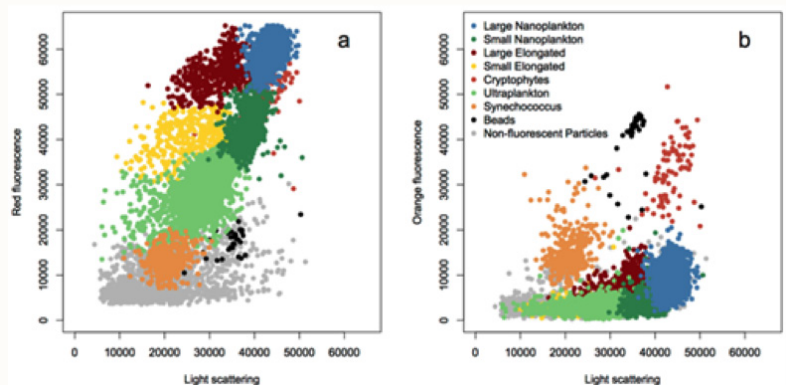
SQLShare: Database-as-a-Service for Science

Bill Howe, Associate Director of the UW eScience Institute and Affiliate Assistant Professor in Computer Science & Engineering, reached out to the Armbrust Lab to see how the Institute might help. Through a close collaboration, the teams developed a tool called SQLShare, intended to make databases dramatically easier to deploy in science contexts. Hosted in the cloud,

SQLShare simplified the use of database technology: there was no software to install, and data could be ingested directly, queried, and shared with others, all through a browser. "SQLShare was motivated by our observation that scientists weren't often using database technology, even when it seemed like a good fit," says Howe. "The problem turned out not to be the technology itself, but the way it was typically delivered."

The SQLShare technology made a believer of Armbrust: "It really opened my eyes. After seeing the power of databases, I became a born-again database person.... And SQLShare demonstrated the power of the cloud, broke down that conceptual barrier for me, and helped me begin to see what cloud computing makes possible." She further notes that "SQLShare allows more of a back and forth with the data, so you can look at the data and figure out what kinds of questions you want to ask. It helps you weed out the garbage data, lets you focus on the good data."

The collaboration with the eScience Institute became a process of thinking together about the data. Armbrust describes the iterative process she began to use: "I think I know the question, and we answer it with SQLShare, and then I realize, 'Oh, that's not the question I want to ask, I want to ask something else.' That kind of rapid iteration is what SQLShare makes possible." Armbrust concluded that what took weeks of analysis using desktop tools took mere minutes using SQLShare.



"Cytograms" displaying data from the SeaFlow instrument. Each color represents a different category of microbe. The left and right images show very different population profiles — the kind of variance that SeaFlow is designed to help us understand.

Interdisciplinary Collaborative Analysis Enabled by SQLShare

In Spring 2013, the Armbrust and e-Science teams conducted a "field test" of the SQLShare technology. In the context of an interdisciplinary oceanography project led by Armbrust, 40 oceanographers from varied sub-disciplines — physical, biological, chemical — organized a retreat to plan an integrative research agenda based on heterogeneous data they had independently collected the previous summer on a joint research cruise. Representatives from the eScience Institute brought all data pre-loaded into SQLShare. As a result, the meeting's agenda shifted from "planning" to "doing."



Dan Halperin giving a demonstration of SQLShare to a rapt audience.

With help from an eScience team led by Dan Halperin, the Institute's Director of Research in Scalable Data Analytics, researchers directly queried the data "at the speed of discussion." For example, they asked about the relationship between Zinc and Cobalt at a particular location, or explored whether ocean salinity affected the count of a particular virus. These questions were directly translated into SQLShare queries and answered on the spot. Immediate answers enabled immediate discussion of results, a critical factor in making the best possible use of the rare combination of domain specialists present at the meeting. "Our hypothesis was that SQLShare could be used interactively to steer the discussion in real time," says Halperin. However, "What we found was that using it in this way was not just faster, but fundamentally different — different questions and different science."

Myria: Scaling Up beyond SQLShare

Armbrust envisions eventually deploying SeaFlow sensors on hundreds of commercial and research vessels simultaneously, all providing a real-time view of the ocean's biological dynamics.

At this scale, however, even SQLShare could not meet data storage and manipulation requirements.

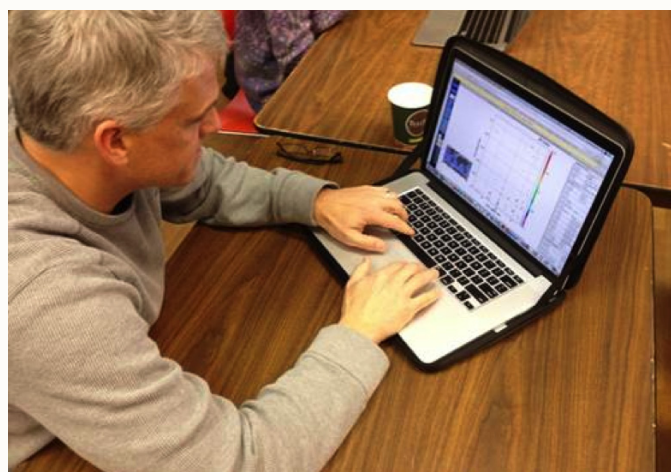
In a recent project called Myria, led by the CSE Database group and the eScience Institute, three CSE faculty members began working with science users like Armbrust to develop the next generation of cloud-based data management and analytics systems. Like SQLShare, Myria is designed to be delivered as a service to support direct analysis through a web-browser — a critical feature for researchers with limited IT support. Unlike SQLShare, Myria scales to hundreds of terabytes and supports much more complex analytics. Halperin, technical lead of the Myria project, is working closely with the Armbrust team to adapt the system for the scale and complexity envisioned in the future of the SeaFlow project.

Armbrust sees the shared, online, cloud-based approach as critical to empowering those in her field to work in data-intensive science: "My dream is to make this data and the data processing available to other scientists for their own research. I strongly believe that we move forward only when we're all working together."

For further information, please refer to the following:

Real-time Collaborative Analysis with (Almost) Pure SQL: A Case Study in Biogeochemical Oceanography, Daniel Halperin, Konstantin Weitz, Bill Howe, Francois Ribalet, Mak E. Saito, E. Virginia Armbrust, 25th International Conference on Scientific and Statistical Database Management (SSDBM) 2013.

Advancing Declarative Query in the Long Tail of Science, Bill Howe, Daniel Halperin, IEEE Data Engineering Bulletin, Vol. 35, No. 3, September 2012.



One of the oceanographers using tools powered by SQLShare at the retreat.

Advanced Database Architectures for Analyzing a Universe of Data

One of Big Data's biggest challenges lies in helping astronomers test theories of the creation and composition of the Universe. How can astronomers make optimal use of terabytes of simulation data and raw data drawn periodically from the Sloan Digital Sky Survey (SDSS) and eventually from the massively powerful Large Synoptic Survey Telescope (LSST)?

Multi-department collaborations through the eScience Institute often occur on what Magda Balazinska, Associate Professor in Computer Science & Engineering (CSE), calls a "What can we do together?" basis. In the field of Astronomy, the answer is the AstroDB collaboration.

Striving to create advanced database architectures and tools for next-generation survey Astronomy, AstroDB brings together students, postdocs and faculty from Astronomy and Computer Science departments at the UW. Under its umbrella are many projects focused on "exploring new ways of analyzing data, either by pushing the scale at which data analysis becomes easy or by pushing on the available capabilities," said Balazinska. These collaborative efforts aim not only to expand the boundaries of scientific discovery in astronomy, but also to produce tools and methodologies that are efficient, scalable, reproducible and, crucially, reusable in other scientific domains.

Efficient Processing of Telescope Images:

AscotDB and More

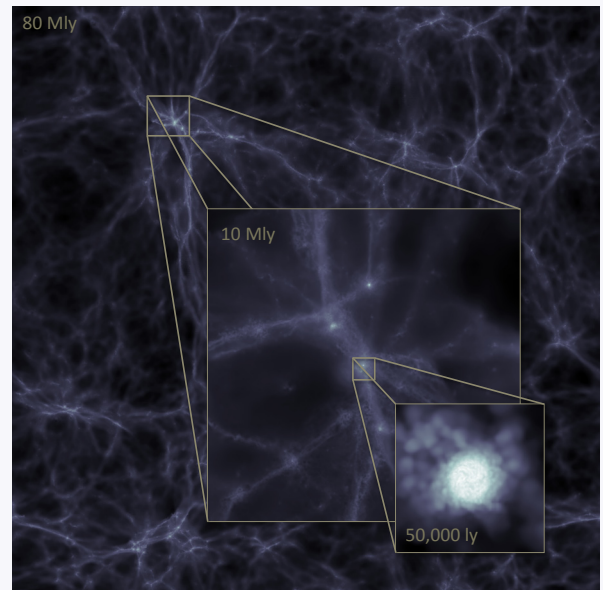
Astronomers currently analyze sky surveys by collecting raw images using large telescopes and digital cameras, processing the images with special-purpose data analysis pipelines (i.e., specialized computer programs that correct for data defects, determine exact positions of stars and galaxies, or perform other preliminary data processing tasks) and preparing catalogs of celestial objects with different properties. These catalogs are then available for general scientific inquiry.

In contrast, the AstroDB team's new tool, called AscotDB, enables the direct analysis of raw pixel data. This lets scientists ask fundamentally different questions than when processing catalog data only. An extensible data analysis system, AscotDB provides the interactive analysis of astronomical survey data. While it uses the SciDB parallel array processing engine as a back-end, SciDBi was designed for processing arrays, while telescope data is 'spherical.' Therefore, AscotDB wraps SciDB with Python middleware to provide efficient support for spherical data and adds iterative processing, a critical step in the analysis process. AscotDB's front-end design integrates a graphical interface for locating moving/transient objects and a programmatic iPython

interface for both detecting and measuring such objects, enabling both interactive exploration and deep data analysis.

According to Andy Connolly, Professor of Astronomy at the UW, "The work here, along with future directions of development in SciDB, points to a system where a full-sky worth of time-domain astronomy imaging data can be directly stored and indexed in a way that will enable efficient image analysis tasks to be performed on-demand by users without their needing to understand the details of how to parallelize and scale their applications."

AscotDB is one of many ongoing collaborations spearheaded by CSE's Database group and aimed at making sky survey image processing and analysis faster and more convenient. Other projects have analyzed Apache™ Hadoop® workloads, explored the use of iterative parallel array processing and parallel database management systems combined with machine-learning methods, and produced tools to help write SQL queries for SDSS image data. According to Jake Vanderplas, Director of Research in Physical Sciences at the eScience Institute, "Such a close collaboration between astronomers and computer scientists is, from what I've seen, fairly unique in the academic community. We've found it extremely fruitful: by combining these two realms of expertise, we're able to explore novel research directions in both fields."



This simulation represents a uniform, cosmological volume that is 80 million light years on a side, contains ~2 billion particles and is capable of resolving scales down to ~1000 light years. This high resolution in such a large volume, only possible due to the large scalability of our code ChaNGa, resolves the morphologies of galaxies down to very small masses giving us a large statistical sample of interesting objects. We evolved the simulation for ~1.5 billion years, creating a dataset of ~5 TB, which we will use to understand the formation and evolution of galaxies in the early universe.

By reducing data management overhead, computer and data scientists are helping astronomers explore the universe of miracles that await discovery.

Analyzing Astronomical Simulation Data: Myria with MyMergerTree Visualizations

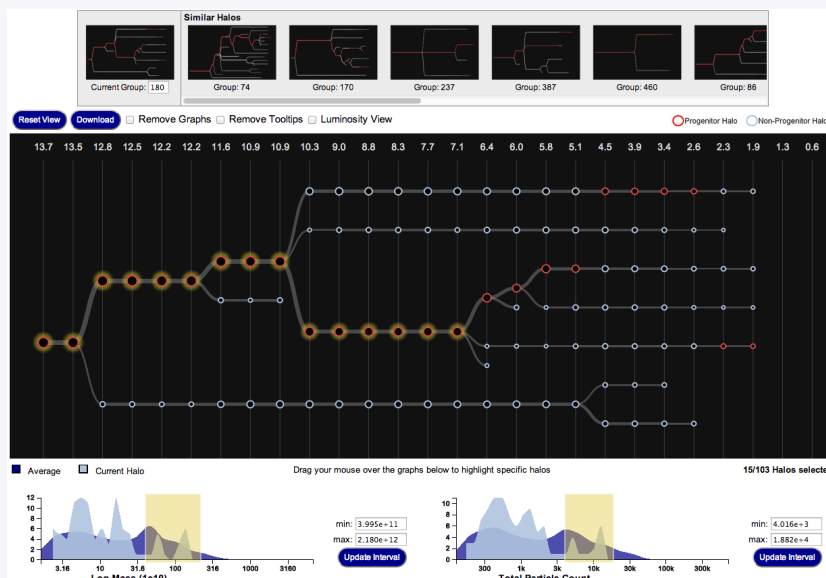
How are comets delivered into Earth-crossing orbits? How do stars like the Sun migrate over great distances in the Milky Way? How do galaxies form and evolve?

Astronomers investigate such questions using cosmological simulations, N-body simulations, in particular. N-body simulations model and project the dynamic behavior of particles/objects, usually under the influence of physical forces such as gravity. They help to explore a broad range of problems, from defining the attributes of few-body systems, such as the Earth-Moon-Sun, to understanding the large-scale structure of the cosmos.

The N-body Shop, an interdisciplinary UW group doing pioneering work in the area of astrophysical cosmological simulations, produces simulations that can range in size from tens of gigabytes to multiple terabytes; analyzing them requires the scaling and optimizing of many data-related tasks — such as data filtering and grouping — before statistical analysis and evaluation efforts can even begin. For simulations, AstroDB initiatives focus on creating techniques and tools that use relational database management systems, both single node and parallel, and new MapReduce-type systems to simplify data manipulation tasks so astronomers can focus on the querying and evaluating pay-off activities.

One revolutionary system we are exploring is Myria, or "Big Data Management as a Cloud Service." A cooperative effort guided by the CSE Database group, Myria facilitates the uploading of large datasets, the performance of complex data analysis tasks in the cloud, and the sharing of results with colleagues. Sarah Loebman (UW Astronomy PhD and Michigan Society of Fellows postdoctoral fellow) says the following of Myria and her ongoing work with the Database group:

"Collaborating with the UW CSE Database group has been a transformative experience for us; thanks to the group's work with Myria, we're able to ask fundamentally different scientific questions than we've ever asked before. For example, we are currently working with a 5 terabyte simulation that is very hard to analyze in its entirety through conventional means....Myria's distributed platform and



The MyMergerTree service enables astronomers to specify a set of galaxies at present day and have Myria compute the merger trees for galaxies that show their evolution over time.

flexible design allows us to load all 5 terabytes of simulation data at once and trace any given subset of the data across time."

Myria is being used in other projects as well. A recent astronomy application is MyMergerTree, a service that helps astronomers study the growth history of galaxies by following their merger trees in large-scale astronomical simulations. Of the powerful Myria/MyMergerTree duo, Loebman says, "This lets us consider how structures like galaxies form and evolve and how properties we observe today (like shape and luminosity) are correlated with a galaxy's merger history."

For further information, please refer to the following:

For AscotDB

Squeezing a Big Orange into Little Boxes: The AscotDB System for Parallel Processing of Data on a Sphere. Jacob Vanderplas, Emad Soroush, Simon Krughoff, Magdalena Balazinska, and Andrew Connolly
IEEE Data Engineering Bulletin. 36(4):11-20, 2013.

For SciDB

Overview of SciDB: Large Scale Array Storage, Processing and Analysis. J. Rogers, R. Simakov, E. Soroush, P. Velikhov, M. Balazinska, D. DeWitt, B. Heath, D. Maier, S. Madden, J. Patel, M. Stonebraker, S. Zdonik, A. Smirnov, K. Knizhnik, Paul G. Brown. SIGMOD 2010.

UW website links

<http://scidb.cs.washington.edu>

<http://www.scidb.org/>

<http://myria.cs.washington.edu>

<http://db.cs.washington.edu/astrodb/>

UW CSE's Shiri Azenkot Wins 2014 Graduate School Medal

Shiri Azenkot, a UW CSE PhD student who is completing her studies with CSE professor Richard Ladner and iSchool professor (and CSE adjunct professor) Jake Wobbrock, received



the 2014 University of Washington Graduate School Medal. The Graduate School awards the Medal "to recognize PhD candidates whose academic expertise and social awareness are integrated in a way that demonstrates an exemplary commitment to the University and its larger community."

Azenkot was also recognized by the College of Engineering's 2014 Community of Innovators Awards as the Student Innovator for Research.

Azenkot's research concerns eyes-free text input on mainstream mobile devices using gestures and speech. Her goal is to enable blind people to use mainstream mobile devices as effectively and efficiently as sighted people. As a secondary pursuit, she explores how mainstream technology can enable blind and deaf-blind people to travel more independently. Learn more about her work here: www.shiriazekot.com

"I work on solving meaningful problems," says Azenkot. "I have been very fortunate to have inspiring and supportive mentors and collaborators."

In the fall she will join the Jacobs Technion Cornell Innovation Institute at Cornell Tech as an Assistant Professor. This is a joint appointment between Cornell Information Sciences at Cornell Tech (the new campus in NYC) and Technion (Israel Institute of Technology).

Azenkot is the fourth CSE PhD student to receive the Graduate School Medal. Other CSE recipients include:

- Yaw Anokwa, the 2011 Graduate School Medal;
- Anna Cavender, the 2010 Graduate School Medal;
- Vibha Sazawal, the 2004 Graduate School Medal.

Congratulations, Shiri!

UW CSE's Martina Unutzer: Honorable Mention in 2014 CRA Outstanding Undergrad Researcher Award

UW CSE undergraduate Martina Unutzer has received an Honorable Mention in the 2014 Computing Research Association Outstanding Undergraduate Researcher Award competition.

The award recognizes undergraduate students in North American colleges and universities who show outstanding research potential in an area of computing research.

Martina's research, with UW CSE professor Magda Balazinska and UW Astronomy research scientist Ben Williams, has completely transformed

the way our astronomy colleagues handle artifacts (due to cosmic rays) in their databases of stars. Balazinska writes: "I would meet with her not to advise her on what to do but to get up to speed on what she had already done! This is a degree of autonomy that one dreams about in graduate students, and Martina is an undergraduate!"



This summer Martina will join Google Seattle/Kirkland as a software engineer.

Engagement in research is a hallmark of UW CSE's undergraduate program. As of last year, CRA had recognized more students from UW CSE in the past decade than from any other university.

Congratulations to Martina, and to all of our outstanding undergraduates!

We want to hear from you!

Do you have news you'd like to share with the CSE community? Comments or suggestions for future issues of MSB? Let us know! Email the editors at: msb@cs.washington.edu

UW CSE's Gaetano Borriello Wins UW's 2014 Distinguished Graduate Mentor Award

Gaetano Borriello, the Jerre D. Noe Professor of Computer Science & Engineering, received The Marsha L. Landolt Distinguished Graduate Mentor Award at the annual UW Awards for Excellence ceremony on Thursday, June 12th.

In his letter announcing the award, UW President Michael Young said: "Your students and colleagues nominated you with the highest praise for your exemplary commitment and skill in mentoring graduate students. They strongly commend you for raising the quality of graduate programs, for recruiting some of the very best students, and for setting an outstanding example of work-life balance. I join them in their tribute to you and extend my congratulations and appreciation for your outstanding dedication and service."

The Landolt Award — named for former Dean of the Graduate School Marsha Landolt — was introduced in 1999 and allows the UW Graduate School to honor those members of the faculty who exemplify excellence in graduate education. CSE professor David Notkin received the second award, in 2000. CSE adjunct professor Tom Daniel received the fourth award, in 2002.

Congratulations, Gaetano!!



UW CSE's Richard Ladner Wins SIGCHI Social Impact Award

UW CSE professor Richard Ladner has been recognized many times for his extraordinary work on accessible computing — a research area he entered after working in theoretical computer science for more than 30 years.

Ladner's most recent honor comes from the ACM Special Interest Group on Human-Computer Interaction, SIGCHI, which presented him with its Social Impact Award at CHI 2014 in Toronto in April. This award is given to individuals who promote the application of human-computer interaction research to pressing social needs. Read the citation [here](http://www.sigchi.org/about/awards/2014-sigchi-awards):

www.sigchi.org/about/awards/2014-sigchi-awards.

Congratulations, Richard!



UW CSE's Shayan Oveis Gharan Receives Honorable Mention 2013 ACM Doctoral Dissertation Award

Each year, ACM recognizes a winner and one or two honorable mentions in its Doctoral Dissertation Award Competition, from among the 2000+ PhD dissertations authored in the field each year. UW CSE professor Shayan Oveis Gharan received one of two Honorable Mentions in the most recent competition for his Stanford doctoral dissertation *New Rounding Techniques for the Design and Analysis of Approximation Algorithms*.

Shayan received his PhD from Stanford in 2013. He is spending the current year as a Miller Fellow at UC Berkeley and will join UW CSE during the 2014-15 academic year. His research involves the development of provably efficient algorithms for problems that seem intractable. He has worked on the classical Traveling Salesman Problem, on clustering in massive graphs using spectral methods, and on stochastic optimization. More information on Shayan's research may be viewed in this brochure:

lazowska.cs.washington.edu/CSE_new_hires_2013.pdf



Datagrams

UW startup SNUPI Technologies is Technology Alliance "Innovation Showcase Company of the Year"

At the annual Technology Alliance "State of Technology" luncheon on May 19th, UW startup SNUPI Technologies was recognized as "Innovation Showcase Company of the Year." SNUPI's first product, Wally, is an environmental sensor system for the home. The company was co-founded by UW CSE+EE professor Shwetak Patel, UW CSE+EE professor Matt Reynolds, UW CSE alum Jeremy Jaech, and UW EE PhD student Gabe Cohn. More info on SnuPI Technologies and Wally available here:



www.wallyhome.com

CSE PhD alum Donald Chinn wins 2014 UW Distinguished Teaching Award

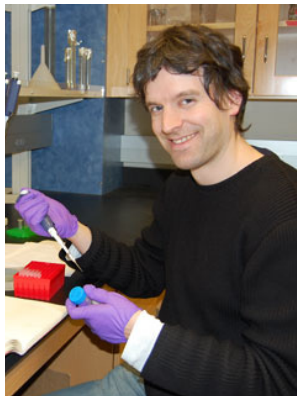
CSE PhD alum Donald Chinn, an Associate Professor in UW-Tacoma's Institute of Technology, is one of seven winners of 2014 University of Washington Distinguished Teaching Awards. Donald was recognized at the Awards of Excellence ceremony on June 12th. Learn more about Donald here:



faculty.washington.edu/dchinn/

CSE+EE professor wins ONR Young Investigator Award

CSE+EE professor Georg Seelig is one of 24 "early-career academic researchers whose scientific pursuits show exceptional promise for supporting the Department of Defense"



who were named recipients of 3-year Office of Naval Research Young Investigator Awards. Georg's research focuses on understanding how biological organisms process information using complex biochemical networks and how such networks can be engineered to program cellular behavior. Circuit elements engineered from DNA and RNA components

are being applied to problems in disease diagnostics and therapy. Learn more about his research here:

homes.cs.washington.edu/~seelig/

CSE's Vincent Liu, EE's Vasmi Talla win \$100,000 Qualcomm Innovation Fellowship



CSE PhD student Vincent Liu and EE PhD student Vamsi Talla, working with CSE professor Shyam Gollakota and CSE+EE professor Josh Smith, are one of 9 teams to receive 2014 Qualcomm Innovation Fellowships. Of 137 submitted proposals (from 18 schools), Qualcomm first selected 34 finalists, then the 9 winning teams. Vincent and Vamsi are working on the Ambient Backscatter project. Another of the 9 winning teams: Georgia Tech PhD students Amir Yazdanbakhsh and Bradley Thwaites, advised by UW CSE PhD alum Hadi Esmaeilzadeh and UW CSE affiliate professor (and Microsoft Research Director of Client & Cloud Apps and Hadi's PhD co-advisor with CSE's Luis Ceze) Doug Burger. More about the Ambient Backscatter

project here:

abc.cs.washington.edu

CSE visits the Living Computer Museum

On Thursday, April 3rd, 250 CSE alumni, friends, families, faculty, and staff gathered at Paul G. Allen's Living Computer Museum for an evening of fellowship and nostalgia. If you have not yet visited the Living Computer Museum, it's a treat. Everything works, and everything is hands-on! Awesome event photos by Bruce Hemingway here:



tinyurl.com/UWCSELCMPhotos.

CSE's Dan Grossman elected to Computing Research Association Board of Directors



CSE professor Dan Grossman has been elected to the Board of Directors of the Computing Research Association (CRA). CRA's members include more than 200 North American academic departments of computer science, computer engineering, and related fields; laboratories and centers

in industry, government, and academia engaging in basic computing research; and affiliated professional societies. Biographies of Dan and the other newly-elected CRA Board members here:

cra.org/about/elections2014/

UW CSE has a long history of close involvement with CRA. See history at: tinyurl.com/UWCSEGrossmanCRA

CSE PhD alum Stefan Savage wins 2013 SIGOPS Mark Weiser Award



The Mark Weiser Award was created in 2001 by the computer systems research community, to be given annually to an individual who has demonstrated creativity and innovation in computer systems research. The award is named in honor of Mark Weiser, a computing visionary recognized for his research accomplishments during his career at Xerox PARC. In

November, the 2013 award was presented to CSE's PhD alum (and UCSD professor) Stefan Savage. Stefan is the fourth CSE PhD alum to receive the Weiser Award in its 13-year history. Earlier winners include: Brian Bershad (now with Google), recognized in 2004; Tom Anderson (UW CSE faculty member), recognized in 2005; and Jeff Dean (Google), recognized in 2012. Learn more about Stefan here:

cseweb.ucsd.edu/~savage/

CSE PhD alum Roxana Geambasu receives honorable mention for inaugural SIGOPS Dennis M. Ritchie Doctoral Dissertation Award

The Dennis M. Ritchie Doctoral Dissertation Award was created by the computer systems research community in 2013 to recognize research in software systems and to encourage the creativity that Dennis Ritchie embodied, providing a reminder of Ritchie's legacy and what a difference one person can make in the field of software systems research. At the ACM Symposium on Operating Systems Principles in November, CSE PhD alumna Roxana Geambasu, now faculty at Columbia University, was recognized as runner-up in the inaugural Ritchie Award competition for her dissertation, entitled *Empowering Users with Control over Cloud and Mobile Data*. Learn more about Roxana here:



www.cs.columbia.edu/~roxana/

Paul G. Allen Center for Computer Science & Engineering: then and now

On October 9, 2003 (roughly 10 years ago), we dedicated the Paul G. Allen Center for Computer Science & Engineering. The Allen Center — still widely regarded as the finest computer science facility in the nation — has had a dramatic impact on UW CSE's competitiveness ... including our competitive desire for a Seahawks win! More information on our 10 year anniversary here: tinyurl.com/UWCSE10Year.



Ben Taskar 1977-2013



Our department, the entire university, and many in our field nationally were shocked and saddened by the loss of Ben Taskar, Boeing Professor of Computer Science & Engineering at the University of Washington, who passed away on the early morning of November 18, 2013 of sudden and severe heart failure. Ben was unique — a superstar in multiple fields including machine learning, vision, and NLP. He leaves behind his wife, Anat Caspi, their two-year old daughter, Aviv Taskar, his mother, father, and sister, and an array of other family members, friends, and colleagues — all of whom miss him tremendously. Services were held in San Francisco on November 22; members and friends of the CSE community gathered in the Atrium at that time to remember him.

Additional information is available at <http://bentaskar.com>.



most significant bits

newsletter of uw computer science & engineering

volume 24, number 1, spring 2014

university of washington



06-0419

Computer Science & Engineering
University of Washington
Box 352350
Seattle, WA 98195-2350



ADDRESS SERVICE REQUESTED

UW CSE alum Bay Area meetup: Join us at Pixar!

If you were not able to join us a couple of years ago, you are in luck! This year's UW CSE Bay Area alumni meetup will once again be hosted by Pixar at their animation studios in Emeryville!



Please plan to join us on Thursday, July 10th, for a special behind-the-scenes look at Pixar... eat ... drink ... connect with CSE faculty, alumni, and friends ...

For more information, please contact Kay Beck-Benton (kbeck@cs).

RSVP is required: tinyurl.com/UWCSE2014Pixar