

UNIVERSITY of WASHINGTON

The Lab's First Year July 2014



Letter From the Founders

The Tech Policy Lab at the University of Washington is off to an energetic start, thanks to a transformative founding gift from Microsoft and the efforts of our staff, students, and colleagues. We have hosted important policy conversations, carefully put into place the methods of procedure for true interdisciplinary research, and completed or initiated a variety of important projects around emerging technology policy. Here are some of the highlights of our first year:

Running Start. Our highly **successful launch** event, timed with the launch of a professionally designed website, saw great enthusiasm in the tech policy community.

Early Impact. At a recent **Federal Trade Commission workshop** on the privacy and security of the Internet of Things, Tech Policy Lab faculty constituted two of the small handful of academic experts invited to participate.

High Quality. Lab faculty and students won **best paper awards** for research on consumer privacy and on brain-machine interface security, respectively, at flagship law or engineering conferences in the 2013-2014 academic year. Two of our PhD candidate students Tamara Denning and Franziska Roesner accepted **tenure-track positions** in leading Computer Science departments where they will bring an awareness of policy to their technical activity.

Sustained Training. The Lab provided training at the intersection of information technology and policy for five UW faculty members, six graduate students, two visiting scholars, and one research staff member from the fields of computer science, electrical engineering, information science, government, and law. In addition, under the leadership of Tech Policy Lab faculty Batya Friedman, the lab began exploring the integration of policy analyses into technical courses.

Thought Leadership. The Lab hosted visitors from Pulitzer and Loeb winner **Ashkan Soltani** to Federal Trade Commissioner and privacy champion **Julie Brill**, among others. Next year we will host, among others, science fiction author **Cory Doctorow** and, as part of a new Distinguished Lecture series, leading moral philosopher of technology **Jeroen van den Hoven**.

We hope you find this report on our first year helpful. Sincerely,

Ryan Calo Batya Friedman Tadayoshi Kohno

The Launch

The Tech Policy Lab launched in September 2013. Thanks in large measure to Microsoft's press team, we had an impressive turnout, filling the entire atrium of the Computer Science & Engineering building at the University of Washington. The event included talks by UW President Michael Young, Microsoft Executive Vice President and General Counsel Brad Smith, and Microsoft Corporate Vice President and Head of Microsoft Research Peter Lee. In addition to the evening's speakers, Bill & Melinda Gates Chair in Computer Science & Engineering Ed Lazowska served as MC for the event. In attendance were technologists, law and policymakers as well as students, faculty, and the public.

The featured presentation was a preview of the Lab's planned work on augmented reality by Faculty Co-Directors Ryan Calo, Batya Friedman and Tadayoshi Kohno.



(from left: UW Computer Science & Engineering Professor Tadayoshi Kohno, University of Washington President Michael K.Young, Microsoft Academic Relations Director Allison Rosenberg, Information School Professor Batya Friedman, UW School of Law Dean Kellye Testy, Head of Microsoft Research Peter Lee, Microsoft General Counsel Brad Smith, UW School of Law Professor Ryan Calo, and Bill & Melinda Gates Chair in Computer Science & Engineering Ed Lazowska)

The Launch of the Lab received great press coverage, including by <u>Geekwire</u> and <u>The</u> <u>Seattle Times</u>.

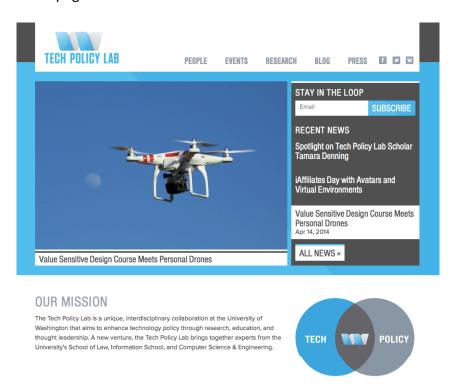
Our Virtual Presence

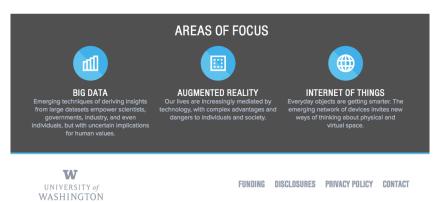
As part of the Launch the Tech Policy Lab's website, www.techpolicylab.uw.edu went live. We understand the importance of having a virtual presence. The website was the result of three months of intensive work with professional designers. During the process, we looked at what made a website engaging for our prospective audience, focusing on how our web presence would enable the success of the Lab's projects. On the front page we used "Focus Areas" to provide a short summary of what the Lab is

working on. In addition to descriptions of the Lab's focus areas, the website includes posts on tech policy topics and in-depth profiles of Lab members.

We provide some screenshots to give a sense of the design direction and content. The Lab continues to consider all aspects of communications; this is meant to be an iterative process and feedback is warmly welcome.

Homepage:





We have used the blog to address interesting issues as they arise:





BEAM ME UP, SCOTTY (BUT PAY THE TOLL FIRST)

Posted by Elena Ponte I Jun 6, 2014 Robots



(photo credit Flickr/FreePress)

Chief Engineer Scott of Star Trek had an answer to long distance travel (be it interstellar or across a backyard): "beaming". While the technology of disassembling and reassembling people atom by atom remains elusive, many companies today are focusing on a different kind of "beaming" [1] – mobile robotic telepresence ("MRP"). MRP is different from other existing forms of communication technology as it seeks to operationalize (and, in time, optimize) remote physical interactions as well as mental ones.

Two such companies, InTouch Technologies, Inc., ("InTouch") and VGo Communications. Inc. ("VGo"), have MRP bots on the market, and for the last few years have been locked in a legal battle that while on paper appears to be about IP, has important import for privacy and accountability in MRP technology [2].

At the crux of the dispute is InTouch's "arbitration" (for now, let's agree that "arbitration" means some sort of mechanism that determines who can be granted exclusive access and control to a remote mobile robot) tech patent. VGo-indeed, any telepresence platform – also uses a mechanism that ensures only authorized people can gain access to private commercial or social context. Notwithstanding, InTouch sued them.

The ensuing dispute about whether "arbitration" is obvious (i.e., not patentable), and the Federal Circuit Court's ruling that it, in fact, was not, clears the way for innovation in MRP privacy and accountability.

As well as profile our Lab Members:



BLOG

SPOTLIGHT ON TECH POLICY LAB SCHOLAR FRANZI ROESNER

osted by Emily McReynolds I Mar 27, 2014

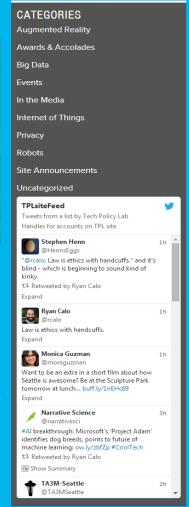
(pictured with fellow Tech Policy Lab member <u>Adam Lerner</u>)

The Tech Policy Lab has interesting projects in the works thanks to our <u>student scholar</u>. We are lucky to count <u>Franzi Roesner</u> from UW's Computer Science & Engineering as one of our Lab members. Part of the 2013 <u>Rising Stars in EECS</u> at MIT, Franzi is doing fascinating work on security and privacy for modern and emerging client platforms, specifically in the domains of third-party web tracking, permission granting in modern operating systems (such as smartphones), secure embedded user interfaces, and most recently, emerging augmented reality platforms.

In work based out of Lab Director Tadayoshi Kohno's <u>UW Security and Privacy Research</u> <u>Lab</u>, Franzi has <u>investigated Snapchat</u>, <u>analyzed the security of augmented reality systems</u>, and <u>helped remotely take over cars</u>. Her latest paper (with Professor Kohno and David Molnar), <u>Security and Privacy for Augmented Reality Systems</u> was just published as the cover story in the April issue of Communications of the ACM (Association for Computing Machinery), and considers the security and privacy concerns associated with augmented reality systems and the supporting technologies.

We asked Franzi how she decided she wanted to research computer security and privacy:

"When I took a computer security class during my time as an undergraduate, I was hooked. Most other classes I had taken taught me how to get things to work better, faster, and smarter, but this one taught me how to view designs skeptically and to challenge assumptions. That was exciting and seemed important. Besides fitting well with my naturally anxious nature, security and privacy as a research area also allows me to be very broad in what topics or technologies I focus on, to work at different levels of the computing stack (from low-level system details to human users), and to interact with researchers across different areas of computer science and beyond. I also believe that security and privacy issues are among the most important problems that affect real user of technology, and I want to help make sure that we can have the benefits of exciting emerging technologies—like augmented reality—without opening ourselves up to new risks."



Early Events

For our initial events, we aimed to form and cement relationships and to support big policy conversations with a bold, interdisciplinary angle. Here are some of the examples of events we hosted or co-hosted in our first year.

Federal Trade Commission, Commissioner Julie Brill

Shortly after the Launch, the Lab hosted its first event welcoming Federal Trade Commissioner Julie Brill to the University of Washington. Her visit included a talk with students about current issues in digital privacy and careers in government service as well as a reception. The reception was attended by local tech policy lawyers and technologists, including representatives from Deloitte Digital, the local FTC office, Microsoft, and the Washington Attorney General's office.



Robot Research

The Tech Policy Lab was proud to sponsor the 2014 Winter Scholars' Studio: Robot Research @ the Commons. Scholars' Studio is an opportunity for graduate students and postdocs to present 5-minute lightning talks describing their research. Imagine trying to explain what may have taken five years to develop for a dissertation in under 5 minutes. We had nine presenters whose topics ranged from surgical robots to robot pets, even a robotic hurricane sailboat. It was truly an interdisciplinary event, with students from expected fields such as electrical engineering and aeronautics but also English, Linguistics and Queer Studies.





World Affairs Council

As part of the State Department's International Visitor Leadership Program, the World Affairs Council brought a group to the Lab for the opportunity to discuss the current debate over privacy rights in the U.S. with Ryan Calo and Emily McReynolds. The theme of the visit was "U.S. Foreign Policy Challenges." The group included representatives from a number of European countries including Croatia, Denmark, Estonia, Lithuania, Portugal and Romania.



Brazilian Tech Policy Center

Brazil is currently one of the more active countries in tech policy, especially data protection and privacy. As part of the University of Sao Paulo professors' visit to Seattle, the Lab was pleased to host the delegation for an afternoon workshop. With the Sao Paulo professors' plan to open a Tech Policy Center at their university, we described the founding of the Lab and answered questions about successfully bridging different university departments. The professors had the opportunity to meet many of our student scholars and other UW professors, as well as members of the local tech community through the Tech Policy Happy Hour.

Who's Afraid of the Internet?

We convened experts in internet law and policy to address two questions: what is the most overblown fear regarding the internet and what is not being adequately examined. The aim of the roundtable was to use the collective expertise of participants to have a frank discussion about issues surrounding the internet today. The group of scholars included technologist Ashkan Soltani and law professors Derek Bambauer, Jane Bambauer and Mary Anne Franks. The themes that emerged covered a wide breadth of current topics from data collection, to personalization and vulnerability, standards for de-identified data, to the First Amendment, and cyberwar. We are now preparing a report about the event.

Bitcoin: Law and Policy

What is Bitcoin? While there is an understanding of the technology as a form of digital currency, its impact on policy is less widely discussed. As part of Tadayoshi Kohno's spring computer science graduate seminar focused on Bitcoin, Emily McReynolds presented the law and policy of Bitcoin. Through the lens of regulators, she



described to technologists the process used by U.S. federal and state agencies in regulating Bitcoin. Key elements of the discussion included the regulatory definition of bitcoin, cases that have occurred in criminal and consumer protection venues, and the important role for technologists in policy.

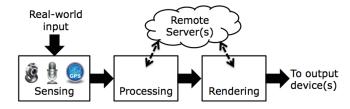
Our Research

The Lab's projects are designed to contribute to better technology policy as well as better informed policymakers and technologists. We used the initial set of ongoing projects to put into place procedures and methods for collaboration across four or more disciplines. In our first year, we examined augmented reality, big data, brain-machine interfaces, drones, and Bitcoin, among other topics.

Augmented Reality

Although a vision for augmented reality (AR) has been around for decades, the technology is today poised to enter the mainstream. Household name technology companies are investing billions in AR. What is AR, from a technical perspective? What could it be? What legal issues does AR present and what are the policy levers for addressing those issues? These and related questions generated a series of memoranda and discussion sessions over the course of six months. Lab members Franziska Roesner, Tamara Denning, and Bryce Newell worked with Lab Co-Directors Tadayoshi Kohno and Ryan Calo on the technical and legal aspects of AR.

Franziska and Tamara developed a technical overview of AR whereas Bryce took the lead on the legal and policy questions. The group was in constant conversation.



(Overview of an augmented reality application or system)

The work has been successfully adapted as a submission to the Workshop on Usable Privacy & Security for wearable and domestic ubiquitous DEvices (UPSIDE) workshop.

The UPSIDE workshop is an opportunity for researchers and practitioners to discuss research challenges and experiences around the usable privacy and security of wearable devices and other consumer sensors and domestic devices and will be held in conjunction with the UbiComp 2014 conference.

Our augmented reality work on the technical and legal aspects is in draft with a planned release for September. By promoting the work in September we plan to target legislators more effectively as they start the fall session.

Big Data

For such a popular topic, big data is not well defined. Discussions tend to gloss over the details of how big data differs from data processing in general. This project is intended to help policymakers better understand what big data is and the technical process that underlie it. For this project, we wanted to create a different type of deliverable, rather than a paper, we are working towards an interactive tool that would take users through a model tech process.

In April, with the help of Art and Design Professor Karen Cheng, we held a workshop to explore how to visually represent big data. We brought together design students, Information school professors and PhDs, and legal scholars to discuss big data and design. In May, we followed up the workshop with a meeting between data visualization experts from Computer Science & Engineering and the Information School. From these two events we have developed a design brief and are continuing our work to explain big data through an interactive experience.

We successfully submitted a panel, "Understanding Big Data," to the International Association of Privacy Professionals (IAPP) Europe Data Protection Congress for November 2014. We will be presenting a working definition of big data and a model version of the technical process based on our research; we look forward to incorporating the feedback from an audience of privacy professionals.

Personal Drones, Policy and Undergraduate Technical Education

Technology policy will improve when both policymakers and technologists understand



how to communicate with each other as well as their respective roles in that communication. To help foster this sensibility, the Tech Policy Lab conducted a pilot project to introduce policy analyses and implications into a technical undergraduate course around the topic of personal drones. The Tech Policy Lab provided funds for purchasing personal drones for use in an undergraduate Information School

class on value sensitive design taught by Information School Professor David Hendry.

Working in teams, the 28 students, about half enrolled in the Informatics program at The Information School, were positioned to learn about value sensitive design by investigating the design space and value implications of personal drones – an emerging category of personal technology. These were personal drones, equipped with video cameras, which can be flown with a special-purpose controller or smart phone.

In brief, students found that personal drones hold the possibility to give human beings new vantage points and new forms of bodily extension and communication. Value implications included privacy, safety, personhood, calmness, solitude, creative expression, reminiscence, among others. Students produced work which explored a wide range of scenarios of the future – drone use for child safety and security, how drones might be used by the visually impaired, a digital photo assistant drone for taking family photographs, the use of personal drones to attack home-based wireless communication systems, and using drones for home security. The policy implications of these and other usage scenarios were discussed.

App Stores for the Brain

An increasing number of brain-computer interfaces (BCI) are being developed in medical and nonmedical fields. BCI has great potential to improve and enhance quality of life for those suffering from neuromuscular disorders, but there are no guarantees or standards currently in place for user privacy and security. Lab member Tamara Bonaci, with the UW BioRobotics Lab, is researching ways to provide privacy and security. Her paper with BioRobotics Co-Director Howard Chizeck and Tech Policy Lab Co-Director Ryan Calo, "App Stores for the Brain, Privacy & Security in Brain-Computer Interfaces," won the best paper award at the IEEE International Symposium on Ethics in Engineering, Science and Technology.



Bitcoin and Crypto-currencies



Bitcoin is a popular topic with technologists and the news media. This spring Tadayoshi Kohno held a graduate seminar focused on the security of Bitcoin and as part of the seminar, Emily McReynolds presented the legal and

policy implications of Bitcoin. The Lab is currently examining the international regulatory developments and opportunities for the technical crypto-currency protocols and regulation to best influence each other. The Lab is also in the planning process for a Bitcoin event in the 2014-2015 academic year.

Our People

The Tech Policy Lab has assembled a versatile team from across multiple departments at the University of Washington. It includes the Lab's Co-Directors: Law School professor Ryan Calo, Information School professor Batya Friedman, and Computer Science and Engineering professor Tadayoshi Kohno. The Tech Policy Lab is staffed by Research Manager Emily McReynolds; a lawyer by training, she also has a background in non-profits and privacy research.

In addition to the Co-Directors and Research Manager, the Tech Policy Lab has seven dedicated student scholars. We had three Ph.D. candidates from Computer Science & Engineering, Tamara Denning, Adam Lerner, and Franziska Roesner and two Ph.D. candidates from the Information School, Bryce Newell and Daisy Yoo. Thanks to Tamara Bonaci from Electrical Engineering we have a great connection to the BioRobotics Lab. Lastly, Aaron Alva is both a Masters in Information Management at the Information School and a J.D. Candidate at the Law School. We also have an undergraduate research intern from the University of Washington.

Lab Co-Directors

Ryan Calo's 2013 paper "Digital Market Manipulation" won the Best Paper Award at the Privacy Law Scholars Conference and gave him the opportunity to present at the September 2013 IAPP Privacy Academy. In the spring of 2014, Calo presented "Robotics and the New Cyberlaw" at the 2014 We Robot conference and his paper has been accepted for publication in the University of California, Berkeley's California Law Review. In addition to his scholarly work, Calo wrote many op-eds and blog posts for mainstream media and spoke at the Aspen Ideas Festival.

Batya Friedman has undertaken a mid-range research project that seeks to understand why technology policy so often seems to come up short. In addition to this research endeavor, she was instrumental in supporting the Lab's engagement with personal drones, policy and undergraduate technical education and, more broadly, has begun to explore how to integrate analyses and design of policy into undergraduate technical education as a means to train a new generation of more policy aware technologists. During her sabbatical this past year, among other activities Friedman has been focused on the Voices from the Rwanda Tribunal project, developing ideas about multi-lifespan information system design.

While on sabbatical this spring, Tadayoshi Kohno has also stayed very involved with the Lab and at the University of Washington. In addition to his work with the augmented reality project at the Tech Policy Lab, he also taught a graduate seminar on Bitcoin that launched the Lab's current crypto-currency project. In addition to the FTC Workshop on the Internet of Things, at the 2014 RSA conference, he led a panel on "Securing Smart Machines: Where We Are, Where We Want to Be, and Challenges."

Staff

In addition to her role managing the startup and operations of the Lab, Emily McReynolds has been a central part of the Lab's projects. She led the big data design workshop, and her recent Bitcoin Law and Policy presentation has provided the foundation for the Lab's current work on crypto-currencies. She has also represented the Lab at events, including moderating a panel discussion on third-party applications and privacy at Xconomy's Big Data in Seattle Conference.

Students

Our student scholars created great opportunities in the Lab's first year. Franziska Roesner and Tamara Denning were both in their last year of a computer science Ph.D. and each had papers related to their Lab work on augmented reality accepted to conferences. Franzi's paper (with Professor Kohno and David Molnar), Security and Privacy for Augmented Reality Systems was published as the cover story in the April issue of Communications of the ACM (Association for Computing Machinery), and considers the security and privacy concerns associated with augmented reality systems and the supporting technologies. Tamara presented her new paper on augmented reality glasses at the International Conference on Human Factors in Computing Systems (CHI 2014). In the video preview on YouTube, is an explanation of how Tamara and her colleagues examined perspectives on bystander privacy and privacy-mediating technologies.

Importantly, these students both landed faculty positions in top Computer Science departments, where they will bring together a sense for both technology and policy. Franzi will be joining the University of Washington, Computer Science & Engineering as an Assistant Professor in the fall. Tamara will be joining the University of Utah's College of Computing program as an Assistant Professor in the fall.

Bryce Newell contributed to two Lab projects this year: he provided the legal research component of our upcoming augmented reality piece and an information science perspective on big data. In March 2014, along with Professor Calo, Bryce had one of the most downloaded cyberlaw articles on SSRN. Bryce was also invited to the Privacy Law Symposium at the University of Maine this year, where he presented "Local Law Enforcement Jumps on the Big Data Bandwagon: Automated License Plate Recognition Systems, Information Privacy, and Access to Government Information."

Aaron Alva's work with the Tech Policy Lab has been around Big Data. Aaron has worked on data mining and cybersecurity from a number of perspectives, including corporate at Intelius, and academic at Carnegie Mellon. He is pursuing a joint J.D. and M.S. in Information Management as a NSF CyberCorps Scholarship recipient. For the Tech Policy Lab, he is working on a paper presenting the policy levers poised to impact big data's technical process and helped organize the Lab's big data workshop. In January, Aaron presented his early research findings to the Microsoft Global Security Strategy & Diplomacy Team in Trustworthy Computing. In addition to his big data work, Aaron is

currently a Research Intern in Trustworthy Computing Security focused on international cybersecurity.

One of the projects the Lab sponsored was Tamara Bonaci's research into brain-computer interface systems. Tamara, a Ph.D. candidate in Electrical Engineering, also presented her work at our Robot Research event in February. The resulting paper co-written with Lab Co-Director Ryan Calo and Howard Chizeck, "App Stores for the Brain: Privacy and security in Brain Computer Interfaces won best paper at the 2014 IEEE International Symposium on Ethics in Engineering, Science and Technology and led to multiple press interviews.

Visiting Scholars

In the first year the Lab has welcomed two visiting scholars. They have contributed to project discussions, helped bridge the Lab between departments, and written pieces for our blog.

Elena Ponte, a J.D. candidate at the University of Ottawa Faculty of Law, visited the Tech Policy Lab in January 2014. She worked with the BioRobotics Lab on a presentation describing the legalities of robotics. She also wrote a piece for the Lab on the recent <u>FDA Medical Device Regulation</u> and its relevance to robotics.

Yoon Sukbae is visiting from the South Korea Ministry of Science, ICT and Future Planning as a recipient of the Korean Government Fellowship for overseas study. As a visiting scholar at the University of Washington, the Tech Policy Lab has provided him with space to work and input on his data protection projects for the Korean government. Recently, Yoon Sukbae wrote about the European Union's reaction to surveillance revelations in the U.S. in light of their data protection regime. He reviewed the EU proposed local cloud services in relation to their World Trade Organization commitments.

Looking Ahead

This has been an exciting and productive first year at the Lab. It took thought and hard work, but we believe we have put into place the people, processes, and channels to produce valuable interdisciplinary research on technology policy. We intend to build on the first year's momentum by tackling even greater challenges. Here are some of our plans and goals going forward:

From Research to Policy. We are working on public-facing versions of our research, starting with an accessible but comprehensive report on the legal and policy challenges of augmented reality for circulation to state and federal policymakers.

Tough Problems. Led by Batya Friedman, we are beginning some longer-term thinking around some of the hardest problems of technology policy, including how to identify when tech policy fails.

Training the Next Generation. Based on the positive results of our educational endeavors with personal drones, in the coming year the Lab will expand efforts to integrate analyses and design of policy into undergraduate technical education with the goal of sensitizing tech-savvy students to the policy implications of their technical work and invested them in policy perspectives early in their education.

New Frontiers. With new students and the end of director sabbaticals, the Lab is branching into new and important areas of focus, including consumer robotics, alternative currencies, and internet censorship.

Thank you for your interest in the Tech Policy Lab!