

UNIVERSITY *of* WASHINGTON

# Tech Policy Lab

## ANNUAL REPORT



# Letter From the Directors

The Tech Policy Lab at the University of Washington has had an exciting third year! From organizing national and international policy fora to helping local authorities generate best practices, the Lab continues its record of rigorous, impactful research. Here are just a few highlights of our third year:

**Policy Impact.** From the city to the national level, our projects and events have reached an ever broader audience. This year we released a set of best practices for open municipal data, adopted almost in its entirety by the City of Seattle, and organized national events on security for startups with the Federal Trade Commission and artificial intelligence policy with the White House. We continued work on characterizing tech policy breakdowns, with an eye toward proactive remedies.

**Global Relationships.** We held the first Global Summit on Grand Challenges for Tech Policy, bringing together individuals from organizations representing eleven countries across Africa, Asia, Europe, and North and South America.

**Methods.** Toward inclusive tech policy, we have developed a process by which to incorporate greater diversity of views into tech policy documents. This year we began to share and apply our Diverse Voices method outside of the Lab and University. We worked with a third party tech policy document on automated vehicles and are in the process of developing a “How to Guide” for the Diverse Voices Panels so that others can appropriate and build upon this approach.

**Training the Next Generation.** The Lab has an ongoing commitment to train the next generation of tech-savvy policymakers and policy-savvy technologists. In our third year we expanded the curriculum modules for use in university courses and continued bringing policy discussions into STEM classrooms through guest lectures.

**Distinguished Lecture Series.** The 2015-2016 Tech Policy Distinguished Lecture Series featured reknowned computer scientist Professor Latanya Sweeney from Harvard University for the fall lecture on technology designers and policy makers, and former Commander of U.S. Strategic Command General Kevin Chilton (retired) for the spring lecture speaking on deterrence and cybersecurity.

**Growth and Sustainability.** This year, we also focused on strategic planning for the long-term sustainability of the Lab. We further diversified our sources of funding and built our national profile.

We are excited by our third year trajectory, emphasizing local and global impact. Thank you for reading our annual report.

**RYAN CALO**

**BATYA FRIEDMAN**

**TADAYOSHI KOHNO**

# Research

The Lab embarked on exciting new research this year while concluding or expanding a variety of long-term projects.

## TOWARD A GLOBAL RESEARCH COMMUNITY

Today we have an opportunity to put in place global strategies for making progress on grand challenges for tech policy. Well-selected grand challenges convey a sense of vision and push a field forward. At the same time, they must be tractable—that is, consist of actual projects of reasonable scale and ambition—for meaningful progress to be made. The goals of our Global Summit research initiative were threefold: (1) to frame an initial set of grand challenges for tech policy for the coming decade; (2) to identify actionable research and policy work to be conducted during the 24-months following the Summit that as a group would make progress on those grand challenges; and (3) to form collaborations and a conduit for continued discussion toward addressing and continually re-evaluating the grand challenges.

In summer 2016, we organized the first Global Summit on Grand Challenges for Tech Policy. We brought together individuals from organizations across Africa, Asia, Europe, North and South America, for a meeting to bridge disciplines and countries in pursuit of improved technology policy. We expect that as participants continue to meet at regular intervals, in addition to developing shared language, methods, best practices, shared resources, and experiences around tech policy, a natural outcome of the meetings would be trust building among the participants. Such trust, along with shared methods and language, would go a good distance toward positioning even more significant coordination of research and policy efforts among summit participants in the coming decade.

## RECOMMENDATIONS FOR AUGMENTED REALITY

The culmination of two years of work by a large and diverse group of scholars, this year the Lab published its first whitepaper [Augmented Reality: A Technology and Policy Primer](#). This whitepaper is aimed at identifying some of the major legal and policy issues augmented reality (AR) may present as a novel technology, and outlines some conditional recommendations to help address those issues. Our key findings include:

1. AR exists in a variety of configurations, but in general, AR is a mobile or embedded technology that senses, processes, and outputs data in real-time, recognizes and tracks real-world objects, and provides contextual information by supplementing or replacing human senses. Importantly, our expansive definition of AR—to include not only augmenting but also replacing senses—shifts the legal and policy arena to better account for disparate impacts on people with disabilities.



2. AR systems will raise legal and policy issues in roughly two categories: collection and display. Issues tend to include privacy, free speech, and intellectual property as well as novel forms of distraction and discrimination.
3. We recommend that policymakers—broadly defined—engage in diverse stakeholder analysis, threat modeling, and risk assessment processes. We recommend that they pay particular attention to: (a) the fact that adversaries succeed when systems fail to anticipate behaviors; and that, (b) not all stakeholders experience AR in the same way.
4. Architectural/design decisions—such as whether AR systems are open or closed, whether data is ephemeral or stored, where data is processed, and so on—will each have policy consequences that vary by stakeholder.

With recent developments in AR, our Primer was uniquely placed to help journalists and policy makers. Several journalists reached out to the Lab to better understand augmented reality and the Primer was featured in [national news articles](#).

## DIVERSE VOICES: BEYOND UW

Creating rich, well-thought-out, and inclusive policies is a difficult process that requires input from multiple stakeholders; its importance cannot be overstated. These sorts of policies increase the likelihood that the needs of non-mainstream populations will be addressed in new, developed, and amended tech policies. In 2016, we accepted our first external tech policy document to bring through the Diverse Voices process. Focused on autonomous cars, this tech policy document was examined by panels on youth, on women, and on non-car users. The panel conversations encouraged panel members to discuss gaps in current discussions around a technology and how they see the technology changing or creating a new human experience for the population they represent. Bringing in an external tech policy document also provided us with an opportunity to refine the Diverse Voices method.

With successful iterations of the Diverse Voices panels we have begun work on a How to Guide for others to run their own diverse voices panels at their institutions. In fall 2016, in addition to finalizing the Guide, we will be submitting an article for publication which will include our two case studies on augmented reality technology and automated vehicle technology.

## MUNICIPAL OPEN DATA: SETTING BEST PRACTICES

Cities hold considerable information, including details about the daily lives of residents and employees, maps of critical infrastructure, and records of the officials' internal deliberations. Cities are beginning to realize that this data has economic and other value: If done wisely, the responsible release of city information can also contribute to greater efficiency and innovation in the public and private sector. New services are cropping up that leverage open city data to great effect. Meanwhile, activist groups and individual residents are placing increasing pressure on state and local government to be more transparent and accountable, even as others sound an alarm over the privacy issues that inevitably attend greater data sharing.

As a result of these and other forces, cities are beginning to open their data to the public and privacy sectors as never before. The Tech Policy Lab's project is among the first sustained, cross-disciplinary assessments of an open municipal government system. The Lab put together a team of researchers in law, computer science, information science, and urban studies. The team worked hand-in-hand with the City of Seattle, Washington for the better part of a year to understand the city's current procedures from diverse disciplinary perspectives. This project resulted in a publication "Push, Pull, Spill: A Transdisciplinary Case Study in Municipal Open Government" the *Berkeley Technology Law Journal* and a set of "Data Privacy Policy Guidelines for Local Government". The Guidelines included 25 specific recommendations in five areas: Responsible Data Collection and Disclosure; Notice and Consent; Access and Participation; Assessments and Precautions; and Legal and Contractual. The recommendations include basic good practices such as reviewing all data before disclosure and providing data security as well as newer considerations such as building an open data policy that prioritizes the needs of residents and disseminating data only to perform a public service.

## STUDYING TOYS THAT LISTEN AND THE INTERNET OF THINGS

Hello Barbie, Amazon Echo, and the home robot Jibo are part of a new wave of connected toys and gadgets for the home that listen. Different than the smartphone, these devices are always on, blending into the background until needed by the adult or child user. We do not yet know all the information our new toys are collecting, storing, or disclosing. With a grant from the Rose Foundation Consumer Privacy Rights Fund we are working to develop best practices for toys and devices in the home that are connected to the internet. Thus far the project has included a hackathon testing the security of the devices and a user study to understand how parents and children interact with the toys and devices. We also organized a panel on the topic at the 2016 Computers Privacy and Data Protection annual conference.

## TECH POLICY BREAKDOWNS

In this project, the Lab is investigating why and how tech policy breaks down, with the ultimate goal of leveraging that understanding to develop a policymaking toolkit that will aid in the crafting of regulations for emerging technologies. This research began by consulting leading experts in technology policy. Asking experts for examples of policies that had failed and why they had failed provided the foundations for a taxonomy of breakdowns. The work includes a developing body of mechanisms and evidence of breakdown. Some examples include an overly broad or overly narrow policy scope; inaccurate or imprecise technical characterization of the relevant technology; a mismatch among the mental models for working with the technology by diverse audiences (e.g., policy makers, the public); unenforceable or easy to circumvent tech policy; and policies that do not adequately resolve critical value tensions (such as those between individual autonomy and safety).

## OTHER INITIATIVES

We continued our work on crypto-currency, working with MIT's Digital Currency Initiative and the Berkman center to explore when crypto-currency should be regulated and how open source technologies interact with the patent system. We drafted outlines on how to develop patent pools for a technology such as Bitcoin and presented our work to participants at Consensus 2015, CoinDesk's inaugural summit on digital currencies and blockchain tech. The goal of the project was to align the incentives of the companies and inventors seeking patent protection with the benefits of a community-based defensive model that discourages the use of patents to stifle competition or to restrict access to innovation. With a variety of stakeholders at a series of workshops, we participated in the development of a group focused on patent pools for Bitcoin.

# Education

Building on our work in curriculum modules and seminars, this year we developed education initiatives designed to create technologists conversant in policy and lawyers and policymakers conversant in technology.

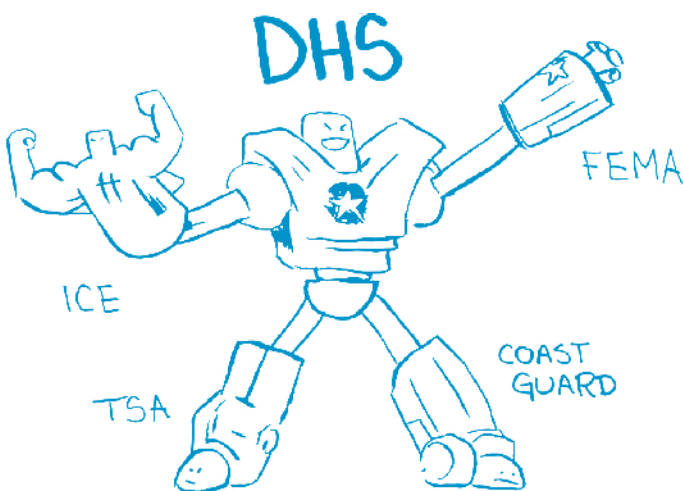
## PRIMER VIDEOS

Growing out of our experience working with interdisciplinary groups of students, this year we created our first series of explainer videos. Designed to cover the basic topics for a robotics policy class, the videos cover tech topics such as: what is a bot, an algorithm, machine learning, and robots; as well as legal topics providing explanations of administrative law and product liability. By working with students from diverse disciplines we were able to vet the tech topic scripts with non-experts and ensure the legal explanations worked for technologists. It was also a great opportunity to discover the multi-faceted talents of our students, thanks to a law student artist and iSchool PhD candidate with a background in film making, we are able to share with you these videos <http://techpolicylab.org/1001-2/>.

## CURRICULUM MODULES ON TECH POLICY

We have developed education modules to bring a tech policy mindset into undergraduate technical education. These modules position students to envision solutions to technical problems within a particular policy environment, which is carefully framed for pedagogical objectives. By prompting students to envision solutions to technical problems in such varying kinds of policy environments we seek to develop students' critical awareness for policy.

In the case study, "Regulations and Technical Requirements for Drones," learners are prompted to consider the socio-technical aspects of drones by engaging in a design activity that involves both technical and policy design. The learning aims of the case study are to: (1) introduce unmanned aircraft systems, (2) develop skills for direct and indirect stakeholder analysis, and (3) explore how policy recommendations might be used to develop legal regulations and technical requirements for drones. The case study is suited to both undergraduate and graduate students, while intended for a ninety-minute in-class activity it can easily be adapted into other learning settings. One of the activities involves designing a "Drones Okay" Playground. It asks the student to suppose they have been contracted by a community organization to develop a plan for a "Drones Okay" playground. And asks who would play in the playground or otherwise be impacted by it - providing some possible stakeholders: children, teenagers, grandparents, people with disabilities, birds, nearby homes. What games might be played? How would they design the playground to be "safe" while enabling stakeholders to have "fun?" How would they define "safe" and "fun," and what other values would your playground support? Answer these and similar questions as you like. It requires students to draw a





sketch of their playground and prepare a two-minute summary of their design. Following the presentations group discussion questions around how the policy and technical design worked together, how the indirect stakeholders influenced their design, and what laws and regulations might need to be taken into account are provided.

### INVITED TECH TALKS

This series began as a way to bring tech topics to law and policy students. In the first event, a software engineer came to the School of Law and presented on how Tor works. We also had those that work with telecommunications companies present the challenges for companies with government surveillance. In addition, Shari Steele, former Executive Director of the Elec-

tronic Frontier Foundation, discussed her work growing EFF and working with technologists. We plan to continue Tech Talks as a monthly series in the School of Law next year.

### WEEKLY TECH POLICY SEMINAR

Feedback from the success of our Tech Policy Seminar in winter 2014, led to the creation of a weekly tech policy discussion group. Bringing together graduate students from communications, computer science, electrical engineering, law, and more, each week we covered tech policy topics that were in the news. For example with the Google v. Oracle case, our computer science students explained APIs and the technical aspects, while the law students described copyright law. A popular event, 10-15 students regularly participate.



# Distinguished Lecture Series

Our lecture series brings to Seattle individuals the public might not otherwise hear from and shares their work with the community. This year we were honored to have Professor Latanya Sweeney providing a different perspective on who the policy makers are in a technical age, and General Kevin Chilton examining how deterrence theory applies in the age of cyberspace.

## PROFESSOR LATANYA SWEENEY: HOW TECHNOLOGY IMPACTS HUMANS

On December 1, 2015, the Tech Policy Lab presented our Fall Distinguished Lecture with Prof. Latanya Sweeney. Prof. Sweeney gave a talk titled "How Technology Impacts Humans." Illustrating how technology designers are the new policy makers through the decisions they make when producing the latest gadgets and online innovations.



How Technology Impacts Humans: Technology designers are new policy makers. No one elected them and most people do not know their names, but the arbitrary decisions they make when producing the latest gadgets and online innovations dictate the code by which we conduct our daily lives and govern our country. As technology progresses, every democratic value and every law comes up for grabs and will likely be redefined by what technology enables or not. Privacy and security were just the first wave.

As a professor at Harvard University, Professor Sweeney creates and uses technology to assess and solve societal, political and governance problems, and teaches others how to do the same. One focus area is the scientific study of technology's impact on humankind, and she is the Editor-in-Chief of the newly formed journal Technology Science. She was formerly the Chief Technology Officer at the Federal Trade Commission, and an elected fellow of the American College of Medical Informatics. Professor Sweeney earned her PhD in computer science from the Massachusetts Institute of Technology, being the first black woman to do so. Her undergraduate degree in computer science was completed at Harvard University.

## GENERAL KEVIN CHILTON: DETERRENCE IN THE 21ST CENTURY

On April 19, 2016, General Chilton presented the Spring Distinguished Lecture. General Chilton focused on Deterrence in the 21st century, describing deterrence theory and how it can be applied in the future and to cyberspace.

General Chilton served 34 1/2 years in the US Air Force in various flying and staff positions and retired in 2011 as the Commander of U.S. Strategic Command, responsible for the plans and operations of all U.S. forces conducting strategic deterrence and DoD space and cyberspace operations. Prior to his work in Strategic Command, General Chilton commanded Air Force Space Command. During part of his Air Force career he served with NASA and was a Command Astronaut Pilot and flew 3 Space Shuttle missions.





# Conferences

This year the Tech Policy Lab was honored to co-organize multiple national level conversations on tech policy. The Lab continues to provide great opportunities for those interested in emerging technology topics to engage with a variety of visitors, workshops, and other events. From the White House Office of Science and Technology Policy event on Artificial Intelligence to the Federal Trade Commission's Start with Security, this year the Lab brought national tech policy discussions to the University of Washington.



## NATIONAL CONFERENCES

On Tuesday, May 24, the Lab and the UW School of Law co-organized the first of four White House public workshops on artificial intelligence. Deputy CTO Ed Felton and Terah Lyons from the White House Office of Science and Technology Policy, as well as Camille Fisher from the National Economic Council joined us in our series of panel discussions throughout the afternoon. The White House is working to spur a public dialogue around Artificial Intelligence and will be publishing a report later this year on some of the future directions and potential challenges of this emerging technology. Allen Institute for Artificial Intelligence CEO Oren Etzioni presented the current "State of AI." He noted that much of the public perception on this technology has been influenced by Hollywood with visions of Skynet or the Terminator. However, artificial intelligence holds many promises as well, particularly in fields such as healthcare where hospital errors are the third leading cause of death and the introduction of these new technologies could make a substantial difference. Etzioni says that "we're just getting started" and that broad, general intelligence is still quite a while away.

The day included two panels on "Artificial Wisdom" and "Embodying Data", with academic and research experts in the field to discuss the implications of this emerging technology. These panels explored questions about autonomous systems, technology ethics, data collection, the social impacts of algorithms in everyday life, and the role of government in these systems. Throughout the panels, many concerns around humans misusing this technology shed light onto the potential for discrimination and inadvertent bias within algorithms. It was widely recognized that there is a need for ethics guidelines within engineering curriculum and research practices for topics around big data and artificial intelligence. The event was covered by [The New York Times](#), [MIT Technology Review](#), [WIRED](#), and [The Seattle Times](#). We recorded the event which can be seen [here](#).



The one-day event continued the FTC’s work to provide companies with practical tips and strategies for implementing effective data security. The event brought together experts to provide insights on how startups and other small companies can secure the software and products they develop, and how important it is to do so. FTC Commissioner Julie Brill kicked things off with opening remarks. The day included panels on Building a Security Culture, Integrating Security into the Development Pipeline, the Business Case for Security, and Securing the Internet of Things. Co-Director Kohno spoke on the Securing the Internet of Things panel, addressing the new security challenges and expanded attack surfaces connected devices provide.

## INTERNAL WORKSHOPS

As part of the Lab’s effort to create different kinds of opportunities for interdisciplinary discussion, we organize and engage in workshops with individuals from other universities and organizations. This year the Lab organized a workshop on conflict modeling.

### Conflict Modeling

During the summer of 2016 we invited a group of experts on threat modeling and online harassment to meet and discuss a conflict modeling program proposed by Amanda Levendowski. Conflict modeling is a way to identify and prioritize conflicts that may arise on your system, and help you think about ways to mitigate the risk of those conflicts. The methodology for conflict modeling draws heavily from the principles behind threat modeling, which serves a similar purpose in the context of identifying, prioritizing, and mitigating security threats to systems. The group provided feedback on areas for improvement and suggestions for deploying the proposed conflict modeling program.

# Looking Ahead

We have had a tremendously rewarding first three years and look forward to continued growth in activity and impact. Here are just a sampling of our plans and goals going forward:

**Grand Challenges.** This year the Lab organized the first of two planned Global Summits. The Grand Challenges for Tech Policy involves individuals and organizations across Africa, Asia, Europe, North and South America. Together we identified an initial set of grand challenges for tech policy and began collaborations on research to be conducted in the 24 months between summits.

**Expanding Research.** The Lab intends to do a deep dive this academic year into the technical, legal, and humanistic dimensions to the Internet of Things.

**Diverse Voices.** We also intend to document our Diverse Voices project with a journal article and to apply the method to new work by the Lab and, increasingly, to other research units and centers.

**Understanding Tech Policy Breakdowns.** This academic year we anticipate completion of our Tech Policy Breakdowns project that helps policymakers identify evidence that a given tech policy is not working and generates a taxonomy of common mechanisms or reasons for breakdown.

[Thank you for your interest in the Tech Policy Lab!](#)

