Proposal: Privacy Education and Design Lab (PEDaL)

June 10, 2019

Organization Information

1. **Name of Organization**

   The MIT Internet Policy Research Initiative (IPRI)

2. **Discuss the founding and development of the organization. Explain the original issue and/or opportunity the organization was founded to address and how that may have changed over time.**

   Daniel Weitzner, a Principal Research Scientist at the MIT Computer Science and Artificial Intelligence Lab (CSAIL), founded IPRI in 2015 as a response to the critical need for technology-informed policy making in the areas of privacy, security, networks and the Internet economy. The group plays an important bilingual role of informing policy making with technical expertise, and helping engineers build secure and privacy protecting products that are informed by policy.

   Over time, the mission of IPRI has expanded to include more research areas, as well as involve researchers and students from a wide variety of disciplines, including computer science, economics, and political science. IPRI has increased its efforts in artificial intelligence (AI) technology and policy as well as expanded its role as an Internet policy expert in the global policy community.

   IPRI is in a unique position to advance individual privacy rights through computer science research that will create new privacy-preserving technologies, and public policy research to explore technically-grounded advances in privacy policy and law.

   IPRI's senior leadership has strong consumer and Internet civil liberty advocacy backgrounds. Daniel Weitzner was the first staff member in Washington DC for the Electronic Frontier Foundation and founder of the Center for Democracy and Technology. He was also a senior policymaker (White House Deputy CTO for Internet Policy). While at the White House, Weitzner was responsible for developing the Consumer Privacy Bill of RIghts in 2012. Taylor Reynolds was the senior economist at the OECD responsible for the Internet economy, and his

research on broadband pricing led to multimillion dollar fines against incumbent telecommunication firms engaged in deceptive advertising. R. David Edelman was Special Assistant in the White House on issues of the digital economy that included Internet civil liberties.

Of particular relevance, Daniel Weitzner has a long history of successful Internet civil liberties advocacy. His work led directly to amendments to the Electronic Communications Privacy Act in 1994 that offered groundbreaking protections for web browsing logs, email records, and other transactional data. (18 USC 2703(d)) Under Weitzner's leadership, the interests of the Class in better privacy protection will be materially advanced.

3. **Describe the organization's current goals.**

The Internet Policy Research Initiative's (IPRI's) mission is to lead the development of policy-aware, technically grounded research that enables policymakers and engineers to increase the trustworthiness of interconnected digital systems like the Internet and related technologies.

To achieve this mission, IPRI produces fundamental, cross-disciplinary technology and policy research (publishing 30 research papers in 2018); engages with global policymakers, industrial partners, and civil society organization; and is building a network of students educated in the field of Internet policy.

4. **Provide a brief description of the organization's current programs. Include population and numbers served, as well as expected results**

MIT is one of the top universities in the world across a number of disciplines, including engineering, computer science, and economics. MIT has 11,376 students and 13,000 employees. Recently the Institute announced the creation of the Schwarzman College of Computing which represents a new paradigm for computer science research and education that recognizes the importance of addressing the social, ethical and policy impact of computing on society.

Currently, IPRI has six main research goals:

1. ***Privacy,*** covering topics such as designing new databases and systems embedded with privacy protection and user control, evaluating the international privacy policy landscape and studying privacy incentives, data protection policy, web surveillance, human-computer interaction in the context of privacy, the implications of silently listening, and overarching insight into the global privacy research area.

2. ***Cybersecurity,*** covering topics like encryption policy, accountability, cryptography, data sharing, securing core economic and social infrastructure, and measuring cyber risk.
3. ***AI Policy,*** covering topics like the role of AI in financial decision-making, increasing access to new training data sets with policy, working with stakeholders on AI principles, and shaping global Internet policymaking via policymaker engagement and informing the public debate.
4. ***Networks,*** covering topics like Internet architecture, Internet security, Internet economics, Internet policy, and network management.
5. ***Decentralized Web,*** covering topics decentralized privacy preserving platforms for clinical research, the trustworthiness of autonomous systems, the relationship between privacy and machine learning, complex machine and model explanations, securely aggregating distributed data, and developing smart contracts for data sharing.
6. ***App Inventor,*** involving the creation of a tool to enable anyone, especially youth, to develop mobile apps that better their communities.

IPRI is a cross-campus initiative made up of 75 researchers from across disciplines but is housed at MIT's Computer Science and Artificial Intelligence (CSAIL) Lab - the largest lab at MIT. CSAIL is one of the leading AI, computer science and robotics research labs in the world. Being housed in the lab provides us daily interactions with leading computer scientists and engineers.

The expanded set of work we could do with additional funding would have broad, global impact. Our work is already used by governments, scholars, and stakeholders, and we are seen as a trusted source of both engineering tools, education and policy guidance. Below is a list of recent projects with broad impact across the globe:

- We developed "Privacy Bridges" with European partner universities to help create a framework for data protection and usage between the US and the EU. Our report was presented at the International Conference of Privacy and Data Protection Commissioners.
- Our team contributed technical and policy guidance to the OECD as they developed the OECD's AI Policy Principles that were adopted by 36 countries. IPRI sent three experts to participate in the OECD's Expert Group on AI. IPRI also hosted the OECD's AI Expert Group Meeting in January 2019.
- Daniel Weitzner was selected to be a member of the OECD's Expert Group to revise the OECD's long-standing privacy guidelines.
- Our researchers and leadership frequently prepare submissions to governments related to encryption policy. Our researchers have testified

in front of the US Congress and meet with Australian Parliament on these issues.

5. **Has your organization been reviewed or rated by Charity Navigator or similar entity?**
   a. **If yes, what are your ratings?**
   No: As a university, MIT is not rated
   https://www.charitynavigator.org/index.cfm?bay=search.profile&ein=042103594

Grant Proposal - MIT Privacy Education and Design Lab - PEDaL

6. **Identify Principal Investigator/Project Director**
   Daniel Weitzner is the MIT IPRI Founding Director and a Principal Research Scientist at MIT CSAIL.

7. **Explain how much money you are requesting**

   We have developed a significant new research proposal with the interests of the Class in mind. We are requesting a total of $1.4 million dollars which will be allocated to new research and educational initiatives which will lead to new privacy-ware software development practices and greater awareness of privacy policy considerations by MIT-trained computer scientists and those beyond MIT who use our educational tools.

   - Education ($758,505)
     - Creation of new open course content on engineering privacy for use by other educators
     - Development of new online open courses
     - Creation of new labs where students build and analyze technical systems to protect user privacy
   - New research streams ($641,205)
     - Privacy aware databases
     - User behavioral analysis: The impact of surveillance on personal behavior

8. **Provide a summary of the plan for the program or project request. Include the issue and/or opportunity addressed, goals and objectives, activities, and timeline.**

   The MIT Internet Policy Research Initiative proposes to launch a new MIT Privacy Education and Design Lab (PEDaL). PEDAL will materially advance the interests of the Class in Joffe v. Google, helping to assure than members of the class, and those similarly situated in the future are far less likely to be victims of privacy harm arising from poorly-educated software developers and careless product managers. We will develop new approaches to privacy education and research to assure that the software developers educated at MIT will learn to be aware of privacy risks as a core part of their computer science education. Through open source curriculum materials and online courseware (MIT's edX), we will also make the core education experience of these courses available to faculty for their own use at universities around the world, to independent students through the edX Massively Open Online Courseware (MooC) platform, as well as to professional software developers already in the field.

Privacy-aware educational materials - training the next generation of computer scientists to design with privacy in mind.

PEDaL will building on the novel, multi-disciplinary education approach of MIT's Internet Policy Research Initiative by extending two courses currently offered by IPRI faculty: 6.805: Foundations of Internet Policy, and 6.S978: Privacy Legislation Law and Technology (offered jointly between MIT Electrical Engineering and Computer Science Department and Georgetown Law School (see New York TImes: Natasha Singer, Top Universities Join to Push 'Public Interest Technology', March 11, 2019; MIT Spectrum, Legal/Code-MIT engineering students team up with Georgetown lawyers-in-training on internet privacy legislation, Winter 2018). These courses teach 30+ computer science and engineering student each semester to develop the intellectual skills necessary to understand the complex public policy questions, including privacy, raised by computing in our society today. PEDaL will add a hands-on laboratory component to each course giving students in-depth experience of actually building and analyzing technical systems that address privacy harms.

By expanding these well-established courses, we will give our students added engineering experience needed to design and develop applications using personal data in a manner that does a better job of adhering to privacy law and best practice, thereby avoiding privacy harms suffered by the class of plaintiffs in Joffe. Engineering students learn good software development style through practice. We already have a well-developed curriculum for teaching our students how to understand broader issues of law and policy. By adding lab components to the courses, we will give students concrete software development challenges that test their policy knowledge and give them the experience to make good design decisions in their careers. To help students understand and master the challenges of privacy-aware system design, we will build software platforms that simulate large-scale databases of personal information, as environments within which students can experiment with different privacy designs. Developing lab teaching materials is a resource-intensive task, so support from this fund will be critical. IPRI will hire additional teaching assistants and a postdoctoral fellow to supervise the development of the new lab materials. Once these are developed, however, we will make them available freely to the rest of the academic community and professional software developers around the world.

Privacy and Data Governance Research Projects

PEDaL will lead technical research on privacy-enhancing data systems and analytic techniques to develop new software architectures are reduce the risk of privacy harm such as was suffered by the plaintiff class. We propose to lead research projects in the following areas:

- Database Systems: Explore new data management architectures to provide enterprises with purpose management, provable delete and automated accountability tools for managing personal data according to legal rules and institutional commitments. Database systems that do a better job of tracking legal purposes, and detecting unlawful purposes, are possible and could go a long way to alert against harms experiences in the Streetview case.
- Human Computer Interaction: Apply rigorous HCI research methodologies to understand the impact of various privacy policy environments on user behavior and learn when the user experience is producing chilling effects. This research will inform both services design and policymaking.

Resources required for these research efforts include funds to cover some of PI Weitzner's time in order to lead these efforts, and then funding for student Teaching Assistants, Research Assistants, and Post-doctoral Fellows. Funds expended for students in these categories not help us to complete the curriculum development and research activities, but also serve as a critical educational experience for the students we will hire. These students, having immersed themselves in research and course development on privacy topics, will bring that experience into the industrial or academic positions they occupy as professionals.

Timeline

MIT IPRI is ready to launch PEDaL as soon as funds become available and complete all work within 3 years.

9. Explain why the organization is approaching the issue and/or opportunity in this way.

Today there are a variety of underlying causes of privacy harm, many of which occur simultaneously. Some companies have business models premised on extracting profits from personal data. Many systems lack basic security protection measures, leaving personal data open to theft and abuse. And finally, as was clearly the case, developers can be careless with the personal data their systems collect and use. In a culture of "move fast and break things", privacy and security concerns are often afterthoughts, but that needs to change.

IPRI is approaching this problem from an educational perspective as this utilizes its proven strength in building a network of students with a disciplinary strength in both engineering and social studies. Such students are thus enabled to better engage with the Internet policy field. We will use the technical and political expertise available at IPRI to both educate and involve students in relevant policy research.

10. Will the money be used to continue an existing project or create a new project

a. If a continuing project please provide all other funding sources

PEDaL will be a new activity that is part of the MIT Internet Policy Research Initiative (IPRI). IPRI is funded by the William and Flora Hewlett Foundation Cyber Program with a leadership grant of $15 Million.

11. Specifically explain how this money will be used to enhance internet privacy and/or internet security for consumers and businesses.

By educating the next generation of scholars, technologists, and policymakers, IPRI will help install a knowledge of potential privacy risks to look out for and how to avoid them. IPRI students are often ideally situated to use this knowledge, as they join a variety of relevant organizations after graduating, including Apple, the White House, Amazon, IBM, the OECD, the Aspen Institute, and many more. By sharing this learned expertise with their future organizations, IPRI students can help develop better-informed Internet policies and technologies that provide enhanced Internet privacy and security.

12. What are the major goals and objectives of this project?

See Section 8 above.

13. Explain exactly how the money will be utilized to accomplish the goal and/or objective identified.

The $1.4 million dollars will be spent as follows over three years:

- Two new research streams ($641,205) will be supported by investments in:
  - **Developing privacy aware Databases:** $213,735 for PIs, postdocs, research assistants, and materials'
  - **User behavioral analysis:** $427,470 for PIs, postdocs, research assistants, and materials.
- PEDaL - Our new education project ($758,505) will be supported by investments in:
  - **Internet policy course:** $266,500 for online course production.
  - **Privacy legislation course for engineers:** $492,055 for PIs, postdocs, teaching assistants and edX (online course) production.

14. What target population will your project benefit

PEDaL will benefit the general public by better ensuring their data privacy in the future, the current plaintiff class. In addition, it will benefit students to learn and grow from this example.

15. **When will the project be completed?**

    The project will be completed three years from the start date.

16. **If the project will be continued beyond a year after receiving the grant please describe when the project will be completed**
    Work will begin immediately upon receiving funds but some of the research and refinements for the courses under development will require three full years of work, as is common with computer computer science research. We will launch revisions to the two existing privacy courses within six months of receiving funds but will revise curriculum and lab material over a three year cycle in order to incorporate student feedback and teaching experience.

17. **Is this project going to be funded by any other sources in addition to the proposed grant?**
    a. **If yes, by whom and how much?**
    As this project overlaps with IPRI's current goals and motivations, some of IPRI's existing funding from the Hewlett Foundation may go to this project.

Utilization of Data

18. **Describe how you will evaluate the success of the grant on improving internet privacy and/or internet security for consumers and businesses**

    We measure success on the following metrics:
    (a) curriculum development: number of students, undergraduates and graduate students who take the courses. Our success metric is 50 students per year for each of three years.
    (b) open courseware and MooC development: We expect at least 250 students annually to complete the online version of the course.
    (c) privacy research: metrics of success include papers published in respected academic journals and, most importantly, software useful by developers of systems that hold actual personal data.

19. **Describe how often and what the form of evaluation you will provide during the course of the project and upon completion**

We will provide reports to the court as requested and publish a public report on progress annually.

20. Do you intend to use the results of the project in any publications, conference papers, and presentations

a. If so, please identify.

Course materials will be made available publicly for use by any academic institution and software professionals. Research results will be published in peer-reviewed journals or conferences.

Miscellaneous

21. Do you have any relationship to the law firms Spector Roseman & Kodroff, PC; Cohen Milstein; or Lieff Cabrasser or any lawyers at those firms?

No

22. Have you ever received cy pres money previously?

a. If yes, please explain.

No

23. Within the last 3 years have you received any money from Google or its parent company Alphabet, Inc.

a. If yes, please identify the amounts and the purposes of the money

MIT IPRI has not received any funds from Google or Alphabet. Other research units at MIT may have received Google funds, but none goes to support IPRI work.

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