

Nathaniel Fruchter | C.V.

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I am an interdisciplinary researcher and analyst interested in issues at the intersection of computing technology and public policy, with a current focus on privacy, artificial intelligence, and machine learning. My core interests center on bridging the gap between tech and policy through good research and communication. I also have interests in Internet policy, usable security and HCI, and web measurement.

Academics

Education

- **Massachusetts Institute of Technology** **Cambridge, MA**
SM Technology and Public Policy 2016–2019
Thesis advisor: Dr. David D. Clark. Research with MIT CSAIL and Internet Policy Research Initiative.
- **Carnegie Mellon University** **Pittsburgh, PA**
BS Decision Science, BS Science, Technology and Public Policy 2012–2016
Minor in Human-Computer Interaction. Phi Beta Kappa honors. GPA: 3.83/4.00.

Research Groups

- **MIT Internet Policy Research Initiative** *Researcher, Aug 2016 – June 2019*
Joint with MIT CSAIL, Advanced Network Architecture Group. Work with Dr. David Clark, Danny Weitzner. Creating tools for measurement of decentralized file systems and studying Internet identity management. Studied use of data by ISPs to notify consumers of cybersecurity incidents on home networks; perceptions of IoT privacy, security using natural language processing and qualitative methods. Created web measurement tools to characterize the obfuscated infrastructure of malicious advertising hosts. Co-supervised an undergraduate RA project through check-ins, mentoring, and monitoring of deliverables.
- **Carnegie Mellon HCII, User Studies Lab** *Research Assistant, January 2014 – May 2016*
Advised by Dr. Laura Dabbish. Created experimental scenarios, methods, and measures for five new and existing studies. Contributed to research on mediated decision making, user mental models, network security, and algorithmic management by participating in writing and editing of papers. Collaborated with lab members and faculty on quantitative and qualitative data collection by running lab studies, performing statistical analyses, coding data, and developing software.

Publications

- Fruchter, N., and Bauer, S. Consumer isp security notification and remediation strategies. In *Proceedings of TPRC'46* (2018), TPRC.
- Fruchter, N., and Liccardi, I. Consumer attitudes towards privacy and security in home assistants. In *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems* (2018), ACM.
- Fruchter, N., Miao, H., Stevenson, S., and Balebako, R. Variations in tracking in relation to geographic location. *IEEE Workshop on Web 2.0 Security and Privacy* (2015).

Gilpin, L., Testart, C., Fruchter, N., and Adebayo, J. Explaining explanations to society. In *Proceedings of the NIPS Workshop on Ethical, Social and Governance Issues in AI* (2018), NIPS.

Kang, R., Dabbish, L., Fruchter, N., and Kiesler, S. "my data just goes everywhere:" user mental models of the internet and implications for privacy and security. In *Symposium on Usable Privacy and Security (SOUPS)* (2015), USENIX Association Berkeley, CA, pp. 39–52.

Lee, M. K., Fruchter, N., and Dabbish, L. Making decisions from a distance: The impact of technological mediation on riskiness and dehumanization. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing* (2015), ACM, pp. 1576–1589.

Posters, Talks, and Non-Refereed Publications.....

Fruchter, N. Characterizing Malicious Redirection in the Malvertising Ecosystem. Poster, ACM IMC 2018.

Fruchter, N. Security, bots, and governance: civic infrastructure for public participation in the age of the social botnet. Talk at 2018 TMP Graduate Consortium. *Winner: TMP Best Junior Presentation.*

Fruchter, N., Specter, M., and Yuan, B. Facebook/Cambridge Analytica: Privacy lessons and a way forward. Technical report, MIT Internet Policy Research Initiative.

Experience

- **Google** **San Francisco, CA**
Staff Privacy Engineer *July 2019–current*

I work on company-wide AI and ML privacy policy, guidance, and advisory, helping teams across the company innovate while respecting the user. I also help evaluate the privacy posture of new products and features, provide up-front technical and system design consultations for teams building new technology, and train and educate Googlers in the field. Finally, I work on internal escalations processes, helping us identify, resolve, and learn from the company's toughest privacy challenges.

- **MITx Professional Education** **Cambridge, MA**
Teaching Assistant *October 2017–May 2018*

Teaching assistant for sessions of *Cybersecurity: Technology, Applications, and Policy* course. I answered questions, managed forums, and served as first point of contact for 100+ MITx Professional Education students in cooperation with MIT CSAIL and MITx.

- **National Telecommunications and Information Administration** **Washington, DC**
Policy Analyst Trainee *June 2017–August 2017*

Assisted staff in the Office of Policy Analysis and Development (OPAD) with research and analysis on Internet policy issues as part of NTIA, Department of Commerce. Wrote and gave research briefings/memos on a variety of subjects (botnets, IoT, cybersecurity, broadband infrastructure, IETF standards). Summarized and created memos on hearings/events related to broadband deployment, broadband infrastructure, and autonomous vehicles.

- **Carnegie Mellon University** **Pittsburgh, PA**
Teaching Assistant *August 2015–December 2015*

Worked in the new CMU Institute for Politics and Strategy. I assisted the professor and co-TA within grading and course management tasks for an introductory political science and government course and served as an academic resource for students by answering questions and running reviews.

Selected Projects and Coursework.....

- **MIT Institute for Data, Systems, and Society** *MIT Policy Hackathon*

I helped found and organize an interdisciplinary hackathon focused on data science for public policy impact. Our team worked with MIT's Institute for Data, Systems, and Society for support. Our first weekend-long event drew over 100 student and professional attendees in May 2018. I also helped organize a short hackathon in cooperation with the Cities of Boston and Cambridge as part of the HUBWeek festival.

- **SM Thesis** *ISP-Consumer Notification and Remediation Strategies*

I studied the landscape around network security notification and remediation efforts, especially within the context of the ISP-consumer relationship. In my thesis, I provide an overview of prior work, highlight other efforts' strengths and weaknesses, propose new guidelines for the design of notification systems, and discuss new technical architectures for supporting notification. *Thesis advised by Dr. David D. Clark for the Technology and Policy Program, MIT.*

- **Harvard Kennedy School** *Attribution and Response in International Cyber-attacks*

Authored proposal and guidance memo on adapting existing incident-response and attribution structures modeled on existing work by Estonia and NATO. Written as part of Prof. Bruce Schneier's *Internet Security: Technology, Policy, and Law* course.

- **MIT/Georgetown Law** *Police Geolocation Legislative Proposal*

Coauthored model federal legislation and a technical white paper on use and privacy implications of geolocation for law enforcement. Written as part of a team of MIT and Georgetown Law students for *Privacy Legislation: Law and Technology*.

- **MIT** *Federal Data Breach Policy Proposal*

Coauthored a report which proposes comprehensive federal data breach legislation for the United States, standards for data breach notification communications, along with a review of legislative history and relevant incident case studies. Written as part of *6.805 Foundations of Information Policy* at MIT.

- **Carnegie Mellon** *Pittsburgh Energy Forums*

Collaborated with leading energy researchers to emphasize the necessity and tradeoffs surrounding the modernization of today's electrical distribution systems by organizing a series of science communication events in the Pittsburgh area. Part of the *Energy: Science, Society, and Communication* course taught in collaboration with the National Academies of Science and their Science Ambassadors program.

Skills

- **IAPP Certified Information Privacy Technologist (CIPT)** credential.
- **Programming Languages:** Proficient in Python, HTML/JavaScript/CSS, PHP. Familiar with R, shell scripting.
- **Computing:** Excellent knowledge of major operating systems (Windows, Mac OS, Linux), along with Adobe Photoshop and Microsoft Office. Basic system and network administration.
- **Design:** User-centered design methods: rapid prototyping and iteration, user testing, experimental design, low and high-fidelity prototyping; graphic and print design.
- **Other:** Basic electronics and physical prototyping. Concert, event, landscape photography. Basic portraiture.