TECHNOLOGY POLICY INSTITUTE

May 31, 2018

Dear NBER,

Please find enclosed a small grant proposal in the area of Innovation Policy, Entrepreneurship and Digitization. I seek a young scholar grant of $15,000 in Digitization for the grant term of July 1, 2018 to June 30, 2019.

I propose a paper entitled, "Do Privacy Laws Affect Online Behavior?" This paper will exploit the existence of privacy laws in Illinois and Texas to measure the effects of such rules on privacy-related online activity. Illinois and Texas both implemented privacy laws through the Illinois Biometric Information Privacy Act (740 ILCS 14) ("BIPA") (2008) and the Texas Statute on the Capture or Use of Biometric Identifier (Tex. Bus. & Com. Code Ann. §503.001) (2009). These laws require companies to handle biometric data more securely for Illinois and Texas residents.

One might expect households in Illinois or Texas to have *less* need for privacy products such as Symantec, Norton, and Experian, because their state legislatures have passed laws to protect their privacy. However, privacy laws may have caused individuals to spend *more* time online to understand rules required by the state. Furthermore, households in Illinois or Texas may have higher privacy preferences, or risk of privacy injury, than the rest of the country, which caused the passage of the privacy laws in the first place, causing them to spend more time on privacy-related domains.

Using a comScore Total Home Panel of U.S. internet households, I compare online visits to privacy-related web domains in a treatment group of households in Illinois and Texas with a control group of households in the rest of the country. I include controls for household demographics, income, broadband access, and other online activity, and state fixed effects.

I would be grateful to receive research support for data analysis and storage fees for this project. The comScore Total Home Panel consists of raw data with 1 trillion observations of web traffic from 10,000 households in 15 minute increments across mobile and fixed devices. I have 8 panels of daily data in 8 alternating months between September 2016 and November 2017. Each of the 244 data tables includes over 150 million rows of online activity. Storage costs of data tables are $400 per month. Each query to combine the raw data with demographics costs over $2,000 per query.

For 1 year, a $15,000 grant will support monthly $1,250 in storage costs and data queries using Google Cloud Platform. I have included my C.V. for your review, and a budget estimate. Thank you very much for your time and consideration.

Sincerely,



Sarah Oh, J.D./Ph.D.
Research Fellow, Technology Policy Institute

"Do Privacy Laws Affect Online Behavior?"

Table 1. Sample Domains Related to Privacy (leading privacy products, or "privacy," "identity" in name)

domain	num
symantecliveupdate.com	72828
symantec.com	52057
mcafee.com	37640
norton.com	9928
privacystar.com	582
experian.com	402
wwnorton.com	213
pingidentity.com	185
privacyfix.com	184
nortoncdn.com	157

Table 2. Budget Estimate

Month	Storage Fees	BigQuery Fees	Monthly Total
1	$400	$850	$1,250
2	$400	$850	$1,250
3	$400	$850	$1,250
4	$400	$850	$1,250
5	$400	$850	$1,250
6	$400	$850	$1,250
7	$400	$850	$1,250
8	$400	$850	$1,250
9	$400	$850	$1,250
10	$400	$850	$1,250
11	$400	$850	$1,250
12	$400	$850	$1,250
Total	$4,800	$10,200	$15,000

Table 3. Example Storage Fees for this Dataset

Billing Period	Description	Amount (USD)
May 1 – 30, 2018	BigQuery Active Storage: 50667.42 Gibibyte-months	$1,013.15
May 1 – 26, 2018	BigQuery Analysis: 312.176 Tebibytes	$1,555.88

Sarah Oh

Research Fellow
Technology Policy Institute
409 12th Street, SW, Suite 700
Washington, D.C. 20024

Email: soh@techpolicyinstitute.org
sarahoh@alumni.stanford.edu

Education

George Mason University, Economics, PhD, 2017
George Mason University, Antonin Scalia Law School, JD, 2009
Stanford University, Management Science & Engineering, BS, 2004

Employment

Technology Policy Institute, Research Fellow. Researched policy matters related to regulation of the technology and telecommunications industries. Developed cloud-based databases. (Jun. 2017–present, Washington, D.C.)

Information Economy Project, Director of Operations and Research. Published articles in top technology law journals. Conducted legal research and writing. Invited speakers for conferences and coordinated the Tullock *Big Ideas* Lecture Series at Antonin Scalia Law School. (Aug. 2009–Aug. 2012, Arlington, VA)

NexTag.com, Marketing Associate II, Keyword Search Engine Marketing and Campaign Management. Managed AdWords campaigns ($MM) for the mid-stage start-up. (July 2004–Aug. 2005, San Mateo, CA)

Dissertation

Title: Essays in Broadband Economics
Job Market Paper: *How Predictive are Cost Forecasts for Broadband Stimulus? Evidence from the Recovery Act*
Committee: Tyler Cowen (chair), Carlos Ramirez, Alex Tabarrok, David Eil
Primary Field: Applied Microeconomics, Secondary Fields: Law & Economics, Monetary Economics

Publications

Is Blockchain Hype, Revolutionary, or Both? What We Need to Know (with S. Wallsten), in Claude Menard and Mary Shirley (eds.) *The Research Agenda in New Institutional Economics.* Northampton & Cheltenham: Edward Elgar Pub., (forthcoming, 2018)

Radio "Fences" and Inventor Attention to Property Rights: Evidence from Wireless Patents, *The Review of Industrial Organization*, (forthcoming, 2018)

Mobile Phone Regulation: The Effects of Prohibiting Handset Bundling in Finland (with T. Hazlett and B. Skorup), *Journal of Competition Law and Economics*, 14(1): 1-26 (2018)

Repacking and Inventorying Federal Spectrum: The Role of Federal Employees, *Journal of Law, Technology and Policy*, 2015(2): 315-339 (2015)

Effects of the Discount Matrix on E-rate Funds from 1998-2012, *Telecommunications Policy*, 38(11): 1069-1084 (2014)

Exactitude in Defining Rights: Radio Spectrum and the "Harmful Interference" Conundrum (with T. Hazlett), *Berkeley Technology Law Journal*, 28(1): 227-340 (2013)

The Overly Active Corpse of *Red Lion* (with T. Hazlett and D. Clark), *Northwestern Journal of Technology and Intellectual Property*, 9: 51-95 (2010)

Publications Under Review

Procurement of Broadband in the Recovery Act (revise and resubmit to *The RAND Journal of Economics*, 2018)

Congressional Testimony

Testimony of Dr. Sarah Oh, Senate Commerce Committee Subcommittee Hearing on "There's an App for That: Mobile Technology Trends," May 2018

Opinion Pieces

The FCC Should Embrace Artificial Intelligence, *RealClearPolicy*, `http://www.realclearpolicy.com/articles/2017/09/14/the_fcc_should_embrace_artificial_intelligence_110355.html` (Sept. 14, 2017)

Bots Go to Washington (with B. Silberstein), *RealClearPolicy*, `http://www.realclearpolicy.com/articles/2017/07/07/bots_go_to_washington_110290.html` (Jul. 7, 2017)

Media Mentions

Contributor to Forbes, Washington Bytes #BeltwayBrief: The FCC's Net Neutrality Repeal: The End Of The Internet Or A Path To A Legislative Compromise?, `https://www.forbes.com/sites/washingtonbytes/2018/03/06/the-fccs-net-neutrality-repeal-the-end-of-the-internet-or-a-path-to-a-legislative-compromise/` (Mar. 6, 2018)

Feds Front $77 Million to Restore Phone Service in Caribbean, *Cnet*, `https://www.cnet.com/news/feds-front-77-million-to-restore-phone-service-in-caribbean/` (Oct. 7, 2017)

Blog Posts

Critiques of 2017 FCC Comment Process Also Apply to 2014. Federal Agencies Should Act to Ensure Integrity of Comment Process (with S. Wallsten) (Feb. 26, 2018)

Berkman Center Report Neither Useful for Policy Nor Generalizable for Consumers (with S. Wallsten) (Jan. 29, 2018)

Machine Learning, Collusion, and Infrastructure, Oh My! Some Observations from the 2018 Annual Meetings of the American Economic Association (with S. Wallsten) (Jan. 9, 2018)

Public Comments in the World of Massively Multiplayer Regulatory Proceedings (with B. Silberstein and S. Wallsten) (Dec. 5, 2017)

Breaking Down the Advance Universal Service Funds for Puerto Rico and the Virgin Islands (with S. Wallsten) (Oct. 5, 2017)

Data-Driven Modernization of E-rate for Wi-Fi in Schools, *Aspen Institute Communications & Society Program Blog* (Mar. 22, 2016)

Co-Host of the Two Think Minimum Podcast

Technology News with Rob Pegoraro (April , 2018)
Political Spectrum: The Hazletts or Haz Nots? with Thomas Hazlett (Mar. 29, 2018)
Do Algorithms Rule the World? Data Privacy and the GDPR with Maja Brkan (Mar. 8, 2018)
Labor Markets and AI with Emilio Colombo (Mar. 2, 2018)
Incentive Auctions and Spectrum Thoughts (Feb. 16, 2018)
Universal Service and Rural Broadband (Feb. 12, 2018)
Infrastructure Week? (Feb. 2, 2018)
What is "Broadband?" (Jan. 26, 2018)

Referee Service

Information Economics and Policy
IEEE Conference Proceedings, Telecommunications and Signal Processing

Teaching

Economics 420: International Money & Finance (GMU, Fall 2015)

Affiliations

Graduate Research Assistant to Tyler Cowen, 2015–2017
Graduate Research Assistant to Thomas Hazlett, 2013–2014
Ph.D. Fellowship, Mercatus Center 2015–2017
Graduate Student Summer Research Fellowship, Mercatus Center 2015, 2016
Dan Searle Fellow, Institute for Humane Studies, 2012–2015
Research Fellow, Information Economy Project, 2012–2015

Conferences

Panelist, American Petroleum Institute, Telecom. Subcommitee Meeting, Washington, D.C., Mar. 22, 2018
Discussant, TPI Artificial Intelligence Conference, Washington, D.C., Feb. 22, 2018
Presenter, Ronald Coase Institute Workshop on Institutional Analysis, Bogota, Colombia, Dec. 10-15, 2017
Presenter, ITIF Capitol Hill Series Tech Policy 101, Washington, D.C., Oct. 5, 2017
Presenter, TPI Aspen Forum, Spectrum Working Group, Aspen, CO, Aug. 20-22, 2017
Presenter, Law & Economics Center, Privacy Roundtable, Arlington, VA, Dec. 10-11, 2015
Presenter, Penn State-JIP Seminar, Embassy of Switzerland, Washington, D.C., Sept. 28-29, 2015
Presenter, International Telecommunications Society Ph.D. Seminar, El Escorial, Spain, June 26-28, 2015
Guest Scholar, Aspen Institute Communications & Society Program, Aspen, CO, Aug. 13-16, 2014
Presenter, International Conference on Mobile Business at LSE, London, UK, June 4-5, 2014
Moderator, Spectrum After Auctions Panel, National Press Club, Washington, D.C., Apr. 24, 2014
Presenter, Pacific Telecommunications Council Young Scholars, Honolulu, HI, Jan. 18-22, 2014
Guest Scholar, NY Law School-Rutgers Broadband Seminar, Washington, D.C., Jun. 10-11, 2013
Presenter, Levy Workshop, Antonin Scalia Law School, Arlington, VA, Sept. 26, 2013
Presenter, Telecommunications Policy Research Conference, Arlington, VA, Sept. 23-25, 2011

Conference Committees

Coordinator, Gordon Tullock: A Celebration, Arlington, VA, Oct. 2-3, 2015
Coordinator, James Buchanan: A Celebration, Fairfax, VA, Sept. 28-29, 2013
Coordinator, Digital Inventor: Platform Competition, Arlington, VA, Feb. 24, 2012
Coordinator, Copyright Compromises, Arlington, VA, Oct. 12, 2011
Coordinator, Gridlock Economy: Property Rights, Arlington, VA, Oct. 2, 2009
Coordinator, Ronald Coase: A Celebration, University of Chicago Law School, Chicago, IL, Dec. 4-5, 2009

Internships

Federal Trade Commission, Law Clerk, Office of Policy Planning, Director Maureen Ohlhausen. Completed a fifty-state survey of health privacy laws. (May 2008–Aug. 2008, Washington, D.C.)

Federal Communications Commission, Law Intern, Office of Commissioner Deborah Taylor Tate. Researched wireline issues. Attended Congressional hearings. (Sept. 2007–Dec. 2007, Washington, D.C.)

U.S. Department of Commerce, Law Intern, National Telecomm. & Info. Administration. Drafted sections of the President's Federal Spectrum Plan. Visited spectrum facilities. (May 2007–Aug. 2007, Washington, D.C.)

Honors

Active Member, Virginia State Bar (2009–present)
Senior Research Editor, Journal of Law, Economics and Policy (2008)
President, Asian Pacific American Law Students Association (2008)
Officer, Society of Women Engineers, Stanford University (2003)
President's Scholar, Undergraduate Research Grant Program, Stanford University (2000)

Code

In a web project, I chart the Federal Communications Commission's universal service program from 1999-2016. I display 82,749 time series charts with separate vendor payments to 25,458 E-rate, 4,281 Connect America, and 2,612 Lifeline geographic areas. I store data in Google BigQuery databases. I manage assets with a Mediawiki LAMP stack [Linux, Apache, MySQL, and PHP/Python/Perl] through Bitnami which is hosted by Amazon Web Services. I use HighchartsJS, Google Cloud Storage, Google App Engine, and Java Eclipse IDE to create chart assets. In Java, I collect data with Jsoup, clean text with Apache Commons, and template results into XML. I use command line terminals to manage cloud storage, load large files into MediaWiki, and run PHP maintenance scripts. This data project is online at `http://fiscly.com`.

Personal

United States Citizen. Hometown: North Potomac, MD.

References

Professor Tyler Cowen
George Mason University
Economics Department
2 Carow Hall
Fairfax, VA 22030
703-993-2312, tcowen@gmu.edu

Professor Thomas Hazlett
Clemson University
Economics Department
233 Sirrine Hall
Clemson, SC 29634
864-656-3481, hazlett@clemson.edu

Dr. Scott Wallsten
Technology Policy Institute
409 12th Street, SW, Suite 700
Washington, D.C. 20024
202-828-4405, scott@wallsten.net

Professor David Eil
George Mason University
Economics Department
Metropolitan Building
Arlington, VA 22201
703-993-4846, deil@gmu.edu