

**IoT Inspector: Crowdsourcing Labeled Network Traffic from
Smart Home Devices at Scale
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Abstract:

The proliferation of smart home devices has created new opportunities for empirical research in ubiquitous computing, ranging from security and privacy to personal health. Yet, data from smart home deployments are hard to come by, and existing empirical studies of smart home devices typically involve only a small number of devices in lab settings. To contribute to data-driven smart home research, we crowdsource the largest known dataset of labeled network traffic from smart home devices from within real-world home networks. To do so, we developed and released IoT Inspector, an open-source tool that allows users to observe the traffic from smart home devices on their own home networks. Between April 10, 2019 and January 21, 2020, 5,404 users have installed IoT Inspector, allowing us to collect labeled network traffic from 54,094 smart home devices. At the time of publication, IoT Inspector is still gaining users and collecting data from more devices. We demonstrate how this data enables new research into smart homes through two case studies focused on security and privacy. First, we find that many device vendors, including Amazon and Google, use outdated TLS versions and send unencrypted traffic, sometimes to advertising and tracking services. Second, we discover that smart TVs from at least 10 vendors communicated with advertising and tracking services. Finally, we find widespread cross-border communications, sometimes unencrypted, between devices and Internet services that are located in countries with potentially poor privacy practices. To facilitate future reproducible research in smart homes, we will release the IoT Inspector data to the public.

Bio:

Danny Y. Huang is an Assistant Professor at New York University. He is broadly interested in the security and privacy of consumer technologies, such as cryptocurrency and IoT. He did a postdoc at Princeton University and obtained his PhD in Computer Science and Engineering from University of California, San Diego. For more information, visit <https://hdanny.org/>.