



THE UNIVERSITY OF  
**CHICAGO**

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## **Watching You Watch: The Tracking Ecosystem of Over-the-Top TV Streaming Devices**



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**Crerar 298**

**Host: Nick Feamster**

The number of Internet-connected TV devices has grown significantly in recent years, especially Over-the-Top (“OTT”) streaming devices, such as Roku TV and Amazon Fire TV. OTT devices offer an alternative to multi-channel television subscription services, and are often monetized through behavioral advertising. To shed light on the privacy practices of such platforms, we developed a system that can automatically download OTT apps (also known as channels), and interact with them while intercepting the network traffic and performing best-effort TLS interception. We used this smart crawler to visit more than 2,000 channels on two popular OTT platforms, namely Roku and Amazon Fire TV. Our results show that tracking is pervasive on both OTT platforms, with traffic to known trackers present on 69% of Roku channels and 89% of Amazon Fire TV channels. We also discover widespread practice of collecting and transmitting unique identifiers, such as device IDs, serial numbers, WiFi MAC addresses and SSIDs, at times over unencrypted connections. Finally, we show that the countermeasures available on these devices, such as limiting ad tracking options and adblocking, are practically ineffective. Based on our findings, we make recommendations for researchers, regulators, policy makers, and platform/app developers.

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Hooman Mohajeri Moghaddam is a PhD student at Princeton University where he is advised by Nick Feamster and Prateek Mittal. As part of his PhD, he is studying the privacy properties of Internet-connected devices, including smart TVs and streaming devices, through automated large scale measurements. Hooman is broadly interested in privacy enhancing technologies, privacy measurements and secure systems and his research has been covered by the Wired magazine, The New York Times and The Wall Street Journal. He is also a member of Center for Information Technology Policy (CITP) and INSPIRE Research Group at Princeton. Before joining Princeton, Hooman was at the University of Waterloo, where he studied the application of traffic shaping techniques in censorship circumvention as part of the Cryptography, Security, and Privacy (CrySP) research group.