Janus Varmarken

✉ VARMARKEN@GMAIL.COM ☎ (949) 880-6177 🌍 WWW.VARMARKEN.COM

Education

University of California, Irvine

Ph.D. in Networked Systems   June 2023
- Thesis: "Privacy Implications of Smart TVs"
- Advisor: Professor Athina Markopoulou
- GPA: 3.82/4.00

M.S. in Networked Systems   June 2023

IT University of Copenhagen

M.S. in Information Technology - Software Development and Technology   June 2017

B.S. in Software Development   June 2013

Work Experience

Juniper Networks, Inc.

Software Engineer 3   July 2023 – Present
- I am primarily working on batch processing of large datasets using Apache Spark.

Intern PhD Software Engineering   June 2022 – September 2022
- Implemented REST endpoints that serve data retrieved from Elasticsearch.

Intern M Software Engineering   June 2021 – September 2021
- Built a user experience predictor for Zoom meetings using data retrieved from the Zoom API.
- Designed and implemented a service that translates IP unicast traffic to IP multicast traffic.

University of California, Irvine

Graduate Student Researcher   September 2017 – June 2023
- My research analyzed smart TVs' network traffic to assess their impact on users' privacy. This work includes a large-scale study of advertising and tracking on smart TVs, which was featured at FTC's PrivacyCon 2021.
- I also did research on network fingerprints of smart TV apps and smart home devices in general.

Teaching Assistant   March 2020 – June 2020, April 2019 – June 2019
- Teaching Assistant for Introduction to Computer Networks (CS 132 / EECS 148).

Visiting Junior Specialist II   September 2014 – January 2015
- Developed the first version of AntMonitor, an Android application that performs network traffic inspection on an Android device while not requiring root (see https://athinagroup.eng.uci.edu/projects/antmonitor/).

Symantec Corporation

Security Technology & Response (STAR) Intern   June 2019 – September 2019
- Worked on network traffic analysis using Swift and Rust, e.g., extracting TLS fingerprints from TLS records.

IT University of Copenhagen

IT Employee   December 2015 – January 2016
- Developed an Android application that uses a Bluetooth connection to relay data from a network traffic inspection tool (AntMonitor) to a wearable device.

Danish Maritime Authority

Student Worker   October 2013 – July 2014
- Developed Java software for vessel navigation computer systems.

Hammerstad A/S

Programmer   March 2012 – September 2013

- Developed websites and database tools in C#. For example, a tool for synchronizing mailing lists stored in a local database with mailing lists stored on MailChimp.com.

PUBLICATIONS

- **J. Varmarken**, R. Trimananda, A. Markopoulou, "Seqnature: Extracting Network Fingerprints from Packet Sequences," in *arXiv preprint arXiv:2312.17370.* December 2023.
- **J. Varmarken**, J. Al Aaraj, R. Trimananda, A. Markopoulou, "FingerprinTV: Fingerprinting Smart TV Apps," in *Proceedings of the Privacy Enhancing Technologies Symposium (PETS) 2022, Issue 3.* July 2022, Sydney, Australia.
- **J. Varmarken**, H. Le, A. Shuba, A. Markopoulou, Z. Shafiq, "The TV is Smart and Full of Trackers: Measuring Smart TV Advertising and Tracking," in *Proceedings of the Privacy Enhancing Technologies Symposium (PETS) 2020, Issue 2.* July 2020, Online.
- R. Trimananda, **J. Varmarken**, A. Markopoulou, B. Demsky, "Packet-Level Signatures for Smart Home Devices," in *Proceedings of the 2020 Network and Distributed System Security Symposium (NDSS).* February 2020, San Diego, CA.
- A. Le, **J. Varmarken**, S. Langhoff, A. Shuba, M. Gjoka, A. Markopoulou, "AntMonitor: A System for Monitoring from Mobile Devices," in *Proceedings of ACM SIGCOMM Workshop on Crowdsourcing and Crowdsharing of Big Internet Data (C2BID)*, London, UK, August 17, 2015.
- A. Shuba, A. Le, M. Gjoka, **J. Varmarken**, S. Langhoff, A. Markopoulou, "Demo: AntMonitor - Network Traffic Monitoring and Real-Time Prevention of Privacy Leaks in Mobile Devices," in *ACM MobiCom S3 Workshop*, Paris, France, July 2015. *Best Demo Award Winner.*
- A. Shuba, A. Le, M. Gjoka, **J. Varmarken**, S. Langhoff, A. Markopoulou, "AntMonitor: A System for Mobile Traffic Monitoring and Real-Time Prevention of Privacy Leaks," in *ACM MobiCom Demos*, Paris, France, September 7-10, 2015.

OPEN-SOURCE SOFTWARE

unicast2multicast-translator (see https://github.com/JNPRAutomate/unicast2multicast-translator)
A service that translates unicast traffic to multicast traffic. The goal is to bring applications that rely on multicast infrastructure to users in networks that do not support multicast.

Rokustic (see https://github.com/UCI-Networking-Group/rokustic)
A tool that automatically explores Roku apps and logs the resulting network traffic. This enabled a large-scale study of advertising and tracking on smart TVs (see https://athinagroup.eng.uci.edu/projects/smarttv/).

PingPong (see http://plrg.eecs.uci.edu/git/?p=pingpong.git)
A tool that automatically discovers patterns ("fingerprnts") in packet exchanges between smart home devices and their cloud servers. These fingerprints enable an in-network observer to infer user actions on smart home devices from the encrypted network traffic.

pcap-trimmer (see https://github.com/jvmk/pcap-trimmer)
A Java tool for filtering network traces. Serves as an alternative to tshark for users who are more comfortable working in Java, or whose filter needs are more complex than what may be expressed using a tshark filter.

SIDE PROJECTS

msgshm238 (see https://github.com/jvmk/msgshm238)
A user-space C library that combines the performance of shared memory with the simplicity of message passing by implementing message passing over shared memory. msgshm238 automatically sets up shared memory regions as needed, handles all pointer arithmetic necessary for indexing the shared memory region, and handles synchronization. The application programmer only deals with a simple `send()`/`recv()` API.

Smartether
An Android application and macOS companion application that automatically enables the smartphone's tethering when the laptop lacks Wi-Fi coverage.

SKILLS

Programming languages: Java, Python.

Protocols: IP, TCP, UDP, HTTP, DNS.

Tools: Wireshark, Git.