HARI VENUGOPALAN

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Personal Website | Linkedin | Google Scholar | GitHub

OBJECTIVE

Computer Science PhD candidate specializing in digital identities. Solid background in security, privacy, hardware, healthcare and malware research. Seeking to leverage strong research background and software development skills in industry research roles, particularly in security at tech companies.

EDUCATION

Ph.D. in Computer Science, University of California, Davis (Expected 2026)
M.S. in Computer Science, University of California, Davis (2020)
B.Tech. in Production Engineering, National Institute of Technology, Tiruchirappalli (2014)

RESEARCH HIGHLIGHTS

Seamless Biometric Authentication for Individuals with Disabilities

- Developed a novel glycemic biometric for individuals with Type 1 Diabetes.
- Currently investigating defenses against replay attacks and developing a system for authentication.

Predictive Glucose Alerting to manage Type-1 Diabetes

- Explored user-preferences and health impact of predictive alerting to manage Type-1 Diabetes via an iOS app.
- App significantly reduced time spent in hypoglycemia for all 8 user-study participants.

DVFS Frequency Scaling for Device Fingerprinting

- Exploited DVFS to fingerprint devices in both native and web environments.
- Investigated granularity of heterogeneity for optimal fingerprinting across device categories.

Iframes for web tracking

- Currently investigating privacy implications of cross-origin communication over iframes.

Secure Automated Insulin Delivery

- Built the first secure, simple, and formally verified system for automated insulin delivery.
- System protects against malicious algorithms, pump drivers and accounts for changes in human physiology.

Discovering Inconsistencies to Detect Evasive Bots

- Deployed honey site with novel architecture to selectively draw over half a million requests from evasive bots.
- Improved bot detection with a data-driven, semi-automatic approach to discover browser attribute inconsistencies.

Rowhammer-Based Device Fingerprinting

- Proposed technique to uniquely identify devices with identical hardware/software configurations.
- Conducted the largest scale study (98 DRAM modules) to demonstrate unique and stable fingerprints.

Privacy-Enhancing System for Mobile Cameras

- Developed an automated and extensible system to protect user privacy from camera apps.
- System enforces fine-grained permissions over information captured in camera frames.

Combating Card-not-Present Credit Card Fraud

- Employed card-scanning as a security challenge to recover false positives from fraud detection algorithms.
- Software from research deployed on over a billion devices, leading to startup acquisition by Stripe.

Graded Biometric Authentication for Mobile Devices

- Developed a face recognition system for graded authentication on mobile devices.
- Research resulted in a US patent filing.

WORK EXPERIENCE

Research Intern, Blue Hexagon Inc., Sunnyvale, California (Summer 2019)
Developed GAN to automatically mutate malware to avoid static analysis detection while preserving functionality.

Student researcher, AHMCT UC Davis, Davis, California (2017)
Developed web interface in Angular for Caltrans engineers to query accident report models.

Software Developer, Oracle India Private Limited, Bengaluru, Karnataka, India (2014-2017)
Developed analytics framework to capture file-related activity and web client features for Oracle Social Network (OSN).

Software Developer Intern, InterviewStreet Technologies (Hackerrank), Bangalore, India (2012)
Developed a real-time collaborative editor using Node.js.

SELECTED PUBLICATIONS (Full list on my website)

GlucOS: Security, correctness, and simplicity for automated insulin delivery
Hari Venugopalan, Shreyas Madhav Ambattur Vijayanand, Caleb Stanford, Stephanie Crossen and Samuel T. King
Under submission at the ACM Symposium on Operating System Principles (SOSP) 2025

FP-Inconsistent: Detecting Evasive Bots using Browser Fingerprint Inconsistencies
Hari Venugopalan, Shaoor Munir, Shuaib Ahmed, Tangbaihe Wang, Samuel T. King and Zubair Shafiq
Under submission at ACM Internet Measurement Conference (IMC) 2025

FP-Rowhammer: DRAM-Based Device Fingerprinting
Hari Venugopalan, Kaustav Goswami, Zainul Abi Din, Jason Lowe-Power, Samuel T. King and Zubair Shafiq
Undergoing major revision at ACM ASIA Conference on Computer and Communications Security (AsiaCCS) 2025

Aragorn: A Privacy-Enhancing System for Mobile Cameras
Hari Venugopalan, Zainul Abi Din, Trevor Carpenter, Jason Lowe-Power, Samuel T. King and Zubair Shafiq
UbiComp 2024 (Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies)

Doing good by fighting fraud: Ethical anti-fraud systems for mobile payments
Zainul Abi Din, **Hari Venugopalan,** Henry Lin, Adam Wushensky, Steven Liu and Samuel T. King
IEEE Symposium on Security and Privacy 2021

Credit Card Fraud Is a Computer Security Problem
Samuel T. King, Nolen Scaife, Patrick Traynor, Zainul Abi Din, Christian Peeters and **Hari Venugopalan**
IEEE Security and Privacy Magazine 2021

Boxer: Preventing fraud by scanning credit cards
Zainul Abi Din, **Hari Venugopalan,** Jaime Park, Andy Li, Weisu Yin, Haohui Mai, Yong Jae Lee, Steven Liu and Samuel T. King
Usenix Security 2020

MultiLock: Biometric-Based Graded Authentication for Mobile Devices
Shravan Aras, Chris Gniady and **Hari Venugopalan**
Mobiquitous 2019

WORK IN PROGRESS

Turning a disability into an advantage: Zero-effort glycemic authentication for individuals with diabetes
Hari Venugopalan, Jun Min Kim, Thomas Screven, Amanda Raybuck, Zubair Shafiq and Samuel T. King

BeaGL: Predictive Glucose Alerting System for Type 1 Diabetes Management
Hari Venugopalan, Jun Min Kim**,** Sriram Magesh, Grace Cheng, Salvador Lopez, Tim Stewart, Brendan Leung, Stephanie Crossen and Samuel T. King

CPUPrint: Power Side-channels for Device Fingerprinting
Kaustav Goswami, **Hari Venugopalan,** Ryan Swift, Jason Lowe-Power, Chen-Nee Chuah and Zubair Shafiq

Inception: Studying the use of iframes for web tracking
Yash Vekaria, **Hari Venugopalan** and Zubair Shafiq

TEACHING EXPERIENCE

Graduate Teaching Assistant, UC Davis, Davis, California

Handled discussions, held office hours, designed and graded programming assignments for undergraduate and graduate courses on Operating Systems, Computer Security, Computer Networks, Object Oriented Programming, Distributed Database Systems and Programming Languages. (Full list on my website)

TECHNICAL SKILLS

Programming Languages:
Python, Java, C, C++, JavaScript, Swift, Kotlin

Tools & Technologies:
Git, XCode, Android Studio, NDK, AOSP, Node.js, Rails, Heroku, Apache, Selenium, PyTorch, Keras, TensorFlow, TensorFlow Lite, CoreML, XGBoost, Scikit-learn, Ludwig, LaTeX

Areas of Expertise:
Computer Security & Privacy, Machine Learning & AI, Healthcare Technology, Computer Architecture, Mobile & Web Development

AWARDS AND HONORS

- Awarded GGCS summer fellowship by the department of Computer Science at UC Davis in 2022 and 2024.
- Invited to deliver a talk on my paper, “GlucOS: Security, Correctness and Simplicity for Automated Insulin Delivery” as part of MIT CSAIL Security Seminar Series
- Invited to deliver a talk on my paper, “GlucOS: Security, Correctness and Simplicity for Automated Insulin Delivery” at the FairComp 2024 workshop, co-located with ACM UbiComp.
- “GlucOS: A secure, safe and extensible system for automated insulin delivery” was recognized as the AI-Selected best poster at the IEEE Symposium on Security and Privacy 2024.

PROFESSIONAL ACTIVITIES

- Served on the PC of SecWeb’23, AISec’23 and AISec’24 workshops.
- Served as an artifact evaluator for PETS’24 and PETS’25.
- Served as an external reviewer for IEEE Internet of Things Journal.