

# Hari Venugopalan

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Google Scholar

## RESEARCH INTERESTS

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Systems, Security, Privacy, Machine Learning, Anti-fraud, Healthcare, Hardware Side-channels

## EDUCATION

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2026 PhD (Computer Science) at **University of California Davis**

2020 MS (Computer Science) at **University of California Davis**

2014 B.Tech (Production Engineering) at **National Institute of Technology Tiruchirappalli**

## WORK EXPERIENCE

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**Applied Scientist, Amazon Web Services (AWS), New York City NY** Jan 2026 - Present

– *AWS Fraud Prevention*: Currently working on proactive bot detection to curtail financial abuse.

**Graduate Student Researcher, UC Davis, Davis CA**

Sep 2018 - Dec 2025

### Diabetes management research

- *GlucOS*: Designed and implemented the first end-to-end secure system for automated insulin delivery.
- *BeaGL*: Built a predictive alerting app to provide individuals with agency and trust in managing diabetes.

### Authentication / Bot detection research

- *FP-Rowhammer*: Proposed a novel technique to exploit the uniqueness and stability of Rowhammer bit flips to identify devices including those with identical hardware and software configurations.
- *FP-Inconsistent*: Conducted large-scale measurement and analysis of browser fingerprint inconsistencies to detect evasive bots in the wild.
- *Javelin*: Conceived a glycemic biometric to provide zero-effort authentication for individuals with diabetes.
- *CPUPrint*: Currently guiding DVFS-based timing side-channel for device fingerprinting.

### Financial fraud research

- *Boxer*: Deployed an advanced card scanning system to recover false positives from fraud detection to combat card-not-present credit card fraud.
- *Daredevil*: Designed and implemented ethical anti-fraud system to support card scanning on resource-constrained devices.

### Privacy research

- *Aragorn*: Designed and implemented the first automated and extensible privacy-enhancing system for mobile cameras.
- *Inception*: Currently collaborating on research to characterize and prevent privacy leaks across iFrames.

**Applied Scientist Intern, Amazon Web Services (AWS), New York City NY** Jun 2025 - Sep 2025

– Drove research on LLM domain adaptation for fraud assessment.

**ML Research Intern, Blue Hexagon Inc, Sunnyvale CA**

Jun 2019 - Sep 2019

– Conceptualized a GAN-based functionality-preserving malware mutation technique to evade static detection.

**Research Collaborator, UofA, Remote**

Jan 2015-May 2017

– *MultiLock*: Collaborated on face recognition based graded authentication in mobile apps.

**Member of Technical Staff, Oracle India Pvt. Ltd, Bengaluru, India**

Jun 2014-Jul 2017

– *Oracle Social Network*: Developed analytics framework and webclient features for enterprise social network.

## PUBLICATIONS

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### **FP-Rowhammer: DRAM-Based Device Fingerprinting**

*Hari Venugopalan*, Kaustav Goswami, Zainul Abi Din, Jason Lowe-Power, Samuel T. King and Zubair Shafiq

ACM ASIA Conference on Computer and Communications Security 2025

### **FP-Inconsistent: Measurement and Analysis of Fingerprint Inconsistencies in Evasive Bot Traffic**

*Hari Venugopalan*, Shaoor Munir, Shuaib Ahmed, Tangbaihe Wang, Samuel T. King and Zubair Shafiq

ACM Internet Measurement Conference 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

### **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

### **Credit Card Fraud Is a Computer Security Problem**

Samuel T. King, Patrick Traynor, Christian Peeters, Nolen Scaife, Zainul Abi Din and *Hari Venugopalan*

IEEE Security and Privacy Magazine 2021

### **GlucOS: Security, correctness, and simplicity for automated insulin delivery**

*Hari Venugopalan*, Shreyas Madhav Ambattur Vijayanand, Caleb Stanford, Stephanie Crossen and Samuel T. King

MobiSys 2026

### **Case study exploring the utility of a novel predictive glucose alerting application for young adults living with type 1 diabetes**

*Hari Venugopalan*, Samuel T. King, Salvador Lopez, Jun Min Kim, Grace Cheng, Tim Stewart, Sriram Magesh, Brendan Leung and Stephanie Crossen

Diabetes Case Reports 2026

### **Computer-vision for Movement Observation and Recovery Enhancement (C-MORE): Box and blocks**

Ziqiang “Joe” Zhu, Jun Min Kim, *Hari Venugopalan*, Matthew Karl Farrens, Samuel T. King and Andria Farrens

In review at Bioengineering journal 2026

### **Adaptability, Extensibility and Simplicity of the MetabolicOS**

*Hari Venugopalan*, Shreyas Madhav Ambattur Vijayanand and Samuel T. King

ACM BioSys Workshop at ASPLOS 2024

## **MultiLock: Biometric-Based Graded Authentication for Mobile Devices**

Shravan Aras, Chris Gniady and *Hari Venugopalan*

MOBIQUITOUS: Mobile and Ubiquitous Systems 2019

## **HammerSim: A Tool to Model Rowhammer**

Kaustav Goswami, Ayaz Akram, *Hari Venugopalan* and Jason Lowe-Power

Young Architect Workshop at ASPLOS 2023

## **Open Source Software Computed Risk Framework**

Jon Chapman and *Hari Venugopalan*

IEEE International Conference on Computer Science and Information Technologies 2022

## AWARDS, PATENTS AND IMPACT

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- Financial fraud research led to a startup which was acquired by Stripe. Software from the research has run on over a billion devices, saving an estimated 100 mn+ in fraud.
- Bot detection research has drawn interest from Amazon Web Services (AWS) to thwart evasive bots indulging in fraud.
- Six individuals have been using the predictive alerting iOS app from my research for over the past year, resulting in statistically significant improvements in reducing hypoglycemia while simultaneously reducing cognitive load.
- One individual has been running the secure system for automated insulin delivery from my research to manage their diabetes for the past 2 years, resulting in glycemic control to match that of non-diabetics (A1C of 5.8%). Currently working on integrating the security mechanism within Trio, a widely used automated insulin delivery system.
- My early-stage startup, Kingsmen Health, spawning from my diabetes research was awarded Mentor's choice award at UC Davis early-stage cohort accelerator program, PLASMA.
- My early-stage startup, Kingsmen Health, centered around my diabetes research was part of the regional NSF I-Corps cohort at UC Davis and has been recommended for the national program.
- My collaboration, Multilock, led to a US patent being filed by the University of Arizona.
- 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.
- Recognized as a top reviewer at AISEC Workshop 2025.
- GGCS summer fellowship by the department of Computer Science at UC Davis in 2022 and 2024.

## TALKS

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- **FP-Inconsistent: Measurement and Analysis of Fingerprint Inconsistencies in Evasive Bot Traffic** IMC (October 2025)
- **Padawan: LLM-Domain adaptation for Fraud Assessment** AWS Fraud Prevention (September 2025)
- **GlucOS: Security, correctness, and simplicity for automated insulin delivery** MIT (December 2024), UC Davis (October 2024), FairComp workshop (October 2024)
- **Aragorn: A Privacy-Enhancing System for Mobile Cameras** UbiComp (October 2024), ProperData (January 2022)
- **FP-Rowhammer: DRAM-Based Device Fingerprinting** ProperData (February 2024)

- **eXeGAN: Not all Malware is created Equal** Blue Hexagon Inc (September 2019)

## MEDIA COVERAGE

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- **Stripe acquires Bouncer, will integrate its card authentication into the Radar fraud detection tool**  
[TechCrunch](#) article by Ingrid Lunden
- **RAM-ramming Rowhammer is back – to uniquely fingerprint devices**  
[The Register](#) article by Thomas Claburn
- **Centauri: Practical Rowhammer Fingerprinting**  
[YCombinator News](#) post by Paul Houle
- **Innovative Device Fingerprinting Technique Developed by University of California Researchers**  
[Bitdefender](#) article by Vlad Constantinescu
- **Serious Security: Rowhammer returns to gaslight your computer**  
[Sophos Blog](#) article by Paul Ducklin
- **Centauri, a Rowhammer-based method for generating unique fingerprints**  
[Desde Linux](#) article by Darkcrizt
- **Rowhammer attack proposed to be used for device fingerprinting**  
[Security Parrot](#) article by Security Parrot Editorial Team
- **Todd Austin’s Post**  
[Linkedin post](#) by Dr. Todd Austin
- **With AI, a New “Metabolic Watchdog” Takes Diabetes Care from Burden to Balance**  
[UC Davis Engineering Progress Magazine](#) by Jessica Heath
- **BeaGL: A T1D Kid’s Personal “Watch Dog”!**  
[Article](#) by Peerani Health
- **UC Davis Health’s AI-powered solution for type 1 diabetes management**  
[Article](#) by American Hospital Association
- **Tidepool Article**  
[Article](#) by Tidepool
- **BeaGL app wins the Mentor’s Choice award of \$5000**  
[UC Davis College of Engineering article](#) by Jessica Heath
- **A Smartphone App Could Change How Stroke Recovery is Measured**  
[UC Davis College of Engineering article](#) by Jessica Heath

## TEACHING

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<b>ECS 150: Operating Systems</b> Teaching Assistant	Sep 2024-Apr 2025
<b>ECS 152A: Computer Networks</b> Teaching Assistant	Sep 2023-Dec 2023
<b>ECS 153: Computer Security</b> Teaching Assistant	Jan 2022-Mar 2022
<b>ECS 140: Programming Languages</b> Teaching Assistant	Apr 2018-Jun 2018
<b>ECS 265: Distributed Database Systems</b> Teaching Assistant	Jan 2018-Mar 2018
<b>ECS 40: Software Development and Object-Oriented Programming</b> TA	Sep 2017-Dec 2017

## SERVICES

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- Reviewer IEEE Transactions on Computers 2025
- PC member AISEC Workshop 2023, 2024 and 2025 (Co-located with ACM CSS)
- PC member SecWeb Workshop 2023 (Co-located with IEEE S&P)
- Shadow PC member IMC 2025
- Reviewer ACM Interactive Mobile Wearable Ubiquitous Technologies (IMWUT/Ubicomp) 2023
- Reviewer IEEE Internet of Things Journal 2023
- Artifact Reviewer PETS 2024 and PETS 2025

## LEADERSHIP

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- Certified Competent Communicator and Advanced Leader Bronze by Toastmasters International.
- President (Jun 2016-Dec 2016), Lexicon Toastmasters, corporate chapter of Toastmasters International at Oracle India Pvt. Ltd.
- Head (Jul 2013-May 2014), Google Developer Group, NIT Trichy.

## SKILLS

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C, C++, Python, Swift, Java, JavaScript