ASMITA

Contact: +1-530-231-2285

aasmita@ucdavis.edu ◇ LinkedIn ◇ Personal-website◇

EDUCATION

University of California, Davis — Sept 2021- Present
- **PhD** in Computer Engineering, GPA : 3.9
- *Research Domain* : Embedded firmware (software) security
- *Major Advisor*: Dr. Houman Homayoun (ASEEC Lab, UC Davis)
- Graduate Student Researcher & Teaching Assistant

International Institute of Information Technology, Pune, India — 2014-18
- Bachelor of Engineering **(BE)** in Electronics Engineering

SKILLS

Languages	Python, C
Firmware Security	Static Analysis, Dynamic Analysis, Fuzzing, Rehosting, Emulation, Control flow graphs, Crash Triaging, Binary reversing (ARM), debugging. *(Embedded Security/ IoT Security)*
Harwdare Security	Firmware dump via JTAG, UART, SWD, flash memory; Hardware root of trust, side-channel & fault injection basics, secure-boot, peripheral-based exploits
Software/Tools	Ghidra, Radare, Qemu, Unicorn, Qiling, AFL, Binwalk, Firmadyne, research tools w.r.t firmware security, Git, Linux.
Others	Embedded systems, Machine learning basics, Cryptography basics, CTFs, Research, security practices & standards, secure coding, vulnerability detection & mitigation techniques

PUBLICATION

1. R. Tsang, D. Joseph, A. Asmita, S. Salehi, N. Carreon, P. Mohaptra, H. Homayoun. "FANDEMIC: Firmware Attack Construction and Deployment on Power Management IC and Impacts on IoT Applications". Network and Distributed Systems Security Symposium 2022 (NDSS 2022)

WORK EXPERIENCE

Netrise, Remote, USA — Summer 2022
- **Firmware Security Intern**

- Research and implementation to contribute towards existing Netrise Platform w.r.t Control flow graph (CFG) based static firmware analysis to perform binary similarity to identify the components.
- The research started from scratch leveraging CFG, progressed towards implementation. Got to learn overall development process, and a lot of brainstorming to tackle challenges ranging from selection of methods, feature extraction, graph approach, and designing.
- Developed prototype using Python to perform binary function similarity on the target binary.
- Work heavily involved binary instrumentation to extract CFG features, and associated function attributes, feature vectorization, and analysis.

Payatu, Pune, India — Oct'19 - Sept'21
- **IoT Security Consultant**

- Embedded hardware security: JTAG, UART debug port-based attacks, external memory access, PCB tracing.
- Firmware reverse engineering: Binary reversing, Emulation, Static and Dynamic Analysis, experience dealing with both Linux OS and bare-metal firmware binaries (ARM Architecture)
- IoT protocols related attacks (MQTT, and CoAP).
- Side channel analysis and fault injection attacks basics hands-on

- Trainer for Payatu's "Practical IoT Hacking Training" at Checkpoint, NULLCON and various private and global organizations.
- Performed security assessment on smart cameras, routers, smart watches, medical instruments, biometric devices.
- Contributor of open source EXPLIoT Framework
- Blogs : Link

Zerowav Pvt Ltd, Pune, India Mar'19 - Sept'19
- Graduate Engineer Trainee (Firmware Development)

- IoT product design
- Firmware development for IoT products

DELIVERED WORKSHOPS & INVITED TALKS

Talks	Nullcon, The Indian Dutch Cybersecurity School (IDCSS), Payatu webinars, Null talks
Workshops	CISO Platform, Nullcon, Hackaday Remoticon,CPX360 Checkpoint, International Institute of Information Technology, Delhi (IIIT)
Podcast	Link
More Details	Link

ACHIEVEMENTS

- **IEEE Best Teaching Assistant (TA) Award**, UC Davis September 2022
- **Best Outgoing Student Academic Topper Award March 2018** : "P. P. Chhabria Award for Best Outgoing Student Academic Topper" in the 2018 Graduated Batch of Bachelor of Engineering at International Institute of Information Technology, Pune, India
- **Best Paper Award Feb 2018** : Received the Best Paper Award at Eighth International Conference on Advances in Computing Electronics and Electrical Technology CEET-2018, Kuala Lumpur, Malaysia.
- **AIT-Tiger Leong International Innovation and Leadership Camp July 2017**: I was selected for this camp from India at AIT, Thailand from 24 July –04 August 2017. The camp had selected 25 students from 9 different countries. During the camp, we worked as a team, performed various activities to brainstorm on how technology can be used for sustainable development. At the end of the camp, our team won the gold level in "Hackathon Sensor Challenge 2017" at Asian Institute of Technology (AIT), Thailand held on 2nd – 3rd August 2017 (Idea: PHIN: Powerful Crop Health Imaging Next-Gen).