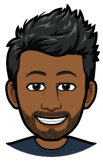

Akshith Gunasekaran

Publication

2021 **Fine-grained Analysis of Kernel Non-Determinism**.
- LLVM pass that finds non-deterministic code paths in the Linux kernel and improves effectiveness of run time profilers.
- Effective attack surface reduction.
- Effective bug finding.

2020 **Multi-K: A multiplexing framework for specialized kernels**.
- Kernel is specialized per application to reduce the attack surface.
- A kernel multiplexing framework with close to bare-metal context switching performance.

NDSS 2019 **Balancing Image Privacy and Usability with Thumbnail-Preserving Encryption**.
- An image encryption scheme that balances privacy and usability.
- Deployable with no changes to your cloud backend.
- Try it at photoencryption.org

Education

2017 - 2022 **PhD - Computer Science**, *Oregon State University*, Corvallis.
- Area of Focus: System Security, Applied Cryptography, AI
- Co-Advised by: Rakesh Bobba, Yeongjin Jang
- Research: Linux Kernel Security, Static Analysis, Dynamic Analysis, Software Profiling, Data flow analysis, Fuzzing.
- Research Tools: LLVM, Qemu, GDB, KLEE, Python, C/C++, ELF.
- Coursework: CS Theory (algorithms, graph theory, distributed systems), Security (operating systems, cryptography), AI (machine learning, reinforcement learning)

2012 - 2016 **BTech - Computer Science**, *SRM University*, Chennai.
- Activities: ABU Asia-Pacific Robot Contest, Semantic Search Engine.
- Venture: Simpl, a fin-tech startup.

Work

Summer 2021 **Research Intern - MIT Lincoln Lab**.
- Real time system security researcher
- Building software defenses against memory corruption attacks and side channel attacks for real time systems
- Tools: Linux Kernel, QEMU, Code Randomization, Cache Coloring

Winter 2017 **Winter Intern - MIT Media Lab, Human Dynamics Group**.
- Mentored by: Dazza Greenwood
- Prototyped an authentication framework based on OAuth that directly translates permissions into enforceable contracts
- Prototyped a decentralized autonomous organization to manage community loans
- Tools: Node, Ethereum, web3.js, TravisCI

2014 - 2017 **Software Developer/Founding Team, Simpl**.
- A pay later service
- Used by 5 Mil+ users
- Scaled the service using an event-based/pub-sub micro-service architecture (1 of 4 devs)
- Built the data engineering pipeline, for Business Intelligence queries (1 of 2 devs)
- Tools: Golang, Ruby on Rails, Python, Redis, Kafka, RabbitMQ, Spark, Cassandra, Datadog

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Activities

Current **CTF Team**, *OSUSEC*.
- Skills: Pwn, Reverse Engineering, Program Analysis, Forensics

Summer 2019 **Instructor**, *Pacific North West Cyber Camp*.
- A week long hands-on educational camp for high school students
- Topics include basic computer/network security hardening, cyber ethics
- Delivered the course material and instructed the lab sessions

Summer 2018 **Volunteer**, *Pacific North West Cyber Camp*.

2020 **Poster Jury**, *IEEE Security and Privacy*.

2020 **Shadow Program Committee**, *IEEE Security and Privacy*.

2019 **External Reviewer**, *ACM Conference on Computer and Communications Security*.

2019 **External Reviewer**, *IEEE Real-Time and Embedded Technology and Applications Symposium*.

2019 **External Reviewer**, *IEEE International Conference on Dependable Systems and Network*.

2018 **Teaching Assistant**, *CS290 Web Technologies and Web Security*.

Since 2017 **Research Mentor**, *Next Tech Lab*.
- A Multidisciplinary undergrad research lab
- International QS Award For Re-imagining Education
- I advise undergrads on Privacy and Security topics.