ALI AHAD

Dept of Computer Science, UVA
aa5rn@virginia.edu - My Website

OVERVIEW

I am a second-year Ph.D. student in the Department of Computer Science at the University of Virginia (UVA). My research focuses in solving system and software security problems via program analysisis. I am currently interested in the analysis and building of reverse-engineering tools for malicious binaries.

EDUCATION

University of Virginia *August 2020 - Present*
Doctorate in Computer Science Expected Graduation - 2025
Advisor - Prof. Yonghwi Kwon

Lahore University of Management Science *August 2016 - June 2020*
BS Computer Science Major GPA: 3.90 - CGPA: 3.52

PUBLICATIONS

[1] **SwarmFlawFinder: Discovering and Exploiting Logic Flaws of Swarm Algorithms**,
Chijung Jung, Ali Ahad, Yuseok Jeon, and Yonghwi Kwon,
In Proc. of the 43rd IEEE Symposium on Security and Privacy (S&P '22)

[2] **Forensic Analysis of Configuration-based Attacks**,
Muhammad Adil Inam, Wajih Ul Hassan, Ali Ahad, Adam Bates, Rashid Tahir, Tianyin Xu, and Fareed Zaffar,
In Proc. of the 29th Network and Distributed System Security Symposium (NDSS '22)

[3] **Swarmbug: Debugging Configuration Bugs in Swarm Robotics**,
Chijung Jung, Ali Ahad, Jinho Jung, Sebastian Elbaum, and Yonghwi Kwon,
In Proc. of 29th ACM SIGSOFT International Symposium on the Foundations of Software Engineering (FSE'21)

[4] **Spinner: Automated Dynamic Command Subsystem Perturbation**,
Meng Wang, Chijung Jung, Ali Ahad, and Yonghwi Kwon,
In Proc. of 28th ACM Conference on Computer and Communications Security (CCS'21)

WORK EXPERIENCE

Research Assistant - UVA August 2020 – *Present*

Currently working as a Research Assistant at University of Virginia under the supervision of Dr. Yonghwi Kwon.

Developer Advocate - Educative, inc. December 2019 – August 2020

Worked as full-time developer advocate at a Seattle based company named Educative. My responsibilities include researching, creating, reviewing and revamping tech-based courses and publishing them on the platform.

Teaching Assistant - LUMS Spring 2018 – Fall 2019
CS300 - Advanced Programming & CS310 - Algorithms

Worked as full-time Teaching Assistant for multiple courses. I helped design and automate the grading infrastructure for assignments and an exam. I also graded components whilst completing other TA responsibilities.

PROJECTS

Tracking fine-grained file changes at kernel level October 2019 - December 2019
Research Project - LUMS

To compliment the auditing mechanism, I wrote a **kernel-module** to hook and track sys-calls that modify annotated files. My kernel module would log file-diffs on each write so that the final provenance graph generated from the file-diff logs, applications logs, and auditd logs can give a holistic view of an attack with fine-grained changes made by the attacker.

Obfuscation of code by flattening of control-flow June 2019 - September 2019
Research Project - LUMS

To protect trusted software running on untrusted hosts, I combined **Intel SGX** technology with program-rewriting using **LLVM**. I pushed critical portions of the transformed program into the Intel SGX enclave to result in a program that yields little or no information to an active adversary.

Statistical analysis for the Boom of Internet in Developing Countries Fall 2018
Course Project - LUMS

Calculated factors that contributed to the increasing usage of internet in developing countries. I used Multi-variable polynomial regression to analyze and predict internet usage for upcoming years.

TECHNICAL STRENGTHS

Languages	Python, C, C++, BASH, Dart, Javascript, Golang
Frameworks & Libraries	LLVM, Flutter, React-Native, Flask, Vue JS
Miscellaneous	Git, Linux, Postman, Wireshark, Jupyter Notebooks

RELEVANT COURSES

Program Analysis	Software Analysis, Program Analysis
Security	Mobile & IoT Security, Network Security & Privacy, Cyber Forensics
Systems	Computer Architecture, Operating Systems
Machine Learning	Intro. to Artificial Intelligence, Machine Learning
Networks	Internet Infrastructure, Network-Centric Computing