

Software engineer currently working on application security. Significant background in software engineering including embedded systems, web systems, and client-side software. **Primarily interested in the reliability, safety, and security of software systems.**

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### *Experience*

#### **Cisco (Duo Security) / Security Software Engineer**

JANUARY 2020 - PRESENT, ANN ARBOR, MI

- Led design, implementation, and testing of dozens of new features for a large, distributed web service used to automate application security testing and analysis.
- Extended technical documentation coverage 4x.
- Ran the "OpenAPI" initiative to standardize and document large RESTful APIs.
- Led testing initiative to expand unit, component, and end-to-end testing 2x.
- Started a performance project to track performance metrics for the web service. Implemented performance improvements that reduced load times 5x.
- Gave several technical talks at Duo. Started a monthly "reading club" where attendees discuss new research papers in computer security / software analysis.

#### **HARMAN International / Senior Security Engineer**

JANUARY 2018 - JANUARY 2020, NOVI, MI

- Led the design and implementation of a full-stack web service used to automate vulnerability management across the organization.
- Led the design and implementation of an "automated threat modeling" toolchain which has reduced the time to complete complicated threat modeling by over 25%.
- Performed implementation audits on C/C++/Java codebases and reported over 50 security vulnerabilities.
- A critical player in creating and performing many aspects of the "Secure Development Lifecycle", including threat analysis and risk assessment, secure development practices, and incident response.
- Acted as lead incident responder several times and was publicly thanked by a researcher.
- Provided security training courses to developers and testers with an average feedback rating of 4/5.

#### **Lear Corporation / Cybersecurity Engineering Intern**

MAY 2017 - DECEMBER 2017, ANN ARBOR, MI

- Responsible for research, design, and implementation of an in-house CAN network intrusion detection system that will be provided as options to automotive OEMs.
- Created the "Threat Analysis and Risk Assessment (TARA)" process and co-authored the corresponding template used to analyze internal programs.
- Performed TARAs on various programs which found (and suggested mitigations to) many security issues.
- Technical lead for a formal analysis of static analysis tools in order to improve security quality across the global organization.
- Research and implementation of secure "Over-The-Air" update frameworks for embedded systems.

#### **HARMAN International / Software Engineering Intern (Navigation)**

MAY 2016 - APRIL 2017, NOVI, MI

#### **Lathrup Industries / Software & Database Developer**

JANUARY 2015 - SEPTEMBER 2016, NOVI, MI

## **Education**

### **Georgia Institute Of Technology / MS Computer Science**

JANUARY 2019 - December 2021, Remote

- Coursework: Software Analysis, Advanced Operating Systems, AI for Robotics, Computer Networks, Computer Vision, Network Security, Secure Computing Systems, Algorithms, Network Science

### **The University of Michigan / BSE Computer Science / 3.4 GPA / Cum Laude**

JANUARY 2016 - APRIL 2018, Ann Arbor, MI

- Significant technical coursework including algorithms, operating systems, computer architecture, security, compiler design, and more.

## **External Work**

- Involved in the Auto-ISAC Best Practices Working Group.
  - APRIL 2018 - JANUARY 2020
- Represent Harman on the Uptane project (a framework for secure over-the-air updates).
  - This includes involvement in the IEEE-ISTO Uptane working group.
  - APRIL 2018 - JANUARY 2020
- Active contributor to open source projects like Mozilla Thunderbird for many years.
  - Front-end, theme, and UX from 2012 - 2015
  - Security from 2018 - 2019

## **Technologies**

**Programming Languages:** C, C++, JS, TypeScript, Python, Rust

**Web Frameworks:** Python + Flask + JNinja2, Node.js + Angular + Hapi

**Cloud Environments:** AWS (EC2, ECS, ECR, S3, EFS, SQS, etc.) + Terraform

**Continuous Integration:** GitLab, TravisCI, Jenkins

**Testing:** GTest, Mocha, Selenium, Cypress, Locust, LLVM, ESLint

## **Publications**

Pese, M., Shin, K., Bruner, J., and Chu, A., "Security Analysis of Android Automotive," *SAE Int. J. Adv. & Curr. Prac. in Mobility*2(4):2337-2346, 2020, <https://doi.org/10.4271/2020-01-1295>.