Joseph Zhang

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EDUCATION

University of Pennsylvania Philadelphia, PA

B.S.E. Networked and Social Systems Engineering *May 2024*
- GPA: 4.0/4.0
- Relevant Coursework: Algorithms, Discrete Math, Linear Algebra, Probability, Intro to Blockchain

TECHNICAL SKILLS

Languages: C++, Python, Java, JavaScript, OCaml
Tools/Technologies: AWS, Linux, GDB, Git, NumPy, Volatility (Memory Forensics), React JS, JUnit

EXPERIENCE

Amazon May 2022 – Present

Software Development Engineer Intern *Sunnyvale, CA*
- Created an escalation service API using Swagger and the Coral framework to append question-answer pairs to escalated cases and publish them to a **Simple Notification Service** topic for ingestion into data lake for analysis
- Wrote integration tests for the entire escalation service using **AWS Hydra** for serverless tests
- Developed a tool to convert **JSON** question hierarchies to cards and workflows defined in **XML**, so workflows can be automatically deployed – the former process required manually writing **thousands** of lines per workflow
- Implemented and **globally deployed** a web app for HR managers to formulate and preview question workflows to better understand employee issues when employees seek to escalate
- Used **React JS** to provide a GUI to easily change question orders and hierarchies and display existing workflows, defined schema and API models in **XML**, and wrote APIs and integration tests in **Java**
- Defined and provisioned infrastructure API Gateways (RPC) and DocumentDB instances through **AWS CDK**
- Led and facilitated team communication as **scrum master** during daily stand-ups for a two-week sprint

Cyber Forensics Innovation Lab May 2020 – May 2022

Research Assistant at Georgia Tech *Atlanta, GA*
- Authored paper with team of graduate students about detecting backdoor attacks on deep learning models using **memory forensics** to ensure the benignity of **online-learning Linux systems**
- Developed **Volatility** plugins using **Python** and **GDB** to introspect memory images, the **CPython** interpreter, and the **Tensorflow** VM and recover key data structures (layers, shapes, biases) with 99.76% accuracy on 63 million plus kernel weights, allowing the team to perform backdoor detection on the model
- Publishing to the Usenix Security Symposium 2023

Department of Defense Jun. 2020 – Jul. 2020

Computer Security Intern *Norfolk, VA*
- Designed an automated client-side detection system for evil twin attacks with **Python** for scripting and tools like **Wireshark** and **Aircrack-ng** for monitoring network and conducting deauthentication attacks
- Selected to represent the lab and present research to a national Department of Defense representative

PROJECTS

BirthWorks | *React, MongoDB, Git* Aug. 2021 – Jan. 2022
- Created an internal dashboard website to allow the nonprofit to search and collect customer data
- Built with 8 other developers from UPenn's Hack4Impact club

Securing Attorney-Client Documents in the Cloud | *C++ backend, HTML/CSS frontend* Jan. – Jul. 2020
- Designed and implemented secret sharing to encrypt and distribute law documents across multiple cloud providers
- Achieved average runtime of 2.5 sec/KB across 29 file types
- Published research paper to **Harvard JEI**, won Synopsys Science Fair

AWARDS & RECOGNITION

USA Computing Olympiad Platinum Division Contestant: Top 200 in age group nationally
American Invitational Mathematics Examination Distinguished Qualifier: Top 2.5% out of 55,000 participants
National Merit Scholar
Eagle Scout