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
- Relevant Coursework: OOP/Functional Programming, Algorithms, Discrete Math, Linear Algebra, Graph Theory

Technical Skills

Languages: C/C++, Python, Java, OCaml
Tools/Frameworks: Linux, Volatility (Memory/GPU Forensics), GDB, Tensorflow, NumPy, Git, React, JUnit

Experience

Amazon Web Services (AWS) Nov. 2021 – Present
Incoming Software Development Engineer Intern *San Jose, CA*

Cyber Forensics Innovation Lab May 2020 – Jan. 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 **C++** 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
- Designed and implemented rehosting pipeline to load model process memory, graft recovered data structures into live model, recontexualize the static model, and perform white-box backdoor detection
- Publishing to USENIX Security Symposium 2023

Department of Defense Jun. 2020 – Jul. 2020
Computer Security Intern *Norfolk, VA*

- Remotely collaborated with research faculty to design 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
- Generated 100 experiments and classified evil twin attacks with 80% accuracy
- Selected to represent the lab and present research to a national Department of Defense representative

Projects

BirthWorks | *React, MongoDB, Git* Jun. 2020 – Present

- Created an internal dashboard website to display and search the nonprofit's user data
- Aggregated data into a unified MongoDB database to organize and expedite their service of birthing families
- 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