Joseph Zhang

jzhang25@upenn.edu | joezbub | +1 (408) 565-5239 | San Jose, CA

Education

University of Pennsylvania — Philadelphia, PA
B.S.E. Networked and Social Systems Engineering — *Spring 2024*
- Concentration: Computer Networks and Security
- Relevant Coursework: OOP/Functional Programming, Graph Theory, Discrete Math, and Linear Algebra

Skills

Languages: C/C++, Python, Java
Tools/Frameworks: Linux, Volatility (Memory/GPU Forensics Research), GDB (GNU Debugger), Tensorflow, NumPy, Git

Experience

Research Assistant — May 2020 – Present
Cyber Forensics Innovation Lab, Georgia Institute of Technology — *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 the IEEE Symposium on Security & Privacy 2022

Computer Security Intern — Jun – Jul 2020
Department of Defense — *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

Crew Member — Jan 2019 – Mar 2020
Chipotle Mexican Grill — *San Jose, CA*

Research (papers linked)

Securing Attorney-Client Documents in the Cloud — Jan – Jul 2020
Independent Research
- Designed and implemented secret sharing to encrypt and distribute law documents across multiple providers (Google Cloud, Microsoft Azure, etc.) using **HTML**, **CSS**, and **JS** front-end and **C++** back-end
- Achieved average runtime of 2.5 sec/KB across 29 file types.
- Published research to Harvard JEI; Won Synopsys Science Fair

CoronaCrypt: A Privacy-Preserving Contact Tracing Application — Mar – May 2020
New York Academy of Sciences
- Led team of 6 students to create website using **ReactJS** and **Python**
- Designed security protocols which encrypt users' geolocation and calculate interaction and COVID-19 risk metrics

Leadership & Activities

Founder/COO — Jun 2018 – Aug 2021
The Human Tech Project
- Raised $11,000 for computer center in Kampala, Uganda
- Organized hackathon with 250+ participants
- Recruit teachers and prepare curricula of free programming courses for all ages

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