

Joseph Zhang

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Education

University of Pennsylvania

B.S.E. Networked and Social Systems Engineering

- Concentration: computer networks and security
- Planned submatriculation into Computer Science MSE

Philadelphia, PA

Spring 2024

Skills

Languages: C/C++, Python, Java

Tools/Frameworks: Linux, Volatility, GDB, Tensorflow, NumPy, Git

Experience

Research Assistant

May 2020 – Present

Cyber Forensics Innovation Lab, Georgia Institute of Technology

Atlanta, GA

- Authoring paper with team of PhD students about **memory forensics** workflow to detect backdoor attacks on deep learning models and 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, recontextualize 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 – Present

The Human Tech Project

- Raised \$11,000 for computer center in slums of 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