Elisa Tsai

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EDUCATION

University of Science and Technology of China (USTC) — Hefei, PRC
B.S. in Computer Science and Technology — *June 2020*

University of Michigan — Ann Arbor, US
Ph.D. student — *2020.9 - present*

RESEARCH INTERESTS

I'm interested in measuring the characteristics of the Internet and privacy-related topics, and understanding what would happen when messages are traversing the Internet. I am interested in how systems work in general.

PUBLICATION

DOLMA: Securing Speculation with the Principle of Transient Non-Observability — USENIX Security 21

Kevin Loughlin, Ian Neal, Jiacheng Ma, **Elisa Tsai**, Ofir Weisse, Satish Narayanasamy, and Baris Kasikci, University of Michigan

COMMUNITY BUILDING

SECRIT (SECurity Reading Is Terrific) Reading Group Host — Ann Arbor, MI, USA
Organizing the bi-weekly security paper reading group at University of Michigan since 2021. — *2021.5 - present*

CSEG Social Co-Chair — Ann Arbor, MI, USA
Organizing social events for CSE graduate students — *2022.5 - present*

CSEG Outreach Chair — Ann Arbor, MI, USA
Organizing outreach events and workshops for different groups of children interested in CS. — *2022.5 - present*

Xplore Engineering — Ann Arbor, MI, USA
Organized a workshop to introduce computer science to students from 4-7th grade. — *2022.7*

RESEARCH EXPERIENCE

Research Assistant at Censored Planet — Ann Arbor, USA
Advised by Prof. Ensafi, University of Michigan Ann Arbor — *2020.9.1 -*

- **introduction**: I am a research assistant in Computer Science and Engineering department at the University of Michigan. I work with Professor Ensafi on network security and censorship-related topics. I am currently developing a machine learning model for event discovery on censorship datasets, to provide a more holistic picture of global censorship and provide insights for remote measurement optimization.

Research Assistant at EFES Lab — Ann Arbor, USA
Advised by Prof. Kasikci, University of Michigan Ann Arbor — *2019.7.1 - 2019.9.30*

- **introduction**: Worked on defenses for speculative execution attacks, providing comprehensive protection for all known spectre-like attacks on the hardware level. I mainly worked on realizing spectre PoC, providing tests for the design.

PROJECTS

Detecting Global DNS Manipulation Via Certificate Validation and Blockpage Matching

2022.3 - 2022.8

- **Project Description**: In this project we further enhanced the state-of-the-art to identify DNS manipulation. We investigated the effectiveness of consistency-based heuristics that compare DNS resolutions with trusted control results to identify inconsistencies. These heuristics are ineffective as a result of the widespread use of CDNs and other cloud providers who use content localization and load balancing, which has led us to rely on more distinct and independently verifiable signals of DNS manipulation - certificate validation and blockpage matching. The research paper is in submission.
- **Role**: Lead student.

Leveraging Machine Learning in Censorship Open-Access Database

2021.6 - present

- **Project Description**: In this project we purpose a machine learning model for event discovery in open-access censorship database such as Censored Planet and OONI. We use decision tree to depict the blocking rules of measured domains on the global scale, and cluster them based on the similarity of pairwise "cross-prediction" accuracy. The project is still developing.
- **Role**: Lead student.

Teaching Assistant for Operating Systems class, Spring 2019

2019.2 - 2019.7

- **Teaching**: Worked as a Teaching Assistant for class of Operating System Principles And Implementation Spring 2019. Provided lectures for the course projects. I also worked as the grader for student projects and tests.
- **Assembly/C Programming**: Helped to redesign and made improvements for the course project: a simple operating system from bootstrap, which supports multi-processing and dynamic memory management, run on QEMU.
- **Documentation**: Wrote a gitbook tutorial for the future course project.

International Genetically Engineered competition (Gold Medal)

2017.5 - 2017.11

- **Python/Frond-end**: A web application for synthetic biology community, with a powerful Biobricks serch engine and a forum for biological ideas sharing, constructed on the basis of iGEM's official database.

Personal Project: Tech Blog

https://etsai.site   *2017 - present*

- **Blog**: Powered by Hexo and Github Pages, maintained since 2017 (blogs mainly written in Chinese).
  - ∗ Tech related: Translated and wrote blogs about systems (Linux kernel).

SKILLS

- **Software Programming**: x86 Assembly, C, C++, Bash, Python, Golang, Julia.
- **Software Engineering**: Git Workflow, Software Testing and Debugging Tools.
- **Language**: English (fluent), Chinese (native), Hebrew (beginner).