AMANDA C. HSU

achsu3.github.io

EDUCATION

Georgia Institute of Technology *Expected Graduation: 2026*
Ph.D. in Computer Science
Advisors: Professor Paul Pearce, Professor Frank Li

University of Illinois at Urbana-Champaign *May 2021*
B.S. Computer Engineering, with Honors
Senior Thesis: *Exploring Boundaries Between Organizations via IPv4 Scan Data*

PUBLICATIONS

1. **Amanda Hsu**, Paul Pearce, Frank Li. Characterizing Address Structure and Behavior in Active IPv6 Networks. *Currently under review*
2. **Amanda Hsu**, Frank Li, Paul Pearce, Oliver Gasser. A First Look At NAT64 Deployment In-The-Wild. *Currently under review*
3. **Amanda Hsu**, Frank Li, Paul Pearce. Fiat Lux: Illuminating IPv6 Apportionment with Different Datasets. 2023 ACM SIGMETRICS.
4. Mohammad A. Noureddine, Ahmed M. Fawaz, **Amanda Hsu**, Cody Guldner, Sameer Vijay, Tamer Başar, William H. Sanders. Revisiting Client Puzzles for State Exhaustion Attacks Resilience. 2019 49th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN).
5. Mohammad A. Noureddine, **Amanda Hsu**, Matthew Caesar, Fadi A. Zaraket, William H. Sanders, P4 AIG: Circuit-Level Verification of P4 Programs. 2019 49th Annual IEEE/IFIP International Conference on Dependable Systems and Networks (DSN).

RESEARCH EXPERIENCE

Understanding Addressing Patterns in Active IPv6 Networks *October 2022 - Present*
Georgia Institute of Technology
Advisors: Professor Paul Pearce, Professor Frank Li

- Characterized IPv6 networks according to addressing patterns with respect to responsiveness to different ports, protocols, and application-level analysis
- Findings include naming conventions embedded in IPv6 addresses that result in non-hierarchical patterns

Measuring IPv6 Transition Mechanisms *July 2023 - November 2023*
Max Planck Institute for Informatics
Advisor: Dr. Oliver Gasser

- Measured and characterized transition technologies between IPv4 and IPv6 networks
- Findings include quantifying NAT64 deployment, the correctness of NAT64 configuration, and assessing the security of such infrastructure.

IPv6 Perspectives from Various Datasets *August 2021 - October 2022*
Georgia Institute of Technology
Advisors: Professor Paul Pearce, Professor Frank Li

- Characterized IPv6 usage according to various metrics by comparing relevant datasets
- Datasets analyzed include: WHOIS records from Regional Internet Registries, routing data from Route Views and RIPE RIS, active IPv6 hitlists
- Developed new methodology for analyzing IPv6 apportionment

Distinguishing Organizations with IPv4 Scan Data *July 2020 - May 2021*
University of Illinois at Urbana-Champaign
Advisors: Professor Matthew Caesar

- Analyzde Censys scanning data and WHOIS records for correlations between organizations and their IPv4 addresses

Circuit-Level Verification of P4 Programs *January 2019 - May 2021*
University of Illinois at Urbana-Champaign
Advisors: Professor William H. Sanders, Professor Matthew Caesar

- Modeled data-plane programs as sequential circuits to be verified using hardware techniques including bounded model-checking
- Implemented with P4 language

Client Puzzles for State Exhaustion Attacks Resilience *August 2018 - December 2018*
University of Illinois at Urbana-Champaign
Advisor: Professor William H. Sanders

- Evaluated client puzzles as a defense against Distributed Denial of Service (DDoS) attacks
- Implemented method of priority queuing requests determined by client puzzles in the TCP stack of the Linux Kernel

AWARDS AND SCHOLARSHIPS

- Community Engagement Award, *School of Computer Science, Georgia Institute of Technology* *2023*
- Graduate Research Fellowship Program (GRFP), *National Science Foundation (NSF)* *2022*
- Herbert P. Haley Fellowship, *Georgia Institute of Technology* *2022*
- President's Fellow, *Georgia Institute of Technology* *2021*
- Knights of St. Patrick Award, *University of Illinois at Urbana-Champaign* *2021*
- PricewaterhouseCoopers Grace Hopper Scholar *2018*
- North Shore Community Service Award for Extra Effort *2017*

Travel Grants

- ACM Internet Measurement Conference (IMC) 2023
- ACM SIGMETRICS Conference 2023
- ACM Internet Measurement Conference (IMC) 2022

PROFESSIONAL SERVICE

- Lead Student Organizer, ACM SIGCOMM 2021
  - Presented Student Welcome Session for all students attending SIGCOMM 2021

- Collaborated with professionals in the SIGCOMM community to compile content relevant to students attending academic conferences

- Student Program Committee Volunteer, ACM SIGCOMM 2021
  - Assisted in technical logistics of the 2-day-long review of paper submissions to SIGCOMM 2021
- Reviewer, USENIX NSDI 2021
- Student Organizer, ACM SIGCOMM 2020
- Reviewer, ACM CCS 2020

TEACHING

Teaching Assistant **CS8803 - Securing Internet Infrastructure** *January 2023 - May 2023*
- Instructor: Professor Cecilia Testart

LEADERSHIP AND EXTRACURRICULAR EXPERIENCES

- Founding Co-Organizer, Georgia Tech Networks Research Group *August 2022 - May 2023*
  - Co-founded an interdisciplinary group of students and faculty in networks research
  - Fostered social and professional connections between researchers at Georgia Tech

Society of Women Engineers, UIUC *August 2017 - May 2021*
- President (2020-21)
- Treasurer (2019-20)

INDUSTRY EXPERIENCE

Research Intern **Censys** *May 2021 - August 2021*
- Designed and implemented methods of HTTP scanning to attribute domains, IP addresses, and certificates to organizations

Software Engineering Intern **Censys** *May 2020 - August 2020*
- Improved attribution system that utilizes Internet-wide scan data to associate assets including hosts, certificates, and domains, to customers
- Contributions include API development in Go and Python as well as database management

Non-Volatile Memory Firmware Validation Intern **Intel Co.** *May 2019 - August 2019*
- Developed Python scripts to collect data to standardize test system setup, including hardware and software specifications
- Reduced false-negatives on firmware validation tests

Analyst Intern, Independent Contractor **Bellwether Analytics** *June 2018 - March 2019*
- Built applications to create precise market landscapes which were used to advice R&D departments of various pharmaceutical companies

SKILLS

C, C++, Python, Javascript, Assembly Language (x86)