James K Holland

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SUMMARY

Computer security researcher with expertise in applying machine learning to computer security challenges. Particularly experienced in developing traffic analysis attacks and defenses for privacy and anonymity tools such as Tor.

EDUCATION

University of Minnesota, Minneapolis, MN — Fall 2019 - Present
Ph.D. in Computer Science
3M Fellowship recipient

University of Notre Dame, Notre Dame, IN — Fall 2015 - Spring 2019
Bachelor of Science, Computer Science
GPA: 3.76/4.0, cum laude

RESEARCH

Graduate Research Assistant - Hopper Lab — Fall 2019 - Present
Security and privacy research at the University of Minnesota

- Created a novel website fingerprinting defense to protect the privacy of Tor users
- Implemented and improved upon existing flow correlation attacks and defenses
- Published and presented research findings at multiple conferences

Undergraduate Researcher - NetHealth Project — Fall 2018 - Spring 2019
Social network study conducted at the University of Notre Dame

- Investigated and presented trends in student activity, health, and social networks
- Created a data analysis pipeline to improve research efficiency and reproducibility

INTERNSHIPS

Cybersecurity Research - Sandia National Laboratories — Summer 2023 - Present
Applied research internship in St. Paul, MN

- Analyzed the security guarantees of existing internet privacy tools
- Assisted in efforts to improve internal cybersecurity tools

Software Data Engineer Intern - Milliman PRM Analytics — Summers 2018, 2019
Summer internship in Indianapolis, IN

- Improved the data analysis pipeline with bug fixes and feature additions
- Used PySpark batch processing to create reports describing client resource utilization

PUBLICATIONS

James K Holland, Jason Carpenter, Se Eun Oh, Nicholas Hopper. "DeTorrent: An Adversarial Zero-delay Traffic Analysis Defense." Proceedings on Privacy Enhancing Technologies 2024.

Nate Matthews, **James K Holland**, Se Eun Oh, Mohammad Saidur Rahman, Matthew Wright, Nick Hopper. "SoK: A Critical Evaluation of Efficient Website Fingerprinting Defenses." 2023 IEEE Symposium on Security and Privacy.

Ethan Witwer, **James K Holland**, Nicholas Hopper. "Padding-only defenses add delay in Tor." Proceedings of the 21st Workshop on Privacy in the Electronic Society (2022).

James K Holland, Nicholas Hopper. "RegulaTor: A Straightforward Website Fingerprinting Defense." Proceedings on Privacy Enhancing Technologies 2022.

Se Eun Oh, Taiji Yang, Nate Matthews, **James K Holland**, Mohammad Saidur Rahman, Nicholas Hopper, Matthew Wright. "DeepCoFFEA: Improved Flow Correlation Attacks on Tor via Metric Learning and Amplification." 2022 IEEE Symposium on Security and Privacy.