Johnny So

Computer Science Ph.D. Candidate

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Google Scholar | PragSec Lab

About Me

I am currently a third-year Ph.D. candidate advised by Professor Nick Nikiforakis at the PragSec Lab in Stony Brook University. I investigate (the lack of) web integrity in various contexts (e.g., domain names and JavaScript) through large-scale experiments, and subsequently design and evaluate defenses that improve the integrity of the web.

Education

Aug 2020 – Present
Stony Brook University
Doctor of Philosophy in Computer Science — *Advisor: Nick Nikiforakis*

Aug 2016 – May 2020
Stony Brook University Honors College
Bachelor of Science in Computer Science & in Applied Math and Statistics — *GPA: 3.97*

Work

Jan 2019 — Present
Research Assistant
PragSec Lab at Stony Brook University — *Stony Brook, NY*

- Designing an application-agnostic link management system that prevents access to external dependencies of websites if such links violate customizable integrity policies
- Demonstrated that strict integrity verification of scripts cannot protect the web and provided insight for future methods through a large-scale, data-driven analysis [1]
- Profiled the behavior of bots that monitor Certificate Transparency logs, analyzing how bots of various intentions and origins react to new certificates within seconds [2]
- Illustrated the capability of adversaries to potentially affect millions of IP addresses in tens of thousands of autonomous systems by re-registering a few hundred domains [3]
- Proposed and evaluated deceptive web authentication mechanisms that remove the integrity of a web application from the attacker's arsenal, and instead place the lack of it in the defender's arsenal [4]

May 2022 — Aug 2022
PhD Research Intern
NortonLifeLock Research Group — *(Remote) Stony Brook, NY*

- Analyzing the integrity of Android applications over time using dynamic analysis (ongoing)

Jun 2019 — Aug 2019
Software Development Engineer Intern
Amazon Alexa — *Seattle, WA*

- Created an intent recommendation service for third-party skills using short utterances
- Proposed new services by leveraging other intern projects and existing production services

Jun 2018 — Dec 2018
Software Engineer Intern
Softheon — *Stony Brook, NY*

- Built the prototype of a new state health exchange platform
- Established a preprocessing library used to build machine learning models

Publications

2023

1. **So, J.**, Ferdman, M. & Nikiforakis, N. *The More Things Change, the More They Stay the Same: Integrity of Modern JavaScript* in *Proceedings of the ACM Web Conference 2023* (May 2023), to appear.

2022

2. Kondracki, B., **So, J.** & Nikiforakis, N. *Uninvited Guests: Analyzing the Identity and Behavior of Certificate Transparency Bots* in *Proceedings of the 31st USENIX Security Symposium (USENIX Security 22)* (2022), 53–70.
3. **So, J.**, Miramirkhani, N., Ferdman, M. & Nikiforakis, N. *Domains Do Change Their Spots: Quantifying Potential Abuse of Residual Trust* in *Proceedings of the 43rd IEEE Symposium on Security and Privacy (IEEE S&P)* (May 2022), 119–133.

2021

4. Barron, T., **So, J.** & Nikiforakis, N. *Click This, Not That: Extending Web Authentication with Deception* in *Proceedings of the 2021 ACM Asia Conference on Computer and Communications Security* (2021), 462–474.

Teaching

Mar 2022 — Oct 2022 | **Instructor**
Stony Brook University — *Stony Brook, NY*
- (Spr 2022) WSE 380: Honeypots and Intrusion Detection
- (Fall 2022) WSE 380: Honeypots and Intrusion Detection

Aug 2017 — May 2021 | **Teaching Assistant**
Stony Brook University — *Stony Brook, NY*
- (Fall 2020 — Spr 2021) Computer Security Fundamentals
- (Fall 2017 — Fall 2018) Data Structures

Service

- USENIX Security Symposium Artifact Evaluation Committee Member: 2022, 2023

Honors

Sep 2021 — May 2022 | **Graduate Assistance in Areas of National Need (GAANN) Fellowship**
Stony Brook University — *Stony Brook, NY*

Qualifications

- Designing and evaluating novel security mechanisms
- Programming in a large codebase
- Building performant and scalable infrastructure
- Collecting and analyzing large data sets
- Applying machine learning models and techniques