Abhay Nayar

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Summary

3+ years of experience in Computer Networks, Web Browsers, Bot Detection, collaborating with Applied Scientists and Software Engineers to scale detection mechanisms. ***Relevant Skills***: Python, JavaScript, Data Analysis, Machine Learning, TCP/IP, TLS, HTTP.

Experience

Security Engineer 2 – Amazon Ads, Bangalore (October 2023 – Present)
Security Engineer 1 (December 2021 – September 2023)
Security Engineer Intern (October 2020 – January 2021)

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- Presented my research on JavaScript-based bot detection at *One Amazon Security Conference 2024*. Created an internal tooling/testbed for this research. Initial techniques on Amazon Stores WW detect ~2% clicks with 0.01% false-positives.
- Uncovered a fraud network of 20+ websites having bot-driven traffic on Amazon's third-party ad supply through a manual rule-mining exercise, detecting ~2M fraudulent impressions per day with minimal false positives, saving advertisers $20K+/month.
- Collaborated with the ML team to detect over 10 million invalid clicks per month with minimal false-positives on Amazon Stores. This was based on insights from incident response on bots evading existing ML-based detections. Insights included anomalies in URLs, referrers, user-agents, other HTTP headers, and TLS-based information.
- Performed threat-hunting exercises for adversarial web-browser extensions that had an impact on Amazon Stores and Twitch, also threat-hunted for latest in techniques client-side bot-detection/development, and for toolkits targeting Amazon Ads.
- Partnered with cross-functional teams, including Software Engineers & Applied Scientists to productionize findings into scalable solutions. Conducted 40+ interviews. Mentored 8+ new Security Engineers. Supported Principal & Senior Security-Engineers on key projects, enhancing overall project efficiency and success.

Mobile Security Intern – intelliCard, Zurich (February 2021 - September 2021)
Pen-tested iOS and Android implementations of a security-sensitive library. Enhanced detection and anti-tampering measures, increasing resistance to adversarial attacks. Delivered a report on mobile security improvements for adoption by the development team for future releases.

Education

Manipal Institute of Technology, Manipal
B. Tech. in Information Technology (2017 - 2021), 8.9/10.0 cGPA.

Mayo College, Ajmer
12th grade (91%) – Physics, Chemistry, Math, Computer Science.
10th grade (10.0/10.0 cGPA) – English, French, Math, Science, Social Science.

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CTFs: (competitive hacking):

- Founding Member of **Team Cryptonite**: Ranked #4 (out of 5000 teams) in India on CTF-Time. Specialized in binary exploitation, reverse engineering, and application security. (web & mobile application security).
- Individually, secured 2nd-rank out of 150 participants in InCTF Nationals 2019: hosted by team bi0s. (The #1 CTF team in India). Earned an Amazon internship through this CTF.
- Individually, qualified for the final round in Cisco SecCon CTF 2019: ranking in the Top-15 out of 300 participants.

Personal Projects

- Genesis: Extended the Jack operating system from the nand2tetris course. Created my own CPU emulator with an updated processor architecture, a hacky filesystem, and an emulator within the emulator. Learned a lot about the whole computing stack– from the CPU, assemblers, byte-code, compilers, operating-systems, to application-programming.
- N2t-wasm: Recreated the Hack CPU emulator in WebAssembly for use in browsers.
- Webcutter: Currently working on a side project to dive deep into Browser/JS internals.
- Obsidian: Write-ups and notes on some of the CTF challenges I solved.

Certifications

- Build Basic Generative Adversarial Networks (GANs)
- Google Cloud Fundamentals: Core Infrastructure
- Software Security – University of Maryland
- Pentesterlab PRO – Completed 201 Pentesting Exercises.
- Build a Modern Computer from First Principles: From Nand to Tetris. (Project-Centered Courses) – Part 1, Part 2.
- Deep Learning Specialization: (5-courses):
    - Neural Networks and Deep Learning
    - Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization
    - Structuring Machine Learning Projects
    - Convolutional Neural Networks
    - Sequence Models

Open-Source Contributions

- SerenityOS/serenity: LibWeb: Fix link on crashed browser page
- OWASP/owasp-mastg: added fix for '/system' not in /proc/mounts
- hasherezade/malware_training_vol1: Lab setup: Run WinDbg as Administrator
- MobSF/Mobile-Security-Framework-MobSF: Added symlink support to path traversal detection