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Yuvraj Malhi

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EDUCATION

Carnegie Mellon University, *M.S. in Information Security* — *Aug 2022 – Dec 2023*
- ○ **Coursework**: Software Reverse Engineering, Secure Software Systems, Network Security, Mobile & IoT Security.
- ○ **Extra-curricular**: Long Distance Running, Hockey Team, Non-profit Teacher, and Punjab Cultural Association

BITS Pilani University, *B.E. in Electronics Engineering* — *Aug 2018 – May 2022*

SKILLS

- **Forte**: Network Security, Buffer Overflow, Malware Analysis, Web Security, Software Security, ML Applications in Security, Cryptography, Networking, Software Development, Linux, Security Automation, Application Security.
- **Languages**: C, C++, Python, MATLAB, LaTeX, HTML, Assembly language, SQL, Java, Shell, Dafny.
- **Tools**: IDA, Ghidra, MobSF, Metasploit, WireShark, Tensorflow, Pytorch, Scikit-Learn Git, GitHub, Snort.

WORK EXPERIENCE

Amazon — Seattle, WA
Security Engineering Intern — *May 2023 – Aug 2023*
- ○ **Analyzed security infrastructure** of third-party applications to avoid illegal data access and incident response.
- ○ Created a **risk-scoring framework** for automation of third-party **application security** vulnerability assessments based on data confidentiality, **SSO** usage, **passive scanning**, and active penetration testing and red team reports.
- ○ Set up AWS cloud architecture for automated identification of **un-authorized applications** being used.

Samsung — Bangalore, IN
Network and Systems Intern — *July 2021 – Jan 2022*
- ○ Worked on ML-based log analysis for **system compromise/fault detection** and **root cause analysis**.
- ○ Designed an **anomaly detection** system to monitor system background information and take pre-emptive action before hard failure. **Saved service teams 20 hrs/week** by automating 90% maintenance.

BITS Pilani Research — Pilani, IN
Research Assistant: Mitigating DDoS Attacks in SDN Data Plane — *Aug 2021 – Jan 2022*
- ○ Surveyed and analyzed methods used to **detect and mitigate** Denial-of-Service (**DoS**) and Distributed Denial-of-Service (**DDoS**) attacks at **Data Plane** level in Software Defined Networks (SDN) using P4 language.
- ○ Identified **limitations of P4** for attack detection/mitigation: no support for loops, complex numerical functions.

BITS Pilani Research — Pilani, IN
Research Assistant: Machine Learning Intrusion Detection Systems for IoT — *Jan 2021 – May 2021*
- ○ Designed and implemented **network IDS for IoT** to overcome few design flaws of existing IDS. This design can detect **22 attacks** with help of **3 ML-based detectors** using Random Forest, ANN, Decision Tree, XGBoost.
- ○ Central Module attack classification rate: **94.41%**. Edge modules attack detection rates: **99.98%** and **99.87%**.

PROJECTS

- **Android Location Stealth**: A Kotlin-based Android application that finds device using (1) **WiFi Triangulation** (for API 19-25) with accuracy of **30 ft** and (2) **IP GeoLocation** (for API 26-31) with accuracy of **200 ft - 2 mi**.
- **Web Security Extension**: Built a Chrome extension using JavaScript to expose on **server design security** based on HTTP headers like CORS, SOP, X-Frame, and ubiquity that could help prevent XSS, CSRF, and code injection.
- **Ultra-fast URL Port Scanner**: Scans URL open ports up to **10X faster** than traditional scanners by using 100 child scanners **concurrently**. The scanner also **lists all IPv4 and IPv6 addresses** via DNS req allotted to each URL.
- **Concurrent TFTP Servers**: A TFTP single process server to handle multiple clients using **listen** call on multiple FDs with speed **25 Mbps**. Second, A TFTP **multi process server** to spawn a child server per client with speed **50 Mbps**.
- **Simple Hadoop Implementation**: Replicated a simpler version of **Google File Storage** by creating client, data server and meta-data server. Client uploads files in chunks and distributed data servers store 3 separate copies of each chunk to ensure **availability**.