

Goal: Computer Security Researcher with extensive experience in networking, parsing algorithms, data-formats, and anomaly detection seeking Systems/Security Engineering roles.

Education

- Ph.D. in Computer Science, **Area: Systems and Network Security**, *Dartmouth College* **June '22 (Expected)**
Thesis: Protecting Systems from Exploits using Language-Theoretic Security
- M.S. in Computer Science, *Dartmouth College* **June '17**
- B.E. in Computer Science, *College of Engineering Guindy, Chennai, India* **May '15**
CGPA: 8.2/10

Programming Languages and Technologies

- Languages:** Ruby, Python, Dafny, Rust, C, C++, VHDL, HTML, CSS, Javascript, Go, Java, Lisp, R
- Software Tools:** Scapy, Rails, Django, Flask, Docker, Wireshark, Linux, Alloy Model Checker, Scikit-Learn, Hammer, Spin, Mysql, PostgreSQL
- Editors:** Vim, Emacs, VS Code, Xilinx Vivado, Android Studio, Atom

Publications (Selected)

- IoTHound: Environment-agnostic Device Identification and Monitoring**, 10th International Conference on the Internet of Things (IoT 2020), Malmo, Sweden. **Best Paper Award. October '20**
- Scalable Identity and Key Management for Publish-Subscribe Protocols in the Internet-of-Things**, 9th International Conference on Internet of Things (IoT 2019), Bilbao, Spain. **Honorable Mention Award. October '19**

Work Experience

Research Intern	SRI International, New York City	June '18 – Sep. '18
• Identified and characterized IoT devices across Bluetooth, Zigbee, and WiFi networks		<i>C/C++, Python</i>
Student Associate	SRI International, Menlo Park	June '17 – Sep. '17
• Designed composite metrics to understand security posture of Internet-of-Things ecosystems		<i>Python, Alloy</i>
Student Associate	SRI International, Menlo Park	June '16 – Sep. '16
• Built language-theoretic security compliant clients for Internet-of-Things protocols		<i>C/C++, Ruby, Hammer</i>

Projects

- Verified Parsing Toolkit for Binary Formats:** Built a verified attribute-based parsing expression grammar parser in Dafny, embedded correctness and termination proofs to show that the algorithm is correct
 - Generated at least 4 major changes to PDF specification using a PDF parser written in Rust
 - Detected several commonly-seen packet malformations using a RTPS parser written in Dafny and Go
- Parsing Data Formats in Hardware:** Designed and implemented two data-format parsers for FPGAs: (i) based on parsing expression grammars (PEGs), and (ii) building on symbolic register automata
 - Highly parallel VHDL parsers automatically generated from Dafny run in less than 5 clock cycles for large inputs
- Securing Power Grid Networks using Parsers:** Built a tool to detect attacks on the power grid network and provide steps to regain control
 - Detected all attempted attacks and malicious operations
 - Recommended steps to successfully restore power supply using automated tools
 - Built tools using Apache Kafka, C, C++, and Python were deployed to a Power Grid network

Additional Experience and Awards

- Patent** on “Modeling Cyber-Physical Attack Paths in the Internet-of-Things”
- Dartmouth Activities: (i) Led the Capture the Flag (CTF) team, (ii) organized a Security Reading Group, and (iii) was elected to the Graduate Student Council to represent the Computer Science department
- TCS Award for the **Best Senior Thesis**