Sushanth Reddy Rachala

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Education

George Mason University, Fairfax, VA, USA **08/2023 – 03/2026 (Expected)**
M.S. in Data Analytics Engineering (Specialization: Cyber Analytics) — GPA: 3.48/4.00
Courses taken - Statistics Visualization, Advanced Information Technology, Principles of Data Mining, Penetration Testing, Malware Reverse Engineering, Network Forensics, Digital Forensics

Amity University, Gurugram, Haryana, India **08/2021 – 07/2023**
M.Tech in Network and Cyber Security — GPA: 9.38/10
Courses taken - Advanced Computer Networks, Advanced DBMS, Network & Wireless Security, Intrusion Detection & Prevention, Cryptography, Cybercrime Investigation & Forensics, Malware Analysis, Digital Watermarking & Steganography

Jawaharlal Nehru Technological University, Hyderabad, Telangana, India **08/2015 – 07/2019**
B.Tech in Computer Science Engineering — Percentage: 54.32%
Courses taken - Computer Networks, Database Management Systems, Operating Systems, Distributed Systems, Mathematical Methods, Probability & Statistics, Mathematical Foundations for CS, Engineering Physics, Finite Automata & Formal Languages

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Skills

Programming Languages: Python, C, MATLAB, SQL,R
Databases: SQL Server, MySQL, PostgreSQL, MongoDB
Security Tools: Wireshark, NMap, Snort, BurpSuite, Bwapp, Network Miner, SQLMap, curl, PowerShell
Malware Analysis: IDA Pro, Process Monitor, Process Explorer, Strings Utility, FakeDNS, YARA32
Forensics: Autopsy, FTK Imager
Analytics Tools: Power BI
Operating Systems: Kali Linux, Ubuntu

Projects

Real-Time Emergency Data Fusion & 3D Visualization using GaiaViz

- Architected a complete **real-time data fusion pipeline** using **Python** to integrate multiple live emergency data streams—**VDOT road incidents (WFS/XML)**, **NWS flood alerts (GeoJSON)**, and geospatial static layers of **hospitals** and **fire stations**.
- Implemented spatial filtering, **geospatial joins**, and proximity analysis using `GeoPandas`, `Shapely`, and `PyProj`, transforming heterogeneous formats into a unified **GeoDataFrame** with consistent schema, temporal alignment, and incident metadata.
- Engineered logic to identify and tag high-risk areas by fusing traffic disruptions with nearby weather threats, annotated with **distance-to-response-unit** metrics for intelligent response modeling.
- Exported fused datasets into **GaiaViz-compatible GeoJSON and SQLite formats**, enabling **3D visual dashboards** that support real-time situational awareness and emergency decision-making in Fairfax County.
- Served as **Scrum Master** for a 5-member capstone team; led backlog grooming, sprint reviews, and daily standups using **YouTrack**, ensuring timely deliverables aligned with stakeholder feedback and Agile methodology.

Live Response Toolkit for Unix/Linux Incident Response

- Developed a comprehensive **Live Response Toolkit** tailored for **Unix/Linux systems**, streamlining digital forensics and incident response workflows for volatile and non-volatile data acquisition.
- Integrated **trusted binaries** and **static analysis tools** (e.g., `lsof`, `netstat`, `ps`, `df`, `ss`, `strings`, `chkrootkit`) to ensure tamper-resistant evidence collection from compromised endpoints.
- Automated the execution of evidence-gathering tasks using **Bash scripts** and **Python CLI wrappers**, enabling quick triage and minimal footprint during live response scenarios.
- Ensured modularity for IR teams by packaging data collection phases (processes, memory, logs, network, persistence) into discrete, verifiable modules following **SANS IR playbooks**.
- Tested across multiple distros (Ubuntu, CentOS, Kali) in **VM sandbox environments**, validating artifact integrity, timestamp preservation, and toolchain reproducibility.

Experience

Defence Research and Development Organization (DRDO) – CAIR Lab, Bangalore, India **07/2022 – 07/2023**
Project Trainee – Research in Post-Quantum Cryptography

- Designed and developed a **post-quantum cryptographic algorithm** based on algebraic and mathematical structures resistant to **quantum attacks**, ensuring encryption remains secure against algorithms such as **Shor's algorithm**.
- Implemented the algorithm in **SageMath**, conducting extensive **simulations** to evaluate computational efficiency, scalability, and robustness under different cryptographic workloads.
- Performed **security analysis and benchmarking** of the cryptosystem against both **quantum and classical cryptographic attacks**, validating resilience and identifying potential optimization areas.
- Researched advancements in **McEliece cryptosystem**, exploring coding-theory-based encryption and its applications in securing communication for military and critical infrastructure.
- Collaborated with a multidisciplinary team of scientists at DRDO to align the algorithm with **national security requirements**, focusing on **defense-grade cryptographic standards**.
- Authored detailed **technical documentation, simulation results, and research reports**, ensuring knowledge transfer and enabling reproducibility for future DRDO research projects.

George Mason University, Fairfax, VA, USA **02/2025 – Present**
Operations Assistant (Part-time)

- Assisted in academic and administrative operations, supporting faculty and students with technical coordination.
- Contributed to smooth execution of departmental activities, ensuring timely delivery of assigned responsibilities.

Senselearner Technologies Pvt. Ltd., Hyderabad, India **09/2023 – 10/2023**
Intern – Cybersecurity

- Gained hands-on experience in **footprinting, reconnaissance, and network scanning** for security assessment.
- Worked with tools such as **Burp Suite, Nmap, and Wireshark** to identify vulnerabilities in test environments.
- Documented findings and prepared structured reports for internal review, enhancing security awareness.

Certifications

- CodePath Intermediate Cybersecurity (Honors) — Issued Aug 2025
- Google Advanced Data Analytics Specialization — Issued Jun 2025
- Google Cybersecurity — Issued Jun 2025
- Google IT Support — Issued Jun 2025

Publication

- **Practical Implementation of the Model Classic McEliece Cryptosystem Using SageMath** — Springer Nature