Shashank Udyavar Madan

+1 (919) 650-9958 | sudyava@ncsu.edu | LinkedIn | Raleigh, NC

Education

North Carolina State University — Raleigh, NC
Master of Computer Science; **GPA: 4.00/4.00** — Expected May 2025
Coursework: Software Engineering, Design and Analysis of Algorithms, Database Management Systems

PES University — Bengaluru, India
Bachelor of Technology ; **GPA: 3.64/4.00** — Aug 2019 – May 2023
Coursework: Operating Systems, Distributed Systems, Cloud Computing, Artificial Intelligence

Skills

Languages: Python, C/C++, JavaScript, Typescript, Go, SQL, Dart, HTML, CSS, PHP

Technologies: Flask, Django, Spring, AWS, Node.js, React.js, MySQL, PostgreSQL MongoDB, Git, Flutter, Docker, REST, GRPC, Jupyter Notebook, Pandas, numPy, Scikit-learn, TensorFlow, PyTorch

Methodologies: Agile, Scrum, OOP, CI/CD, Kubernetes, TDD, Agile, Scrum, EDA, OOP, CI/CD

Experience

Software Engineer Intern *Zebra Technologies, Bengaluru, India* — *Jan 2023 – Jul 2023*
- Developed mobile application modules for Android, iOS, and Flutter, adopted across all Zebra mobile apps for authorization, authentication, and SSO (Single Sign-On).
- Created a POC (Proof of Concept) for UI automation using Robot Framework, later adopted by the User Management team, reducing manual testing time by 40%.

Teaching Assistant *Computer Network Security, PES University, Bengaluru, India* — *Aug 2022 – Jan 2023*
- Led hands-on lab sessions on network security attacks and defenses, including configuring firewalls, penetration testing, and packet sniffing with tools like Wireshark.
- Delivered feedback on assignments and exams in cryptography, secure network protocols, and coding practices, while mentoring students on network security troubleshooting and developing lab exercises for key security concepts.

Software Developer Intern *Jeev Lifeworks, Bengaluru, India* — *Jun 2022 – Jul 2022*
- Built a scalable Python microservice using NumPy and Pandas for a Dynamic Transformation Engine, handling large-scale data migration across diverse formats (databases, CSV, and Excel files).
- Optimized data transformation workflows by implementing batch processing and parallelization, reducing processing time and ensuring high efficiency for large-scale data pipelines.

Full Stack Developer Intern *Reap Benefit, Bengaluru, India* — *Jan 2022 – Mar 2022*
- Designed and implemented a PostgreSQL database to store air quality data, enabling real-time environmental monitoring.
- Developed an interactive website to display air quality data on a map using PHP and JavaScript, contributing to the deployment of environmental solutions for communities.

Projects

Technical Security Review of OpenEMR
- Conducted Static Application Security Testing (SAST) with SonarQube and Dynamic Application Security Testing (DAST) using ZAP, identified vulnerable dependencies with Snyk.io, and performed comprehensive threat modeling aligned with the OWASP Top 10.
- Employed advanced techniques such as fuzzing, attack/defense trees, and abuse/misuse case identification to uncover vulnerabilities, LINDDUN for privacy threat modeling and participating in the Cornucopia Game to enhance threat analysis and risk assessment.
- Discovered critical security vulnerabilities through exploratory penetration testing and proposed detailed remediation strategies, enhancing the application's security posture by addressing code weaknesses, third-party dependency risks, and ensuring compliance with security best practices.

OWASP Juice Shop Challenges
- Completed various security challenges in OWASP Juice Shop, focusing on web application vulnerabilities including SQL Injection, Cross-Site Scripting (XSS), and Broken Authentication.
- Gained hands-on experience in identifying and mitigating common security flaws.

University Network Security Audit and Vulnerability Assessment
- Performed a comprehensive network audit leveraging Censys.io and Shodan.io to identify Autonomous System Numbers (ASN), exposed services and potential attack vectors within the university's network perimeter.

- Conducted passive reconnaissance to enumerate and analyze network assets, categorizing hosts by operating systems, web servers, and communication protocols, and visualized data using Python and Plotly for actionable insights.
- Documented security vulnerabilities, including shadow IT risks, and provided remediation strategies based on industry best practices.

Assessing Application Sandboxing Effectiveness in Security Contexts

- Conducted an experiment demonstrating an attack that successfully escapes the Flatpak sandbox, highlighting vulnerabilities and the need for robust permission management.
- Developed a security model to identify threats from malicious developers, social engineers, and state-sponsored attackers, addressing attack vectors like denial of service and privilege escalation through informed user decisions on application permissions.

Image Colorization using GAN

- Built and trained a GAN model to restore grayscale images, achieving high visual fidelity and realism.
- Utilized PatchGAN and optimized the model to produce low loss results with lesser data and training time.

AdTracking Fraud Detection

- Designed a hybrid detection model combining sequence modeling (e.g., LSTMs) with traditional classifiers (Random Forest, XGBoost) to analyze temporal and static features, identifying coordinated fraud patterns.

RAFT simulation in Go

- Designed and implemented the Raft Consensus Algorithm using Go, enabling leader election, log replication, and fault tolerance in a distributed system.
- Simulated real-world scenarios including node failures and network partitions to validate consistency, availability, and performance of the protocol.

Scalable Pub/Sub Microservices Architecture with RabbitMQ

- Designed and implemented a cloud-native microservice architecture utilizing RabbitMQ for message brokering to ensure reliable, asynchronous communication between services.
- Deployed microservices using containerization (Docker) and orchestration (Kubernetes)

QLEN (Research Project)

- Developed a novel load balancing algorithm for fog networks, resulting in a paper titled "QLEN: A Load Distribution Algorithm to Improve QoS Factors Among Fog Devices."
- Paper accepted into the IC2E3 conference held at NIT Uttarakhand.

E-Learning Application

- Designed and implemented a relational database schema and application flow for an e-learning system akin to ZyBooks, using MariaDB/MySQL and fastapi for database interactions.
- Built features for role-based content management, user authentication, and dynamic activity scoring.

Software Engineering Projects

- **DollarBot** is a handy little bot built on top of Telegram, to help you with daily expense tracking and analytics on your past spends. Built with python and has integrated budgeting and spending analysis with graphical visualizations.
- **Burnout** is a fitness application that allows you to track your fitness habits. Built on React.js, python, and MongoDB, burnout can help users track their calories through meals and exercise activity. It also has a social component where app users can interact with each other.

CERTIFICATES

CompTIA *Security+* *Mar 2025*

ISC2 *Certified in Cybersecurity (CC)* *Jul 2024*

PES University *Network and cybersecurity specialization* *Jul 2023*

AWARDS & ACHIEVEMENTS

MRD scholarship: Awarded to the top 20% of the department by PES University (Semesters 1,2,3,5,6)

Rajya Puraskar Scout Governor's award from Bharat Scouts and Guides

Chathurtha Charan Cub Governor's award from Bharat Scouts and Guides