Shashank Udyavar Madan

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SUMMARY

Driven and detail-oriented software engineer pursuing a master's in computer science at North Carolina State University, with experience in designing and developing scalable applications and distributed systems. Passionate about building intelligent, agentic AI systems that can reason, adapt, and act autonomously in complex environments. Actively seeking software engineering and AI roles where I can apply my technical expertise, research experience, and deep interest in agentic AI to deliver innovative and impactful technology solutions.

EDUCATION

North Carolina State University   Raleigh, NC
Master of Computer Science; **GPA: 4.00/4.00**   Aug 2023 – May 2025
Coursework: Software Engineering, Software Security, Neural networks and Deep Leanring, DBMS
PES University   Bengaluru, India
Bachelor of Technology ; **GPA: 3.64/4.00**   Aug 2019 – May 2023
Coursework: Artificial Intelligence, Information security, Distributed Systems, Cloud Computing

SKILLS

Programming languages: Python, JavaScript, Typescript, C/C++, Java, Go, SQL, Dart, Swift

Frameworks Tools: React, Flutter, Flask, Django, Node.js, Docker, Kubernetes, Git, Wireshark, REST, gRPC, LangGraph, LangChain

Databases Cloud: MySQL, PostgreSQL, MongoDB, AWS, GCP

EXPERIENCE

Software Engineer *One Community Global, Remote, United States*   *June 2025 – Present*
- Contributing as a full-stack developer using the MERN stack (MongoDB, Express.js, React, Node.js) to build scalable applications for community-focused initiatives.
- Conducting code reviews, collaborating with other developers, and contributing to feature development such as announcements, attendance tracking, and progress dashboards.

Information Security Engineer *Virufy, Remote, United States*   *June 2025 – Present*
- Securing data pipelines and evaluating system vulnerabilities for AI-powered health diagnostics applications, leveraging Python, AWS/GCP, and tools such as Wazuh (SIEM), Prowler (AWS security), and OWASP Threat Dragon (threat modeling).
- Collaborating with cross-functional teams to strengthen security controls, ensure compliance, and improve data confidentiality and integrity.

Software Engineer *Zebra Technologies, Bengaluru, India*   *Jan 2023 – Jul 2023*
- Developed mobile application modules for iOS and Android using Swift, Java 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%, enhancing the overall System Performance and supportability of the application.

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 *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 assisting in requirement specification through detailed documentation.

Full Stack Developer *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

EventFlow.AI
- Built an end-to-end event planning platform leveraging Agentic AI to autonomously manage budgeting, licensing, vendor coordination, timelines, and social media strategy.
- Integrated LangChain and LangGraph with human-in-the-loop feedback loops and used CopilotKit to deliver a seamless AI chat experience.
- Shipped a full-stack MVP using Flask and MongoDB on the backend, with a modern React + TypeScript frontend.

FinQuest – Gamified Financial Literacy Platform
- Developed an interactive web application to promote financial literacy, using a TypeScript frontend with React/Next.js and a Node.js backend with Express, integrated with MongoDB for scalable data storage.

- Created a VR mini-game using WebXR and Unity; the project won 1st place at HackNC for innovation in financial education.

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.

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.

Technical Security Review of OpenEMR
- Performed SAST with SonarQube and DAST using ZAP; identified vulnerable dependencies via Snyk.io and conducted threat modeling aligned with OWASP Top 10 and NIST checklist.
- Applied advanced techniques such as fuzzing, attack/defense trees, misuse/abuse cases, and LINDDUN for privacy threat modeling; leveraged the Cornucopia Game for adversarial scenario analysis.
- Uncovered critical vulnerabilities through exploratory pentesting, mapped findings to MITRE ATT&CK, and recommended remediation strategies to address code flaws and third-party risks.

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.

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.

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.

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.

Software Engineering Projects
- A Telegram bot built with Python, leveraging the python-telegram-bot library for seamless interaction. The app performs real-time expense tracking, budgeting, and spend analysis with NumPy and Pandas for data processing. Graphical visualizations are generated using Matplotlib and Seaborn. The project integrates GitHub Actions for CI/CD, automating testing, linting, and deployment.
- A web application built with React.js for the frontend, Flask for the backend, and MongoDB for data storage. The backend handles API requests, user authentication, and calorie-tracking logic, utilizing JWT (JSON Web Tokens) for secure authentication and session management. Axios is used for efficient HTTP communication between the frontend and backend.

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)

RajyaPuraskar Scout: Governor's award from Bharat Scouts and Guides

ChathurthaCharan Cub: Governor's award from Bharat Scouts and Guides