Tanishq Somani

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EDUCATION

University of Tennessee, Knoxville, Tennessee *January 2023 - December 2025*
Master of Science in Computer Science | GPA: 3.8

East Tennessee State University, Johnson City, Tennessee *August 2017 - May 2021*
Bachelor of Science in Microbiology

WORK EXPERIENCE

Graduate Assistant – Programming & Automation Developer *January 2025 – Present*
University of Tennessee, Knoxville • Office of Information Technology

- Built and deployed 10+ iPaaS automation workflows that eliminated manual processing steps, reducing IT staff time spent on routine requests
- Developed the VolTech Repair Kiosk, an interactive self-service application that integrated dynamic forms, and automation to reduce wait times and improve customer intake efficiency
- Designed dynamic forms (e.g., Firewall Request, DNS Lookup, Security Services Change Requests) with advanced conditional logic, accelerating IT request resolution across campus

Software Engineering Intern *June 2023 – August 2023*
Hack4Impact – Sustainable Future Center

- Worked with the Sustainable Future Center and the founder of Director David Bolt, on early-stage planning and prototyping for a nonprofit web platform, contributing to requirements, discussions, and feature scoping.
- Assisted with preliminary UI concepts and technical documentation used to guide future development work by the Hack4Impact engineering team.

PROJECTS

PSO Brain MRI Tumor Segmentation (Python, NumPy, OpenCV)

- Implemented Particle Swarm Optimization (PSO) to segment brain tumor regions from 75,000 BraTS MRI slices, achieving a 0.483 Dice score and 0.373 IoU with perfect accuracy on healthy scans.
- Built a fully automated segmentation pipeline capable of processing thousands of MRI scans in nii.gz format, enabling consistent evaluation and efficient research workflow.

Password Security Enhancements (Python, RAG, Vector DBs, Llama 3.2)

- Built a hybrid password-analysis system combining technical entropy checks with RAG-enhanced LLM reasoning to generate high-entropy passwords.
- Developed end-to-end RAG pipeline: HuggingFace embeddings, Chroma vector stores, custom retrieval, UI via Streamlit, and evaluation using NIST SP 800-63B guidelines.
- Upgraded LLM model and improved explanation accuracy by grounding outputs in deterministic security signals from 3 specialized vector stores.

HPC Performance Dashboard (Dash, Plotly, Pandas)

- Developed an interactive dashboard for analyzing Thicket + Caliper HPC performance metrics using Python, Dash, and Plotly.
- Enabled real-time exploration of CSV performance datasets with line graphs, bar charts, heat maps, and detailed metric tables.

SKILLS

Languages: Python, C++, C#, JavaScript (React, Node.js) HTML, CSS, SQL
AI/ML: PyTorch, NumPy, Pandas, scikit-learn, OpenCV
Frameworks/Tools: Dash, Plotly, Streamlit, React Native, Git, Linux, Docker
Specialties: RAG, Vector DBs (Chroma), PSO optimization, Data Visualization, Workflow Automation.