SANJAY MOHAN KUMAR

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EDUCATION

George Mason University   Fairfax, VA

Bachelor of Science in Computer Science   Aug 2022 - May 2025

Coursework: Artificial Intelligence, Data Structures, Algorithms, Software Engineering

EXPERIENCE

Undergraduate Teaching Assistant - GMU   Aug 2023 - Present

- Assisted Professors and GTAs in teaching for Low-Level & Computer Systems programming, supporting over 400 students each semester and contributing to an increase in class participation and engagement.
- Conducted mid-semester and end-of-semester review sessions, helping students improve their grades and fostering a collaborative learning environment.

PROJECTS

AsyncFSM: *Data Structures | Concurrent Processing*

An extremely robust and efficient data structure, designed to handle FSM operations efficiently. Supports non-blocking management, enabling concurrent processing without risk of data corruption, and is particularly effective in applications requiring high concurrency and minimal latency. Enables an $O(1)$ time complexity for state accessing operations, and $O(n)$ for state searches and executions.

VIMU Process Monitor: *C | Unix*

Developed the VIMU Task Monitor using C to implement advanced process management features in a Unix-like operating system. Designed and built a custom interactive command-line shell capable of executing, inspecting, and managing multiple tasks, including file redirection and inter-process communication through pipes. Implemented robust logging functions to track and report task status, signal handling, and error conditions, ensuring consistent output for grading and debugging. Demonstrated proficiency in Unix system calls, process control, and signal handling, achieving successful execution and management of concurrent processes.

Naviguide AI: *Computer Vision | AI*

An intuitive vision-based AI to aid visually impaired individuals in navigating any environment with ease. Developed and trained an AI to dynamically detect and track objects, autonomously calibrating its vision parameters to avoid background noise. Designed a Neural Network to provide real-time haptic feedback, allowing users to understand the direction and distance of nearby objects. This solution operates on any commercial phone, ensuring all data stays on the device for privacy.

BlockCertify: *Blockchain | Data Structures*

Developed a blockchain-based verification system leveraging Zero-Knowledge Proofs to enhance security and privacy in in-class polling. Utilized the Dock blockchain to issue and manage decentralized identifiers and digital credentials, ensuring data integrity and mitigating identity fraud. Created a framework with secure data structures and algorithms, that allows for verification of credentials without revealing personal information, adhering to privacy laws. This solution provides a robust and efficient method for maintaining the credibility and fairness of identity security.

TECHNICAL STRENGTHS

Languages	Java, Python, C/C++, Kotlin, x64/x86 Assembly, R, LaTeX
Frameworks	NumPy, Pandas, TensorFlow, Matplotlib, PyTorch, SciPy, JavaFX
Technologies	Git, Linux/Unix, Blockchain, ROS, Quantum Algorithms