Brett J. Mitchell

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EXPERIENCE

NASA – National Aeronautics and Space Administration January – April 2025
Software Engineer Intern

- Engineered a modular, full-stack software system to automatically provision and manage access control among modules within a mission-critical application for **hundreds** of NASA employees.
- Prototyped a full-stack work ingestion pipeline with custom GUI, backend, & data handling aimed at improving operational efficiency for the Digital and Analytics Services Division and supporting hundreds of internal users.

QuickScout (Tech Startup) January – May 2024, August – December 2024
Software Engineer Intern

- Built an AI agent transforming user queries into real-time geospatial maps using GIS data with **~98%** accuracy.
- Developed an end-to-end **ETL pipeline** to extract and structure over **100,000+** legacy PDFs of oil production data into indexed databases, enabling spatial querying and directly increasing client acquisition.

Systems Planning and Analysis (DoD Contracting) May – August 2024
Data Science Intern

- Prototyped development & integration of a lightweight Convolutional Neural Network **(CNN)** onto an embedded device **(edge AI)** for real-time radionuclide anomaly detection & identification.

Midwestern State University August 2023 – December 2024
Computer Science Graduate Assistant

- Delivered lectures, evaluated Python and C++ assignments, and tutored **60+** students.

PROJECTS

Autonomous Robot Navigation & Obstacle Avoidance with Multi-Sensor Fusion | Demo

- Programmed full autonomy in **C++** for a physical robot using multiple ultrasonic range finders, a vision sensor, & GPS (added after the created demo) for **real-time** detection, classification, obstacle avoidance, & movement.

Embedded Flight Software Simulator with Real-Time Fault Handling & Telemetry (Ongoing) | Demo GitHub

- Designing & implementing a software simulator with CI pipeline featuring RTOS task scheduling, watchdog-driven fault recovery, & CCSDS-style telemetry uplink/downlink, & simulated command/sensor inputs.

NASA SUITS Challenge – Spacesuit UI with Lunar Rover Simulation (Ongoing) | Demo
Selected among top 10 teams nationwide to compete & present at NASA's Johnson Space Center (Team Selene, MSU)

- Developed a **real-time resource prediction algorithm** in **Python** to estimate time-to-threshold levels (caution, warning, critical, empty) for rover subsystems (e.g., position, thermal load, battery) and astronaut vitals (e.g. oxygen levels, heart rate), enabling preemptive fault handling & automated telemetry alerts.
- Helped create logic for autonomous navigation for a simulated rover with **LiDAR** & **D* pathfinding algorithm**.
- Worked on backend integration with GUI for telemetry, point of interest determination, & camera feeds.

Real-Time Operating System (RTOS) Kernel with Preemptive Scheduling & Interrupt Handling | Demo GitHub

- Created a real-time OS simulation visualizing process queues & performance metrics from scratch with a preemptive, multi-core multi-level feedback queue (MLFQ) scheduler with strict timing constraints, task prioritization, time slicing, and interrupt handling.

Linux Shell with Embedded File System & Advanced Command-Line Features | Demo GitHub

- Developed a full-stack Linux-style shell & virtual file system from scratch using Python, FastAPI, and SQLite to support advanced command-line utilities such as piping, redirection, and file permission parsing.
- Implemented a backend with optimized memory management handling & shell history components.

EDUCATION

Midwestern State University | Wichita Falls, TX
*M.S. in Computer Science, **Expected: August 2025** – **GPA: 4.0***

- **Graduate Man of the Year (University-Wide Award for the Highest-Ranked Man in the Graduate School).**
- **Graduate Computer Science Student of the Year (Department Award).**

*B.S. in Biology; Minor in Chemistry (Cum Laude), May 2022 – **GPA: 3.62***
Activities: UPE Computer Science Honor Society (President)**,** Robotics Club (Software Lead).

SKILLS

Flight & Embedded: C++, C, Python, FreeRTOS, Zephyr, Telemetry Systems, Sensor Fusion, UART, SPI, I2C, cFS.
Robotics & Simulation: ROS, Gazebo, SLAM, Pathfinding, OpenCV, MATLAB/Simulink, Git, Linux.
AI, Data Tools & Misc.: PyTorch, TensorFlow, Transformers, Pandas, NumPy, Jupyter, Agile/Scrum, JavaScript.
Cloud, APIs, Infrastructure, Misc.: REST APIs, Docker, AWS (EC2, S3, Lambda), CI/CD, PostgreSQL, SQLite, SQL.