Mohammed Abdul-Nabi

Email | LinkedIn | Github | Portfolio-Website

Education

Honours Specialization in Computer Science London,ON Canada
University of Western Ontario *2023 - 2027*

- *Deans Honour List, 90+ in DSA, SWE, Systems Programming, Computer Organization & Architecture*
- **Relevant Coursework:** Data Structures, Analysis of Algorithms, Time Complexity, Databases, Operating Systems, Objected Oriented Programming, Software Design, Agile Development, Computer Architecture, Multi-Threaded.

Technical Skills

Languages: C, C++, Java, ARM Assembly, Bash, SQL, Typescript, Python, Javascript, HTML, CSS
Frameworks & Technologies: CAN, SPI, I2C, UART, RTOS (FreeRTOS), LVGL, Bare-metal firmware, Microcontrollers, Interrupt-driven programming, Sensor integration, Memory & Power constrained systems
Tools: Git, Unix/Shell Scripting, GDB Debugger, Linux, Altium Designer, PlatformIO, Draw.IO, Qt, Jira, Notion, Doxygen

Experience

Western Formula Racing - FSAE London, ON
Firmware Lead & Cockpit Controls Lead *07/25 - Present*

- Oversaw all vehicle firmware across 3+ critical subsystems, managing a safety-critical embedded codebase through implementation reviews, system validation, & ensuring compliance to FSAE competition rules for 420 V electric race car.
- Completely redesigning the steering wheel as a fully custom driver-interface system, handling the full stack from CAD and mechanical packaging to custom PCB design and embedded firmware for the display, buttons, dials, and encoders.
- Rewrote the vehicle motherboard firmware from the ground up, eliminating false fault detections & achieving near-zero erroneous shutdowns while improving overall system stability
- Wrote comprehensive firmware documentation using Doxygen, including detailed module descriptions, usage guidelines, & developer notes. Supplemented with diagrams and flow charts to improve onboarding & reduce ramp-up time by 30%.

Dashboard Engineer *07/24 - 06/25*

- Designed & built embedded dashboard solution for an electric race car, displaying real-time data from CAN bus network.
- Evaluated & integrated hardware components, including CAN transceivers, micro-controller, and display, optimizing for performance in various conditions, compatibility with existing hardware, space limitations and budget constraints.
- Utilized DBC files to decode and display CAN messages in real time, enabling in-dash fault reporting and reducing diagnostic time during testing by over 50%.
- Collaborated with multiple subsystem teams to define dashboard requirements and validate sensor accuracy to within ±2.5%, ensuring reliable real-time data for diagnostics and performance monitoring.

General Team Member *08/23 - 06/24*

- Gained foundational experience across multiple subsystems, learning electrical design principles, CAN communication, embedded systems, and various workflows through hands-on involvement and mentorship.

Projects

Brake Signal Plausibility Device(BSPD)

- Designed and implemented a Brake System Plausibility Device that validates brake/throttle signals in real time & triggers shutdown on implausible states, improving driver safety and ensuring compliance to FSAE competition rules.
- Reduced PCB footprint and component count by 30% by redesigning the analog thresholding and filtering network, fully eliminating all false-positive triggers
- Achieved a deterministic sub 5 ms reaction time & stable operation across the full brake-pressure and throttle-sensor range.

Virtual Pet Care Game

- Developed a virtual pet care simulation in Java with gameplay mechanics for health, happiness, and hunger, supporting persistent state and interactive user decisions; wrote JUnit tests to validate core logic and ensure consistent behavior.
- Collaborated within a team to apply and utilize software engineering principles, UML diagrams, Javadoc documentation, Slack for project management and GitLab-based version control, ensuring adherence to project specifications and timelines.
- Designed and implemented an intuitive Graphical User Interface (GUI) using JavaSwing, to increase player immersion.

CourseWork

- Achieved 90%+ on all programming assignments across all CS courses, developing in languages such as C, Java, and ARM.

Personal Projects

Car Modification & Maintenance, Sim Racing, PC Building, Motor-sports, Tinkering, 3D Modeling.