Mohamed Omar

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EDUCATION

Bachelor of Computer Engineering *Expected May 2027*

College of Science & Engineering, University of Minnesota Twin-Cities — Minneapolis, MN

Dean's List: Spring 2024, Fall 2024, Spring 2025 — *GPA: 3.76*

Relevant Coursework: Computer Architecture & Machine Organization, Microcontrollers, Embedded System Design, Signals Circuits and Electronics, Analog/Digital Electronics, Algorithms & Data Structures, Program / App Development

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SKILLS

Languages & Tools: C / C++, STM32, Altium Designer, RTOS, MATLAB, Python, LTspice, Git, Java, Vivado (FPGA), Verilog

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WORK EXPERIENCE

Battery Team Engineer — *August 2025 - Present*
University of Minnesota Solar Vehicle — Minneapolis, MN

- Designed & implemented a battery management system architecture for a **high voltage** (≈ 150V) lithium ion pack, including writing **STM32 firmware** and designing PCB's for **isoSPI** cell monitoring, **CAN communication** & passive balancing
- Developed embedded control firmware for HV safety and power management in a **race critical environment**, implementing contactor sequencing, precharge state machines, ADC based current/voltage monitoring & extensive **fault handling logic**

Undergraduate Research Assistant — *August 2025 - Present*
Computer Networking & AI Research Lab, University of Minnesota — Minneapolis, MN

- Engineered and evaluated **autonomous vehicle** and teleoperation systems using multimodal sensor fusion (camera, LiDAR, radar) to support safe operation over long distances and bandwidth constrained networks.
- Developed indoor mobile **robot autonomy systems** using embedded edge computing on an **NVIDIA Jetson** and conducted research on robotic manipulation using diffusion based learning to enable robots to adaptively choose among multiple valid actions in uncertain, real world environments.

Software Engineering Intern — *May 2025 - August 2025*
TalkRemit — London, United Kingdom

- Contributed to a cross platform remittance / money transfer application by implementing RESTful API driven features, SSL encryption, and AML (Anti Money Laundering) safeguards to improve user experience, data security, and industry regulations while collaborating with the UX team on key transaction flows.
- Implemented real time "Quick Quote" UI components that fetch dynamic FX rates and estimated fees, improving user experience with instant pricing transparency, improving speed of transfers by 20%.

Data Analytics Intern — *September 2023 - December 2023*
3gem Research and Insights — Sevenoaks, United Kingdom

- Leveraged AskiaDesign to design surveys, transforming research studies into targeted questions for high profile clients.
- Managed and queried SQL databases to retrieve and prepare data for analysis, optimizing workflow efficiency.
- Partnered with cross functional teams to verify data accuracy and alignment with client objectives for high profile clients

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PROJECT EXPERIENCE - OmarsLab.com

Baby Monitor - Sound, Temperature, and Bluetooth Integration

- Collaborated with peers to develop a dual PIC24 microcontroller system with sensor / audio processing , LED/LCD output, PWM driven LED control with real time ADC interrupts for low latency data transfer
- Independently scaled the design into a custom PCB & CAD enclosure, creating a manufacturable design with integrated sensors & embedded peripherals using **Altium Designer** for schematics / PCB routing & **Fusion 360** for modeling

Autonomous Obstacle Avoiding RC Car

- Built an autonomous RC car powered by an **ESP32** microcontroller and servo mounted **VL53L1X** time of flight sensor, integrating real time distance sensing with embedded control for safe independent navigation.
- Implemented closed loop motor control and decision logic using PWM and sensor driven interrupts, enabling obstacle detection, path correction, and safe autonomous-like operation.

Career Engagement Ambassador, August 2024 - Present | National Society of Black Engineers, August 2024 - Present