

# MEHMET MERCAN

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## Education

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**Purdue University - GPA: 4.0**

**Expected Graduation: Dec. 2027**

*B. S. Computer Science, Minor in Mathematics, Minor in Electrical and Computer Engineering*

*West Lafayette, IN*

– **Relevant Coursework:** Discrete Math, Object Oriented Programming, Programming in C, Linear Algebra, Statistical Methods

## Technical Experience

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**Brookhaven National Laboratory**

**Jul. 2024 – Aug. 2024**

*Research Intern*

*Upton, NY*

- Built an automated defect detection system for silicon wafers using Python, OpenCV, and a 3D printer-mounted camera.
- Optimized the image processing pipeline to improve defect detection accuracy and throughput across multiple wafer types.
- Collaborated with research mentors to enhance the project's sustainability for ongoing semiconductor studies.

**Purdue Electric Racing**

**Sep. 2025 – Present**

*Electronics Team Member*

*West Lafayette, IN*

- Developed embedded firmware for the team's Formula-style electric vehicle using an STM32F4 Discovery board.
- Implemented low-level control of dashboard LEDs and driver inputs using GPIO configuration and interrupt-driven routines.
- Designed and tested safety-critical firmware to process pedal torque requests using ADC sampling, and signal filtering.

**Embedded Systems @ Purdue — HarmoniCore Project**

**Aug. 2025 – Present**

*Embedded Software Developer*

*West Lafayette, IN*

- Implemented Fast Fourier Transform IP blocks in SystemVerilog for real-time, low latency Digital Signal Processing workloads.
- Designed Register-Transfer Level designs for algorithmic logic flow and integrated modules with FPGA-based hardware systems.
- Optimized HDL modules for resource-constrained environments, increasing processing efficiency under limited multipliers.

**Purdue Lunabotics**

**Aug. 2025 – Oct. 2025**

*Software Developer*

*West Lafayette, IN*

- Implemented autonomous navigation algorithms inspired by **A\* search** to traverse simulated lunar terrain quickly and efficiently.
- Converted legacy competition codebase from ROS1 to ROS2, reducing latency by **20%** and improving system responsiveness.

## Projects

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**Sumobot (Personal Project)** | *Arduino Uno, KiCAD, C, Embedded Systems, PID Control*

**Sep. 2025 – Present**

- Designed and fabricated a custom PCB, integrating over **15 external components** including sensors, motors, and power circuitry.
- Programmed modular firmware in C, implementing reusable driver code through header files for efficient hardware abstraction.
- Developed a fully autonomous control system enabling the robot to detect, pursue, and evade opponents in real-time using a **Finite State Machine** architecture with dynamic state transitions, sensor fusion logic, and adaptive decision-making.
- Calibrated and tuned PID-based motor control for precise maneuvering, responsiveness, and stability under variable conditions.

**FocusUp!** | Hello World Hackathon | *MediaPipe, TypeScript, React, Next.js*

**Sep. 2025**

- Placed **5th overall** among 410 participants with a project meant to help correct posture using vision-based tracking.
- Implemented the blink + slouch detection algorithms by implementing MediaPipe and designed the focus score logic for feedback
- Gained hands-on experience in web development, real-time computer vision, and agile teamwork under a 24-hour deadline.

## Leadership / Extracurricular

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**Hello World Hackathon**

**Jan. 26 – Present**

*Organizer & Board Member*

*West Lafayette, IN*

- Working towards securing **\$50,000+** from corporate sponsors, up from \$40,000 last year.
- Inviting companies and their recruiters to interact with the competing students and share their own company's initiatives.

**FIRST Robotics Competition — Team 9016**

**Sep. 2024 – Present**

*Alumnus Mentor*

*Syosset, NY*

- Mentored 10 teammates in debugging, quality assurance, and system integration, contributing towards its continued success.

## Technical Skills

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C, C++, Python, Linux, CAN, MicroControllers (ESP32, STM32) R, Git/GitHub, HDL, SystemVerilog, Digital Design, RTL Diagrams, PCB Design, OpenCV, Java, Pandas