Vedant K. Naik

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Electrical Engineering student specializing in robotics, embedded systems, and control, with hands-on experience in firmware and system prototyping, seeking opportunities to drive innovation and devise intelligent systems

EDUCATION

Michigan State University, College of Engineering　　　　　　　　　　　　　　East Lansing, MI
Bachelor of Science, Electrical Engineering, GPA: 4.0　　　　　　　　　　　　　August 2022 - May 2026
Activities and Societies: IEEE South East Michigan-Chapter, Tau Beta Pi, MSU Solar Racing, PoliMOVE-MSU Autonomous Racing Team

EXPERIENCE

Intrepid Control Systems　　　　　　　　　　　　　　　　　　　　　　　　　Troy, MI
Embedded Systems Intern　　　　　　　　　　　　　　　　　　　　　　　　　May 2024 - August 2024
- Enhanced firmware of Zynq-based products by integrating IMU, DoIP, and GPS support using Xilinx SDK, resolving over 7+ firmware driver issues to enrich product functionality
- Added gPTP support for 10Base T1S PHY and TC10 support for 100/1000 Base T1 Automotive Ethernet products, optimizing GPS signal reporting and enhancing system performance through the company's resource API
- Took the initiative to automate network traffic testing on automotive Ethernet products using Ixia's network load module, reducing manual effort from 120 to 5 minutes and accelerating report generation

Polimove-MSU Autonomous Racing Team　　　　　　　　　　　　　　　　East Lansing, MI
Research Assistant　　　　　　　　　　　　　　　　　　　　　　　　　　October 2024 - Present
- Developing reinforcement learning-based vehicle controllers for IndyCar racing using dSPACE ASM and Aurelion simulation environments; optimizing autonomous racing performance through high-fidelity vehicle dynamics modeling
- Developed LiDAR-based opponent detection for the Polimove-MSU Autonomous Racing Team to enhance real-time performance and obstacle avoidance at speeds up to 180 mph

Smart Microsystems Lab, Michigan State University　　　　　　　　　　　　East Lansing, MI
Undergraduate Research Assistant　　　　　　　　　　　　　　　　　　　August 2023 - Present
- Engineered an autonomous robotic blimp with 4-thruster configuration, IMU, WiFi, and LoRa connectivity; developed microcontroller PCB and firmware with micro-ROS architecture to streamline algorithm development between low-level and high-level control systems
- Modeled a non-linear strain sensor with considerable time dynamics using Time Delayed Neural Network(TDNN), to capture temporal features. Resulting in a model with a $R2=0.98+$, and a prediction frequency of over 2kHz
- Designed an 8-pressure sensor breakout board with Altium Designer to interface with a pneumatic pressure setup to measure negative and positive gauge pressures

MSU Solar Racing Team　　　　　　　　　　　　　　　　　　　　　　　East Lansing, MI
Electric Propulsion lead (Motor and Motor Controller)　　　　　　　　　　　August 2022 - Present
- Led a sub-team of 5 members to configure and interface the motor controller with the PMSM motor and telemetry system, utilizing operational knowledge of CAN 2.0 communication protocol and power converters

SKILLS

Embedded Systems & Hardware: Altium Designer (PCB Design), Microcontroller Programming, Soldering, IoT Prototyping, Fusion 360 (CAD), Verilog (HDL), Xilinx SDK, Datasheet Interpretation,Oscilloscope
Programming & Simulation: C, C++, Python, MATLAB, Simulink, git(version control), Linux, Docker
Robotics & AI: ROS 2(Robot Operating System), OpenCV, TensorFlow (Keras)