Karan Thakkar

karant@uci.edu | ksthakkar.com | www.linkedin.com/in/ksthakkar | San Diego, CA

Education

University of California, Irvine GPA: 3.72 | Dean's Honor List | Expected Graduation: June 2027
Bachelor of Science in Computer Engineering

Relevant Coursework: Data Structures & Algorithms, Computer Networks, Network Analysis, Digital Systems, Discrete Math Linear Algebra, Differential Calculus, Engineering Probability

Experience

Lead Embedded Systems Engineer | UC Irvine Racing September 2024 – Present
Formula SAE Electric *Irvine, CA*

- Designing multi-layer PCBs for compact circuit design and robust data collection from analog/digital sensors.
- Writing a lightweight C++ PID library, reducing computation time by ~20%, and velocity control accuracy to <5% error
- Managing embedded Linux systems for real-time data visualization and diagnostics, enabling data acquisition over a CAN network in an F1-style racecar.
- Leading a team of 7 students by delegating tasks, organizing workflows and communicating with faculty to compete annually.

Programming Instructor February 2022 – July 2024
Code Ninjas *San Diego, CA*

- Tripled the number of graduating students through one-on-one mentorship and weekly sessions
- Managed 40+ students in a collaborative learning environment
- Taught JavaScript and C# through web and game development in an organized 10-week course

President and Software Engineer | FRC Team 2658 August 2020 – June 2024
FIRST Robotics Competition *San Diego, CA*

- Led a team of 125+ high school students to create a life-sized robot for competition
- Secured $20,000 in funding through corporate sponsorships, increasing team resources by 62%
- Optimized production workflows, improving manufacturing speed by 30% through strategic scheduling
- Developed autonomous motion planning algorithms in Java, leveraging PID controllers & computer vision for precision

Projects

Central Computer Module | *C++, KiCad, FreeRTOS* January 2025 – May 2025

- Designing and building a central firmware PCB that integrates data from 15+ analog and digital sensors
- Programming a finite state machine using FreeRTOS to manage driving motor commands, regen braking, and traction control
- Optimizing data caching and PID control, reducing processing latency by 30% during high-demand racing scenarios.

Accumulator Precharge Circuit | *C++, Multisim* October 2024 – January 2025

- Designed a robust precharge circuit for an FSAE racecar and increased battery charge by 31% using dynamic thresholds
- Wrote C++ programs to detect faults during the precharging stage; ensured human driver safety and extended battery lifespan
- Integrated voltage-to-frequency modules to maintain HV isolation while logging data for live data transmission

Hermite Quintic Trajectory Follower | *WPILib, Java, Git* January 2024 – April 2024

- Developed autonomous trajectories in Java and followed paths with real-time correction
- Implemented multiple PID + FF controllers; increased setpoint stability by 40% using motion profiling for controller gains
- Visualized trajectories using a custom GUI tool made in React for quick modifications
- Interpolated between set waypoints and maximized physical constraints using a 5th-degree polynomial equation (HQT)

Skills

Programming & Embedded Development: C/C++, Java, Python, C# | FreeRTOS
Frameworks & Tools: ROS, React, Node.js, Next.js | Git, TravisCI
Embedded Systems & Hardware: CAN, I2C, SPI, UART | PCB Design (KiCad, Altium) | ARM Cortex-M (Teensy, STM32)
Libraries & Data Analysis: WPILib, OpenCV, TensorFlow, NumPy, pandas