

Koushik Jandhyala

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SUMMARY

Robotics Engineer focused on autonomous systems, perception, and embedded control. Experienced in designing and deploying real-world robotic systems integrating sensing, control, and hardware-software co-design.

EDUCATION

B.S. Robotics Engineering - University of California, Riverside | Expected Fall 2028

- **Relevant Coursework:** ROS Programming, Discrete Structures, Differential Equations, Engineering Graphics and Design, Assembly Programming, Data Structures and Algorithms
- **Activities and Societies:** University Honors, Engineers Without Borders(EWB), American Society of Mechanical Engineers (ASME), Farbod Khoushnoud's Research Lab, Autonomous Robots and Control Systems Lab

TECHNICAL SKILLS

Programming: Python, C, C++, Java

Robotics & Perception: ROS2, Gazebo, Computer Vision (OpenCV, YOLOv8), Sensor Fusion, PID Control, State-Based Control, ArUco Markers, UAV Autonomy

Embedded & Edge Systems: Embedded C, Linux (Ubuntu), Raspberry Pi, Arduino, ESP32/ESP8266

Tools & Hardware: Git, ArduPilot/MissionPlanner, PCB Prototyping, Oscilloscopes, Multimeters, SolidWorks, Logisim

RELEVANT EXPERIENCE

R&D Engineer - Stealth Startup • May 2025 - Present

- Leading end-to-end design and commercialization of autonomous consumer robotic products from concept through manufacturing
- Architected and developed a commercially deployable head-tracking desktop IoT device integrating real-time vision-based tracking, AQI sensing, Bluetooth audio, and embedded control systems
- Implemented closed-loop perception and actuation pipelines enabling real-time human tracking and responsive motion behavior
- Designing system architecture across embedded firmware, hardware integration, and high-level control for scalable production
- Driving transition from prototype to manufacturing, including hardware validation, design iteration, and production readiness

Robotic Quantum Cryptography Research Intern | Farbod Khoshnoud Lab • Oct 2025 - Present

- Designed and published a Python-based ArUco Marker toolkit (OpenCV, FastAPI) to standardize and simplify visual tracking across university-wide multi-robot research projects and academic instruction
- Assisted in experimental implementation of BB84 quantum key distribution for secure optical communication between autonomous robotic systems in confined space
- Proposed and tested optical hardware designs to enhance signal range and reliability in real-world lighting environments.

Research Assistant - Autonomous Robots and Control Systems Lab • Dec 2025 - Present

- Developing soft robotic systems for safe infant interaction, focusing on compliant actuation and adaptive material behavior to ensure gentle, non-invasive contact

- Prototyping and iterating on compliant mechanisms using soft materials to enable safe physical interaction in dynamic, human-centered environments
- Conducting experimental testing to evaluate system responsiveness, safety constraints, and adaptability under varying interaction conditions

PROJECTS

CycleSafe: Advanced Bicycle Collision Avoidance System | Personal Project • 2023-2025

- Engineered a real-time multi-sensor fusion system (LiDAR, vision, ultrasonic) achieving <50 ms latency on embedded Linux systems
- Designed state-based control architecture to handle sensor uncertainty and trigger adaptive safety responses
- Evaluated and optimized perception models under varying environmental conditions to balance accuracy and runtime

Human-Mimicking Robotic Arm System | ACM Forge • 2025-2026

- Designed and built a robotic arm capable of mirroring human arm motion using real-time sensor input and kinematic mapping
- Modeled and optimized mechanical joint structures (servo housings, linkages) in SolidWorks for precision, stability, and repeatability
- Evaluated system performance under dynamic inputs, improving motion smoothness and tracking accuracy

LiDAR-Based Autonomous Differential Drive Robot | Personal Project • 2026 - Present

- Developing a LiDAR-based autonomous navigation system implementing mapping, localization, and obstacle avoidance in dynamic environments
- Building a full autonomy stack using ROS2 including perception, planning, and low-level motor control

IoT-Based Gas Stopper | Personal Project • 2024-2025

- Designed a mechatronic safety system integrating mechanical actuation, stepper motor control, and ESP8266-based embedded systems
- Enabled remote monitoring and actuation through wireless communication for real-world safety applications

LEADERSHIP & ACTIVITIES

President (Incoming) - Highlander Combat Robotics Team

- Leading design and development of competitive combat robots, focusing on durability, power systems, and attack strategies
- Mentoring team members in mechanical design, embedded systems, and system integration

Software and Electrical Team Member - Engineering Without Borders

- Contributing to the design of an autonomous agricultural robot using computer vision (OpenCV) for navigation and precision fertilizer deployment
- Integrated a custom wireless control and telemetry via ESP8266-Arduino architecture with web-based ground station for real-time monitoring implementing WebSockets
- Optimized robot power systems through battery testing and circuit analysis using multimeters, extending the estimated operational time and field performance

HONORS/AWARDS

- RoseHack Cash Cow Track Winner(2026)
- CutieHack 3rd Place Finalist(2025)