



Hassan Shahzad

Robotics Engineer | AR Innovator | Entrepreneur



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BACKGROUND



ABOUT

Inventor, roboticist, and entrepreneur passionate about bridging the gap between AI, robotics, and AR to create real-world impact. Founder of Silkun Innovations, dedicated to revolutionizing human-device interaction through AR-driven protocols. Built autonomous robots, SLAM systems, and IoT-integrated platforms. Continuously pushing the boundaries of perception, interaction, and control in intelligent systems.



PROJECTS EXPERIENCE

AR Dining – Augmented Reality & 3D Menus

Dec, 2024 - Mar, 2025 ⌚ 3 months

Developing a WebXR-powered, in-browser 3D/AR menu experience for restaurants. Uses NFC for instant access and marker based AR for precise positioning.

- NFC beacons for frictionless AR menu access.
- ThreeJS + WebXR for high-quality 3D rendering on mobile devices.
- Enabling interactive food visualization using real-time AR.

OpenBase2 – Autonomous Mobile Robot

Jan, 2024 - Aug, 2024 ⌚ 7 months

A modular, two-wheeled autonomous robot using hoverboard motors, capable of precise indoor navigation using ROS2 Nav2, SLAM, and sensor fusion. This project showcases my ability to integrate complex algorithms into real-world robotics.

- Hoverboard motors repurposed for efficient torque and speed control.
- RGB-D cameras + multiple IMUs for robust state estimation and mapping.

- RTAB-Map and Nav2 stack for SLAM and real-time path planning.

BiStable – Self-Balancing ROS2 Robot

Jun, 2024 - Aug, 2024 ⌚ 2 months

A self-balancing robot that uses a combination of PID control and sensor fusion to maintain stability. The system is implemented on a Raspberry Pi 4 and ESP32, integrating OpenCV for hand-tracking.

- ROS2-based real-time control with micro-ROS integration.
- PID tuning for optimal self-balancing and responsiveness.
- Hand tracking with OpenCV for intuitive user interaction.

A24

Jun, 2024 - Aug, 2024 ⌚ 2 months

- Nav2
- slam_toolbox
- custom urdf
- 2D-Lidar
- encoder odometry

RoboPipe

Jun, 2024 - Aug, 2024 ⌚ 2 months

- OpenCV
- PyBullet
- Robot Simulation
- ROS2
- Google MediaPipe

radioROS

Jun, 2024 - Aug, 2024 ⌚ 2 months

- custom PCB design
- ROS2
- SMD soldering
- Product Design
- Serial Communication



SKILLS

Robotics & AI

ROS2

Nav2

RTAB-Map

Gazebo

PyBullet

Model Predictive Control

Sensor Fusion

Autonomous Navigation

AR & Computer Vision

WebXR

Three.js

ArUco Markers

SLAM-based AR

Real-time Object Tracking

Embedded Systems & IoT & Networks

ESP-IDF NimBLE Bluetooth ESP-NOW UDP WebRTC

Software Development

Python C++ Flask REST APIs Real-time Communication

Hardware & Prototyping

3D Printing Injection Molding Laser Cutting SMD Soldering Custom PCB Design



EDUCATION

Robotics & AI, Integrated Masters, University College London

Sep, 2023 - Jun, 2027

N/A

Machine Learning & AI Autonomous Robotics Embedded Systems SLAM & Computer Vision
Advanced Control Systems



INTERESTS

Shared AR Experiences

Multi-user AR interactions Cloud-based AR rendering Networking for synchronized AR environments

Reinforcement Learning for Robotics

Sim2Real Transfer Isaac Sim & Gazebo Deep Reinforcement Learning End-to-End Policy Learning

Real-time Conversational AI

Voice-driven Robotics LLM-powered IoT Control Natural Language Understanding (NLU)
AI-assisted UI/UX

Humanoid & Assistive Robotics

Whole-body Control AI-assisted Manipulation Human-Robot Collaboration
Soft Robotics & Tactile Sensing

Advanced Navigation & Perception

Multi-Modal Sensor Fusion Event-based Vision Spatial AI Active SLAM