Hassan Shahzad

Robotics Engineer | AR Innovator | Entrepreneur

CONTACT

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SKILLS

Robotics & AI (Expert)

ROS2, Nav2, RTAB-Map, Gazebo, PyBullet, Model Predictive Control, Sensor Fusion, Autonomous Navigation

AR & Computer Vision (Advanced)

WebXR, Three.Js, ArUco Markers, SLAM-Based AR, Real-Time Object Tracking

Embedded Systems & IoT & Networks (Advanced)

ESP-IDF, NimBLE Bluetooth, ESP-NOW, UDP, WebRTC

Software Development (Advanced)

Python, C++, Flask, REST APIs, Real-Time Communication

Hardware & Prototyping (Advanced)

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

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

Education

2023-2027	Integrated Masters : Robotics & AI	University College London
3.7 Years	Machine Learning & AI, Autonomous Robotics, Embedded Systems, SLAM & Computer Vision, Advanced Control Systems	
2016-2023	Secondary Education :	Altrincham Grammar School For Boys
6.7 Years	Maths, Further Maths, Physics, Computer Science	

Projects

2024-2025 (2 Months)
AR Dining – Augmented Reality & 3D Menus : 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.

2024-2024 (6 Months)
OpenBase2 – Autonomous Mobile Robot : 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.

2024-2024 (2 Months)
BiStable – Self-Balancing ROS2 Robot : 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.

2024-2024 (2 Months)
A24 :
A platform to teach myself robot navigation on a custom robot. Going from simulation to real life

Nav2, Slam_toolbox, Custom Urdf, 2D-Lidar, Encoder Odometry

2024-2024 (2 Months)
RoboPipe :
Control a simulated robot arm with just a hand. Uses OpenV, Google MediaPipe, ROS2 and PyBullet

OpenCV, PyBullet, Robot Simulation, ROS2, Google MediaPipe

2024-2024 (2 Months)
radioROS :
A custom universal robot controller for mobile robots using an RC transmitter

Custom PCB Design, ROS2, SMD Soldering, Prodouct Design, Serial Communication