Ahmad Ilyas

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Education

Bachelor of Technology in Electronics & Communication Engineering, Zakir Husain College of Engineering and Technology, Aligarh Muslim University (Expected May 2026)

- **Cumulative GPA:** 9.315 / 10.0 (Until 6th Semester)

Research Interests

Robotics, Additive Manufacturing, Analog Circuit Design, Control Systems

Research Experience

Summer Research Intern | Indian Institute of Technology (IIT), Ropar (Hybrid)
May 2025 – July 2025

- Designed, researched, and simulated a novel mixed-signal Proportional-Integral (PI) controller for a Cesium-based atomic clock.
- Developed a dual-loop wavelength/frequency lock system for the atomic clock in MATLAB.

Summer Research Fellow | Indian Institute of Space Science and Technology (IIST), Thiruvananthapuram (On-site)
May 2024 – July 2024

- Developed and benchmarked U-Net-based architectures for the semantic segmentation of fetal anatomy in ultrasound images.
- Improved Dice Similarity Coefficient over baseline by implementing an ensemble architecture with ResNet.
- *Funded by the prestigious IASC Summer Research Fellowship Program (SRFP).*

Publications & Posters

- **[Ilyas, A.]**, et al. (2025). "High-PSRR, Ultra-Low Quiescent Current, Capless LDO Regulator Using a Self-Biased Recycling Folded-Cascode Error Amplifier in 90 nm CMOS". *Presented at IEEE DELCON 2025.*
- **[Ilyas, A.]**, et al. (2026). "VoltSense: A Cloud-Native Smart Switch with AI-Powered Anomaly Detection for Enhanced Home Safety and Energy Management". *Submitted to IEEE IMPACT 2025.*
- ***[Ilyas, A., U.A. Khan]** (2026). "Low-Latency AR Teleoperation for Mobile Robots via Direct Input Mapping and mDNS-Stabilized Communication." Abstract submitted to ICRCA 2026.*
- **[Ilyas, A.]**, et al. (2025). "Fine-tuning Text-to-Speech Models for English Technical Speech and Regional Languages". *Poster presented at: AMU-OSU Indo-US STEM Research Program 2025.*
- **[Ilyas, A.]**, et al. (2026). "A Low Quiescent Current, High PSR LDO Regulator Design in 130 nm CMOS Technology". *Submitted to IEEE IMPACT 2026.*

Selected Technical Projects

XR Interaction with Robotics | Coursework Major Project
June 2025 – Present

- Engineered a system for teleoperating a custom robot using an AjnaXR headset, creating an immersive control environment in Unity.
- Designed and 3D-printed the expandable robotic platform and established a real-time video stream from the robot to the XR headset.
- Adding a live head-tracking video stream system and LiDAR mapping.

- Working on implementing shared autonomy pipeline of the robot.

Autonomous Robot | Lab Collaboration Project

August 2025 - Present

- Migrating the ROS1 Noetic program to ROS2 Humble.
- Simulation in Gazebo Ignition
- Mapping of a room with 3D LiDAR.

Quadruped Robot with Inverse Kinematics | Coursework Mini Project
Dec 2024 – May 2025

- Designed and built quadruped robot based on Vladimir Glukhov's design with 3D-printed links, Raspberry Pi Zero 2 W, and custom servo control
- Derived kinematics from CAD and implemented inverse kinematics from scratch to generate trotting gaits
- Studied hybrid dynamical systems and contact stability through real-world failures: timing-induced gait drift, unplanned mode switches on uneven terrain, and compliance effects
- Built web-based controller for manual and autonomous operationSoft Robotic Actuator | Personal Project
- Jan 2024

Embedded Classroom Broadcasting System | Startup Venture
Dec 2024 – June 2025

- Core team member developing a cost-effective classroom broadcasting system. Responsible for bare-metal firmware (C), designing a robust RS-485 multi-node communication protocol, and PCB design/assembly.

Technical Skills

- **Programming:** Python (PyTorch, Keras, OpenCV, KerasCV), C/C++, MATLAB, ROS2
- **Simulation & CAD:** Fusion 360, SolidWorks, Onshape, LTSpice, Cadence Virtuoso, Simulink and Simscape, Gazebo, Webots
- **Hardware & Fabrication:** FFF 3D Printing**,** CNC Machining, PCB Design (KiCAD, Eagle), Embedded Systems (RPi, Arduino, STM32, 8051), Analog & Digital Circuit Design

Leadership Experience

Coordinator | AMU Roboclub
Sep 2022 – Present

- Coordinated a team of 30+ students, organizing robotics workshops and competitions (ROS, Fusion360, Arduino, Basic Robotics, etc.)
- Part of the ABU Robocon 2023 team, which made it to stage 3 of the competition.
- Led and mentored the technical teams for IIT-Rorkee Cognizance 2024, IIT-Delhi Tryst 2025, IIT-Kanpur Techkriti 2025, and Technoxian 2025.

Senior Member | Engineering Design and Implementation Club (EDIC)
Dec 2023 - Present

- Spearheaded workshops on analog electronics, 3D printing, multirotors and embedded systems to provide hands-on experience to junior students.
- Helped junior students in writing their manuscripts for their research works.

Additional Links

- Linkedin: https://www.linkedin.com/in/ahmad-ilyas-b79631278/
- Portfolio: ahmad-ilyas.netlify.app