

# Anujith Muraleedharan

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 [Personal Website](#)

 [Google Scholar](#)

## EDUCATION

### Rajiv Gandhi Institute of Technology

Bachelor of Technology in Electronics and Communication Engineering GPA: 8.16/10

Aug '18 – Aug '22  
Kottayam, India

- Qualified GATE 2023 (ECE) with top 1.58 percentile ranking among 70,000+ registered candidates.

## RESEARCH EXPERIENCE

### Indian Institute of Technology, Delhi

Research Associate Advised by **Prof. M. Hanmandlu**

June '24 – June '25  
New Delhi, India

- Built a goal-retargeting framework that allows robots to re-aim goals in real time under sensing delays and perturbations, maintaining task success through uncertainty-aware adaptation.
- Designed a progress-aware human-in-the-loop reinforcement learning framework that maintained full task success while halving feedback requirements through selective querying based on learning progress.

### Indian Institute of Science

I3D LAB, Research Associate Advised by **Prof. Pradipta Biswas**

Aug '23 – May '24  
Bangalore, India

- Designed and evaluated multiple control strategies (LQR, PD, Stanley, SMC), performed sensor fusion, and contributed to the robotic system development for an autonomous aircraft taxiing system.
- Developed an eye-gaze-controlled assistive robotic system integrating safety protocols, hand detection, and dynamic path planning to enable safe and autonomous stamp printing for individuals with SSMI.

### Rajiv Gandhi Institute of Technology

CASP LAB, Undergraduate Research Assistant Guided by **Prof. Manju Manuel**

Jan '21 – June '22  
Kottayam, India

- Tested and validated the Processing Element (PE) unit design within the Unified Winograd-GEMM (UniWiG) architecture, ensuring functionality through simulations in Vivado.
- Verified Modified Booth Encoding (MBE) multipliers and Wallace tree adders while analyzing power consumption and resource utilization to optimize performance metrics.

## WORK EXPERIENCE

### RobotX Workshops [Website]

Simulation Developer

Oct '22 – Feb '23  
Remote

- Built a modular simulation framework for the DJI Tello drone using Ursina engine, supporting realistic flight dynamics, real-time camera streaming, and command execution via both API and socket communication.
- Developed an interactive learning platform adopted by 200+ students, integrating GUI controls and visual feedback for immersive drone programming.

## PUBLICATIONS

\*Denotes Equal Contribution

### 1. U-LAG: Uncertainty-Aware, Lag-Adaptive Goal Retargeting for Robotic Manipulation

Anamika J H\*, Anujith Muraleedharan\*

IROS 2025 Workshop on Perception and Planning for Mobile Manipulation in Changing Environments.

[Paper]

### 2. SPARQ: Selective Progress-Aware Resource Querying

Anujith Muraleedharan, Anamika J H

CoRL 2025 Workshop on Resource-Rational Robot Learning [Paper]

3. **Accessibility Analysis of Educational Websites using WCAG 2.0**  
Utkarsha Singh, Jeevithashree Divya Venkatesh, **Anujith Muraleedharan**, Anamika J H, KamalPreet Singh Saluja, Pradipta Biswas  
*ACM Digital Government: Research and Practice* [[Paper](#)]
4. **Eye-Gaze-Enabled Assistive Robotic Stamp Printing System for Individuals with Severe Speech and Motor Impairment**  
**Anujith Muraleedharan**, Anamika J H, Himanshu Vishwakarma, Kudrat Kashyap, Pradipta Biswas  
*ACM Conference on Intelligent User Interfaces (ACM IUI) 2024*  
[[Project Page](#)] [[Paper](#)]
5. **Developing a Computer Vision based system for Autonomous taxiing of Aircraft**  
Prashant Gaikwad, Abhishek Mukhopadhyay, **Anujith Muraleedharan**, Mukund Mitra, Pradipta Biswas  
*AVIATION Journal Vol 27 No 4 (2023)*  
[[Project Page](#)] [[Paper](#)]

## PROJECTS

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- Vision-Enabled and Natural Language Control for Mobile Robots** [[Website](#)] January 2025
- Built the language-to-action pipeline for interpreting natural-language commands into structured robot actions, enabling real-time control over motion and navigation tasks.
  - Implemented fuzzy and semantic destination mapping with sentence-transformer embeddings, integrating LLM-driven instructions with ROS for simulation and real-world execution.
- Get-3D** [[Website](#)] October 2024
- Implemented a real-time 2D-to-3D video conversion system with depth-based object segmentation and adaptive thresholding to enhance rendering accuracy and dynamic visual effects.
- Interactive 3D Holographic Display** [[Website](#)] June 2022  
*Undergraduate Thesis*
- Designed a 3D holographic projection system using the Pepper's Ghost technique with gesture-based interaction, integrating Raspberry Pi, Leap Motion, and OMNI Haptic for advanced 3D object manipulation.
- Autonomous Racing: MPC vs. LQR** [[Website](#)] December 2020  
*Undergraduate Minor Project*
- Developed and simulated a Model Predictive Control (MPC) algorithm for real-time vehicle trajectory tracking using linear model approximations, optimizing state and control variables within PyBullet.

## AWARDS

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- Division of Mechanical Sciences Research Symposium** [[Certificate](#)] May 2024  
*IISc Bangalore*
- Participated in the 3-minute Research Video Contest and got shortlisted among the top 5 out of 28 teams.
- Technoxian World Robotics Championship** [[Certificate](#)] July 2023  
*AICRA*
- Participated in innovation contest in which around 150 teams participated.
- Graduate Aptitude Test in Engineering (GATE)** [[Scorecard](#)] February 2023  
*IIT Kanpur*
- Secured admissions to M.Tech. Programme in IISc Bangalore, IIT Madras, IIT Bombay and IIT Kharagpur.

## PROGRAMMING SKILLS

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**Subjects of Interest:** Reinforcement Learning, Control, Robotic Vision, Machine Learning

**Languages:** Python, C/C++, C#, JavaScript, SQL

**Tools:** MATLAB, Fusion 360, GIT, Unity, Motive

**Frameworks:** ROS, TensorFlow, PyTorch, PyBullet

## **SERVICE**

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### **Prominence**

*Chief Organizer*

January 2021

*Department TechFest*

- Organized a competition on fastest line follower robot with a total participation of 10 teams.
- Conducted a seminar on Solar Electric Propulsion.
- Organized a workshop on Advanced Driver Assistance Systems (ADAS).

### **Intelligent User Interfaces (ACM IUI)**

*Reviewer*

December 2024

*Conference*

- Reviewer for the Posters and Demos track of ACM IUI 2025.