Anujith Muraleedharan

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EDUCATION

Rajiv Gandhi Institute of Technology **August 2018 – August 2022**
Bachelor of Technology in Electronics and Communication Engineering GPA: 8.16/10 *Kottayam, India*

Amrita Vidyalayam **April 2014 – March 2017**
Class XII AISSCE, CBSE; 85% ; Class X AISSE, CBSE; 9.8/10.0 *Pandalam, India*

RESEARCH EXPERIENCE

Indian Institute of Science **August 2023 – Present**
I3D LAB, Research Associate Guided by ***Prof. Pradipta Biswas*** *Bangalore, India*

- Co-authored a journal paper focusing on a computer vision-based autonomous aircraft taxiing system.
- Served as lead author on a short paper on the rehabilitation of individuals with Severe Speech and Motor Impairments (SSMI).
- Involved in an ISRO-funded project focused on developing a Mixed Reality (MR) environment using Unity customized for the astronaut cockpit, aligning with preparations for the upcoming Gaganyaan mission.
- Developed a novel computer vision algorithm for localizing stamp locations and devised a segmentation model for hand and forearm identification, enhancing precision in robotic interactions for Eye-gaze controlled robots, prioritizing safety inspired by Asimov's Laws.

Rajiv Gandhi Institute of Technology **Jan 2021 – June 2022**
CASP LAB, Undergraduate Research Assistant Guided by ***Prof. Manju Manuel*** *Kottayam, India*

- Assisted in the FPGA implementation research focused on a Convolutional Neural Network (CNN) accelerator using a modified Booth multiplier and Wallace tree adder on the UniWiG architecture.
- Conducted comprehensive literature review and comparative analysis of existing FPGA implementations
- Developed a functional prototype of a 3D hologram with gesture controller using Raspberry Pi 4, employing unique algorithms with OpenCV and MediaPipe.
- Explored optimization techniques for the Pepper's Ghost phenomenon, including acrylic sheet tilt angle and thickness variation, to enhance image quality

PUBLICATIONS

Eye-Gaze-Enabled Assistive Robotic Stamp Printing System for Individuals with SSMI **March 2024**

[https://drive.google.com/file/d/1M8BGHj2CGJxLX8PAPL79frMIxsQu2T2A/view?usp=drive_link]

- Developed the User Interface to facilitate user interaction and control over the robotic system
- Utilized MATLAB for conducting simulations to validate system behavior and performance.
- Executed inverse kinematics calculations to ensure precise positioning of the manipulator and found homogeneous transformation matrix for accurate spatial mapping.

Developing a computer vision based system for autonomous taxiing of aircraft **December 2023**

[https://doi.org/10.3846/aviation.2023.20588]

- Developed state space kinematic model for the robot and formulated an algorithm for sensor fusion.
- Integrated proximity sensors with object detection models to enhance the robot's perception capabilities.
- Designed and assessed the performance of four controllers (LQR, PD, Stanley, SMC) to identify the most effective one for precise trajectory tracking.

TEACHING EXPERIENCE

Undergraduate Course Assistant, RIT Kottayam **August 2020 – May 2021**
Introduction to Electronics Engineering ***BE10104*** *Kottayam, India*

- Diodes (intrinsic and extrinsic semiconductors), PN junction diodes, and their characteristics.
- BJT structure, operation principles, configurations (common base, common emitter), input/output characteristics, biasing techniques, and amplifier applications.
- Discussed diode circuits (series/parallel), rectifiers (half-wave/full-wave), voltage multipliers, clipper/clamper circuits, and power supply design including capacitor filters and zener voltage regulators.
- Conducted first Internal examinations and evaluated assignments

PROFESSIONAL EXPERIENCE

NSS Indian Institute of Technology, Roorkee **July - August 2023**

Industrial Training *Remote*

- Completed 6 Weeks (60 hours) Industrial Training on Machine Learning and Artificial Intelligence.

AWARDS

Technoxian World Robotics Championship **July 2023**

AICRA

- Participated in innovation contest in which around 150 teams participated
- Selected for presentation at Noida NCR, India

Graduate Aptitude Test in Engineering (GATE) **February 2023**

IIT Kanpur

- Achieved an overall rank within the top 1.58 percentile among 70,361 candidates registered in the Electronics and Communication Engineering stream.
- Provisionally selected for M.Tech. Programme after written Test and Interview on offline mode under (RA/RAP) category
- Offered admission to M.Tech. Programme in IIT Madras and IIT Kharagpur

PROGRAMMING SKILLS

Languages: Python, C/C++, C#, JavaScript, SQL
Tools: VS Code, Sublime Text Editor, CATIA V5, ROS, ROS-2, AutoDesk, RoboGuide, Fusion 360, Ansys, GIT, Unity
Frameworks: Linux, TensorFlow, PyTorch, OpenCV, NumPY

SERVICE

Prominence **January 2021**

Chief Organizer *Department TechFest*

- Organized a competition on fastest line follower robot with a total participation of 10 teams. The objective of the robot is to efficiently navigate through a predefined course by detecting and tracking a black line.
- Conducted a seminar on Solar Electric Propulsion
- Conducted a workshop on Advanced Driver Assistance Systems (ADAS)