




Rakhul Kumar B

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Summary

I am an Electronics and Instrumentation Engineering undergrad at Anna University, MIT Campus. My interests span a broad cross-section of areas such as Embedded Systems, IoT, Artificial Intelligence, Machine Learning, PCB Design, Physics, Music, and Debate. I immensely believe in the complementary nature of these diverse areas. I'm highly motivated and constantly on the lookout for opportunities to improve.

Education

Madras Institute of Technology, Anna University

B.E in Electronics and Instrumentation

- CGPA: 9.18 (up to 5th Semester)

Aug 2019 - Present

Chennai, Tamil Nadu

Maharishi Vidya Mandir Senior Secondary School

Grade 11 and 12, Major in Computer Science

Jun 2017 - Mar 2019

Chennai, Tamil Nadu

- C.B.S.E: 93.8% in All India Senior School Certificate Examination 2019

Intern Experience

Indian Institute of Technology, Madras

Research Intern

Mar 2022 – Present

Chennai, Tamil Nadu

- **Designed** a Velostat and FSR based smart boxing shoe for analyzing the footwork of a boxer during a bout.
- **Embedded** a microcontroller chip inside the insole which could connect to any mobile device and transfer data using Bluetooth communication protocols
- **Programmed** an Android application which can connect to the shoe and download EEPROM data. The application can display the player's performance statistics and present a video analysis of the foot.
- **Skills:** Product Designing, C++, Memory allocation and management, Embedded System Designing

Microleaf Software Technologies

Research & Development Associate

Aug 2021 – Oct 2021

Chennai, Tamil Nadu

- **Constructed** an IoT enabled Mobile Warehouse locker for a Singapore based supply chain management company
- **Developed** a dedicated user interface for it using QML and C++
- **Skills:** QML, C++, Raspberry Pi programming, Python, Arduino programming

IoTIoT.in

Intern - Embedded GUI Developer

Jun 2021 – Sep 2021

Remote

- **Designed** User Interfaces for Shunya OS (Embedded Linux)
- **Developed** a user interface for a **Point-of-Sale System** using QML and C++
- **Programmed** a dashboard UI for Power Consumption management
- **Skills:** Qt, QML, OpenCV, C++

YantroMitra Learning Technologies Pvt. Ltd

Intern - IoT and Robotics Engineer

May 2021 – Aug 2021

Remote

- **Assembled** an Arduino based Remote Controlled Car (Line Follower + Obstacle Avoider)
- **Skills:** Arduino programming, C++, functioning of basic hardware components

Projects

ANALYZING THE FOOTWORK OF A BOXER DURING A BOUT USING COMPUTER VISION TECHNIQUES Nov 2022- Jan 2023

- **Conducted** an extensive study on the different foot movements of a boxer during a bout and **developed** a computer vision algorithm to determine the foot placement/position to determine player engagements
- **Generated** a custom dataset, and applied transfer learning to an object detection model by removing classifiers and replacing a few layers of the Convolutional Neural Network

HOSPITAL RECORDS DATABASE MANAGEMENT SYSTEM

May 2022- Jun 2022

- **Created** a database management system using MySQL for managing hospital records such as patient records, doctor details, patient appointments, pharmacy details, departments and blog posts.
- **Designed** an interactive website using PHP, HTML and CSS as a frontend for the database.

MOVEMENT OF MOUSE CURSOR IN CONJUNCTION WITH LASER DOT Oct 2021 – Dec 2021

- **Worked** on making the mouse cursor of a computer to follow a laser point's mark using Image Processing and Convolutional Neural Networks.
- **Implemented** this using PyTorch, OpenCV, SciKit-image, RaspberryPi and PyAutoGUI

MODELLING OF A CONICAL TANK AND IMPLEMENTING A CONTROL SCHEME USING MATLAB AND SIMULINK Oct 2021 - Nov 2021

- **Modeled** a conical tank system in Simulink and **implemented** a suitable control scheme for the system to maintain the desired level
- **Computed** the Transfer Function and State Space Model analytically and verified the simulated results

AI HANDWRITTEN DIGIT CLASSIFICATION USING RASPBERRY PI

Apr 2021- Jun 2021

- **Trained** a Convolution Neural Network using MNIST dataset and PyTorch library for recognizing handwritten digits
- **Deployed** the CNN on a RaspberryPi 4 using SciKit-image, OpenCV and PiCamera.

Skills and Interests

Programming Languages: C++, Python, MATLAB, QML(Qt)

Software and Libraries: Proteus, Keil μ Vision, KiCAD, Simulink, Arduino, RaspberryPi , Xilinx ISE, and Microsoft Office packages

Soft Skills: Team building and Leadership, Time Management, Positive Attitude, and Critical Thinking

Interests: Music Composition, Financial Planning, Entrepreneurship

Languages: English, Tamil

Achievements and Certifications

- **All India Rank 1** in National Engineering Olympiad 4.0, Jul 2021.
- **Arduino Platform and C Programming** from University of California, Irvine
- **Interfacing with Arduino** from University of California, Irvine
- **The Raspberry Pi Platform and Python Programming for the Raspberry Pi** from University of California, Irvine
- **Artificial Intelligence and Machine Learning** from Entrepreneurship-Cell IIT Madras
- **Python Programming and Data Structures** from University of Michigan
- **Machine Learning in MATLAB** from Mathworks
- **Mathematics for Machine Learning: Linear Algebra** from University of London
- **Grade 1 Plectrum Guitar (Practical)** from Trinity College, London

Leadership Positions

MIT Robotics Association

Head of Marketing and Promotion

Nov 2022 - Present

Joint Secretary

Jun 2021 – Nov 2022

- **Established** the social media pages of the club and **orchestrated** marketing campaigns to create more user engagements by **mentoring** a team of 10 members

Youth Red Cross of MIT

General Secretary

Jul 2022 – Nov 2022

Event Coordinator

Jun 2021 – Jul 2022

- **Organized** weekly talk sessions on different topics related to healthcare for 300 members of the club.
- **Instrumental** in conducting the 7-day Annual YRC Camp 2022 based on the theme of Azadi Ka Amrit Mahotsav. Supervised the camp activities by conducting competitions to engage the volunteers
- **Planned** an orphanage visit for 80 members

MIT Quill, Literary Club of MIT

Head of Event Planning

Jul 2022 - Present

Senior Event-Planning In-charge

Jul 2021 – Jul 2022

Content Editor

Jul 2020 – Jul 2021

- **Publicized** the social media presence of the club by drafting and posting various articles in the club's official Instagram page
- **Supervised** a team of content writers and headed a column that focused on stories about people's experiences in uncommon situations
- **Organized** INITIUM 2.0, a 3-day intra college event for 150 students and Quillantine 3.0 for 3000 social media followers

Personality Development Association of MIT

Treasurer

Oct 2021 – Aug 2022

- **Allocated** funds for the club's yearly activities and **maintained** the club's financial books by keeping track of all the expenses

Instrumentation Department, Madras Institute of Technology

Student Representative

Dec 2019 – May 2022

Coordinated with faculty members and students, and acted as a prime official channel of communication between them and **ensured** that student's views on academic matters were heard by the faculty members of the department.