

SUSIM MUKUL ROY

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EDUCATION

Indian Institute of Technology, Jodhpur

4th Year Undergraduate, Dept. of CSE

December 2020 - Present

Overall CGPA: 8.73 (Till Sem-VI)

Garden High School, Kolkata

12th Standard

2020

Percentage : 96.8%

TECHNICAL STRENGTHS

Computer Languages

Python, C, C++, JAVA, VueJS, SQL

Open-Source Libraries

Sklearn, OpenCV, Pytorch, TensorFlow, Hugging Face,
NLTK, Scipy, ROS

Tools and Softwares

MATLAB, Gazebo, Moveit, RVIZ, NS-3, GIT

Platforms

Linux, Arduino, Raspberry Pi

Soft Skills

Leadership, Event Management, Public Speaking, Time Management

COURSEWORK

Pattern Recognition and Machine Learning - **A**

Deep Learning - **A**

Data Structures and Algorithms - **A-**

Dependable AI - **A**

EXPERIENCE

Visual Motion Analysis from Images and Videos(Under Dr.Li Cheng) May 2023 - Aug 2023

MITACS GRI'23

SGA Website

- Analyzing visual behaviors of articulated objects (human and animals) from video feed
- Multi-modality computer vision data collection, annotation, and analysis

RefMOS, IIT Guwahati (Under Dr.Santosh Kumar Vipparthi)

May 2022 - January 2023

AI Research Intern

- Worked on **video object instance segmentation** in which the videos were guided with **natural language** features using some advanced Deep-learning architectures like **DeepLab-V3**, encoder-decoder structures etc.

ABU-ROBOCON 2k22 (Under Dr.Jayant Mohanta & Dr.Anoop Jain) Nov 2021 - April 2022

Team Member (IIT Jodhpur)

Github Link

- Leading the team in the domain of **ROS** for making the Semi-Automated Shooter(R1) and Picker(R2) Robots, to perform on "**Lagori**" **Problem Statement**.
- Integrating AI with ROS for proper detection of disks to perform the necessary path planning of the Robots.

ASSISTANTSHIP

Teaching Assistant(Under Dr. Richa Singh)

Jan 2023-May 2023

IAB Lab

TA for the course Pattern Recognition and Machine Learning(CSL2050) at IIT Jodhpur.

PROJECTS

Adversarial Defence (Under Dr.Richa Singh and Dr.Mayank Vatsa)

Aug 2022 - Present

Undergraduate Research Project

- Reviewing literature and designing techniques for **black-box** adversarial defence mechanisms.

- Creating novel yet memory-efficient method to discriminate between noise and adversarial attacks.

Intensity Optimized CT Reconstruction (Under Dr. Michael Moeller) Aug 2023 - Present *AI Research Intern*

- Working on noise modelling for the **sinogram** generated from backward propagation algorithm for CT Images
- Working on suitable reconstruction technique for the noisy images (**Poisson/Gaussian**) for ULDCT.

Autonomous UAV-UGV Navigation (Inter-IIT 2k22) Feb 2022 *Core Contributor* [*Github Link*](#)

- Designed an algorithm to move an **UAV** on a mountainous terrain with no texture and thereby made a UGV follow its path to the destination.
- Used depth image to segment between road and terrain following which we used **OpenCV** to separate it into two classes and drew a line joining the midpoints of the road which the UAV follows as it moves ahead.
- Used **ROSBags** to record messages from UAV and scaled them down to prius messages for **UGV** movement.

Autonomous Drone Obstacle Avoidance (Robotics Society, Inter-IIT 2k21) Feb 2021 *Core Contributor* [*Github Link*](#)

- Helped design an algorithm of a drone to make it move through a world in Gazebo with obstacles in its path and finally land on an **Aruco Marker**.
- Converted **Pointcloud** data to **Laserscan** data and furthermore used this to detect obstacles and move the drone appropriately.
- Helped in proper detection of the **Aruco Marker** and land the drone.

AI-Assisted Human Decision Making through Analogy-Based Preference Learning (Under Dr. Manish Aggarwal) Aug 2021 - Jan 2022 *Research Project*

- Using the **Microsoft MSLR-WEB10K** dataset, I designed a pipeline for web document ranking using a custom improved model of **LambdaRank**.
- Applied **PCA** followed by a modified algorithm of LambdaRank where probabilistic values were assigned to be the relevance values of documents instead of assigning only 0s and 1s
- The new model gives a **better** ranked documents structure as judged by the **NDCG** metric.

ACHIEVEMENTS

MITACS Scholarship Awardee

- Awarded the MITACS GRI-2023 scholarship for on-site internship at **University of Alberta**
- Rewarded by SuperGEO AI for exceptional and meticulous work as part of the project.

InterIIT 2K21 and 2k22

- Secured **5th** and **8th** rank in **DRDO** problem statements in InterIIT 2021 and 2022 respectively with an overall rank **8** in InterIIT 2022.

Robocon 2022

- Our team secured **full marks(100/100)** in Stage-I

Batch Rank

- In Top **5** of a batch of **500** students and department rank **2** after Sem-VI at IITJ.

JEE Advanced

- Secured **AIR 3199** with ranking among the top 0.3 % among over 10 Lakh candidates

POSITIONS OF RESPONSIBILITY

Robotics Society, IIT Jodhpur Dec'21 - Feb'23 *Coordinator*

- Overall Management of society by organising sessions on ML, ROS, Mechanics of robots etc. along with leading the **ROS** department