

SKANDA AITHAL

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Education

Course	Institute	Score	Year
Bachelor of Technology	Indian Institute of Technology Kharagpur	CGPA: 8.96	2026
XII standard	Rashtrottana Vidya Kendra	97.8%	2022
X standard	Sandeepan English Medium School	98.88%	2020

Experience

Head, Technology Robotix Society, IIT Kharagpur

- Mentored 100+ students in a workshop on Autonomous Robotics, Computer Vision and Machine Learning verticals
- Conducted sessions on topics like Basic Electronics, Hough Transforms, Support Vector Machines and Neural Networks

Perception Team Member, Aerial Robotics Kharagpur

Supervisor: Prof. Somesh Kumar | Department of Mathematics

- Conducted a workshop and organized selection from a pool of **500+** students, including interviews and task design
- Participated in the first round of ICUAS competition, specifically, worked on path planning and trajectory generation
- Developed a controller for drone using gestures in Gazebo and a simple ball detector with the use of transfer learning

Controls Intern, ARTPark, IISc

Supervisor: Prof. Shishir Kolathaya | Department of Computer Science and Automation

- Developed a robust library in C++ to simulate single rigid body physics for **quadrupeds** achieving accurate results
- This serves as the reference model for quadruped controls achieved with the help of Model Predictive Controls (MPC)

Projects

Interpretable Communication in Multi-Agent Reinforcement Learning

Supervisor: Siddharth Nayak | PhD Scholar, Massachusetts Institute of Technology

- Developed a pipeline to process images through **VIT-GPT2** and **GTE** models generating **communication vectors**
- Optimized the pipeline by relocating it outside sampling, ensuring efficient memory usage in the **MAPPO** algorithm
- Future plans include using LLaVA for enhanced performance and conducting comparisons against a basic CNN baseline

Improving Formal Verification for IR in XLS

Supervisor: Prof. Aritra Hazra | Department of Computer Science and Engineering

- Implemented a modification to ensure function parameters are displayed in Z3 code during the conversion from IR to Z3
- Handled the assertion node appropriately during the conversion process from IR to Z3 to ensure accurate functionality

PPT Gesture Control

- Collaborated in a group of three to develop a Python program for gesture-controlled presentations, enhancing experience
- Implemented backend processing utilizing MediaPipe, hosted by the UWP framework, ensuring robustness and reliability
- Developed a Tkinter front end to input URLs for mobile camera feeds and initialize shoulder-to-height ratio parameters

Small scale projects

- Implemented Dijkstra's and A* algorithms on Kharagpur Map and RRT on a custom binary map, ensuring modularity
- Implemented **Behavioral Cloning**, **DAgger** and **Policy Gradients** as part of the assignments for the Deep RL course
- Realised **Markov's localization** on a given maze by utilizing local snapshots with the help of Python and OpenCV

Competitions

Tourist Arrival Prediction of Shimla Using Internet Search Index

- Implemented a **Neural Network** on monthly data from the Google Trends and the ground truth monthly tourists data
- Leveraged the above trained network on the weekly data from Google Trends to generate an approximate weekly data
- Applied TFT, LSTM, Prophet, and SARIMAX as baselines to thoroughly assess prediction performance on weekly data
- Enhanced TFT's effectiveness through feature engineering, achieving metrics: MAPE 0.11, MAE 0.08, and RMSE 0.18

Technical Skills

Languages: Python, C/C++, HTML/CSS, JavaScript, LaTeX

Technologies/Frameworks: TensorFlow, ROS, OpenCV, Arduino, NumPy, PyTorch, CMake

Relevant Coursework

University: Advanced Calculus, Programming and Data Structures, Mechanics, Analog Circuits, Network Theory, Probability and Statistics, Digital Electronics, Signals and Systems, Systems and Control, Linear Algebra and Optimization, Algorithms(Ongoing), Discrete Signal Processing(Ongoing)

Others: Machine learning Specialization, Deep Learning Specialization, Deep Reinforcement Learning (UC Berkeley CS285), Theory of Computation (MIT OCW)

Achievements

- Secured an All India Rank of **1751** in JEE Advanced 2022 out of **1,50,000+** candidates
- Secured an All India Rank of **840** in JEE Mains 2022 out of **8,00,000+** candidates