Aaryan Takayuki Panigrahi

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Experience

SAMSUNG RESEARCH INSTITUTE | PRISM Internship — May 2024 - Feb 2025 | Bengaluru

- Enhanced Samsung's proprietary 360° audio and video recording technology with generative AI in collaboration with industry experts. •Achieved a 70% accuracy in inpainting masked segments of speech.

INDIAN INSTITUTE OF SCIENCE | Robert Bosch Center for Cyber Physical Systems — June - July 2024 | Bengaluru

- Researched transformer-based models for visual robot navigation. Fine-tuned and deployed the NoMaD model on a quadruped robot with ROS2. •Developed a data collection pipeline for UMI-based exoskeleton and visualized it using ReRun.

PROJECT MANAS LAB | Artificial Intelligence Subsystem — May 2023 – Present | MIT, Manipal

- **IGVC 2024** (Intelligent Ground Vehicle Competition) - *Website*
  We ranked 1st internationally in the Design Challenge and 6th in AutoNav. •Researched Reinforcement Learning-based approaches for autonomous robot navigation, focusing on local motion planning.
- **SUAS 2024** Competition (Student Unmanned Aerial Systems) -
  •Worked on the development of an autonomous drone for aerial surveillance and mapping.
  •We ranked 4th in Mission Demonstration and 8th overall.
- Currently serving as Head of AI for the team — Aug 2024 - Present | MIT, Manipal

Projects

TRAFFIC SIGN GAN | PyTorch, LSGAN, Spectral Norm, CBN — *Code*

- Developed a Conditional LSGAN in PyTorch to synthesize diverse traffic signs across 43 classes from the imbalanced GTSRB dataset.
- Employed Spectral Normalization, Conditional Batch Norm, and Projection Discriminator techniques to enhance training stability and conditioning.

ACCELERATED DWT | CUDA, C++, OpenCV, DWT — *Code*

- Implemented CUDA-accelerated multi-level 2D DWT/IDWT, achieving a 14x performance speedup over a C++ CPU baseline on 4K images.
- Enabled real-time webcam video processing at 200 FPS using CUDA, significantly outperforming the 10 FPS CPU version.

ANTI-DERIVATIVES WITH OP-NET | Physics Informed ML — *Code*

- Implemented a neural network to estimate the anti-derivative of any quadratic function, and achieved a R^2 score of 0.99 on unseen data.

INTELLIGENT GOAL TRACKING AGENT | Reinforcement Learning — *Code*

- Deployed a DQN-based RL agent to learn to track and navigate to a goal in a 2D environment and compared the performance with a greedy agent.

REAL-TIME TENNIS BALL TRACKING | OpenCV — *Code*

- Devised a program to track a tennis ball in a video feed using several image manipulation techniques. •Implemented agglomerative clustering to rule out false positives and track the ball's trajectory.

GROUND PLANE SEGMENTATION | ROS, PCL — *Code*

- Developed a package to segment the ground plane from a point cloud using PCL. •Published segmented point clouds to ROS, and visualized them in Rviz.

CHATBOOK | JavaFX, SQL — *Code*

- A clutter-free chatting application that allows users to organize chats into profiles and folders.

Education

MIT, MANIPAL — 2022 - Present | Manipal

B. Tech in Computer Science
Specialization in AI & ML

- Current CGPA = 9.50, Rank 2^{nd}

CHETTINAD VIDYASHRAM

Schooling — 2017 - 2021 | Chennai

- 12^{th} - 96.6%
- 10^{th} - 95%

Coursework

B. TECH IN CSE (AI & ML)

- Artificial Neural Networks
- Machine Learning
- Big Data Analytics
- Computer Vision
- Object Oriented Programming
- Data Analysis and Visualization
- Data Structures and Algorithms

Interests

- Generative AI
- Computer Vision
- Large Language Models
- Physics Informed ML
- Robotics
- Reinforcement Learning