Apratim **Mukherjee**

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Education

Manipal Institute of Technology — *Manipal, KA*

Bachelor's in Computer Science and Engineering — *July. 2016 - Expected April. 2020*

- Relevant Coursework: Data Structures, Object Oriented Programming, Design and Analysis of Algorithms, Database Systems.

Research Experience

Project MANAS (www.projectmanas.in) — *Karnataka, India*

Head of Perception — *Feb. 2018 - Present*

- Responsible for the Perception subdivision under Artificial Intelligence.
- Overseeing the completion of a bot for the 26^{th} **Intelligent Ground Vehicle Competition** and a **self-driving car** for the Mahindra **$1Million Rise Prize** challenge.

Project MANAS — *Karnataka, India*

AI Division (Perception) Member — *Feb. 2017 - Jan. 2018*

- Worked on different tasks revolving around the perception of the car.
- Wrote different algorithms for tasks such as **Lane Detection**, **Speed bump Detection**, **Sensor and Data Fusion**, **Localization** etc. using **Image Processing** and **Deep Learning**.

Projects

Autonomous Bot for IGVC — *Completed*

Manipal Institute of Technology — *Jan. 2018 - Jun. 2018*

- Headed the perception team responsible for mapping out the environment around the bot.
- Different Computer Vision and Deep Learning approaches to achieve the most desirable results were used.
- Placed 9^{th} among 27 teams from across the globe and 2^{nd} in India.

Augmentation of Images for bettering Class-wise Accuracy for Deep Neural Networks — *Currently in literature review stage*

Manipal Institute of Technology — *Feb. 2018 - Present*

- Writing a **research paper** under Dr. Ashalatha Nayak.
- Research revolves around a novel method of **augmentation** and studying its effects on the performance of **Deep Neural Networks**.

Self-Driving Car for the Mahindra Rise Prize Challenge — *Work in Progress*

Manipal Institute of Technology — *Feb. 2017 - Present*

- Currently working on getting the car to level 3-4 autonomy.
- Responsible for the handling the data through a lidar and stereoscopic camera.
- Successfully implemented **Lane Detection, Speed Bump Detection, Data Fusion** amongst other things from things from scratch.
- Continuously involved in other tasks of **Traffic Light and Sign Detection** as well as Localization.

InterFace — *Continuous Updates*

Manipal Institute of Technology — *Feb. 2018 - Feb. 2018*

- Created an interface that lets the user control any web page through a **series of gestures** along with **eye tracking**.
- Used Computer Vision algorithms along with Machine Learning for gesture recognition and eye tracking with an integration through **Flask** and **Node.JS**.

NumJ — *Completed*

Manipal Institute of Technology — *Oct. 2017 - Nov. 2017*

- Attempted to build a **NumPy counterpart** for Java to ease the flow of weights through a neural network.
- Were successful in integrating most of the **matrix operations** required for the **propagation of weights in a neural network**.
- The library was completely **multi-threaded** while we looked for better ways i.e **executors**.

Java Deep Learning Library (JDL) — *Completed*

Manipal Institute of Technology — *Oct. 2017 - Nov. 2017*

- Built a **Deep Learning Library** from ground up in Java.
- All the operations on the weights were handled by **NumJ**.
- Were successful in creating a neural network for the **classification** of handwritten digits (**MNIST** dataset) using **JDL** with an accuracy of **95%**.

Skills

Programming	C++, Python, Java, C, Matlab, GNU Octave, SQL
Libraries & Tools	NumPy, Pandas, OpenCV, imgaug, ROS, Scikit-Learn, Matplotlib, Keras, Tensorflow, PyTorch, TFLearn
Experienced in	Artificial Intelligence, Deep Learning, Computer Vision, Machine Learning, Image Processing

Extracurriculars

- One of the **13** out of **153** teams remaining for the **Rise Prize Challenge**.
- Finalists for the **Philips Hackathon 2017**.
- **Deep Learning Specialization** by **deeplearning.ai** (https://www.coursera.org/account/accomplishments/specialization/7G 4YBF-SJTVUH)
- **Mathematics for Machine Learning** by **Imperial College London** (https://www.coursera.org/account/accomplishments/specialization/LQ2LXKEHN34E)
- **Bayesian Statistics : From Concept to Data Analysis** by **UC Santa Cruz** (https://www.coursera.org/account/accomplishments/verify/YH87Z4GUW5WB)
- **Parallel Programming in Java** by **Rice University** (https://www.coursera.org/account/accomplishments/verify/WW8G3EYT5G59)
- **Concurrent Programming in Java** by **Rice University** (https://www.coursera.org/account/accomplishments/verify/ZDTM7JPTYCGL)
- Represented my high school at state level basketball tournaments; passionately follow and play both basketball and football.
- Lover of all music, guitarist/vocalist in my college band.