Mohit Kulkarni

Sophomore Undergraduate
Department of Mathematics and Statistics
Indian Institute of Technology, Kanpur

mohitmk@iitk.ac.in
m2kulkarni | m2kulkarni
m2kulkarni.github.io
+91-9405602576

Educational Qualifications

Year	Degree	Institution(Board)	CGPA/%
July'19 – June'23 (expected)	B.S., Mathematics	Indian Institute of Technology, Kanpur	8.3/10.0
2019	SSC – XII	Vidyadham Junior, Aurangabad	87.8%
2017	ICSE – X	Podar International School, Aurangabad	95.6%

Interests

Open Source, Computational Neuroscience, Robotics, Image Processing, Machine Learning, AGI

Skills

Prog. Language: C, C++, Python, Java, Bash
Web: HTML, CSS, JavaScript, Jekyll
Utilities: OpenCV, ROS, Brian2, PyTorch, Tensorflow, Gazebo, Makefile, Git, MATLAB, LaTeX

Achievements

- AIR 615, JEE Advanced - 2019, amongst 200,000 candidates
- AIR 637, JEE Main - 2019, amongst 1.2 million candidates
- Awarded INSPIRE scholarship by Department of Science and Technology, Government of India,
- Selected for the National Undergraduate Program at Chennai Mathematical Institute,

Positions of Responsibility

Robotics Club, IIT Kanpur
Secretary April'20 - Present
- Part of team responsible to suggest and execute ideas to increase participation in robotics related activities.
- Worked along side 25 people to develop curriculum for a Robotics Summer Camp.
- Conducted lectures on Raspberry Pi, NodeMCU and on Sensors and Actuators in Robotics.

National Service Scheme
Student Volunteer August'19 - May'20
- Taught Computer and Digital Literacy to Underprivileged students in rural parts of India

Camps and Workshops

Neuromatch Academy 2020
An online school for Computational Neuroscience July'20
- A 15 day 15 topics intensive workshop where we were introduced to various methods and principles in Computational Neuroscience.
- Worked alongside 7 participants and a TA from various domains of science.

Vijyoshi Camp 2019
IISER, Kolkata Dec'19
- Selected for the National Science Camp funded by the Department of Science and Technology, India
- Interacted with Leading Researchers from various fields of science.

Projects

The Omniglot Project Github
Brain and Cognitive Society, IIT Kanpur May'20 - July'20
- This project was aimed at understanding and solving the problem of one-shot learning.
- Implemented SOTA meta-learning models to solve one-shot classification and generative problem.
- Used architectures like GANs, VAEs, LSTMs and bayesian statistics to develop models in PyTorch.

Autonomous Humanoid(AUTOMI) Github
Team Humanoid, IIT Kanpur Sep'19 - Present
- Involved in the development of a complete, highly optimised software stack for AUTOMI.
- AUTOMI v1 is designed for autonomous navigation in a static environment using techniques like depth estimation, SLAM, object recognition, avoidance, lane detection etc.
- The software stack is based on ROS, with image processing using OpenCV.

DumE Github
Robotics Club, IIT Kanpur May'20 - July'20
- The aim was to create a Robotic arm that mimicks human arm, particularly useful in high precision environments.
- The simulation was based on ROS and Gazebo, with arm detection using custom joint detection algorithms.
- Secured the Best Innovation Award from amongst 50 summer projects under Science and Technology Council, IITK .

Following Sub-Population Signals Github
Mentor: Prof. James Murray, University of Oregon July'20
- The goal was to reveal more insights about the connection between different brain areas and how the sub-populations communicate, like order of firing of specific neuronal type, and the correlation between order of firing between different brain regions.
- This analysis was performed on Steinmetz dataset, as a part of Neuromatch Academy 2020.
- Techniques such as Granger Causality, PCA, dPCA, Markov Models were used.

PETcat Github
Robotics Club, IIT Kanpur April'20 - Present
- Aimed at developing a biologically inspired robotic cat.
- Simultaneous Localization and Planning Algorithms like orb-SLAM, gmapping, roVIO were implemented and benchmarked.
- Currently involved in optimization of software stack using storage optimization, multi-threading etc.

Relevant Courses

Introduction to Programming
Introduction to Electronics[1]
Linear Algebra and ODE
Sequence Models*
Real Analysis
Set Theory and Mathematical Logic[1]
Classical Mechanics
Introduction to Tensorflow*
Foundations of Cognitive Science[1]
Algorithmic toolbox*
Neural Networks and Deep Learning*
Convolutional Neural Networks*

([1]): Ongoing Courses (*): Coursera online course