



Rishabh Ramteke
Electrical Engineering
Indian Institute of Technology Bombay

170070046
UG Final Year
Male
DOB: 07/06/99

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	7.91
Intermediate/+2	Andhra Pradesh Board of Secondary Education	Sri Chaitanya Jr. College	2017	98.20
Matriculation	CBSE	Dr. KKR' Gowtham Int School	2015	10.00

Awarded **Undergraduate Research Award** (URA 01) for indigenous MRI contribution (2019)

Publications

Improving Single and Multi-View Blockmodelling by Algebraic Simplification

Rishabh Ramteke, Peter Stuckey, Jeffrey Chan, Kotagiri Rao, James Bailey, Christopher Leckie
International Joint Conference on Neural Networks (IJCNN) 2020 IEEE WCCI, Glasgow (UK)

- Extended Blockmodelling to incorporate multiple sources of information including multiple edges and node features which improved on the state of the art for various real datasets
- Devised new, efficient approaches to perform **pareto based optimisation** based on idea of homophily, that can find groups of nodes that are highly similar in connections and/or attributes
- Conducted experiments to benchmark performance of various architectures against previous work

Internship Experience

Practical Transfer Learning for Intelligent Robot Programming

Summer 2020

Guide : Prof. David Touretzky | Computer Science Department | **Carnegie Mellon University**

- Employed transfer learning to allow a mobile robot with a low-resolution camera for object recognition from a small number of samples and guide users to construct effective training sets
- Utilized extensive set of transformations to allow reasonable recognition rates for 2D patterns
- Studied the minimal set and type of training samples necessary to achieve good performance on a highly varied test set with various orientations/viewing angles

Clustering white-matter fiber tracts of diffusion MRI

Winter 2019

Guide: Prof. Ramamohanarao Kotagiri | Dept. of Information Technology | University of Melbourne

- Devised a novel algorithm for clustering white-matter fiber tracts of diffusion-weighted MRI to generate realistic fiber models for the human brain
- This algorithm outperformed previous state of the art method and is computationally efficient
- Improved the gray-matter region connectivity of the fiber trajectories, which were initially disconnected when estimated from tractography and were discarded in brain connectivity analysis

Technical Activities

Attention based Graph CNN for scene classification

Spring 2019

Guide: Prof. Biplab Banerjee | Dept. of Resource Engineering | IIT Bombay

- Classified region adjacency graph representation of images by **spatial graph convolution** networks
- Implemented Attention model in TensorFlow for **better classwise region highlights**
- Obtained **state of the art** results in scene recognition for several aerial datasets

Unsupervised Domain Adaptation with GAN

Autumn 2019

Guide: Prof. Biplab Banerjee | Dept. of Resource Engineering | IIT Bombay

- Implemented the research paper **Unsupervised Pixel-Level Domain Adaptation with Generative Adversarial Networks** on PyTorch
- The proposed method adapts source-domain images to appear as if drawn from the target domain by learning a transformation in pixel space from one domain to other based on GANs
- Outpaced the proposed method's performance by replacing the proposed PixelDA GAN with LS-GAN

Accent recognition | Course Project

Autumn 2019

Guide: Prof. Preeti Jyoti | Dept. of Computer Science | IIT Bombay

- Extracted and refined the Long and Short Term features from the audio data using PCA and HLDA
- Improved the Accent classification by combining phonetic vowels with acoustic features and trained the model using a combination of Deep Neural Networks and Recurrent Neural Networks

Image Reconstruction with MRI technology

Spring 2019

Guide: Prof. V.M.Gadre | Scan Era | Ministry of Communication & Information Technology, India

- Awarded the **Undergraduate Research Award** for this notable contribution
- Implemented a modified version of GRAPPA algorithm on SDK for image reconstruction with parallel MRI technology which would be used in the indigenous state-of-art MRI Machines
- Simulated the algorithm on MATLAB and then implemented it on **Xilinx Zynq-7000 FPGA board**

International Aerial Robotics Competition | AUVSI foundation

Sept 2018 - Jan 2019

Unmesh Mashruwala Innovation Cell | IIT Bombay

- Contributed to control and hardware design of autonomous quadcopters in a **GPS-denied** environment
- Implemented communication between on-board processor Intel i5 NUC, offboard computer and **Pixhawk** for transfer of localization and IMU data using MAVLink communication protocol on ROS
- Utilized **LIDAR** sensors and **Stereo Vision** camera to maintain the current position of the quadcopter
- Investigated optimum PID parameters which enhanced flight stability and performance

Neural Style Transfer

Spring 2019

Guide: Prof. Biplab Banerjee | Dept. of Resource Engineering | IIT Bombay

- Implemented the research paper "**A Neural Algorithm of Artistic Style**" using TensorFlow for **texture transfer** algorithm, that constrains a texture synthesis method by feature representations
- Utilized Deep convolutional generative adversarial networks with **Wasserstein loss** to generate images

Autonomous Sign Following Bot

Summer 2018

Institute Technical Summer Project | IIT Bombay

- Engineered an autonomous car using **Raspberry Pi** and ultrasonic sensors which can read sign boards using **Image Processing** techniques and navigate with the help of these signs
- Trained a model using TensorFlow to perform **multi-class** classification of sign board images

Technical Skills

Programming	C++, C, MATLAB, R, Python, JavaScript, Robot Operating System
ML Libraries	TensorFlow, Pytorch, TensorBoard
Other Softwares	AutoCad, SolidWorks, Arduino, Unity 3D, Spice, L ^A T _E X, Adobe Premiere Pro

Positions of Responsibility

Coordinator | Events | TechFest, IIT Bombay

May 2018 - December 2018

Asia's Largest College Technical Festival | 1,75,000+ footfall

- Lead a team of **10+** to organise and monitor International exhibitions, showcasing **30+** world class innovations to more than **60,000** people from all over India
- Assisted in 'SPEAK: Stand to Express', an initiative to promote Mental Wellness in over 8 states through a network of **50+** colleges targeting **7000+** college students

Key Courses Undertaken

Computer Science	Data Structures and Algorithm, Machine Learning, Image Processing*. Automatic Speech Recognition, Medical Imaging Physics*, Cryptography*
Mathematics	Data Analysis & Interpretation, Probability & Random Processes, Calculus
Electrical Engineering	Markov Chain and Queuing Theory, Information Theory & Coding, Signal Processing, Communication, Control Systems, Microprocessors

* to be completed by November 2020

Extracurriculars

- Completed A1 level **Spanish & German** courses organized by Cultural Council, IIT Bombay (2017)
- Secured **Top 5** position in Segreta 2018, a tech cryptic hunt conducted by Techfest, IIT Bombay
- Instructed two teams of four each to successfully complete a **Bluetooth Controlled Bot**
- Completed a year long rigorous training in **Lawn Tennis** under National Sports Organization
- Awarded certificate of achievement for Successfully **Skydiving** over Melbourne
- Mentored a group of students for **Machine Learning** as a part of summer of science program
- Part of the **gold** winning hostel team in inter hostel sophomore cross country run GC
- Volunteered in the **World's largest** beach cleanup campaign at Versova by Afroz Shah