Akansha Mukherjee

a.mukherjee-11@student.tudelft.nl | akansha2001 | akansha-mukherjee | akansha2001

Education

Delft University of Technology — *Delft, the Netherlands*

1st year, Master Robotics — *Sept. 2023 - Present*

- Expected graduation date: August 2025
- Relevant courses taken include Robot Software Practicals, Machine Learning for Robotics, Robot Dynamics and Control, Machine Perception, Planning and Decision Making, Human Robot Interaction.
- Relevant ongoing courses include Intelligent Control Systems, Deep Learning, Robot and Society, Ready to Startup, Seminar Computer Vision by Deep Learning, Introduction to Engineering Research, Engineering Optimisation: Concepts and Applications.

Jadavpur University — *Kolkata, India*

Bachelor in Electronics and Telecommunication Engineering — *Aug. 2019 - Aug. 2023*

- Cumulative GPA of 9.79/10.
- Relevant courses taken include Mathematics I, II and III, Basic Electrical Engineering, Computer Programming and Numerical Methods, Data Structures and Algorithms (in C), Computer Organisation and Architecture, Control Engineering, Pattern Recognition, Artificial Intelligence, System Software Lab, Digital Signal Processing, Digital Image Processing.

Profile

2019-Present	**Communication and Coordination**, Worked well in Bachelors and Masters group assignments. Took charge when needed, assigned roles and made submissions well within the deadlines.	*Kolkata, Delft*
2019-Present	**Time management**, Has never missed a deadline for course work or internship projects.	*Kolkata, Delft*
2019-Present	**Quality of Work**, The quality of outputs has never suffered even when dealing with multiple tasks at the same time.	*Kolkata, Delft*

Experience

AI Lab, Jadavpur University — *Kolkata, India*

Research Scholar under Prof. Amit Konar — *Nov. 2021 - Aug. 2023*

- Problem statement 1: To develop a simple algorithm to address the open-set recognition problem.
- Work: Implemented a feature selection algorithm for detection of examples in test set that do not belong to the ”known” classes that the model has been trained on.
- Features: The algorithm offers the advantages of simplicity and enhanced computational efficiency owing to parallelisation of operations using matrix shifting and concatenation properties.
- Results: Obtained F1 score of 0.068 for speech data (comparable to state-of-the-art approaches).
- Problem Statement 2: To develop a novel clustering approach for unlabeled data using statistical parameters of the distribution (range).
- Status: Fine-tuning the initial implementation of the algorithm to enhance scalability.

SISIR Radar Pvt. Ltd. — *Kolkata, India*

Research Intern under Mr. Tapan Mishra retired director of ISRO — *May - Jul. 2022, Jan. - Mar. 2023*

- Problem Statement 1: To implement real-time SAR image despeckling algorithms.
- Approach 1: Implemented Simulated Annealing-based Speckle Filtering for SAR images.
- Additional work: Implemented random number generators and random choice functions.
- Features: Over 10x speed-up using vectorisation to parallelise standard deviation computations.
- Results: Estimated Number of Looks (ENL) enhancement: 6.7 to 42.4 for 10 iterations.
- Approach 2: Implemented novel selective median-based SAR image Depeckling Algorithm with faster convergence for real-time image processing.
- Results: Despeckled image quality was comparable to Simulated Annealing despeckling for 1 iteration.
- Problem Statement 2: To implement Block Adaptive Quantisation (2 to 6 bits) for on-board data compression.
- Results: Obtained satisfactory results for data compression and reconstruction.
- Problem Statement 3: To develop motor-control code for a path-tracking cart (for ground penetrating radar).
- Results: Smooth motion of cart was implemented using a 4-wheel drive mechanism and stepper motors for linear motion and turning. Zero-radius and finite-radius turning on rough surfaces was observed.

CSRE, IIT Bombay *Mumbai, India*

Research Intern under Prof. Biplab Banerjee *Nov. 2021 - Feb. 2022*

- Problem Statement: To develop a regulariser for spatially correlated data that is a tradeoff between traditional approaches (dropout and dropblock).
- Work: Implemented a novel regularization technique "Dilated Dropblock" (DDB) for deeply supervised U-Net for Single Image Super Resolution.
- Results: Obtained improvement in image quality (PSNR, SSIM) for Deeply Supervised U-Net with DDB regulariser compared to state-of-the-art approaches.

VIPLAB, IIT Kharagpur *Kharagpur, India*

Summer (2021) Research Intern under Prof. Jayanta Mukhopadhyay *May - Jul. 2021*

- Problem Statement: To develop an unsupervised classification algorithm using the similarity of gradients for training examples belonging to the same class and using these classification pseudo-labels to synthetically balance skewed datasets.
- Work: Developed the software implementation for Unsupervised Data Augmentation to Generate Balanced training sets.
- Results: Obtained improved testing NMI (0.81) for the balanced dataset, as opposed to skewed binary dataset (0.78) for Wisconsin Breast Cancer Dataset.

Open Online Courses

Machine Learning *Coursera*

Completed the course with 100% grade *Apr. 2020 - Present*

- Decision Trees, Artificial Neural Network, Logistic Regression, Linear Regression.
- Regularisation to Avoid Overfitting, Gradient Descent, Supervised Learning, Logistic Regression for Classification.

Deep Learning Specialization *Coursera*

Completed the course with 100% grade *May. 2020 - Present*

- Neural Networks, Deeplearning, CNNs.
- Hyperparameter tuning, regularisation and optimisation techniques.

AI for Medical Diagnosis *Coursera*

Completed the course with 100% grade *Aug. 2020 - Present*

- Image segmentation, model evaluation and multi-class classification for diagnosis of diseases.

AI for Medical Prognosis *Coursera*

Completed the course with 100% grade *Aug. 2020 - Present*

- Application of tree-based models to predict patient survival rates.

Technical Skills

Programming Languages	Java, C, C++, ROS, Python, MATLAB, Octave.
Python Frameworks and Libraries	Pytorch , Tensorflow, Pandas, NumPy.
Others	LaTex, Multisim, Raspberry Pi.

Languages Spoken

English	Fluent.
Bengali	Proficient.
Hindi	Proficient.

Hobbies and Extra-curricular Activities

Running	Loves to run. Participates in at least one 10K a year.
Badminton	Frequently competed in mixed-doubles competitions during Bachelors.
Football and Futsal	Plays for leisure and competitively. Part of FC Tutor Vrouen, TU Delft.