Pragati Meshram | CV

+91-9833957147 • pragatimeshram2206@gmail.com

Education

Indian Institute of Technology (IIT) Bombay, India [Jul'17-Jun'22]
Masters of Technology in Communication and Signal Processing, Electrical Engineering
Bachelor of Technology in Electrical Engineering
Cumulative Performance Index (CPI): 8.29/10.00

Interests

Computer Vision, Deep Learning, Machine Learning

Work Experience

Software Engineer | Uber Technologies Inc [Aug'22-Present]
- Working as an iOS front-end developer in Micromobility team
- Contributed in various project like, tembici-vendor integration trip attribution, mimo-receipt, unification of station and vehicle tap flow.

Publications

Multi-Source Open-set Deep Adversarial Domain Adaptation | ECCV [Nov'19-Mar'20]
- Researched in domain adaptation to classify target domain images using source domain knowledge
- Proposed a novel learning paradigm to accommodate multiple source domains for domain alignment
- Followed adversarial learning strategy to discriminate between target-domain and unknown classes
- Achieved a significantly better results while comparing MOSDANET with previous architectures

Sample Specific Generalised Cross Entropy for Robust Histology Image Classification | ISBI [Jul'20-Nov'20]
- Trained a model robust to input and label noise for computational pathology disease classification
- Bootstrapped the loss function in order to be aware of the difficulties of classifying individual samples
- Validated our approach by comparing against the models trained using other loss functions
- Achieved better results with proposed loss than cross entropy and GCE loss on Breast Cancer dataset

Internships

Face Pose Synthesis | AWL Inc. Japan | Mentor - Sridhar Babu [Jul'20-Aug'20]
- Received recommendation letter by Sridhar Babu for commendable performance during internship
- Solved the problem of inadequate training data for robust recognition of mask wearing facial images
- Researched methods for Facial Landmark detection, Face Rotation mask wearing face image generation
- Designed a pipeline for multi view image generation for both mask and non mask data
- Developed a system for face pose synthesis using advanced generative adversarial networks

Packet Routing | Aalborg University Denmark | Prof. Beatriz Soret [Apr'20-Jul'20]
- Received recommendation letter by Prof. Beatriz Soret for commendable performance during internship
- Simulated packet routing in Satellite constellation using Q-Learning and Dijkstra Algorithm
- Modelled the arrival of packets to follow a poisson process and introduced Buffering in the model
- Analyzed and compared the results based on route complexity , end-to-end packet latency, average delay

Dual Degree Project | AWL japan | Prof. Subhasis Chaudhari [Feb'22-May'22]
- Researched the methods for detecting the Out-of-Distribution samples
- Compared three methods, ODIN, Mahalanobis Distance (MD) and Relative Mahalanobis Distance (RMD)

to detect the accuracy reduction on the digit dataset
- Designed the approximate algorithm to alert the system if model does not work nicely (according to customer's need) on the test dataset

Dual Degree Project | Mercedes-Benz R&D India | Prof. Subhasis Chaudhari [July'21-Sep'21]
- Worked on a task of Domain Adaptation for Action Recognition in presence of insufficient source data
- Implemented a code for paper 'Few-shot Action Recognition with Prototype-centered Attentive Learning' and evaluated on HMDB51 and UCF101 dataset
- Followed the similar method to enrich the source video domain for the benefit of target video domain

Key Projects

Open-set modality distillation | Prof. Biplab Banerjee [Jan'21-May'21]
- Dealt with the problem of modality distillation in the absence of bands for the purpose of remote sensing (RS) image classification by exploring the deep generative models
- Proposed an adversarial training capable of learning discriminative feature representation

Pixel-wise segmentation of right ventricle of heart | Prof. Amit Sethi [Oct'20-Nov'20]
- Performed binary segmentation on heart MRI to detect the right ventricle contour for medical diagnosis
- Achieved the Dice score of 0.85 by comparison of various training losses, architecture & hyperparameter

Understanding Deep Network's Decision | Prof. Biplab Banerjee [Mar'19-Apr'19]
- Implemented Grad-CAM on UC Merced dataset to visualise features in images that caused the activation in particular class by using gradients of last convolution layer
- Utilized VGG16 pretrained model to extract features designed dense layer to inculcate output of image

Multi-Label Domain Adaptation | Prof. Biplab Banerjee [Apr'21-Jan'22]
- Developed a robust model to perform multi-label classification of target dataset by adapting the knowledge by source samples
- Adapted the ideas from previously proposed ideas MLGCN, DANN, and Asymmetric loss
- Evaluated our network on MS COCO and Pascal VOC dataset for multi label classification

Maze Solver | Prof. Shivram Kalyanakrishnan [Sep'20-Oct'20]
- Modelled a maze as a markov decision process with appropriate rewards and transitions
- Found the Shortest path from a given end to multiple end points in maze using Value Iteration algorithm

Image Caption Generator | Prof. Amit Sethi [Oct'20-Nov'20]
- Built an Image caption generator on two benchmark datasets i.e. Flicker8 and MS COCO
- Analysed and compared the performance of basic image caption generator and by adding Bahdanau attention module in it using BLEU and WMD metrics

Sentiment Analysis | Prof. Amit Sethi [Sep'20-Oct'20]
- Implemented a sentiment analyser model on IMDB dataset using deep learning techniques
- Analysed the performance of model with different learning settings and modules like GRU, lstm

Energy Based Out of Distribution Detection | Prof. Amit Sethi [Mar'21-Apr'21]
- Explored different score functions to detect the Out-of-Distribution uncertainty in the testing data
- Compared the accuracy obtained by Energy score function with the basic Softmax score function
- Obtained 7 percent better accuracy for OOD detection task with Energy scores to that of Softmax scores

Teaching Assistant

Teaching Assistant at IIT Bombay

- **GNR652 : Machine Learning for Remote Sensing** [Jan'20-Apr'20]
- **EE229 : Signal Processing** [July'21-Dec'21]
- **EE793 : Topics in Cryptology** [Jan'22-Jun'22]

Position of Responsibility

Summer of Science Mentor | M&P Club, IIT Bombay [Summer '19,'20]
- Helped to set goals and work toward achieving them by guiding four mentees about the basics of Machine Learning, Deep Learning & Neural Networks
- Scheduled doubt clearing sessions and provided opportunities for quality learning by giving assignments

XLR8 Mentor | Electronics and Robotics Club, IIT Bombay [Summer '18]
- Mentored a team of four students helping them win the intra college bot-making competition
- Described Working of basic entities like L293D motor Driver, ATtiny micro-controller, IC LM7805
- Ensured the development of mentee's interests in technical activities

Technical Skills

- **Programming Languages:** Python, C++, MATLAB, SQL, Swift
- **Libraries:** PyTorch, OpenCV, Tensorflow, sklearn, NumPy
- **Hardware and Software Skills:** Xcode, VHDL, Assembly, Embedded C, SolidWorks, AutoCAD, Ngspice

Key Courses Undertaken

- **Machine Learning and applications:** Foundations of Intelligent and Learning Agents, Advance Machine Learning, Machine Learning for Remote Sensing-I, Machine Learning for Remote Sensing-II, Principles of Satellite Image Processing
- **Mathematics and Statistics :** Probability and Random Processes, Data Analysis and Interpretation, Markov Chain and Queuing Systems, Science of Information, Statistics, and Learning, An Introduction to Number Theory and Cryptography, Topics in Cryptology, Applied Mathematical Analysis in Engineering
- **Electrical :** Microprocessors, Electronic Devices and Circuits, Network Theory, Signals and Systems, Analog Circuits, Digital Systems, Power Electronics, Control Systems, Communication Systems, Electromagnetic Waves
- **Miscellaneous:** Biology, Chemistry, Economics, Sociology, Environmental Studies, Complex Analysis, Differential Equations

Extra-Curricular Activities

- Participated in the 7th NCVPRIPG 2019 held at KLE Technological University [22-24 Dec'19]
- Mentored 4 students in Bot making competition organised by Electronics Robotics club [Aug'18-Sep'18]
- Mentored 4 juniors in high-reach event of Summer of Science (Machine Learning) [May'19-Jul'19]
- Undertook a year long training in Carnatic Violin under the National Sports Organisation [Jul'17-Apr'18]
- Participated in XLR8 - Bot making competition organised by Electronics Robotics club [Aug'17-Sep'18]