Pragati **Meshram**

Natural Language Processing · Computer Vision · Machine Learning Researcher

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Education

University of Illinois, Urbana-Champaign (UIUC) *Urbana-Champaign, USA*

PhD Student in Electrical and Computer Engineering *Jan 2024 - Present*

- **Key Courses**: Adv topics in NLP, Computer Vision, Optimization, Computational Inference, Deep Learning for CV

Indian Institute of Technology Bombay (IIT Bombay) *Mumbai, India*

Dual Degree (M. Tech. + B. Tech.) in Electrical Engineering *Jul 2017 - Jun 2022*

Key Publications

AAAI **Extended VQA benchmark for Multi-modal LLMs ***
(Under review) Association for the Advancement of Artificial Intelligence (AAAI) *2024*

ISBI **Sample Specific Generalized Cross Entropy for Robust Histology Image Classification**
IEEE International Symposium on Biomedical Imaging (ISBI) *2021*

ECCV **Multi-source open-set deep adversarial domain adaptation**
European Conference on Computer Vision (ECCV) *2020*

* first author publications

Industrial Experience

Uber *Bangalore, India*

Software Engineer *Aug 2022 - Dec 2023*

- Co-led the integration of Tembici vendor services into the Uber app, launching the Micro-Mobility service in approximately 20+ major cities
- Streamlined user experience by unifying tap flows of map entities and enabling access to past trip receipts, enhancing convenience
- Developed and implemented event tracking analytics to monitor user engagement, leveraging insights to drive further app enhancements
- Mentored a newly onboarded engineer, accelerating their ramp-up on key projects and the codebase

Mercedes-Benz, R&D India *Bangalore, India*

Computer Vision Intern | Guide : Megh Shukla *Jul 2021 - Sep 2021*

- Worked on Domain Adaptation for Few-shot Action Recognition, focusing on recognizing action classes with limited source samples using a Prototype-centered Attentive Learning (PAL) model
- Implemented a prototype-centered contrastive learning loss to enhance data efficiency and a hybrid attentive learning mechanism to handle outliers and class overlap, moderate performance gains on standard few-shot action benchmarks

AWL Inc. | Face Pose Synthesis *Sapporo, Japan*

Research Intern | Guide: Sridhar Babu *Jul 2020 - Aug 2020*

- Resolved issue of inadequate training data for mask-wearing facial recognition by researching Facial Landmark detection and designing a pipeline for multi-view image generation for both masked and unmasked data
- Developed a face pose synthesis system using advanced GANs, enhancing the robustness of mask-wearing facial image recognition

Research Internships and Projects

Hint Generation utilising VLMs | UIUC *Urabna-Champaign, USA*

Research | Guide: Prof. Suma Bhat *Aug 2024 - Present*

- Proposing a novel paradigm for generating hints for math problems using Vision Language Models to enhance learning and problem-solving

Out-of-distribution sample detection | IIT Bombay *Mumbai, India*

Dual Degree Project | Guide : Subhasis Chaudhury | Sponsored by AWL Inc Japan *Jan 2022 - May 2022*

- Researched Out-of-Distribution (OOD) samples detection methods ODIN, Mahalanobis Distance, and Relative Mahalanobis Distance
- Designed an approximate algorithm to alert the system when model underperforms on the test dataset

Packet Routing | Aalborg University *Aalborg, Denmark*

Research Intern | Guide: Prof. Beatriz Soret *May 2020 - Jul 2020*

- Simulated packet routing in satellite constellations using Q-Learning and Dijkstra's Algorithm, modeling packet arrival with a Poisson process and incorporating buffering
- Analyzed and compared routing performance based on route complexity, end-to-end packet latency, and average delay

Skills and Responsibilities

Libraries PyTorch • TensorFlow • Tensorboard • Keras • NLTK • OpenAI • OpenCV • Pandas
Languages Python • C • C++ • Assembly • Swift • GO • LaTeX | **Tools** Docker • Git • MATLAB • SFTP • SSH
Responsibilities Research Assistant • Engineer Mentor at Uber (2023)