Dipesh **Tamboli**

Computer Vision · Machine Learning Researcher

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Education

Purdue University *West Lafayette, USA*

Grad Student in Electrical and Computer Engineering *Aug. 2021 - Present*

- **GPA**: 4.0 / 4.0 • **Key Courses**: Optimization for Deep Learning, Data Mining, Mathematics for Data Science, Random Variables, AI

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

Bachelor of Technology (B. Tech.) in Electrical Engineering And Minor in Computer Science *Aug. 2017 - Dec. 2020*

Key Publications

IGARSS **RSINet: Inpainting Remotely Sensed Images Using Triple GAN Framework ***
International Geoscience and Remote Sensing Symposium *2022*

ICIP **Saliency-driven class impressions for feature visualization of deep neural networks ***
International Conference on Image Processing (ICIP) *2020*

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

ICLR **Image-based phenotyping of diverse Rice (Oryza Sativa L.) Genotypes**
International Conference on Learning Representations Workshop on Computer Vision for Agriculture (CV4A) *2020*

JPhysD **Fast design of plasmonic metasurfaces enabled by deep learning**
Journal of Physics D: Applied Physics, Volume 53, Number 49, 2020 *2020*

WIECON **Breast Cancer Histopathology Image Classification and Localization using Multiple Instance Learning**
Best Paper Award | 2019 IEEE International WIE Conference on Electrical and Computer Engineering *2019*

* first author publications

Industrial Experience

AWL Inc. *Sapporo, Japan*

Machine Learning Researcher *Jan. 2021 - Jul 2021*

- Managed a proof-of-concept project utilizing different video analytics methods to do object detection and person re-identification
- Implemented self-supervised learning methods, including image reconstruction and contrastive learning for better feature representation from unlabelled data along with online learning algorithms to fine-tune model over time
- Improved F1 score from 0.88 to 0.94 on edge devices having less computing resources
- Offered position of Machine Learning Researcher after the internship

Research Internships and Projects

Imitation Learning with Decision Transformers | Purdue University *West Lafayette, USA*

Research | Guide: Vaneet Agarwal *Aug 2022 - Present*

- Increased divergence from negative trajectories in order to mimic expert agent's behavior and steer clear of adverse routes

Privacy Preserving Federated Learning | Purdue University *West Lafayette, USA*

Research | Guide: Saurabh Bagchi | ICLR (under review) *Aug 2021 - Jul 2022*

- Proposed a novel aggregation technique for modeling non-IID aspect of data that considers client data quality, heterogeneity, and utility
- Achieved 12% improvement by training computationally intensive video-action recognition on a low resource edge device like Nvidia-Nano

Zero-shot and Multi-Source Domain Adaptation | IIT Bombay *Mumbai, India*

BTech Thesis | Guide: Subhasis Chaudhuri, Biplab Banerjee | ECCV, IGARSS Publication *Jul 2019 - Dec 2020*

- Introduced a novel learning paradigm of multi-source open-set adaptation leveraging the knowledge from all accessible domains
- Associated semantic subspace of labels with vision subspace for unsupervised evaluation and improved accuracy 91.9% to 98.3%

University of California San Diego *La Jolla, USA*

Research Intern | Guide: Pengtao Xie *May 2020 - Jul 2020*

- Designed a Contrastive network for unsupervised domain adaptation and achieved the same performance while using only 10% labeled data

Video Analytics Lab, Indian Institute of Science Bangalore *Bangalore, India*

Research Intern | Guide: R. Venkatesh Babu | ICIP Publication *May 2019 - Jul 2019*

- Improved visualization generated from a pre-trained model by imposing a novel loss function to filter high-frequency elements
- Explored modifications to Gradient Descent algorithm to generate robust features and better visualizations

Skills and Responsibilities

Libraries PyTorch • TensorFlow • Tensorboard • Keras • NLTK • OpenAI Gym • Pandas

Languages Python • Shell • C • C++ • Assembly • R • LaTeX • ROS | **Tools** Docker • Git • MATLAB • SFTP • SSH

Responsibilities Reviewer BMVC 2021 • Leading FL discussion in ML reading group • Research & Teaching Assistant • Volunteer ICLR 2020