

## Education

- 2021-Present **Indian Institute of Science**, *Prime Minister's Research Fellow - Ph.D in Computer Vision & Deep Learning*,  
Guide: Dr. Punit Rathore CGPA: 8.70/10.0.
- 2017-2021 **Indian Institute of Technology Jammu**, *master of Technology in Computer Science & Engineering*,  
**Thesis:** Anomaly Detection in Dynamic Graphs  
Guide: Dr. Satyadev Ahlawat CGPA: 9.03/10.0 .
- Relevant Coursework** Stochastic Models & Applications (10/10), Pattern Recognition & Neural Network (10/10), Advanced Image Processing (9/10), Computational Methods in Optimization (8/10), Advance Deep Representation Learning (Audit)

## Publications

\* denotes joint co-authorship

### Conference & Workshop Proceedings

- WACV'24 **Alokendu Mazumder**, Tirthajit Baruah\*, Bhartendu Kumar\*, Rishab Sharma, Vishwajeet Pattanaik and Punit Rathore, "Learning Low-Rank Latent Spaces Using Simple Deterministic Autoencoders: Theoretical & Empirical Insights". In Proceedings of IEEE/CVF Winter Conference on Applications of Computer Vision (WACV), 2024. [Paper]
- ICCV'23 **Alokendu Mazumder**, Tirathajit Baruah, Akash Kumar, Pagadla Krishna Murthy, Vishwajeet Pattanaik and Punit Rathore, "DeepVAT: A Self-Supervised Technique for Cluster Assessment in Image Datasets". In Proceedings of IEEE/CVF International Conference on Computer Vision Workshops (ICCVW), 2023. [PDF]
- OCEANS'21 Pious Pradhan, **Alokendu Mazumder**, Srimanta Mandal and Badri N Subudhi, "Fusion-UWnet: Multi-channel Fusion-based Deep CNN for Underwater Image Enhancement". In Proceedings of IEEE OCEANS, 2023. [Paper]
- ICIP'21 Shubham Chaudhary, **Alokendu Mazumder**, Deebha Mumtaz, Vinit Jakhetiya and Badri N. Subudhi, "Perceptual Quality Assessment of DIBR Synthesized Views Using Saliency Based Deep Features". In Proceedings of IEEE International Conference on Image Processing (ICIP), 2021. [Paper]

### Thesis

- M.Tech **Alokendu Mazumder**, "Eigenspace Based Anomaly Detection in Dynamic Graphs and Synthetic Data Set Generator", In partial fulfilment of the requirements for the award of the degree Master Of Technology. [PDF]

### Preprints / Under Review

- ICASSP'24 **Alokendu Mazumder**, Bhartendu Kumar, Manan Tayal and Punit Rathore, "Convergence of ADAM with Constant Step Size in Non-Convex Settings: A Simple Proof". (Submitted) [ArXiv]

## Research Experience

- Dec. 2020 - Jun. 2021 **Data Scientist Intern**, *Ericsson R&D*  
Lab: ● Global AI Accelerator.
  - Worked on a research project to detect anomalies in dynamic networks.
  - The goal is to identify anomalies in dynamic networks with limited prior knowledge about the system.
- Dec. 2019 **Winter research Intern**, *IIT Bombay*  
Guide: ● Dr. Virendra Singh, IIT Bombay.
  - *Project title:* Horizon Separation in Images using Machine Learning.
  - Extracted textures and spatial features from various sky and ground images, then trained an SVM to distinguish the horizon between the sky and the ground.

## Research Projects

- May 2023 - Present **Test-Time Adaptation for Optical Flow Estimation.**
- Given a trained model  $f_\theta$  and  $x_{test}$  (*test data*), update  $\theta \rightarrow \theta^*$  such that performance improves
  - Developed novel algorithm for domain shifts and task invariant *Test Time Adaption* for optical flow models
  - Showed decreases of 0.5 Average *end-point-error (epe.)* of *RAFT* model trained on *KITTI* data to test on *Sintel* data. Attained results comparable to *SOTA* in cross-domain optical flow
- Jan 2022- **GANs in Frequency Domain, [Code].**
- Mar 2022
  - Course Project for Advance Image Processing (*E9 – 246*) (*at IISc.*). Experiments are done by making the discriminator look into different frequency bands of images. Hence, trying to make the generator learn "*original*" images not only in the spatial domain but in the frequency domain also.
- Aug 2021- **Variational Ladder Auto Encoder with SSIM & MMD Loss, [Code].**
- Dec 2021
  - In this work, a ladder-based hierarchical VAE model with SSIM loss & MMD regularizer is proposed to learn rich feature hierarchies over images. This gives improved performance as compared to the baseline paper.

## Technical Skills

- Languages C++, Python
- Others Pytorch, Flask, L<sup>A</sup>T<sub>E</sub>X

## Achievements

- MISTI-MIT Recipient of the MIT International Science & Technology Initiative (MIT-MISTI.) grant along with my research team.
- PMRF Recipient of prestigious **Prime Minister's Research Fellowship** in August-2022 cycle. Awarded by Ministry of Education, Govt. of India.
- Google AI Selected and attended **Google Research Week 2022** hosted by Google Research India.

## Teaching Experience

- IISc Teaching Assistant for CP 318: Data Science for Smart City Applications (August-Dec 2023)
- IISc Teaching Assistant for CP 218: Theory and Applications of Bayesian Learning (Jan-April 2022)

## Positions Of Responsibility

- Aug 2019 - **Chairman,** *IEEE ComSoc, IIT Jammu.*
- Jan 2021
  - Conducted classes for students to familiarise them with basic Machine Learning concepts.