

Education

- 2021-Present **Indian Institute of Science**, *Prime Minister's Research Fellow - Ph.D., Division of EECS*,
Guide: Dr. Prathosh A.P CGPA: 9.15/10.0.
- 2017-2021 **Indian Institute of Technology Patna**, *Bachelor of Technology in Electrical Engineering*,
Thesis: Mitigating Device Heterogeneity for Indoor Localization
Guide: Dr. Sudhir Kumar CGPA: 8.53/10.0.
- Relevant Coursework** Stochastic Models & Applications (10/10), Pattern Recognition & Neural Network (10/10), Reinforcement Learning (10/10), Advanced Image Processing (9/10), Information Theory (9/10), Computational Methods in Optimization (8/10), Foundations of Data Science (8/10), Measure Theoretic Probability Theory (Audit), Stochastic Approximation Algorithms (Audit), Interacting Particle Systems (Audit).

Publications

* denotes co-authorship

Journals

- IEEE-TNSE Ankur Pandey, **Piyush Tiwary** and Sudhir Kumar, "Bessel Function Mixture Model for Localization in Generalized $\eta - \mu$ IoT Fading Environment". IEEE Transaction on Network Science and Engineering. (Accepted)
- MICCAI **Piyush Tiwary**, Kinjawl Bhattacharyya and Prathosh A.P, "Cycle Consistent Twin Energy-based Models for Image-to-Image Translation". Medical Image Analysis, Vol. 91, November 2023, DOI: 10.1016/j.media.2023.103031 [PDF]
- IEEE-TSP Ankur Pandey*, **Piyush Tiwary***, Sudhir Kumar and Sajal K Das, "FadeLoc: Smart Device Localization for Generalized $\kappa - \mu$ Faded IoT Environment". IEEE Transaction on Signal Processing, Vol. 70, pp. 3206-3220, June 2022, DOI: 10.1109/TSP.2022.3183527. [PDF]
- MIT-QSS Tirthankar Ghosal*, **Piyush Tiwary***, Robert Patton and Christopher Stahl, "Towards Establishing a Research Lineage via Identification of Significant Citations". Special Issue of Quantitative Science Studies (QSS) on "Scientific Knowledge Graphs and Research Impact Assessment", Vol. 2, No. 4, pp. 1511-1528, 2021, DOI: 10.1162/qss_a_00170. [PDF]
- IEEE-SENSL **Piyush Tiwary**, Ankur Pandey, Sudhir Kumar and Moustafa Youssef, "Novel Differential r -Vectors for Localization in IoT Networks". IEEE Sensor Letters, Vol. 5, No. 6, pp. 1-4, June 2021, Art no. 7002204. [PDF]
- IEEE-JIoT Ankur Pandey, **Piyush Tiwary**, Sudhir Kumar and Sajal K Das, "Adaptive Mini-Batch Gradient Ascent based Localization for Indoor IoT Networks under Rayleigh Fading Conditions". IEEE Internet of Things Journal, Vol. 8, No. 13, pp. 10665-10677, July 2021. [PDF]

Conferences

- ICLR'23 Arnab Mondal, **Piyush Tiwary**, Parag Singla and Prathosh A.P, "Few Shot Image-Generation Via Inference-Stage Latent Mixing in GANs". In International Conference on Learning Representation (ICLR), 2023. [PDF]
- AISTATS'23 Arnab Mondal, Lakshya Singhal, **Piyush Tiwary**, Parag Singla and Prathosh A.P, "Implicit Minority Oversampling for Imbalanced Data via Class-Preserving Regularized Auto-Encoders". In International Conference on Artificial Intelligence and Statistics (AISTATS), 2023. (Accepted)
- COMSNET'21 **Piyush Tiwary**, Ankur Pandey, Sudhir Kumar. "Differential d -Vectors for RSS based Localization in Dynamic IoT Networks". 13th International Conference on COMMunication Systems & NETWORKS (COMSNETS'2021). [**Best Poster Presentation Award**] [PDF]
- ICCCN'20 Ankur Pandey, **Piyush Tiwary**, Sudhir Kumar and Sajal K Das, "Residual Neural Networks for Heterogeneous Smart Device Localization in IoT Networks," 29th International Conference on Computer Communications and Networks (ICCCN'2020), Honolulu, HI, USA. [PDF]

ICDCN'19 Ankur Pandey, **Piyush Tiwary**, Sudhir Kumar, and Sajal K Das. "A hybrid classifier approach to multivariate sensor data for climate smart agriculture cyber-physical systems". 20th International Conference on Distributed Computing and Networking (ICDCN ACM'2019). [PDF]

Workshops

NeurIPS'22 Arnab Mondal, **Piyush Tiwary**, Parag Singla and Prathosh A. P., "Few Shot Generative Domain Adaptation Via Inference-Stage Latent Learning in GANs," In NeurIPS 2022 Workshop on Distribution Shifts: Connecting Methods and Applications, Virtual. [PDF]

NAACL'21 Kamal Varanasi, Tirthankar Ghosal, **Piyush Tiwary** and Muskaan Singh, "IITP-CUNI@3C: Supervised Approaches for Citation Classification (TaskA) and Citation Significance Detection (Task B)," The 2nd Workshop on Scholarly Document Processing at Annual Conference of the North American Chapter of Association for Computational Linguistics (NAACL) 2021, Virtual. [PDF]

Thesis

B.Tech **Piyush Tiwary**, "Localization in Heterogeneous IoT Environment", In partial fulfillment of the requirements for the award of the degree Bachelor Of Technology. [PDF]

Preprints / Under Review

Conference **Piyush Tiwary**, Atri Guha, Subhodip Panda and Prathosh A.P, "Adapt then Unlearn: Exploiting Parameter Space Semantics for Unlearning in Generative Adversarial Networks". [PDF]

Conference **Piyush Tiwary**, Kumar Shubham, Vivek Kashyap and Prathosh A.P, "Constructing Bayesian Pseudo-Coresets using Contrastive Divergence". [PDF]

Conference Arnab Mondal, **Piyush Tiwary**, Parag Singla and Prathosh A.P, "SoLAD: Sampling over Latent Adapter for Few Shot Generation".

Research Experience

March 2021 - **Few-Shot Generative Domain Adaptation**, *IISc*,
Dec. 2022 Guide: • Dr. Prathosh A.P, IISc • Dr. Parag Singla, IIT Delhi.
• Worked on the problem of adapting a pre-trained GAN on a target domain under a few-shot setting.
• Our first solution advocates use of a latent adapter network which is prepended before the pre-trained GAN.
• The first solution although superior to many SoTA methods, suffers through large inference time. We solved this in the consequent work where we use a hyper-network to sample the parameters of the latent-adapter.

Aug. 2020 - **Establishing Research Lineage via Citation Significance**, *IIT Patna*,
Oct. 2020 Lab: • Oak Ridge National Laboratory CDA Group.
• Worked on a research project to identify Significant Citations in a Research Paper.
• The aim is to establish a Research Lineage & Identify how knowledge is transferred through research papers by creating a Citation graph through a feature engineering approach.

Dec. 2019 - **Localization under Generic Fading Models**, *IIT Patna*,
Dec. 2020 Guide: • Dr. Sudhir Kumar, IIT Patna • Prof. Sajal Das, Missouri University.
• Worked on localization using generic fading models using an MLE based approach.
• Rayleigh Fading: Proposed **MLE for Rayleigh fading model** with simultaneous parameter estimates and an **Adaptive Mini-Batch** gradient ascent method to quickly maximize the log-likelihood to find the location estimate.
• $\kappa - \mu$ Fading: Proposed an **approximate MLE for $\kappa - \mu$ fading model** and an **Adaptive Order** based likelihood maximization using a look-up table to localize a smart device.
• $\eta - \mu$ Fading: Proposed a **weighted approximation** for MLE of $\eta - \mu$ fading model which can use multiple Bessel function approximations to localize a smart device.

May 2019 - **Research Intern**, *IIIT Bangalore*,
July 2019 Guide: • Dr. Manish Gupta, Professor IIIT Bangalore (Currently Head of Google Research India).
• Worked as a part of R&D Team of VideoKen (a IIITB based startup). Studied and made a *Pytorch* implementation of Google's **UIS-RNN** and developed a model to **diarize 2 speakers** with maximum latency of 30 seconds for "Interview" type of audios.

Industrial Experience

- May 2020 - **Software Development Intern,** *Remote (due to COVID-19),*
July 2020 CapitalVia Global Research Limited - Investment Advisor.
- Worked with Research team of CapitalVia, to implement deploy-able framework for various trading strategies aimed to provide optimum parameter for a certain strategy based on back-testing results.
 - Made a UI in Python using **Flask & BeautifulSoup** to extract live data from NSE website.
- June 2019 - **Crio Summer Of Doing - 2019,** *Remote,*
July 2019 Crio.Do.
- Developed Back-end of Q-Eats (a food Ordering App) using Spring framework in Java.
 - Learnt and implemented many Industry related tools/technologies like - REST APIs, MongoDB, Caching and Docker, and used it to create an Order Page for Q-Eats in the Capstone Challenge.

Technical Skills

- Languages C++, Python
Others Pytorch, Flask, \LaTeX

Achievements

- PMRF Recipient of prestigious **Prime Minister's Research Fellowship** in August-2022 cycle.
- COMSNET'21 Received **"The Best Poster Presentation Award"** at COMSNETS-2021.
- Google AI Selected and attended **AI Summer School** hosted by Google Research India.
- Codechef Secured a Global Rank of **60** in Codechef July Long Challenge'19.
- Comp Coding Specialist on Codeforces, 4-star on Codechef and Ranked in top 5000 on UVa Online Judge.
- JEE Adv. Secured **All India Rank 4880** in JEE Advanced 2017 among **150,000** candidates.

Teaching Experience

- GTU-W Conducted Workshop on Theoretical Basis for Machine Learning at Gujrat Technical University [Video Lectures].
- NPTEL Teaching Assistant for NPTEL NOC23-CS24: Deep Learning (Instructor: Dr. Sudarshan Iyengar) [Video Lectures].
- E9-333 Teaching Assistant for E9-333: Advanced Deep Representation Learning (Instructor: Dr. Prathosh A.P.).

Services

- Reviewer CVPR 2022, NeurIPS 2023, AISTATS 2024
- Volunteer IEEE International Conference on Signal Processing (SPCOM) 2022, NeurIPS 2021

Positions Of Responsibility

- May 2020 - **Advisor,** *NJACK IIT Patna.*
April 2021 ◦ Advisor of Machine Learning Department at NJACK, Computer Science Club of IIT Patna.
◦ Conducted classes for students to make them familiar with basic concepts of Machine Learning.
- Aug 2018 - **Badminton Coordinator,** *Student Gymkhana IIT Patna.*
July 2020 ◦ Lead the Badminton team of IIT Patna in various Sports tournament. Represented IIT Patna in 51st (at IITM), 52nd (at IITG) & 53rd (at IITBBS) **Inter IIT Sports Meet** along with 4 other teammates