Alik Pramanick

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Ph.D. in Computer Science and Engineering
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Education

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
Ph.D. in CSE	Indian Institute of Technology, Guwahati	8.50	*Dec'20-Present*
M.Tech. in CSE	Defence Institute of Advanced Technology, Pune	8.66	*Jun'18- Jun'20*
M.Sc. in CS	Pondicherry University	9.39	*Jun'16-Jun'18*
B.Sc. in CS	Ramakrishna Mission Vidyamandira, Calcutta University	71.5%	*Jun'13-Jun'16*

Experiences

- **Teaching Assistant,** IIT Guwahati- CS590: Deep Learning, CS360: Machine Learning. *Jan'21 - Present*
  –Instructed 270+ students on ML, DL, and computer vision projects, and graded assignments.
- **Mentor,** Peer-Assisted Learning Program, IIT Guwahati - CS101: Introduction to Computing. *Feb'24 - Apr'24*
  –Mentored 100+ UG students in fundamental programming concepts and problem-solving exercises.
- **Intern,** Indian Institute of Remote Sensing, ISRO. *Dec'17 - Apr'18*
  –Modeled an application for documentation of heritage that automates structural change (e.g., 5% in 10 years).

Publications

- ***A. Pramanick****, A. Sur, V. V. Saradhi,* Harnessing multi-resolution and multi-scale attention for underwater image restoration. [The Visual Computer'25] [Link]
- *U. Srivastava, S. Roy,* ***A. Pramanick****, A. Sur,* Turbit: Generating Turbid Underwater Images With Diffusion and Differential Transformers. [ICIP'25] [Link]
- *A. Daydar,* ***A. Pramanick****, A. Sur, S. Kanagaraj,* Diffusion Based Shape-Aware Learning With Multi-Scale Context For Segmentation Of Tibiofemoral Knee Joint Tissues: An End-To-End Approach. [ICIP'25] [Link]
- ***A. Pramanick****, S. Kumar, A. Daydar, A. Sur,* River-GEM: Generating and Enhancing Muddy Water Images. [ICASSP'25] [Link]
- ***A. Pramanick****, U. Bheda, A. Sur,* Efficient-USR: Prompt Guided Dual-Domain Feature Information for Efficient Underwater Image Super-Resolution. [ICASSP'25] [Link]
- *A. Daydar,* ***A. Pramanick****, A. Sur, S. Kanagaraj,* MedCAM-OsteoCls: Medical Context Aware Multimodal Classification of Knee Osteoarthritis. [ICASSP'25] [Link]
- ***A. Pramanick****, U. Bheda, A. Sur,* ML-CrAIST: Multi-scale Low-High Frequency Information-Based Cross Attention with Image Super-Resolving Transformer. [ICPR'24] [Link]
- ***A. Pramanick****, S. Sarma, A. Sur,* X-CAUNET: Cross-Color Channel Attention with Underwater Image-Enhancing Transformer. [ICASSP'24] [Link]
- ***A. Pramanick****, D. Megha, A. Sur,* Attention-Based Spatial-Frequency Information Network for Underwater Single Image Super-Resolution. [ICASSP'24] [Link]
- *M. Chakraborty,* ***A. Pramanick****, S. Dhavale,* Two-stream mid-level fusion network for human activity detection. [ICICC'20] [Link]
- *M. Chakraborty,* ***A. Pramanick****, S. Dhavale,* MobiSamadhaan- Intelligent Vision-Based Smart City Solution. [ICICC'20] [Link]
- ***A. Pramanick****, S. Roy, A. Sur,* D2Mamba: Dual Domain Guided Informed Search in State Space Model for Underwater Image Enhancement [IEEE JOE] [Submitted]
- ***A. Pramanick****, A. Daydar, S. Kumar, A. Sur, V. V. Saradhi,* PLUM: A Prompt-guided Lightweight Unified Model for Enhancement of Multi-degraded Underwater Image. [IEEE JOE] [Submitted]
- ***A. Pramanick****, A. Sur, V. V. Saradhi,* UEnhancer: Spatially Enriched Transformer with Dual-color Information for Underwater Image Enhancement. [ACM TOMM] [Submitted]
- ***A. Pramanick****, M. Bansal, U. Srivastava, S. Ghosh, A. Sur,* Trans-defense: Transformer-based Denoiser for Adversarial Defense with Spatial-Frequency Domain Representation. [SN Computer Science] [Submitted]
- *S. Soor,* ***A. Pramanick****, J. K, A. Sur,* A Generative Adversarial Approach to Adversarial Attacks Guided by Contrastive Language-Image Pre-trained Model. [SN Computer Science] [Submitted]
- *S. Kumar, A. S. Akshith,* ***A. Pramanick****, A. Sur, R. D. Baruah,* Object-centric Pseudo-supervised Contrastive Learning for Unsupervised Semantic Segmentation. [IEEE TETCI] [Submitted]
- *S. Ghosh, R. Sharma, S. Kumar,* ***A. Pramanick****, A. Sur, P. Mitra,* MUSe: A Text-Prompted Multimodal Framework for Semi-Supervised Underwater Semantic Segmentation. [ICASSP'26] [Submitted]

Projects

- **Weakly-Supervised Few Shot Segmentation Segmentation** [Ph.D. Project] *Aug'25 - Present*
  - –Designed a framework that learns from limited weak labels, combining **frequency-domain decomposition** with **CLIP-guided priors** to improve segmentation via adaptive fusion of spatial and contextual cues.
  - –Achieved state-of-the-art performance of 65.51 mIOU, with a 2.36% improvement and 81.61% fewer parameters on standard few-shot segmentation benchmarks (Pascal-5i).
- **Underwater Semantic Segmentation using Knowledge Distillation and Quantization** [Ph.D. Project] *Jul'25 - Sep'25*
  - –Devised a lightweight, real-time segmentation model on edge devices using **SegFormerB4**-to-**MobileNetV2 knowledge distillation** with **quantization-aware training**.
  - –Reduced model size by 74% and increased CPU inference speed by 3.7× (INT8 QAT) with $< 0.5\%$ mIoU drop, enabling efficient real-time deployment.
- **A Study on Hate Speech Classification Using Multimodal Contents** [Pre-Ph.D. Project] *Jul'20 - Sep'20*
  - –Implemented a multi-modal deep learning framework for hate speech detection, leveraging **BERT for text** and **ResNet for image** feature extraction.
  - –Attained an accuracy of 67.5%, an AUC of 0.73, and an F1 score of 0.70 on the MMHS150K dataset.
- **Deep Learning based Human Activity Detection for Video Surveillance.** [M.Tech Project] *Oct'19 - Apr'20*
  - –Developed **single and two-stream** models for human activity recognition, integrating **CNN, LSTM, and GCN** to capture spatial, temporal, and structural video features.
  - –Obtained 91.63% accuracy on the UCF101 dataset using a two-stream and 86.29% with a single-stream, highlighting the benefits of multi-modal feature integration for activity recognition.
- **Mobisamadhaan-Intelligent Vision-Based Smart City Solution** [SIH Project] *Feb'19 - Jun'19*
  - –Created an AI-based smart mobility system integrating **object detection (YOLOv3)** and **real-time tracking (SORT)** to analyze traffic flow, congestion, and passenger density.
  - –Collected and analyzed 30 video recordings, each 8-10 minutes long, across five congested Pune locations during peak hours, identifying the key factors contributing to traffic congestion.
- **An Application of 3D Modeling For Digital Documentation of Cultural Heritage.** [M.Sc. Project] *Jan'18 - May'18*
  - –This project involves the development of software that can analyze, detect, and report on changes and damages that occur or are likely to occur over time, ensuring that heritage is well-maintained throughout.
  - –Applied **GLCM-based texture feature extraction** to quantify pixel-level surface variations and detect up to 93% of structural changes across temporal image datasets for heritage conservation.

Key Courses Taken

- Computer Vision, Machine Learning, Deep Learning, Topics and Tools in Social Media Data Mining

Technical Skills

- **Programming**: Python, C/C++
- **Machine Learning Framework**: PyTorch, Keras, Tensorflow
- **Computer Vision & Image Processing**: OpenCV, PIL, scikit-image, PCL, Open3D
- **Operating Systems**: Windows, Linux
- **Data Handling & Analysis**: NumPy, Pandas, Matplotlib, SciPy, Scikit-learn
- **Model Optimization & Deployment**: TorchScript, Quantization (QAT/PTQ), ONNX, TensorRT
- **Other Tools**: Jupyter, Colab, Docker, Matlab, VisualStudio, Git, GitHub, GitLab

Achievements

- **Travel grant** to attend the IndoML 2024 (100 USD), International Conference on Image Processing 2025 (1500 USD), and International Conference on Acoustics, Speech and Signal Processing 2025 (1000 USD).
- **Selected** for Ph.D. admission (July 2020) at IIT Kharagpur, IIT Guwahati, IIT Patna, and IIT Jodhpur.
- **MHRD Scholarship** for M.Tech (2018-2020) and PhD (2021 - present).
- **Winner** of Smart India Hackathon, 2019.
- **Qualified NET** 2019 December examination with Lectureship.
- **Qualified GATE** 2018 and 2020.

Volunteering Activities

- **Peer Reviewer** for top international conferences and journals, including ICPR 2024, ICASSP 2025, IJCNN 2025, BMVC 2025, IEEE TGRS, and ACM TIST.
- **Session Chair** at the IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2025).
- **Technical Administrator** for NVIDIA DGX Servers under Prof. Arijit Sur from 2022 to 2025.
- **Organizing Committee Member**, IIT Guwahati Winter School 2024 and Summer School 2025- Contributed to event planning, technical coordination, and student engagement for programs with over 250 participants.

Extra-curricular Activities

- Cooking, Traveling, Playing Cricket, Table Tennis, Football, Volleyball, Badminton