Mritunjoy Halder

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EXPERIENCE

Researcher   July 2023 – December 2025
TCS Research Labs   *Kolkata, India*
- **Gen3D Researcher** specializing in 3D content generation in XR environment from 3D sketch.
- Integrated generative modeling and 3D vision to develop simulators for AR/VR-driven robot training.
- Designed a fast 3D data generation algorithm. Reduced generation time from over 1 hour to 30 seconds.
- Proposed a 3D object retrieval method from sketches. Achieved 60% accuracy, where SOTA benchmark is 49%.
- Enabled generation of 3D environments and objects from text or audio prompts for commercial use.

Research Intern   March 2022 – May 2022
TCS Research Labs   *Remote*
- Proposed a spatio-temporal CNN for anomaly detection in surveillance robots.
- Achieved 91% accuracy on a benchmark dataset and validated on a real-world robot.
- Granted patent and accepted for oral presentation at IEEE IJCNN.

Research Intern   June 2021 – May 2022
NIT Agartala   *Remote*
- Designed a hybrid model for real-time image defogging.
- Achieved 92% SSIM and 0.1s processing time with fog removal model.

Research Intern   January 2022 – March 2022
NIT Hamirpur   *Remote*
- Developed a transformer-based system for sex, accent, and emotion recognition from speech.
- Achieved 94.62% (sex), 97.37% (accent), 99.84% (emotion) accuracy.

EDUCATION

Indian Institute of Science, Bangalore   Bengaluru, Karnataka
Doctor of Philosophy in Robotics and Autonomous Systems   *2026 – Present*

Indian Institute of Engineering Science and Technology   Shibpur, West Bengal
B.Tech in Information Technology (CGPA 9.1)   *2019 – 2023*

Jadavpur Vidyapith   Kolkata, West Bengal
Senior Secondary Examination (Score 90.2%)   *2017 – 2019*

PUBLICATIONS

Sketch3R: Rapid and Realistic 3D VR Sketch Creation to Shape Retrieval   2026
IEEE/CVF Winter Conference on Computer Vision (WACV)
- Mritunjoy Halder, Shivam Ashok Shukla, Raghav Mittal, Lokender Tiwari, Brojeshwar Bhowmick

FAV3R–Fast and Accurate 3D VR Sketch to 3D Shape Retrieval   2025
IEEE International Symposium on Mixed and Augmented Reality (ISMAR)
- Mritunjoy Halder*, Shivam Ashok Shukla*, Lokender Tiwari, Raghav Mittal, Brojeshwar Bhowmick

InGenCo–Integrated In-Place 3D Scenario Generation and Collaboration   2025
IEEE International Symposium on Mixed and Augmented Reality (ISMAR)
- Raghav Mittal, Lokender Tiwari, Satyam Bhardwaj, Mritunjoy halder, Brojeshwar Bhowmick

GeMR–Multimodal Interactive 3D Scene COmposition in XR   2025
*ACM Indian Conference on Computer Vision, Graphics and Image Processing(**Best Paper Award**)*
- Raghav Mittal, Lokender Tiwari, Shivam Ashok Shukla, Mritunjoy Halder, Brojeshwar Bhowmick

A Transmission Model based Deep Neural Network for Image Dehazing   2024
Multimedia Tools and Applications, Springer
- Tannistha Pal*, Mritunjoy Halder*, Sattwik Barua*

Anomalous Activity Detection from Ego View Camera of Surveillance Robots   2023
IEEE International Joint Conference on Neural Networks (IJCNN)
- Mritunjoy Halder, Snehasis Banerjee, Balamuralidhar P

Multi-feature based Hazy Image Classification for Vision Enhancement   2023
Procedia Computer Science, Elsevier
- Tannistha Pal*, Mritunjoy Halder*, Sattwik Barua*

Deep Learning Model to Detect Foggy Images for Vision Enhancement	2023

The Imaging Science Journal, Taylor and Francis
- Tannistha Pal*, Mritunjoy Halder*, Sattwik Barua*

Dehazing and Vision Enhancement: Challenges and Future Scope	2023

IET Computer Vision, Book Chapter
- Tannistha Pal*, Mritunjoy Halder*, Sattwik Barua*

A Framework for Sex Identification, Accent and Emotion Recognition from Speech Samples	2022

IEEE Conference on Computing Communication and Networking Technologies (CCNT)
- Mohit Kumar*, Mritunjoy Halder*, Sattwik Barua*

PATENTS

Anomalous Activity Detection for Mobile Surveillance Robots	Granted

US Patent
- Inventors: Mritunjoy Halder, Snehasis Banerjee, Balamuralidhar P

Real-Time Dynamic Scene Dehazing using Deep Residual Neural Networks	Published

Indian Patent
- Inventors: Tannistha Pal, Mritunjoy Halder, Sattwik Barua

FAV3R — Fast and Accurate 3D VR Sketch to 3D Shape Retrieval	Filed

Patent Application
- Inventors: Mritunjoy Halder, Shivam Ashok Shukla, Lokender Tiwari, Raghav Mittal, Brojeshwar Bhowmick

PROJECTS

Improved Diagnosis on Low Resolution Medical Images (B.Tech Thesis)
Dual GAN, Python
- Proposed a dual GAN framework to enhance low-res medical images for better diagnosis.
- Introduced a novel loss function for improved ROI reconstruction.
- Achieved 91% accuracy, outperforming SOTA.

Cartoon Emotion Recognition
Transformer, Python, PAN India Hackathon
- Developed a transformer-based model for sentiment classification using a custom cartoon dataset.
- Trained using synthetic images; achieved 95% accuracy on Hackathon dataset.

PROFESSIONAL SERVICES

Reviewer
IEEE International Joint Conference on Neural Networks (IJCNN)
- Served as reviewer for Technical Program Committee (TPC).

TECHNICAL SKILLS

- **Languages**: Python, C/C++, MATLAB, LaTeX

- **Technologies**: Blender (BPY), GANs, CNNs, Transformers, Pytorch, 3D Libraries.

- **Domains**: GenAI (VLM/LLM/3D), Computer Vision, Graphics, Image Processing, Deep Learning, ML

LANGUAGES

- **English**: Fluent

- **Bengali**: Native

- **Hindi**: Fluent