

# Asim Manna

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## CAREER OBJECTIVE

Research Scholar at IIT Kharagpur specializing in computer vision, medical imaging, and AI, currently interning at Samsung Research Institute Bangalore on image signal processing pipelines. Passionate about advancing cutting-edge AI technologies to develop innovative solutions for real-world applications.

## EDUCATION

<b>Indian Institute of Technology Kharagpur, Kharagpur</b> Doctor of Philosophy, Department of Artificial Intelligence	[August 2021 - Present] Overall GPA: 8.5/10
<b>Indian Statistical Institute, Kolkata</b> Master of Technology, CSRU	[July 2019 - July 2021] Overall Percentage: 73.55%
<b>University of Calcutta, Kolkata</b> Master of Science, Department of Pure Mathematics	[August 2017 - June 2019] Overall Percentage: 67.6%
<b>The University of Burdwan, Bardhaman</b> Bachelor of Science, Department of Mathematics, Bankura Sammilani College	[June 2014 - July 2017] Overall Percentage: 70.75%

## SKILLS & EXPERTISE

- **Programming Languages:** Python, MATLAB, C, SQL, BASH
- **Frameworks & Libraries:** PyTorch, TensorFlow, OpenCV, scikit-learn, ASTRA Tomography
- **Software & Tools:** Git, TensorRT, ONNX, NVIDIA CUDA, Linux
- **Cloud Platforms:** AWS SageMaker, Azure ML

## PROJECTS

<b>Medical Image Retrieval Using Deep Neural Hashing   PhD Thesis   Dr. Debdoot Sheet</b>	[August 2021 - Present]
<ul style="list-style-type: none"><li>• Develop a method to retrieve images with respect to organs and associated pathology towards achieving EBM. (🔒)</li><li>• Develop a structured Deep Neural Hashing method to retrieve images with respect to various attributes.</li><li>• Design a framework for multimorbidity image retrieval to access the similarity between different symptoms occurring in chest X-rays. (🔒)</li></ul>	

*Skill Used:* Python, PyTorch, OpenCV, Sckit-learn, Deep learning, Hash code learning, Matplotlib.

### Generating High Dynamic Range Images | Class Project | Dr. Debdoot Sheet

- Generate a single high dynamic range (HDR) image by fusing multiple exposure-bracketed images through radiance map reconstruction, followed by tone mapping and gamma correction.

*Skill Used:* MATLAB, ImageJ, Tone mapping.

## EXPERIENCES

<b>Research Intern   Samsung R&amp;D Institute India-Bangalore</b>	[February 2025 - present]
<ul style="list-style-type: none"><li>• Designing a deep learning-based framework for RAW image fusion, including multi-frame alignment, multi-exposure frame fusion, demosaicing, and generating HDR images from multi-exposure inputs.</li><li>• Participated in the NITRE Challenge 2025 for the image denoising task and secured 5th rank worldwide.</li></ul>	

*Skill Used:* Python, PyTorch, OpenCV, Sckit-learn, Matplotlib, FastStone, Attention and Transformer network.

<b>Research Assistant   IIT Kharagpur &amp; GE Healthcare</b>	[August 2023 - January 2025]
<ul style="list-style-type: none"><li>• A dataset has been constructed based on sparse views and varying levels of noise in low-dose sinograms.</li><li>• Noise distributions according to X-ray dose variations are modeled and noisy sinograms are generated.</li><li>• Developed a diffusion model with different time levels for the reconstruction of low-dose CT images.</li></ul>	

*Skill Used:* Python, PyTorch, MATLAB, OpenCV, ASTRA, Matplotlib, FastStone, ImageJ, Diffusing model.

<b>Teaching Assistant   NPTEL</b>	[January 2025 - April 2025, January 2023 - April 2023]
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- *Deep Learning for Visual Computing*: Oversee more than 1000 students, design assignments, create questions, and evaluate students' understanding of deep learning concepts.

## Research Intern | IIT Bhilai

[January 2021 - July 2021]

- Implemented the difference and value phase of target difference algorithm on S-box of Keccak and Ascon hash function.

### RESEARCH INTEREST

- Computer Vision
- Image Processing
- Hash Learning
- Computed Tomography
- Deep Learning
- Linear Algebra
- Generative AI

### PUBLICATIONS

- **Manna, A.**, Dewan, D., Sheet, D., "Structured hashing with deep learning for modality, organ, and disease content sensitive medical image retrieval", Scientific Reports, vol. 15, no. 8912, March 2025. (🔗)
- **Manna, A.**, Sathish, R., Sethuraman, R., and Sheet, D. OPHash: learning of organ and pathology context-sensitive hashing for medical image retrieval, J. Med. Imag. 12(1), 017503 (2025), doi: 10.1117/1.JMI.12.1.017503. (🔗)
- **Manna, A.** and Sheet, D. (2025). Learning Neural Networks for Multi-label Medical Image Retrieval Using Hamming Distance Fabricated with Jaccard Similarity Coefficient. In ICPR pp. 251-266. Springer, Cham. (🔗)
- Dewan, D., **Manna, A.**, Srivastava, A., Borthakur, A. and Sheet, D., "MeDiANet: A Lightweight Network for Large-scale Multi-disease Classification of Multi-modal Medical Images Using Dilated Convolution and Attention Network." In ICPR, pp. 170-184. Springer, Cham, 2025. (🔗)
- Borthakur, A., Kasliwal, A., **Manna, A.**, Dewan, D. and Sheet, D., 2023. FedERA: Framework for Federated Learning with Diversified Edge Resource Allocation. *International Conference on Federated Learning Technologies and Applications*. (🔗)
- **Manna, A.**, Sista, R., Sheet, D., 2024. Deep neural hashing for content-based medical image retrieval: A survey. Authorea Preprints. (Submitted in CIBM Journal)
- Deep Neural Hashing for Medical Image Retrieval (OpenVINO Toolkit) (🔗).

### AWARDS & ACHIEVEMENTS

- Served as Plenary Chair at the Kharagpur Digital Health Symposium and Roundtable 2023.
- Qualified in CSIR-UGC NET Lectureship on 2019 (June) with AIR-94.
- NBHM-2018 (Scholarship) – Written Qualified.
- NBHM-2019 (Fellowship) – Written Qualified.
- Swami Vivekananda Merit-cum-Means Scholarship 2017.

### REFERENCE

#### Dr. Debdoot Sheet

Associate Professor

Department of Electrical Engineering,

Indian Institute of Technology Kharagpur