

# Asim Manna

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## EDUCATION

<b>Indian Institute of Technology Kharagpur, Kharagpur</b> Doctor of Philosophy, Centre of Excellence in Artificial Intelligence	[August 2021 - Present] Overall GPA: 8.5/10
<b>Indian Statistical Institute, Kolkata</b> Master of Technology, Cryptology and Security Research Unit	[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	[June 2014 - July 2017] Overall Percentage: 70.75%
<b>West Bengal Council of Higher Secondary Education</b> Class XII	[2012 - 2014] Overall Percentage: 81.4%
<b>West Bengal Board of Secondary Education</b> Class X	[2010 - 2012] Overall Percentage: 75.71%

## RESEARCH INTEREST

Computer Vision, Deep Learning, Digital Image Processing, Image Retrieval, Medical Image Analysis, Linear Algebra

## SKILLS AND EXPERTISE

- **Programming Languages:** Python, MATLAB, C
- **Library/Framework:** Pytorch, OpenCV, Pandas, Matplotlib, Plotly, Scikit-Learn, Torchmetrics, ASTRA

## 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. [Github Link]</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>	
<b>Computed Tomography Sinogram Denoising   Project   Sponsored by GE Healthcare</b>	[August 2023 - Present]
<ul style="list-style-type: none"><li>• Dual-domain denoising for low-dose CT using sinogram total variation and multi-scale Curvelet filtering.</li><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>• Employed U-Net architecture-based diffusion model with different time levels for the reconstruction of low-dose CT images.</li></ul>	
<b>Investigating Applications of the Target Difference Algorithm in Keccak &amp; Ascon   M.Tech Thesis   Dr. Dhiman Saha</b>	[January 2021 - June 2021]
<ul style="list-style-type: none"><li>• Implemented the difference phase and value phase of target difference algorithm on S-box of Keccak and Ascon hash function.</li></ul>	

## EXPERIENCES

<b>Teaching Assistant   Indian Institute of Technology Kharagpur  </b>
<ul style="list-style-type: none"><li>• Artificial Intelligence Foundations and Applications, Deep Learning Foundations and Applications, Machine Learning Foundations and Applications</li></ul>
<b>Teaching Assistant   NPTEL  </b>
<ul style="list-style-type: none"><li>• Deep Learning for Visual Computing</li></ul>

## PUBLICATIONS

- **Manna, A.** and Sheet, D. 2024. Learning Neural Networks for Multi-label Medical Image Retrieval Using Hamming Distance Fabricated with Jaccard Similarity Coefficient. *International Conference on Pattern Recognition (ICPR)*.
- Borthakur, A., Kasliwal, A., **Manna, A.**, Dewan, D. and Sheet, D., 2023. FedERA: Framework for Federated Learning with Diversified Edge Resource Allocation. *IEEE International Conference on Federated Learning Technologies and Applications*. ([Github Link]).
- **Manna, A.**, Sathish, R., Sethuraman, R., and Sheet, D. 2024. OPHash: Learning of Organ and Pathology Context Sensitive Hashing for Medical Image Retrieval. *Journal of Medical Imaging*. (Submitted)
- Deep Neural Hashing for Medical Image Retrieval (OpenVINO Toolkit) ([Github Link]).

## AWARDS and ACHIEVEMENTS

- Qualified in CSIR-UGC NET Lectureship on 2019 (June) with AIR-94.
- NBHM-2018 (Scholarship) – Written Qualified.
- NBHM-2019 (Fellowship) – Written Qualified.

## REFERENCE

### **Dr. Debdoot Sheet**

Associate Professor

Department of Electrical Engineering

Indian Institute of Technology, Kharagpur