Asim Manna

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EDUCATION

Indian Institute of Technology Kharagpur, Kharagpur   *[August 2021 - Present]*
Doctor of Philosophy, Department of Artificial Intelligence   Overall GPA: 8.5/10

Indian Statistical Institute, Kolkata   *[July 2019 - July 2021]*
Master of Technology, CrS   Overall Percentage: 73.55%

University of Calcutta, Kolkata   *[August 2017 - June 2019]*
Master of Science, Department of Pure Mathematics   Overall Percentage: 67.6%

The University of Burdwan, Bardhaman   *[June 2014 - July 2017]*
Bachelor of Science, Department of Mathematics   Overall Percentage: 70.75%

West Bengal Council of Higher Secondary Education   *[2012 - 2014]*
Class XII   Overall Percentage: 81.4%

West Bengal Board of Secondary Education   *[2010 - 2012]*
Class X   Overall Percentage: 75.71%

RESEARCH INTEREST

Computer Vision, Deep Learning, Image Retrieval, Medical Imaging, Linear Algebra, Retrieval-Augmented Generation

SKILLS AND EXPERTISE

- **Programming Languages:** Python, MATLAB, C, SQL

- **Library/Framework:** Pytorch, OpenCV, Pandas, Matplotlib, Plotly, Scikit-Learn, Torchmetrics, ASTRA

PROJECTS

Medical Image Retrieval Using Deep Neural Hashing | **PhD Thesis** | **Dr. Debdoot Sheet**   *[August 2021 - Present]*

- Develop a method to retrieve images with respect to organs and associated pathology towards achieving EBM. [Github Link]

- Develop a structured Deep Neural Hashing method to retrieve images with respect to various attributes.

- Design a framework for multimorbidity image retrieval to access the similarity between different symptoms occurring in chest X-rays.

Computed Tomography Sinogram Denoising | **Project** | **Sponsored by GE Healthcare**   *[August 2023 - Present]*

- Dual-domain denoising for low-dose CT using sinogram total variation and multi-scale Curvelet filtering.

- A dataset has been constructed based on sparse views and varying levels of noise in low-dose sinograms.

- Noise distributions according to X-ray dose variations are modeled and noisy sinograms are generated.

- Employed U-Net architecture-based diffusion model with different time levels for the reconstruction of low-dose CT images.

Investigating Applications of the Target Difference Algorithm in Keccak & Ascon | **M.Tech Thesis** | **Dr. Dhiman Saha**   *[January 2021 - June 2021]*

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

EXPERIENCES

Teaching Assistant | **NPTEL** |

- *Deep Learning for Visual Computing*: Oversee more than 1000 students, design assignments, create questions, and evaluate students' understanding of deep learning concepts.

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)*.

- **Manna, A.** and Sheet, D. 2024. Research Reproducibility Paper: Medical Image Retrieval Using Hamming Distance Fabricated with Jaccard Similarity Coefficient. *Fifth workshop on Reproducible Research in Pattern Recognition*. ([Github Link])

- Dewan, D., **Manna, A.**, Srivastava, S., Borthakur, A. and Sheet, D. 2024. MeDiANet: A Lightweight Network for Large-scale Multi-disease Classification of Multi-modal Medical Images using Dilated Convolution and Attention Network. *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.**, Sista, R., Sheet, D., 2024. Deep neural hashing for content-based medical image retrieval: A survey. Authorea Preprints.

- **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

- Quallified 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