ARINDAM GHOSH

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EDUCATION

Barcelona Institute of Science and Technology, Barcelona, Spain — 2022 - 2023
Master of Multidisciplinary Research in Experimental Sciences (MMRES) — CGPA: 8.4/10

Amity University, Noida, India — 2020 - 2022
Master of Technology (M.Tech) — CGPA: 9.43/10
Specialization - Computer Science and Engineering

University of Mumbai- Department of Atomic Energy- Center for excellence in Basic Science (UM DAE CEBS), India — 2015 - 2020
Integrated Master of Science (B.Sc and M.Sc) — CGPA: 6.26/10
Specialization - Mathematics

FELLOWSHIPS AND AWARDS

Awarded 1st Place in the 2023 Telespazio Technology Contest (Italy) for the ESTESIA project, including EUR 10,000 prize and invitation Seraphim Space Accelerator program.

Living allowance Fellowship awarded by the Institut de Física d'Altes Energies (IFAE), Barcelona, Spain 2022-2023.

BIST- Full Tuition fee waiver Fellowship by Barcelona Institute of Science and Technology(BIST)- Universitat Pompeu Fabra(UPF), Spain 2022-2023.

Silver Medalist at Amity University, India, for outstanding academic performance and securing the second-highest position in the class.

Winners of Smart India Hackathon 2022 for **ISRO's** Problem statement: Deep Learning based Cyclone Intensity estimation using INSAT-3D IR imagery.

DST-INSPIRE Fellowship by Department of Science and Technology (DST), Government of India 2015-2017.

Qualified National Entrance Screening Test (NEST 2015) and selected for UM DAE CEBS, India.

PUBLICATION

- A. Ghosh and S. Thakur, "Review of Brain Tumor MRI Image Segmentation Methods for BraTS Challenge Dataset," in 2022 12th International Conference on Cloud Computing, Data Science & Engineering (Confluence), Noida, India, Jan. 2022, pp. 405–410. doi: 10.1109/Confluence52989.2022.9734134.

- A. Ghosh and I. Singh, "INCYDE: A large scale cyclone detection and intensity estimation dataset using satellite infrared imagery," (Zenodo Doi: 10.5281/zenodo.8015544) (Submitted, currently under review)

- A. Ghosh and I. Singh, "Cyclone Vision: A Comprehensive Deep Learning Framework and Web App for Early Cyclone Detection and Monitoring," (Submitted, currently under review).

RESEARCH EXPERIENCE

PIC – Port d'Informació Científica , UAB, Barcelona — May 2023 - July 2023
Neural spike detection in retina microscopy
Supervisor: Dr. Martin Børstad Eriksen, PIC, UAB, Barcelona

· I was part of a collaborative research project between VHIR, ICFO, and PIC, which focuses on exploring the effects of photoreceptor restoration therapies. Specifically, my work involved an exploratory analysis of potential spike detection techniques for light sheet microscopy images of organoids. Finding such techniques would enable a more detailed 3D analysis of retina activity, contributing to the understanding of the impact of photoreceptor restoration therapies.

Institut de Fisica d'Altes Energies (IFAE), Barcelona   Oct 2022 - July 2023
Optimizing Proton Tracking and Energy Determination for Improved Proton CT Imaging
Supervisor: Dr. Pillar Casado and Dr. Throsten Lux, IFAE-BIST

· I was involved in developing an algorithm that utilizes image processing and machine learning techniques to reconstruct the energy of protons by analyzing their trajectories through a range detector, thus optimizing Proton Tracking and Energy Determination for Improved Proton CT (pCT) Imaging.

Amity University- Noida   Oct 2021 - Jan 2022
Brain Tumor MRI classification using deep learning
Supervisor: Professor Sanjeev Thakur, HoD-CSE, ASET

· I used different feature descriptors like Local Binary Pattern (LBP) and Histogram of Oriented Gradients (HOG) to extract features from MRI images using OTSU thresholding. I finetuned all layers of the transfer learning models like VGG-16, Resnet-18, Densenet-121 to get better classification rate.

Amity University- Noida   Jun 2021 - Sept 2021
Review of Brain tumor segmentation methods
Supervisor: Professor Sanjeev Thakur, HoD-CSE, ASET

· I did a comparative study of different Machine Learning and Computer Vision methods used for Brain Tumor Segmentation. The Brain tumor segmentation (BraTS) challenge dataset from 2012 to 2020 was used on the models being compared. I provided an overall workflow, comparison of different models and an assessment of the existing research literature with corresponding future advancements.

Indian Statistical Institute, Kolkata   Jun 2019 - Nov 2019
Comparative study of HEp-2 Cells classification using dictionary learning
Supervisor: Professor Pradipta Maji, Machine Intelligence Unit

· It was a comparative study of different discriminating Dictionary Learning methods. Algorithms like Sparse Representation based classification, Label consistent K-SVD 1, Label consistent K-SVD 2 and Fisher Discriminant Dictionary Learning were tested by classifying the MIVIA HEp-2 cells staining pattern image database with different feature descriptors.

Institute of Chemical Technology, Mumbai   Jan 2019 - Apr 2019
Generative Adversarial Networks (GAN) to Denoise images
Supervisor: Professor Ajit Kumar, HoD-Mathematics department

· I resized images from the Image-Net ILSVRC2013 Data set and added Gaussian noise. This data was used to train a GAN model and denoise images.

Institute of Chemical Technology, Mumbai   Nov 2018 - Dec 2018
Forex Forecasting Using Support Vector Machines in Python
Supervisor: Professor Ajit Kumar, HoD-Mathematics department

· I achieved an in-depth mathematical understanding of SVC, SVR and Kernels by implementing a forecasting model on Forex currency pairs. Subsequently, I presented a comparison of different kernels on SVR with Linear Regression.

Indian Institute of Technology (IIT), Bombay   May 2017 - Jun 2017
Parallel Programming using CUDA.

Supervisor: Professor Sachin Patkar, Electrical Engineering department

· I worked at the High Performance Computing Laboratory (HPCL) on boolean matrix-vector multiplication (BMV) using Wiedemann method in CUDA

PROFESSIONAL EXPERIENCE

Estesia - Smart Analytics, Chile   Nov 2023 - Present
AI Research Scientist

Currently working on leveraging GeoSpatial data and using tailor-made AI models to deal with real-time satellite images to segment for extraction surfaces and subsoils, covering the complete cycle of water dynamics to be analyzed and used in the mining industry for sustainable lithium extraction.

ClaimZippy Pvt. Ltd., India   Sep 2023 - Present
AWS Data Engineer Internship

Enhancing ClaimZippy's AI computer vision to automatically extract handwritten and printed data from claim documents, enabling efficient processing. Identifying and advising on opportunities to integrate emerging innovations; improving automation, accuracy and workflow of the AI claims review system. Consulting executives to incorporate the latest artificial intelligence into products that serve policyholders and carriers.

Cognizant, India   Feb 2022 - June 2022
AWS Data Engineer Internship

I completed a project and a case study that significantly enhanced my skills in various technologies. Specifically, I gained hands-on experience with Pyspark, SQL, and Python, which were used extensively in the project.

CONFERENCE AND WORKSHOPS

- Attended Workshop organized by Smart India Hackathon on AWS Cloud Computing and Machine learning fundamentals (2022).
- Presented a paper titled 'Review of Brain Tumor MRI Image Segmentation Methods for BraTS Challenge Dataset' at the 12th International Conference on Cloud Computing, Data Science & Engineering (Confluence), 2022.
- Attended Winter School on Advances in Deep Learning for Multimedia Signal Processing (2022).
- Attended IEEE Quantum Computing Healthcare Summit (2022).
- Attended the Conference on Computer Vision and Pattern Recognition (CVPR- 2021) virtually.

OTHER ACHIEVEMENTS AND EXTRA-CURRICULAR ACTIVITIES

- **Winners** of Smart India Hackathon 2022 for **ISRO's** Problem statement: Deep Learning based Cyclone Intensity estimation using INSAT-3D IR imagery.
- **Organized** the **BIST-MMRES Scihack 2023** hackathon for high school students in Catalonia, Spain, with the goal of promoting scientific thinking and problem-solving skills. Led the conceptualization of the event, identified problem statements, and managed event logistics to ensure a successful execution.
- We were among the **global finalist** teams (top 35) in the **NASA International Space Apps Challenge 2022**, out of 5,327 teams and 31,561 participants.
- Active IEEE Graduate Student Member (2022).

- Active member of Amity Artificial Intelligence Club (2021).
- Qualified Google CodeJam- Qualification Round (2020).
- Received Google Hash Code certification- Qualification round (2020).
- Won Crescendo 2020, an online treasure hunt event organized by UM DAE CEBS.
- Attended meet-ups and talks organized by School of AI- Mumbai (2018).
- Founding member of E-game Club at UM-DAE CEBS and organized multiple intra-college e-sports events (2017).
- **Organized** Jigyasa, an inter-college science quiz competition at UM DAE CEBS in collaboration with St. Xaviers College, Institute of Chemical Technology, Mumbai and Indian Institute of Technology-Bombay (2017).
- Organized Ragnarok, an inter-college sports event at UM DAE CEBS (2015 and 2016).

RELEVANT COURSES

Core Courses	**Other Courses**
Advanced Data Structures	Mathematical Foundation of CS
Principles Of Machine Learning	Data Warehousing and Data Mining
Pattern Recognition and Image Processing	Data Compression and Techniques
Probability Theory	Discrete Mathematics
Calculus and Linear Algebra	Statistical Techniques and Applications
Graph Theory	Infrastructure for Cloud

Certification Courses

· Machine Learning by Andrew Ng on Coursera.
· Deep Learning Specialization (5 courses) on Coursera.
· Algorithms: Specialization by Tim Roughgarden on Coursera.
· CS50 Introduction to Artificial Intelligence in Python on edX.
· CS50x Introduction to Computer Science on edX.
· Data Engineering with Databricks.

TECHNICAL STRENGTHS

Computer Languages	Python, Matlab, C, R, SQL, Pyspark
Tools	Pytorch, LaTeX, Mathematica
Familiar	AWS, Mathematica, Sage, Fortran, C++.