Madhumitha V

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Interests

Computer Vision, Deep Learning, AI for Neuroscience, Explainability

Education

Indian Institute of Technology, Hyderabad — **Aug 2023 - Present**
PhD in Artificial Intelligence — *GPA:8.38/10*

BMS Institute of Technology and Management, Bangalore — **Aug 2019 - Jun 2023**
B.E in Artificial Intelligence & Machine Learning **[Gold Medalist]** — *GPA: 9.49/10*

Delhi Public School Bangalore North — **May 2019**
CBSE, PCMB [12th Std] — *Perc: 93.4%*

St. Vincent Pallotti School — **May 2017**
ICSE [10th Std] — *Perc: 95.3%*

Experience

Data Scientist Intern — **Feb 2023 – Jul 2023**
IBM India Systems Development Lab — *Bangalore, India*

- Worked with Team AI on IBM-Z systems
- Built, tested, and delivered a prototype for deploying ML models (using SnapML) for Credit Card Fraud Detection on S/390x Z systems using the Triton Inference Server.

Research Intern — **Aug 2022 – Dec 2022**
NeuRonICS Lab, DESE, Indian Institute of Science — *Bangalore, India*

- Guided by Ms. Madhuvanthi and Prof. Chetan Singh Thakur
- Trained Neural Network using Simultaneous Perturbation Stochastic Approximation techniques on MNIST for deployment on Neuromorphic hardware.

Publications

BRAIN-ViT: Boosting Representations with Anatomical Knowledge for Identifying Neurodegenerative Disorders using ViTs — Under Review (A* conference)
Madhumitha V, Sunayna Padhye, Shanawaj S Madarkar, Konda Reddy Mopuri

MOYAGEN3D: Geometric Deep Learning Model of Internal Carotid Artery towards understanding pathogenesis of Moya Moya Angiopathy — SBMT 2024 (Accepted)
Muthu Palaniappan, ***Madhumitha V***, Santhi Natarajan, Sundharakumar KB, Ram Kishan Nekkanti, Manjunath N, Sanjay HM, Sudhir Jayanand, Prasad Patnaik BSV

URVoice: An Akl-Toussaint/ Graham-Sklansky Optimization for Sign Language Interpretation — IEEE-EMBS BHI 2023
Madhumitha V, Santhi Natarajan, Bharathi A, Manjunath Sargur Krishnamurthy
URVoice

Machine Learning Approach for Diagnosis of Schizophrenia Using EEG Signals — MARC 2023
I. S. Rajesh, D. Sri Lakshmi Priya, ***V Madhumitha***, Shreyas Sreenivas
10.1007/978-981-97-5231-7

A Comparative Study for Early Diagnosis of Alzheimer's Disease Using Machine Learning Techniques. — ICICC 2023
A. Bharathi Malakreddy, D. Sri Lakshmi Priya, ***V Madhumitha***, Aryan Tiwari
10.1007/978-981-99-4071-4

SENSE3D: A Novel Optimality Sensing Algorithm to Characterize Internal Carotid Artery in Moya Moya Disease — ConfAI 2022 (Accepted)
V Madhumitha, Santhi Natarajan, B Jayanand Sudhir, Sanjay H M, Manjunath N

Projects

Deep Insights: Understanding Brain Disorders with AI [PhD Thesis] **Dec 2023 - Present**
DiL Lab, Guide: Dr. Konda Reddy Mopuri

- Employing Deep learning models in diagnosis of Brain disorders using sMRI and fMRI modalities.
- Providing interpretable solutions for the assistance of doctors in various disorder diagnosis like Alzheimer's disease, Schizophrenia, Parkinson's disease, etc.

Hallucination Detection in Large Language Models **Jan 2024 - Apr 2024**
NLP coursework, Advisor: Dr. Maunendra Desarkar

- Performed a comparative study of SOTA models (GPT-3, LED, BART-Base, T5) in generating hallucinated text using the BERT Score, Question Answering and N-gram variants of SelfCheckGPT.

Blood report (CBC-DBC) generation using blood smear images **Jan 2024 - Apr 2024**
IVP coursework, Advisor: Dr. Sumohana Channappayya

- Employed Image processing techniques to segment out RBCs and WBCs, and count them.
- Trained YOLO model to detect and classify the 5 major classes of WBC cells.

Radiogenomics approach for Neurocognitive disorders; **Dec 2021 - Jan 2023**
BMSIT&M, Advisor: Dr. Santhi Natarajan, Dr. Bharathi Malakreddy

- Applied Radiomics and Genomics techniques on a patient's data and later combined the results using statistical mapping to identify a neurocognitive disorder.
- Worked on employing genetic algorithms and GATK pipeline for the Genomics part of the research.

Achievements

Second best project in NLP coursework **Apr 2024**

- Project on "Hallucination detection in Large Language Models" was awarded 2^{nd} best project.

Awarded GOLD MEDAL from Visveswaraya Technological University, Karnataka **Aug 2023**

- Secured **First Rank** in Bachelor of Engineering (Dept. of AI&ML) in Karnataka State.

Winner of Project-based learning, Open Day, BMSIT&M **Jul 2022**

- Project on "Early detection of Alzheimer's Disease using Machine Learning techniques".

Special Recognition Award, Srishti Hackathon 2022 **Apr 2022**

- State-level competition, conducted by Yuvaka Sangha in association with BMS College of Engineering.
- Presented a project on "Smart System for Patient Health Records Management", which focused on integrating AI with Medical Transcriptions.

Illustrator and Coordinator of *NATYRA* **Jun 2022**

- Contributed paintings to NATYRA, a handbook published on behalf of Eco club [OIKOS], BMSIT&M.
- Was also a coordinator for the release of the handbook.

Coursework

Matrix Theory, Probability, Advanced Data Structures and Algorithms, Convex Optimization, Foundations of Machine Learning, Deep Learning, Natural Language Processing, Image and Video Processing, Explainability in Machine Learning, Introduction to Brain & Neuroscience.

Teaching Assistantship

Deep Learning	Spring 2024 & 2025
AIET course by TalentSprint on Computer Vision	16^{th} & 23^{rd} Feb, 2025
DRDO Workshop on Deep Learning and Computer Vision algorithms	$11^{th} - 13^{th}$ Jul, 2024

Sub-Reviewer

ICLR 2025, WACV 2025, TPAMI 2024, ECAI 2024

Technologies

Languages: Python, C, HTML, CSS, SQL
Packages: Linux, LATEX, Docker, Git
Framework: Numpy, Pandas, Scikit-learn, Pytorch, Tensorflow, OpenCV, Matplotlib, Seaborn

Conferences Attended

ICVGIP, IIIT Bangalore	Dec 2024
NCVPRIPG, IIST Trivandrum	Aug 2024
ICVGIP, IIT Ropar	Dec 2023

Languages

English [Technical Proficiency], Telugu, Kannada, Tamil