

# Madhumitha V

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## Interests

Computer Vision, Deep Learning, AI for Neuroscience, Explainability

## Education

<b>Indian Institute of Technology, Hyderabad</b> <i>PhD in Artificial Intelligence</i>	<b>Aug 2023 - Present</b> <i>GPA: 8.38/10</i>
<b>BMS Institute of Technology and Management, Bangalore</b> <i>B.E in Artificial Intelligence &amp; Machine Learning [Gold Medalist]</i>	<b>Aug 2019 - Jun 2023</b> <i>GPA: 9.49/10</i>
<b>Delhi Public School Bangalore North</b> <i>CBSE, PCMB [12th Std]</i>	<b>May 2019</b> <i>Perc: 93.4%</i>
<b>St. Vincent Pallotti School</b> <i>ICSE [10th Std]</i>	<b>May 2017</b> <i>Perc: 95.3%</i>

## Experience

<b>Data Scientist Intern</b> <i>IBM India Systems Development Lab</i>	<b>Feb 2023 – Jul 2023</b> <i>Bangalore, India</i>
<ul style="list-style-type: none"> <li>Worked with Team AI on IBM-Z systems</li> <li>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.</li> </ul>	
<b>Research Intern</b> <i>NeuRonICS Lab, DESE, Indian Institute of Science</i>	<b>Aug 2022 – Dec 2022</b> <i>Bangalore, India</i>
<ul style="list-style-type: none"> <li>Guided by Ms. Madhuvanthi and Prof. Chetan Singh Thakur</li> <li>Trained Neural Network using Simultaneous Perturbation Stochastic Approximation techniques on MNIST for deployment on Neuromorphic hardware.</li> </ul>	

## Publications

<b>BRAIN-ViT: Boosting Representations with Anatomical Knowledge for Identifying Neurodegenerative Disorders using ViTs</b> <i>Madhumitha V, Sunayna Padhye, Shanawaj S Madarkar, Konda Reddy Mopuri</i>	Under Review (A* conference)
<b>MOYAGEN3D: Geometric Deep Learning Model of Internal Carotid Artery towards understanding pathogenesis of Moya Moya Angiopathy</b> <i>Muthu Palaniappan, Madhumitha V, Santhi Natarajan, Sundharakumar KB, Ram Kishan Nekkanti, Manjunath N, Sanjay HM, Sudhir Jayanand, Prasad Patnaik BSV</i>	SBMT 2024 (Accepted)
<b>URVoice: An Akl-Toussaint/ Graham-Sklansky Optimization for Sign Language Interpretation</b> <i>Madhumitha V, Santhi Natarajan, Bharathi A, Manjunath Sargur Krishnamurthy</i> <a href="#">URVoice</a> <a href="#">🔗</a>	IEEE-EMBS BHI 2023
<b>Machine Learning Approach for Diagnosis of Schizophrenia Using EEG Signals</b> <i>I. S. Rajesh, D. Sri Lakshmi Priya, V Madhumitha, Shreyas Sreenivas</i> <a href="#">10.1007/978-981-97-5231-7</a> <a href="#">🔗</a>	MARC 2023
<b>A Comparative Study for Early Diagnosis of Alzheimer's Disease Using Machine Learning Techniques.</b> <i>A. Bharathi Malakreddy, D. Sri Lakshmi Priya, V Madhumitha, Aryan Tiwari</i> <a href="#">10.1007/978-981-99-4071-4</a> <a href="#">🔗</a>	ICICC 2023
<b>SENSE3D: A Novel Optimality Sensing Algorithm to Characterize Internal Carotid Artery in Moya Moya Disease</b> <i>V Madhumitha, Santhi Natarajan, B Jayanand Sudhir, Sanjay H M, Manjunath N</i>	ConfAI 2022 (Accepted)

## Projects

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<b>Deep Insights: Understanding Brain Disorders with AI</b> [PhD Thesis] <i>DiL Lab, Guide: Dr. Konda Reddy Mopuri</i> <ul style="list-style-type: none"><li>Employing Deep learning models in diagnosis of Brain disorders using sMRI and fMRI modalities.</li><li>Providing interpretable solutions for the assistance of doctors in various disorder diagnosis like Alzheimer's disease, Schizophrenia, Parkinson's disease, etc.</li></ul>	<b>Dec 2023 - Present</b>
<b>Hallucination Detection in Large Language Models</b> <i>NLP coursework, Advisor: Dr. Maunendra Desarkar</i> <ul style="list-style-type: none"><li>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.</li></ul>	<b>Jan 2024 - Apr 2024</b>
<b>Blood report (CBC-DBC) generation using blood smear images</b> <i>IVP coursework, Advisor: Dr. Sumohana Channappayya</i> <ul style="list-style-type: none"><li>Employed Image processing techniques to segment out RBCs and WBCs, and count them.</li><li>Trained YOLO model to detect and classify the 5 major classes of WBC cells.</li></ul>	<b>Jan 2024 - Apr 2024</b>
<b>Radiogenomics approach for Neurocognitive disorders;</b> <i>BMSIT&amp;M, Advisor: Dr. Santhi Natarajan, Dr. Bharathi Malakreddy</i> <ul style="list-style-type: none"><li>Applied Radiomics and Genomics techniques on a patient's data and later combined the results using statistical mapping to identify a neurocognitive disorder.</li><li>Worked on employing genetic algorithms and GATK pipeline for the Genomics part of the research.</li></ul>	<b>Dec 2021 - Jan 2023</b>

## Achievements

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<b>Second best project in NLP coursework</b> <ul style="list-style-type: none"><li>Project on "Hallucination detection in Large Language Models" was awarded 2<sup>nd</sup> best project.</li></ul>	<b>Apr 2024</b>
<b>Awarded GOLD MEDAL from Visveswaraya Technological University, Karnataka</b> <ul style="list-style-type: none"><li>Secured <b>First Rank</b> in Bachelor of Engineering (Dept. of AI&amp;ML) in Karnataka State.</li></ul>	<b>Aug 2023</b>
<b>Winner of Project-based learning, Open Day, BMSIT&amp;M</b> <ul style="list-style-type: none"><li>Project on "Early detection of Alzheimer's Disease using Machine Learning techniques".</li></ul>	<b>Jul 2022</b>
<b>Special Recognition Award, Srishti Hackathon 2022</b> <ul style="list-style-type: none"><li>State-level competition, conducted by Yuvaka Sangha in association with BMS College of Engineering.</li><li>Presented a project on "Smart System for Patient Health Records Management", which focused on integrating AI with Medical Transcriptions.</li></ul>	<b>Apr 2022</b>
<b>Illustrator and Coordinator of NATYRA</b> <ul style="list-style-type: none"><li>Contributed paintings to NATYRA, a handbook published on behalf of Eco club [OIKOS], BMSIT&amp;M.</li><li>Was also a coordinator for the release of the handbook.</li></ul>	<b>Jun 2022</b>

## Coursework

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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.
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## Teaching Assistantship

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Deep Learning	Spring 2024 & 2025
AJET course by TalentSprint on Computer Vision	16 <sup>th</sup> & 23 <sup>rd</sup> Feb, 2025
DRDO Workshop on Deep Learning and Computer Vision algorithms	11 <sup>th</sup> – 13 <sup>th</sup> Jul, 2024

## Sub-Reviewer

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ICLR 2025, WACV 2025, TPAMI 2024, ECAI 2024
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## Technologies

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

## Conferences Attended

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

## Languages

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English [Technical Proficiency], Telugu, Kannada, Tamil