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RESEARCH EXPERIENCE

- **A Dual-Attention Aware Deep CNN for Early Alzheimer's Detection**  VIT Chennai
Medical Imaging (MRI), Machine Learning, Computer Vision May 2024 - July 2024
 - Created a robust image preprocessing pipeline to improve feature extraction for more accurate analysis of deep learning model performance in medical image analysis.
 - Proposed a dual spatial and self attention enhanced deep CNN enabling improved feature extraction and facilitating the identification of disease-specific biomarkers from MRI scans.
- **Glioma Segmentation & Grading With 3D MRI-Guided Hybrid Deep Learning Models** VIT Chennai
Medical Imaging (MRI), Machine Learning, Computer Vision Feb 2024 - May 2024
 - Facilitated accurate spotlighting of tumor regions, achieving 98.5% accuracy, through the use of multimodal cues in the Spatial and Graph Attention based Tumor Localization algorithm
 - Developed a LinkNet Framework with a SeResNet101 backbone for precise tumor segmentation, achieving an IoU score of over 97%
- **Integrative GF and FFT for Neuro MRI-based Parkinson's Disease Identification** VIT Chennai
Medical Imaging (MRI), Machine Learning, Computer Vision Jan 2024 - Feb 2024
 - Implemented an automated disease detection system by focusing on segmenting white matter in the brain to efficiently distinguish between healthy individuals and those with Parkinson's disease.
 - Employed Gabor Filters and Fast Fourier Transform for feature extraction which are then fused together.
 - Developed a shuffle-squeeze classification framework for Parkinson's disease detection, yielding a precision of over 97%.
- **Multi-Attention Integrated DL Frameworks for Enhanced Breast Cancer Analysis**  VIT Chennai
Medical Imaging (Ultrasound), Machine Learning, Computer Vision Nov 2023 - Jan 2024
 - Designed a spatial-channel based attention enhanced LinkNet framework with InceptionResNet backbone for breast cancer segmentation.
 - Developed a deep CNN framework utilizing self attention mechanisms for breast cancer classification, achieving over 98% accuracy.
- **Traffic Sign Classification using Attention Fused Deep Convolutional Neural Network** VIT Chennai
Machine Learning, Computer Vision Dec 2023 - Jan 2024
 - Built an attention-fused deep CNN to capture crucial features from diverse spatial orientations.
 - Employed diverse feature extraction backbones to capture features at multiple resolutions, enhancing accuracy.
 - Accepted for publication in the proceedings of *IEEE International Conference on Robotics and Automation Sciences, Tokyo, Japan*.
- **A Comprehensive Study on Skin Cancer Detection Using Deep Learning** VIT Chennai
Medical Imaging (X-ray), Machine Learning, Computer Vision Oct 2023 - Dec 2023
 - Conducted a comparative analysis of CNN architectures for the differential diagnosis of cutaneous malignancies.
 - Concluded a maximum of 99.73% accuracy through rigorous comparative analysis using the ResNet50 architecture, optimized with data augmentation and hyperparameter tuning.
- **A Transformer-Enabled DL Framework For Enhancing Bone Fracture Detection** VIT Chennai
Medical Imaging (X-ray), Machine Learning, Computer Vision Sep 2023 - Nov 2023
 - Implemented a vision transformer enhanced using a EfficientNetV2-assisted backbone to facilitate highly effective feature extraction.
 - Patched the features without loss in information, and achieved over 98.7% accuracy in detecting fractures in various bones in the body from X-ray images.

- **A Novel Climatic GAN with X-ViT for Traffic Sign Classification in AVT** VIT Chennai
Generative Adversarial Networks, Machine Learning, Computer Vision Jul 2023 - Oct 2023

 - Devised a novel climatic Generative Adversarial Network (C-GAN) to diversify dataset with 200K images per weather condition.
 - Formulated an X-Vision Transformer (X-ViT) for Traffic Sign Classification in Autonomous Vehicle Technology (AVT), achieving over 99% accuracy on all major benchmark datasets.
- **Novel Self Attention-Enabled Weighted Ensembling in CNNs for DDoS Detection** VIT Chennai
Network Security, Machine Learning, Deep Learning Aug 2023 - Oct 2023

 - Engineered a novel self-attention-enabled weighted ensemble CNN framework for highly accurate DDoS attack detection.
 - Achieved 98.3% precision in identifying complex network anomalies using a multi-scale feature extraction approach, surpassing conventional methods.
- **Enhancing Network Intrusion Detection Using Modified Residual Connections** VIT Chennai
Network Security, Machine Learning, Deep Learning Jul 2023 - Sep 2023

 - Constructed a novel Modified Residual Connection Enabled Convolutional Neural Network (MRCECNN) for robust network intrusion detection.
 - Demonstrated superior NID capabilities by achieving 99.6% accuracy using a novel MRCECNN architecture, effectively minimizing false alarms and missed attacks.
- **Mango Leaf Disease Detection Using Attention-Enabled Ensemble Classifier**  VIT Chennai
Machine Learning, Computer Vision Jul 2023 - Aug 2023

 - Developed a high-performance ensemble classifier incorporating spatial attention layers to model and capture intricate, high-dimensional dependencies in mango leaf images for precise disease identification, achieving over 97% accuracy.
 - Accepted for publication in the proceedings of *IEEE International Conference on Advances in Data Engineering and Intelligent Computing Systems (ADICS)*.
- **Multimodal Emotion Recognition using Attention Enabled Audio-Video Transformer** VIT Chennai
Machine Learning, Computer Vision Apr 2023 - Jun 2023

 - Designed a cross-attention enhanced audio-video transformer network to integrate and analyze multimodal audio and visual signals for advanced emotion recognition.
 - Surpassed performance using benchmark datasets in comparison to existing works, achieving an accuracy of 90%.
- **A Channel Attention-Driven CNN Framework for Paddy Leaf Disease Detection**  VIT Chennai
Machine Learning, Computer Vision Feb 2023 - Apr 2023

 - Implemented a SwiSeNet classifier, leveraging the SENet architecture and incorporating sophisticated channel attention mechanisms for enhanced feature representation across the network.
 - Attained a remarkable accuracy of over 98.8%, exceeding the performance of established frameworks and baseline models.
- **Smart Crop Protection Using AI-Driven Cotton Leaf Disease Detection** VIT Chennai
Machine Learning, Computer Vision Dec 2022 - Feb 2023

 - Engineered sophisticated deep learning models with spatial attention mechanisms and boosting classifiers, incorporating dynamic feature extraction and multi-scale analysis
 - Accepted for publication in a Q1-ranked journal: *Neural Computing and Applications*.
- **Enhanced Tomato Leaf Disease Classification using EMA Fusion and EWGO**  VIT Chennai
Machine Learning, Computer Vision Oct 2022 - Dec 2022

 - Implemented an adaptive ensemble approach by integrating Exponential Moving Average (EMA) Fusion and Enhanced Weighted Gradient Optimization (EWGO).
 - Demonstrated significant performance improvements with an accuracy of 98.7% on test data.
 - Published the paper in a Q1-ranked journal: *Frontiers in Plant Science*.

WORK EXPERIENCE

- **MedxAI Innovations and MGM Healthcare** Chennai, India
AI Intern (Medical Imaging/Diagnostics) May 2024 - Jul 2024
 - Established an innovative web solution for automating report generation in Upper GI Endoscopy, using state-of-the-art AI algorithms on a django backend framework.
 - Significantly decreased report generation at MGM Hospitals(Chennai) delays by over 80% and integrated a mechanism to evaluate the quality of UGI Endoscopy procedures.
- **Apollo Hospitals and Apollo Sindoori Hotels Ltd** Chennai, India
AI Consultant and Solutions Architect Feb 2024 - May 2024
 - Built an AI-integrated android app using flutter to track calorie intake and patient recovery at Apollo Hospitals, Chennai.
 - Deployed in several Apollo Hospitals branches, and facilitates doctors, nurses, and nutritionists in overseeing patient recovery rates and nutrition intake, significantly lightening workload by over 50%.
- **Innovative Implements Private Ltd (State Government-Funded)** Chennai, India
AI and Internet of Things Consultant and Solutions Architect Oct 2023 - Dec 2023
 - Developed a high-speed IoT framework using Raspberry Pi and TensorFlow for gesture-based automation to enhance teaching assistance in rural schools across Tamil Nadu.
 - Optimized efficiency to achieve a minimal response time < 33ms per frame while utilizing limited memory to prevent overheating in the absence of a heat-sink.
- **Virtusa** Chennai, India
Computer Vision Intern Aug 2023 - Nov 2023
 - Engineered FaceLog, a web app integrating PyTorch-powered facial recognition AI for automated attendance management at VIT Chennai hostels.
 - Presented a Proof of Concept (POC) to the management of VITc, showcasing a comprehensive full-stack web application built with the Django Framework and integrated AI capabilities, demonstrating the potential of the innovative solution.

PROJECTS

- **MedBalance Pro - Clinician Burnout Support System** Gemini API Developer Competition
Python, Gen AI, HTML/CSS, JavaScript, Express.js May 2024 - Present
 - Creating a Burnout-Assistance application for clinicians to streamline patient management and assess personal workload to reduce burnout.
 - Currently designing a dynamic dashboard powered by Gen AI to automatically update clinicians' schedules in realtime according to the severity of patients' conditions.
- **Augmented Autonomous Vision using GANs** AMD Pervasive AI Developer Contest
Python, Generative Adversarial Networks Mar 2024 - Jun 2024
 - Developed a deep convolutional CycleGAN-based solution for realistic day-to-night image translation and vice versa, to enhance the adaptability and safety of autonomous vehicles in varying lighting conditions.
 - Provided more reliable visual data by focusing on improved image fidelity and environmental accuracy to improve AVs' ability to navigate safely and effectively.
 - Won exclusive early access to AMD Radeon Instinct GPUs with ROCm 6.1.2, worth \$24,000.

TECHNICAL SKILLS

Languages: Python, R, C, C++, Java, SQL, HTML5, CSS3, JavaScript, Dart, and PHP

Clouds & Databases: AMD Accelerator, Google, and Amazon Web Services (AWS)

Frameworks: PyTorch, TensorFlow, Keras, TFLite, MediaPipe, Scikit-Learn, Hugging Face, OpenCV, Roboflow, NLTK, Django, Flask, Git, Flutter, React, IBM Watson

Softskills: Leadership, Management, Teamwork, Communication, Creative thinking, Analytical & Problem solving

ACHIEVEMENTS AND RECOGNITIONS

- **Academics and Research**
 - Currently a teaching assistant for Dr. Pandiyaraju V in the **deep learning lab** at VIT Chennai.
 - Physical presentation of my **research paper** in Tokyo at the international IEEE conference: **ICRAS 2024**.
 - Selected for a **state-government funded R&D project** under VIT Chennai.
 - Granted a key research project for the **Kauvery group of hospitals**.
 - Selected as a **team lead** for a high-impact R&D project funded by **Apollo chain of hospitals**.
 - Presented my **research paper** at Hindustan University at the international IEEE conference: **IDCAS 2024**.
 - Consistent **9+ CGPA** holder since the beginning of undergraduate.
 - Published research papers in **Q1-ranked and high-impact** journals.