Swarun Raj R S								
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Objective

Driven and innovative engineering professional with a strong passion for research and development in signal processing, machine learning, and deep learning. Seeking a challenging position in a reputed institution that offers opportunities to effectively apply my teaching, research, and administrative skills. Committed to continuous professional growth while contributing meaningfully to the organization's objectives and academic excellence.

Skills

LanguagesImage: Strong reading, writing and speaking competencies for English and Malayalam.SoftwaresImage: MATLAB, Code Composer Studio, LaTeX, C, C++, Python

Employment History

2019 -Present	Research Thrikkakka	Scholar(U ara	GC J	RF) G	overnment	Model	Engineering	College
2012 - 2019	Assistant tupuzha	Professor	Ilahia	School	of Science	And '	Techonology,	Muvat-

Education

2019 - Present	 Ph.D(Pursuing) in Biomedical Image Processing(Under UGC JRF Scheme) Model Engineering College, Thrikkakkara, APJ Abdul Kalam Technological University(APJKTU), Kerala
2010 - 2012	M.Tech in Electronics with specialization in Signal Processing Model Engineering College, Thrikkakkara, Cochin University Of Science And Technology(CUSAT) CGPA-8.88
2009 - 2010	Advanced Diploma in Digital Signal Processing Cranes Varsity, Bangalore
2004 - 2008	 B.Tech Electronics and Communication College of Engineering, Vadakara, Cochin University Of Science And Technology(CUSAT) Percentage-76.27%
2002 - 2004	Plus Two Board of public examination,Kerala Percentage-83.83%
2002	SSLC Board of public examination,Kerala Percentage-88.33%

Projects

Decoding Alzheimer's Disease Progression with Vision Transformers

This work offers a deep learning based approach that uses MRI data to classify AD stages with Vision Transformers. By treating brain MRI scans as sequences of image patches, ViTs can capture intricate spatial dependencies crucial for accurate classification. ViTs can effectively model global relationships within brain images through the transformer architecture's self attention mechanisms, discerning subtle patterns indicative of Alzheimer's disease progression. This ViT-based model showcased promising performance in accurately categorizing AD stages into four distinct classes: CN, EMCI, LMCI, and AD.

A Machine Learning Approach for Classifying Alzheimer's Disease Based on Changes in the Default Mode Network

This work is a machine-learning approach for the detection of AD by examining changes in the functional connectivity of the Default Mode Network (DMN). Initially, the timecourse signals are extracted from the selected voxel points in the default mode network. Thereafter, the Pearson's correlation coefficient is calculated as a measure of functional connectivity and the performance of different classifier models are evaluated. The instantaneous phase synchronization of time series signals is also taken into account as a feature input. It is found that this increased the classification accuracy of the majority of the models under consideration.

A Deep Learning Based Classification of Alzheimer's Disease Using 3D CNN This work provides a deep learning-based approach that uses fMRI data to classify Alzheimer's disease cases. This model employs a multi-layered 3-dimensional convolutional neural network (CNN) architecture to efficiently learn hierarchical representations from spatial and temporal characteristics of fMRI data. The model is trained on the Alzheimer's Disease Neuroimaging Initiative(ADNI) dataset, incorporating both healthy control subjects and individuals diagnosed with Alzheimer's disease. Comparative analyses are conducted against traditional machine learning approaches and state-of-the-art methods to demonstrate the superior classification performance and efficiency of the proposed model.

Video Copy Detection System using Content-based Fingerprinting

This work proposes a system to identify a given video query in a database by measuring the distance between the query fingerprint and the fingerprints in the data base identify the presence of a given query video in a video database. Video fingerprints are feature vectors that uniquely characterize one video from another. This project relies on a fingerprint extraction algorithm followed by a fast approximate search algorithm. The fingerprint extraction algorithm extracts compact content- based signatures from special images constructed from the video. The search algorithm searches the stored fingerprints to find close enough matches for the fingerprints of the query video. The Matlab simulation of this system is done and is implemented on TI's TMS320DM6437 processor.

Research Publications

Conference Proceedings

Swarun Raj R S, Bineesh, and V. Thomas, "A deeplearning based classification of alzheimer's disease using 3d cnn," in *IEEE International Conference on ICTEST*, 2024.

Swarun Raj R S, Binish, and V. Thomas, "Brain tumor classification using multi-resolution averaged spatial attention features using cham and convolutional neural network," in *IEEE International Conference on ICTEST*, 2024.

3 Swarun Raj R S, Navya, and Meenakshy, "Wavelet thresholding using gwo optimization for eeg denoising," in *IEEE International Conference on ICTEST*, 2024.



Swarun Raj R S, Binish, and A. Raheem, "Contrast-based intelligent image dehazing technique," in *conference name*, 2017.

Awards and Achievements

2023	Qualified	GATE	(Graduate	Aptitude	Test in	Engineering)	

2019 Qualified UGC NET JRF in Electronic Science

Personal Profile



References

Dr Vinu Thomas

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Dr Rajesh M V

Principal, College of Engineering, Poonjar Chairman, IEEE Kochi Subsection Vice Chairman, IETE Kochi ✓ mvrajeshihrd@gmail.com 9447464687

Declaration

I hereby declare that all information above stated is true and correct to the best of my knowledge and belief.

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