

PAVAN RAJKUMAR MAGESH

Bangalore

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My Website

SUMMARY

- Interested in working in the research domain. Currently looking for research internships in the fields of applied machine learning.
- Organised and motivated student who practises proper planning and time management to get work done.
- Possesses great communication skills, is a quick learner and keen listener, and not to mention, an early riser.
- Still discovering my research interests, but am currently interested in applied AI for healthcare and relevant research fields. Open to exploring new domains of research.

RESEARCH WORK

- **An Explainable Machine Learning Model for Early Detection of Parkinson's Disease using LIME on DaTscan Imagery** - developed a neural network model using transfer learning on the VGG16 CNN architecture to diagnose Parkinson's Disease by analysing the varying sizes of the putamen and caudate regions of the brain visualised in SPECT DaTscans. Explained the predictions obtained using superpixels generated by LIME methods. (Paper submitted to Computers in Biology and Medicine)
- **An Explainable Machine Learning Model for Early Detection of Parkinson's Disease using LIME on Speech Signals** - Developed SVM, random forest and neural network models to diagnose Parkinson's Disease by analysing the variations in the speech samples of patients. Further utilised the LIME framework to explain the classifications obtained. (Paper under construction)
- **A Comparative Study of Transfer Learning Models for Medical Imaging** - Transfer Learning is often used to speed up the training process of ML models by using existing weights and architectures as a basis step. This study compares the transfer learning performance on popular CNNs - AlexNet, VGG16, LeNet, InceptionV3, and ResNet. (Research Ongoing)
- **Software Risk Prediction using Machine Learning** - Predicting the risk and impact of newly introduced code into a project code base. Using supervised machine learning to classify new code integrations as bug inducing or not. Comparing performance on neural networks, naive-bayes, SVMs, random forests, and logistic regression. (Research Ongoing)

TECHNICAL SKILLS

- Programming languages - Python, LaTeX, Java, C, SQL
- Machine learning algorithms and underlying mathematics. ML pipe-lining with implementation using relevant python libraries.
- Data pre-processing, visualization, and extrapolation using relevant python tools and packages.

EDUCATION

BE Computer Science and Engineering

CGPA - 8.77 (Top 10% of class of 2021)

High School

Grade 12 - 89.5% (PCMC - Karnataka State Board)

Grade 10 - 10.0 CGPA (Central Board of Secondary Education)

CMR Institute of Technology

2017 to present

Narayana Educational Institutions

2013-2017

RELEVANT COURSEWORK

- Machine Learning
- Digital Image Processing
- Natural Language Processing
- Python Application Programming
- Operations Research
- Data structures and Algorithms

CERTIFICATIONS

(Links to certificates can be found on My Website link above)

- Computational Neuroscience - Coursera
- Fundamental Neuroscience for Neuroimaging - Coursera
- Principles of fMRI 1 & 2 - Coursera
- AI for Medicine Specialization (3 courses)- Coursera
- Deep Learning Specialization (3 courses) - Coursera
- Machine Learning - Coursera

PROJECTS

- **fMRI Analysis** - Worked with real fMRI data to understand how to handle them in digital format, enhance and reconstruct them, observe relationships amongst voxels, develop correlation maps and linear modelling.
- **Computational Neuroscience Mini-Projects** - Developed a series of mini-projects in accordance with the computational neuroscience course from Coursera. Wrote code involving neural modelling and neuron simulations.
- **Brain Tumour Auto-segmentation** - Developed a deep neural network to segment brain tumours from a given MRI scan using the U-net architecture. Used various computer vision python libraries like OpenCV and Pillow.
- **Chest Disease Classification** - Made a neural network model to classify 14 classes of chest diseases by analysing Chest X-Ray scans from patients. Accompanied the study by reading state of the art papers like 'CheXNet' from the Stanford ML Group.
- **Medical Prognosis Models** - Worked on building prognostic models to predict future patient risks. Built a risk score model for diabetic retinopathy in diabetic patients using logistic regression.
- **Machine Learning Mini-Projects** - Have developed and implemented various machine learning algorithms on corresponding datasets as part of the online courses I have taken. Carried out data preprocessing and analysis on database sets. Some of the algorithms include - Regression, Decision Trees, Bayesian Methods, Clustering techniques, Dimensionality Reduction, and Artificial Neural Networks.