

PAVAN RAJKUMAR MAGESH

Personal Website

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EDUCATION

Visvesvaraya Technological University

CGPA - 8.80

Bachelor of Engineering in Computer Science

2017 - 2021 (Expected)

Narayana Educational Institutions

Grade 12 - 89.5% (Focus in science and computers - Karnataka State Board)

High School

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

2013 - 2017

PROFESSIONAL EXPERIENCE

Eurofins Scientific

July 2020 - Present

Was involved in developing an application that estimates the bug inducing risk of a 'git commit' using machine learning. I was tasked with model building, tuning and explainability. The project led to the minimization of time spent on code reviews and was implemented and tested on an open source ERP system using Python. Data tested on various ML models and utilised model interpretability techniques to tune and improve performance. Wrote two research papers on the same.

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 published in 'Computers in Biology and Medicine', Elsevier.
- **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. (Papers under review)
- **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. (Research Ongoing)
- **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. The aim is to improve methods for rapid prototyping of medical imaging systems. (Research Ongoing)
- **Bachelor's Thesis Project** - Aim to implement our existing research into clinical practice by developing a desktop tool which can be used by medical practitioners to diagnose Parkinson's Disease using various health bio-markers like speech, gait and handwriting. Project in collaboration with National Institute of Mental Health Sciences, Bangalore.

TECHNICAL SKILLS

- Programming Languages - Java, Python, SQL, Bash scripting, LaTeX, and Git version control.
- Machine learning algorithms using relevant python packages for data cleaning, analysis, and extrapolation.
- Experience in building predictive models across healthcare data involving digital image and signal processing.
- Research skills such as formulating, designing, conducting and writing conclusive studies.

RELEVANT COURSEWORK

- Machine Learning
- Operations Research
- Engineering Mathematics
- Software Engineering
- Data Structures and Algorithms
- Python Application Programming

POSITIONS OF RESPONSIBILITY AND ACHIEVEMENTS

- Student Coordinator at Google Developers Student Club - was responsible for conducting requirement analysis and building mobile solutions for local businesses around college.
- Core organizer for Google's Student Mobile Developer Fest held at CMR Institute of Technology attended by over 500 participants.
- Selected for Finals of India Innovation Challenge Design Contest with two idea selections-'Vehicle Footpath Violation Detection' and 'Vehicle to Vehicle Collision Avoidance'.
- 2nd Prize Winner at Pravega Sustainability Challenge held at the Indian Institute of Science for devising an efficient and eco-friendly method of filtering pollutant gases.

ACADEMIC PROJECTS

- **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.
- **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.
- **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.
- **Machine Learning Mini-Projects** - 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 ANNs.