ANJANA KARATHAT RAJEEV

Data Science Graduate

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Summary

Passionate and dynamic data scientist with a solid foundation in machine learning, data analysis, and adept problem-solving skills. Leveraging a blend of analytical prowess and creative thinking, I bring data to life, transforming complex datasets into actionable insights. My enthusiasm extends beyond theoretical knowledge-I love tackling hands-on projects. I have actively taken up numerous research projects, delving into real-world challenges to apply my skills and push the boundaries of what's possible in the realm of data science

Education

RMIT University — Melbourne
Master of Science in Data Science | GPA: **3.5** / 4.0 — 02/2023 - Present

Aalto University - Student exchange program — Espoo, Finland
Master of Science in Applied Statistics and Data Analytics | GPA: **3.2** / 4.0 — 01/2022 - 07/2022

Amrita Vishwa Vidyapeetham (Deemed University) — Tamil Nadu, India
Master of Science in Applied Statistics and Data Analytics | GPA: **9.19** / 10.0 — 06/2020 - 07/2022

Amrita Vishwa Vidyapeetham (Deemed University) — Tamil Nadu, India
Bachelor of Science in Mathematics | GPA: **8.83** / 10.0 — 06/2017 - 06/2020

Experience

InflaMed — Melbourne, Australia
Data Science Intern — 07/2024 - Present

Machine Learning, Natural Language Processing, LangChain, Flask, Python, Image Classification, Healthcare AI Applications

- Developing an advanced chatbot system for skin condition diagnosis using LangChain, integrating image classification models and research paper processing capabilities
- Implementing machine learning techniques including deep learning for image analysis and natural language processing for symptom evaluation and recommendation generation.
- Creating a user-friendly web interface with Flask, enabling seamless interaction between users and the AI-powered diagnostic system
- Collaborating on end-to-end development, from data preprocessing and model training to system integration and performance optimization, enhancing healthcare diagnostics through AI applications

Projects

Skin Cancer Detection App using Grad CAMM — 2023 - Present

Class Activation Map, Explainable Machine Learning, Grad-CAM, Object detection, Healthcare, Evaluation metrics

- We opted to integrate the Grad CAM model with the ResNet50 architecture based on prior research I conducted on the Class Activation Map (CAM), which showed a 15% improvement in localization accuracy compared to traditional methods.
- Currently, we actively train the model, closely monitoring both accuracy and loss metrics. We aim for a minimum accuracy of 95% and a loss below 0.1 to ensure optimal performance on the dataset.
- Upon completion of training, we will utilize the model to generate the class activation map and conduct various analyses. These analyses will shed light on how the model identifies and distinguishes features within the dataset, thereby enhancing our comprehension of skin cancer patterns and lesion recognition.

Projects

Grad-CAM: Comprehensive Survey

2022 - 2023

Class Activation Map, Explainable Machine Learning, Grad-CAM, Evaluation, Intersection of Union

- The primary objective of the paper lies in comparing the performance of various CAM (Class Activation Mapping) models with multiple computer vision models and assessing the quality and accuracy of explanation maps using different evaluation methods.
- Provides an overview of popular GradCAM variants - Grad CAM, Grad CAM++, LayerCAM, and XGradCAM, offering insights into their functionalities and distinctions.
- Analyzes the explanation maps produced by each method, objectively quantifying their performance using metrics like Intersection over Union (IoU), confidence score, etc.
- The experiment involved comparing the performance of ResNet50, VGG-16, and ViT architectures on both PASCAL VOC 2007 and ImageNet datasets. The aim was to understand how different architectural characteristics of ResNet50, VGG-16, and ViT impact their performance in image classification tasks. Notably, models utilizing the ResNet50 architecture demonstrate the most favorable outcomes, with IOU values ranging between 0.2 and 0.8.
- Examines the ability of each CAM variation to efficiently discriminate and highlight different classes in a single image. XGradCAM, implemented with the ResNet50 architecture, exhibits the lowest intersection value of 0.2.
- Finally, computes confidence scores, indicating that XGradCAM, implemented with the ResNet50 architecture, exhibited the highest performance with an average confidence score of 68.34 percent.

Comparing Logistic Regression and Decision tree classifier in Predicting Prevalent Hypertension

https://github.com/anjana1916/Comparing-Logistics-Regression-and-Decision-tree-classifier-in-predicting-Prevalent-Hypertension 2022

Machine Learning, Logistic regression, Decision Tree Classifier, Sklearn, Matlplotlib, Seaborn, numpy

- The primary objective of this report entails predicting hypertension in patients based on their medical records, demographic, and behavioral aspects. This prediction is accomplished using logistic regression and decision tree classifier models, aiming to compare their performance.
- Both models exhibit high accuracies, with minor discrepancies in training accuracy but identical validation accuracies. Logistic regression achieved a training accuracy of 0.9949 and a validation accuracy of 0.9911, with logistic loss values of 0.174 (training) and 0.305 (validation).
- The decision tree classifier attained a training accuracy of 1.0 and a validation accuracy of 0.9911. However, it shows signs of overfitting due to hyperparameter tuning with GridSearchCV.
- Logistic regression performs well but is affected by uneven class distribution, leading to the false positive paradox.Despite logistic regression's lower test error, the decision tree classifier emerges as the preferred model for its interpretability and potential to handle nonlinear functions effectively.

Difficulty Analysis of Quiz Item with Mouse Dynamics

https://mdquiz.vipresearch.ca/ 2021 - 2022

HTML, PHP, Database Management, Javascript, pattern recognition

- The objective of this project is to enhance the integrity and effectiveness of online exams by developing a system that utilizes mouse movement tracking to assess student responses accurately. By identifying genuine understanding and gauging question difficulty levels, the system aims to provide teachers with valuable insights for tailored support and fair evaluation of student performance.
- Developed a website that tracks mouse movement to analyze student behavior during online quizzes. Uses mouse motion data to differentiate between genuine understanding and guesswork in student responses. Utilize response times to assess the difficulty level of quiz items and tailor support accordingly.

Volunteering

Amritapuri Ashram

Food Service Assistant and Crowd Control 2017 - 2020

Volunteered as a Food Service Assistant at Amma's Ashram, dedicating my time every September from 2017 to 2020. My responsibilities encompassed various facets of hospitality and assistance, contributing to the smooth functioning of the ashram's activities.