VIGNESHWAR J

AI/ML Engineer & Data Sciencetist

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PROFILE SUMMARY

AI/ML Engineer & Data Scientist with hands-on experience in designing, developing, and deploying machine learning and deep learning models for real-world applications. Skilled in predictive analytics, natural language processing (NLP), and audio signal processing. Proficient in Python, cloud deployment (AWS, Streamlit), and MLOps tools such as MLflow and Git. Strong track record in building scalable AI systems, optimizing model performance, and delivering measurable results across healthcare, automotive, and audio domains.

SKILLS AND EXPERTISE

Programming Languages – Python, SQL.
Tools & Frameworks – Git, MLflow, Pickle, Streamlit.
Technical Skills – Scikit-learn,TensorFlow, PyTorch, Keras,spaCy,Pandas, NumPy, Matplotlib, Plotly, Streamlit,AWS,Librosa,Pydub,Seaborn, Pickle,Hugging Face,Selenium.

PROJECTS

Music Genre Classification System
Sep 2023 - Nov 2023 | Self-Driven Project

- Engineered a music genre classification pipeline using CNN, SVM, and KNN on the GTZAN dataset (10 genres, 1,000 audio tracks).
- Preprocessed audio data using MFCCs and Spectrograms, optimizing feature extraction to boost signal clarity and training efficiency.
- Delivered classification accuracies of 86% (SVM), 87% (KNN), and a remarkable 99% (CNN), demonstrating the superior performance of deep learning approaches
- Enhanced data quality and model robustness through noise filtering, class balancing, and data augmentation techniques.
- Fine-tuned model hyperparameters using Grid Search and cross-validation, leading to a 13% average improvement in performance.
- Conducted detailed comparative analysis across models to determine the most effective architecture for real-world deployment.
- Validated CNN's effectiveness in extracting meaningful features from time-series audio, showcasing deep learning's dominance in acoustic pattern recognition.

Early Disease Detection & Diagnosis of Parkinson's Disease
Mar 2024 - May 2024 | Self-Driven Project

- Engineered an AI-driven diagnostic system for early detection of Parkinson's Disease using a hybrid CNN-GNN architecture on MRI image data.
- Scaled the dataset to 1,365 MRI samples by applying targeted data augmentation and advanced sampling techniques to mitigate class imbalance.
- Extracted high-impact clinical and spatial features using graph-based relational modeling, enhancing diagnostic context and model learning.
- Attained 98% training accuracy and 95% testing accuracy, reflecting strong model learning and real-world generalization capabilities.
- Optimized model architecture and hyperparameters via Bayesian tuning, resulting in a 10–12% performance boost compared to baseline.
- Conducted extensive evaluations to validate the system's effectiveness in early disease detection.

Multi-Disease Prediction System
Nov 2024 - Dec 2024 | Self-Driven Project

- Designed an AI-powered disease prediction platform using machine learning to diagnose Parkinson's (195 samples), Kidney (400 samples), and Liver (583 samples) conditions from clinical datasets.
- Achieved 89% accuracy on Parkinson's prediction using a DecisionTreeClassifier, demonstrating efficient learning from small datasets.
- Reached 98% accuracy on Kidney disease detection using an SVC model, showcasing robust pattern recognition in high-dimensional data.
- Gained 75% accuracy for Liver disease prediction with a RandomForestClassifier, addressing class imbalance through feature engineering and preprocessing.
- Built an end-to-end Streamlit web application to deliver real-time, multi-disease diagnosis through a user-friendly interface.
- Deployed the system on AWS EC2 (Ubuntu), maintaining >99% uptime and scalable access for users.
- Improved model generalization with feature selection, missing value imputation, and data normalization, boosting predictive reliability.

Car Resale Price Prediction with AI Chatbot
Jan 2025 - Mar 2025 | Self-Driven Project

- Architected an AI-powered system to predict used car resale values and recommend personalized options via an integrated NLP-based chatbot.
- Collected and processed a dataset of 8,067 used car listings from multiple Indian cities using web scraping and advanced data cleaning pipelines.
- Selected Random Forest and XGBoost for deployment due to superior performance in handling non-linearity and high variance in price data.
- Deployed the ML model and interactive chatbot on Streamlit Cloud, enabling real-time price predictions and conversational recommendations.
- mplemented cloud storage for efficient data handling and ensured scalability across user sessions with optimized compute usage.

EDUCATION

M.E.CSE - PSG College of Technology. – batch (2022 – 2024) with **CGPA 7.45**
B.E. CSE - PSG College Of Technology – batch (2019 – 2021)with **CGPA 7.04**

PAPER PUBLICATION

- Published a paper titled "**Sustainable development for smart cities: challenges and opportunities**", International Journal of Science & Engineering Development Research (www.ijsdr.org), ISSN:2455-2631, Vol.8, Issue 1, page no.1045 - 1055, January-2023,   Available:https://www.ijsdr.org/papers/IJSDR2301166.pdf.

- Published a paper titled "**Performance Analysis of Deep Learning and Machine Learning Methods for Music Genre Classification System**", International Journal of Soft Computing Paradigm (https://irojournals.com), ISSN: 2582-2640,Vol.6, Issue 2, page no.116 - 127, May-2024, Available:https://irojournals.com/jscp/article/view/6/2/1.