MANGALI DHEERAJ KUMAR

• dheeraj9393840522@gmail.com • 8639564948 • linkedin.com/in/mangalidheerajkumar • github.com/MDheerajkumar123

Summary

Aspiring AI/ML graduate with hands-on experience in Python, Java, and Android development. Skilled in building machine learning models, data preprocessing, and implementing secure login systems. Proficient in using TensorFlow, Firebase, and Android Studio. Passionate about developing innovative AI solutions and eager to contribute to impactful, collaborative projects.

Education

Madanapalle Institute of Technology & Science Dec 2021 – May 2025
B. Tech | CSE-AI | Full-time - 8.81 CGPA (88%)

Sri Chaitanya JR College Jun 2019 - Mar 2021
Intermediate | MPC | AP BIE - 900/1000 (90%)

Kesava Reddy Public School Apr 2019
10th | SSC - 9.5 CGPA (95%)

Internship

National Institute of Technology Puducherry
Intern | Deep Learning Jun 2024 - Aug 2024

- Developed a CNN-based model for chest X-ray classification to detect pneumonia.
- Processed medical images using OpenCV, NumPy, and TensorFlow.
- Optimized model performance with data augmentation and transfer learning.
- Achieved high classification accuracy on the Kaggle dataset.

National Institute of Technology Puducherry
Intern | Machine Learning Jul 2023 - Sep 2023

- Worked on data preprocessing, feature engineering, and classification models for a dataset using Python, Pandas, NumPy, and Scikit-learn.
- Performed data cleaning, normalization, and encoding techniques to handle missing values and categorical variables.
- Performed data preprocessing and developed decision tree visualizations for model interpretability.
- Optimized model performance with cross-validation (~99% accuracy) and visualized results using Matplotlib and Seaborn.

Projects

BRIDGING LINGUISTIC BARRIERS:A SPEECH-TO-SPEECH TRANSLATING SYSTEM FOR INDIAN LANGUAGES USING ADVANCED NLP TECHNIQUES

- Developed a real-time mobile app using React Native for translating speech across Indian languages.
- Implemented a custom NLP pipeline: Whisper Large for Speech-to-Text, NLLB 1.3B for Text Translation, and gTTS for Text-to-Speech.
- Built a FastAPI backend integrated with WebSockets for seamless two-way voice communication between users.
- Optimized model size and latency for deployment on Hugging Face Spaces to ensure low-resource, real-time translation.
- Integrated mic control, live transcription, and speech playback while ensuring minimal UI/UX clutter.
- Designed a scalable architecture supporting multiple Indian languages with dynamic source-target language selection.

Conversational AI Voice Assistant (Android + FastAPI + Hugging Face) for Real-Time Intelligent Task Automation

- Built a real-time AI-powered mobile voice assistant with custom wake-word detection (“Hello Friday”) using the Porcupine SDK, and on-device activation with a UI.
- Designed a FastAPI backend with intent recognition and context-aware NLP logic powered by Hugging Face Transformers, supporting multi-modal responses (text + audio).
- Integrated voice-controlled features: app launching, reminders with alarm sound, phone calls via local contacts, YouTube/Spotify playback, website opening, weather/news queries, and wake-word-triggered listening.
- Deployed the assistant for real-time inference using Docker and Hugging Face Spaces, ensuring low-latency communication between the Android app and backend.

Comparative Analysis of Mice Protein Expression Data: Assessing Genotype and Behavioral Treatments Using Machine Learning Algorithms

- Conducted an in-depth comparative analysis of protein expression data in mice to assess the impact of genotype and behavioral treatments.
- Performed data preprocessing techniques, including handling missing values, feature scaling, and encoding categorical variables, to prepare the dataset for machine learning models.
- Developed and implemented classification models using Random Forest and Decision Trees, achieving an accuracy of approximately 99% through hyperparameter tuning and cross-validation.
- Utilized feature importance analysis and correlation heatmaps to interpret relationships between protein expressions and experimental conditions.
- Applied Python libraries such as Pandas, NumPy, Scikit-learn, Matplotlib, and Seaborn for data manipulation, model building, and result visualization.

- Conducted statistical evaluations and performance metrics analysis, ensuring reliable model validation and accuracy measurement.

Enhancing Pneumonia Detection in Chest X-Rays Using Ensemble Learning of Pre-Trained CNN Models

- Developed a deep learning-based pneumonia detection model leveraging ensemble learning of pre-trained Convolutional Neural Networks (CNNs), including VGG16, ResNet, and Inception.
- Conducted image preprocessing techniques such as data augmentation, contrast enhancement, and normalization to improve model generalization and accuracy.
- Implemented transfer learning to fine-tune pre-trained CNN architectures, optimizing classification performance on chest X-ray datasets.
- Evaluated model efficiency using precision-recall curves, AUC-ROC analysis, and confusion matrices, ensuring accurate pneumonia detection.
- Achieved high classification accuracy on a Kaggle dataset, demonstrating the effectiveness of model ensembling in medical image classification.
- Utilized Python frameworks such as TensorFlow, Keras, OpenCV, and Matplotlib for deep learning model development and visualization.
- Conducted hyperparameter tuning and performance optimization, reducing overfitting and enhancing model interpretability.

Login Credential App (Android, Java)

- Designed and developed a secure mobile application for user authentication and credential management using Java and Android Studio.
- Implemented user registration, login, password recovery, and logout functionalities to ensure a seamless authentication process.
- Integrated Firebase Authentication as the backend service enables real-time, secure user authentication and credential storage.
- Developed a user-friendly interface using XML and Android UI components, ensuring an intuitive and accessible user experience.
- Applied data encryption and security best practices to protect sensitive user information from unauthorized access.
- Conducted extensive testing and debugging using Android Studio's built-in tools to enhance application stability and performance.
- Utilized version control with GitHub to track development progress and manage collaborative contributions effectively.

Skills & Programming Languages

- Python, Java, Machine Learning, Deep Learning, Natural Language Processing, Docker, SQL, Data Visualization, UI Design (XML), TensorFlow, Scikit-learn, OpenCV, Pandas, NumPy, Matplotlib, Seaborn, Android Studio

Certification

- Soft Skill Training NPTEL
- Python with DSA from FLM
- STC on AI, ML, and DL from NITW
- Programming in Java from NPTEL

Publications

- Comparative Analysis of Mice Protein Expression Data: Assessing Genotype and Behavioral Treatments Using Machine Learning Algorithms, Cognitive Computing and Cyber-Physical Systems, 2025. DOI: 10.1007/978-3-031-77075-3_21

Extra Circular Activities/Achievements

- Organized Chess and Quiz competitions at national level events (RAIDS and ASHV) and served as a student coordinator for the National Technical Symposium (AURA) in 2023-2024.
- IEEE Student Member; appointed as Treasurer & Chair of the MITS IEEE Student Branch in 2023 and 2024 respectively.
- Presented a Paper titled "Comparative Analysis of Mice Protein Expression Data" at the EAI Conference