Unlocking Silent Signals : Decoding Body Language with Mediapipe

Milestone 1: Project Initialization and Planning Phase

The "Project Initialization and Planning Phase" marks the project's outset, defining goals, scope, and stakeholders. This crucial phase establishes project parameters, identifies key team members, allocates resources, and outlines a realistic timeline. It also involves risk assessment and mitigation planning. Successful initiation sets the foundation for a well organized and efficiently executed machine learning project, ensuring clarity, alignment, and proactive measures for potential challenges.

Activity 1: Define Problem Statement

The challenge is to develop an Body language Detection system that can accurately predict the facial or Hands recognisation by the webcame in real time and based on various actions of human body . This system should integrate data from multiple sources, such as different actions performed by Humans weather sad, happy victorious, and fight mode data. By leveraging machine learning algorithms and advanced data the goal is to create a predictive model that can be detect the action performed by humans.

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Unlocking silent signals Problem Statement Report: Click Here

Activity 2: Project Proposal (Proposed Solution)
"Unlocking silent signals:Decoding Body Language with mediapipe," aims to leverage machine learning for Detecting the actions. Utilizing a comprehensive dataset that includes Happy, sad, fight,victorious and other relevant variables, the project seeks to develop a predictive model to body language Detection. This initiative aligns with Facial Expressions.

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Activity 3: Initial Project Planning
Involves outlining key objectives, defining scope, and identifying stakeholders. Despite the critical role of body language in human communication, there is a lack of reliable, real-time tools to interpret these nonverbal cues accurately. Existing solutions are often limited by their complexity and inaccessibility. This project seeks to address

this gap by leveraging MediaPipe's technology to create an intuitive system for decoding body language. data processing and Effective initial planning lays the foundation for a systematic and well executed project, ensuring successful outcomes.

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Milestone 2: Data Collection and Preprocessing Phase

The Data Collection and Preprocessing Phase involves executing a plan to gather relevant actions data, ensuring data quality through verification and addressing missing values. Preprocessing tasks include cleaning, encoding, and organizing the dataset for subsequent exploratory analysis.

Activity 1: Data Collection Plan, Raw Data Sources Identified, Data Quality Report

The dataset for "Unlocking silent signals:Decoding body language with mediapipe" is sourced from various meteorological and environmental data providers. It includes happy, sad ,victorious,fight and other relevant Gestures. Data quality is ensured through thorough verification and maintaining adherence to ethical guidelines, establishing a reliable foundation for predictive modeling**.**

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Activity 2: Data Quality Report

The dataset for "Unlocking silent signals :Decoding body language with mediapipe" is sourced from multiple providers. Data will be collected from actions like happy sad fight etc. with the sequence of 10 actions per each mood with facial expression and hand gestures.Gathering data from facial expression and hand gestures in various moods like happy sad, fight etc in webcame . Data quality is ensured through thorough verification, addressing missing values, and maintaining adherence to ethical guidelines, establishing a reliable foundation for predictive modeling.

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Activity 3: Data Exploration and Preprocessing

Data Exploration involves analyzing the mood related dataset to understand patterns, distributions, and outliers. Preprocessing includes handling missing values, scaling, and encoding categorical variables. These crucial steps enhance data quality, ensuring the reliability and effectiveness of subsequent analyses in the action prediction pr

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Milestone 3: Model Development Phase

The Model Development Phase entails crafting a predictive model for class prediction. It encompasses strategic feature selection, evaluating and selecting models (Random Forest classifier,logistic regression classifier,Gradient Boosting classifier), initiating training with code, and rigorously validating and assessing model performance for informed decision-making in Body language Detection.

Activity 1: Feature Selection Report
The Feature Selection Report outlines the rationale behind choosing specific features (e.g., Rainfall, River Levels, Soil Moisture, Topography) for the flood prediction model. It evaluates relevance, importance, and impact on predictive accuracy, ensuring the inclusion of key factors influencing the model's ability to discern potential flood events**.**

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Activity 2: Model Selection Report
The Model Selection Report details the rationale behind choosing Random Forest, Decision making models for Facial expressions or Gestures. It considers each model's strengths in handling complex relationships, interpretability, adaptability, and overall predictive performance, ensuring an informed choice aligned with project objectives.

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Activity 3: Initial Model Training Code, Model Validation and Evaluation Report
The Initial Model Training Code employs selected algorithms on the Body Dectection dataset, setting the foundation for predictive modeling. The subsequent Model Validation and Evaluation Report rigorously assesses model performance, employing metrics like accuracy and precision to ensure reliability and effectiveness in predicting actions.

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Milestone 4: Model Optimization and Tuning Phase

The Model Optimization and Tuning Phase involves refining machine learning models

for peak performance. It includes optimized model code, fine-tuning hyperparameters, comparing performance metrics, and justifying the final model selection for enhanced predictive accuracy and efficiency.

Activity 1: Hyperparameter Tuning Documentation
The Gradient Boosting model was selected for its superior performance, exhibiting high accuracy during hyperparameter tuning. Its ability to handle complex relationships, minimize overfitting, and optimize predictive accuracy aligns with project objectives, justifying its selection as the final model.

Activity 2: Performance Metrics Comparison Report
The Performance Metrics Comparison Report contrasts the Logistic Regression is used for binary classification tasks, predicting outcomes like spam vs. non-spam or disease vs. no disease, and it provides probabilities of class membership. It also helps in understanding feature importance and serves as a strong baseline model due to its simplicity and interpretability. This assessment provides a clear understanding of the refined predictive capabilities achieved through hyperparameter tuning.

Activity 3: Final Model Selection Justification
The Final Model Selection Justification articulates the rationale for choosing Gradient Boosting as the ultimate model. Its exceptional accuracy, ability to handle complexity, and successful hyperparameter tuning align with project objectives, ensuring optimal body language detection with action performance.

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Unlocking silent signals Model Optimization and Tuning Phase Report: [Click Here](#)

Milestone 5: Project Files Submission and Documentation
For project file submission in Github, Kindly click the link and refer to the flow. **[Click](#)**

[Here](#) For the documentation, Kindly refer to the link. **[Click Here](#)**

Milestone 6: Project Demonstration
In the upcoming module called Project Demonstration, individuals will be required to record a video by sharing their screens. They will need to explain their project and demonstrate its execution during the presentation.