

Model Development Phase Template

Date	06 JULY 2024
Team ID	739909
Project Name	Unlocking Silent Signals: Decoding Body Language With Mediapipe
Maximum Marks	6 Marks

Model Selection Report:

In the forthcoming Model Selection Report, various models will be outlined, detailing their descriptions, hyperparameters, and performance metrics, including Accuracy or F1 Score. This comprehensive report will provide insights into the chosen models and their effectiveness.

Model	Description	Hyperparameters Performance	Metric (e.g., Accuracy, F1 Score)
SVM	SVM is particularly effective for body_language_decoder prediction due to its robustness to overfitting, especially in high-dimensional spaces, and its ability to handle non-linear relationships through kernel tricks.	<pre># Define the parameter grid for RandomizedSearchCV param_distributions = { 'C': [0.1, 1, 10, 100], 'kernel': ['linear', 'poly', 'rbf', 'sigmoid'], 'gamma': ['scale', 'auto'] }</pre>	Accuracy score = 74%
Logistic Regression	Logistic Regression is effective for body_language_decoder prediction due to its simplicity, interpretability, and efficiency in binary classification problems. It provides probabilistic outputs, aiding in understanding prediction confidence.	<pre># Define the parameter grid for RandomizedSearchCV param_distributions = { 'C': [0.1, 1, 10, 100], 'solver': ['newton-cg', 'lbfgs', 'liblinear', 'sag', 'saga'] }</pre>	Accuracy score = 74%

Ridge Classifier	Ridge Classifier is effective for body_language_decoder prediction due to its ability to handle multicollinearity by adding a penalty to the model complexity. This regularization helps in reducing overfitting, making it robust in high-dimensional spaces.	<pre># Define the parameter grid for RandomizedSearchCV param_distributions = { 'alpha': (0.1, 1, 10, 100), 'solver': ('auto', 'svd', 'cholesky', 'lsqr', 'sparse_cg', 'sag', 'saga') }</pre>	Accuracy score = 74%
Gradient Boosting Classifier	Gradient Boosting Classifier is effective for body_language_decoder prediction due to its ability to combine weak learners iteratively, improving model accuracy. Its flexibility in handling complex relationships makes it a powerful tool for classification tasks.	<pre># Define a smaller parameter grid for RandomizedSearchCV param_distributions = { 'n_estimators': (50, 100), 'learning_rate': (0.01, 0.1), 'max_depth': (3, 4), 'min_samples_split': (2, 5), 'min_samples_leaf': (1, 2)</pre>	Accuracy score = 86%
Random Forest	Ensemble of decision trees; robust, handles complex relationships, reduces overfitting, and provides feature importance for body_language_decoder prediction.	<pre># Define a smaller parameter grid for RandomizedSearchCV param_distributions = { 'n_estimators': (50, 100), # Reduced number of options 'criterion': ('gini', 'entropy'), 'max_features': ('auto', 'sqrt'), 'max_depth': (None, 10, 20), # Reduced number of options 'min_samples_split': (2, 5), # Reduced number of options 'min_samples_leaf': (1, 2) # Reduced number of options</pre>	Accuracy score = 90%