Dataset Loader

Upload Training CSV

☁ Drag and drop file here
Limit 200MB per file • CSV

Browse files

📄 train.csv 45.9MB ✕

Upload Testing CSV

☁ Drag and drop file here
Limit 200MB per file • CSV

Browse files

📄 test.csv 18.4MB ✕

✅ Both datasets loaded successfully!

Dataset Overview

Train set shape: (7352, 563)

Test set shape: (2947, 563)

Train Data Info

	0
tBodyAcc-iqr()-Z	float64
tBodyAcc-entropy()-X	float64
tBodyAcc-entropy()-Y	float64
tBodyAcc-entropy()-Z	float64
tBodyAcc-arCoeff()-X	float64
tBodyAcc-arCoeff()-X	float64
tBodyAcc-arCoeff()-X	float64
tBodyAcc-arCoeff()-X	float64
tBodyAcc-arCoeff()-Y	float64
tBodyAcc-arCoeff()-Y	float64
tBodyAcc-arCoeff()-Y	float64

Train Data Preview

	tBodyAcc-mean()-X	tBodyAcc-mean()-Y	tBodyAcc-mean()-Z	tBodyAcc-std()-X	tBodyAcc-std()-Y	tBodyAcc-std()-Z	tBodyAcc-mad()-X	tBodyAcc-mad()-Y	tBodyAcc-mad()-Z	tBodyAcc-max()-X	tBodyAcc-max()-Y	tBodyAcc-max()-Z	tBodyAcc-min()-X	tBodyAcc-min()-Y
0	0.2886	-0.0203	-0.1329	-0.9953	-0.9831	-0.9135	-0.9951	-0.9832	-0.9235	-0.9347	-0.5674	-0.7444	0.8529	0.6858
1	0.2784	-0.0164	-0.1235	-0.9982	-0.9753	-0.9603	-0.9988	-0.9749	-0.9577	-0.9431	-0.5579	-0.8184	0.8493	0.6858
2	0.2797	-0.0195	-0.1135	-0.9954	-0.9672	-0.9789	-0.9965	-0.9637	-0.9775	-0.9387	-0.5579	-0.8184	0.8436	0.6824
3	0.2792	-0.0262	-0.1233	-0.9961	-0.9834	-0.9907	-0.9971	-0.9827	-0.9893	-0.9387	-0.5762	-0.8297	0.8436	0.6824
4	0.2766	-0.0166	-0.1154	-0.9981	-0.9808	-0.9905	-0.9983	-0.9797	-0.9904	-0.9425	-0.5692	-0.8247	0.8491	0.6832

Test Data Preview

	tBodyAcc-mean()-X	tBodyAcc-mean()-Y	tBodyAcc-mean()-Z	tBodyAcc-std()-X	tBodyAcc-std()-Y	tBodyAcc-std()-Z	tBodyAcc-mad()-X	tBodyAcc-mad()-Y	tBodyAcc-mad()-Z	tBodyAcc-max()-X	tBodyAcc-max()-Y	tBodyAcc-max()-Z	tBodyAcc-min()-X	tBodyAcc-min()-Y
0	0.2572	-0.0233	-0.0147	-0.9384	-0.9201	-0.6677	-0.9525	-0.9252	-0.6743	-0.8941	-0.5546	-0.4662	0.7172	0.6355
1	0.286	-0.0132	-0.1191	-0.9754	-0.9675	-0.945	-0.9868	-0.9684	-0.9458	-0.8941	-0.5546	-0.806	0.768	0.6837
2	0.2755	-0.0261	-0.1182	-0.9938	-0.9699	-0.9627	-0.9944	-0.9707	-0.9635	-0.9393	-0.5685	-0.7991	0.8483	0.6679
3	0.2703	-0.0326	-0.1175	-0.9947	-0.9733	-0.9671	-0.9953	-0.9745	-0.9689	-0.9386	-0.5685	-0.7991	0.8483	0.6679
4	0.2748	-0.0278	-0.1295	-0.9939	-0.9674	-0.9783	-0.9941	-0.966	-0.9773	-0.9386	-0.5608	-0.8259	0.8492	0.6707

🧹 Missing Values & Sensor Noise Summary

Missing Values (Train)

0

Missing Values (Test)

0

Potential Sensor Noise (Z > 3)

40503

📊 View Descriptive Stats for Train Set ⌄

Preview of Scaled Training Data

	tBodyAcc-mean()-X	tBodyAcc-mean()-Y	tBodyAcc-mean()-Z	tBodyAcc-std()-X	tBodyAcc-std()-Y	tBodyAcc-std()-Z	tBodyAcc-mad()-X	tBodyAcc-mad()-Y	tBodyAcc-mad()-Z	tBodyAcc-max()-X	tBodyAcc-max()-Y	tBodyAcc-max()-Z	tBodyAcc-min()-X	tBodyAcc-min()-Y
0	0.2233	-0.0977	-0.5744	-0.8693	-0.9394	-0.7391	-0.8611	-0.939	-0.7674	-0.856	-0.9285	-0.6406	0.9075	0.871
1	0.0447	0.0563	-0.3454	-0.8759	-0.9239	-0.8512	-0.8698	-0.922	-0.8501	-0.8714	-0.8946	-0.8947	0.8974	0.871
2	0.0664	-0.0649	-0.0999	-0.8695	-0.9078	-0.8959	-0.8644	-0.8989	-0.898	-0.8633	-0.8946	-0.8947	0.8817	0.8609
3	0.058	-0.3319	-0.3396	-0.8711	-0.94	-0.924	-0.8658	-0.9381	-0.9266	-0.8633	-0.9597	-0.9335	0.8817	0.8609
4	0.0133	0.05	-0.1463	-0.8757	-0.9349	-0.9235	-0.8686	-0.9318	-0.9294	-0.8703	-0.9349	-0.9163	0.8968	0.8634

🧪 Standardization & Outlier Clipping

✅ Outliers clipped and features normalized.

Train shape: (7352, 563)

Test shape: (2947, 563)

🔍 Preview Scaled Train Data   ⌄

⚙️ Feature Engineering for Human Activity Recognition

📁 Upload Training CSV

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📄 train.csv 45.9MB   ✕

📁 Upload Test CSV

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	Limit 200MB per file • CSV	

📄 test.csv 18.4MB   ✕

✅ Data successfully loaded!

📌 Engineered Features (Train Set)

	acc_speed	gyro_speed	acc_ori_change	gyro_ori_change	accX_freq_peak	gyroX_freq_peak
0	0.624	0.4203	1.3268	0.8171	1642	961
1	0.3528	0.1425	2.3087	2.8369	1642	961
2	0.1364	0.2247	1.3728	4.4895	1642	961
3	0.4784	0.1532	0.9469	0.8268	1642	961
4	0.1552	0.0883	2.5529	4.1911	1642	961

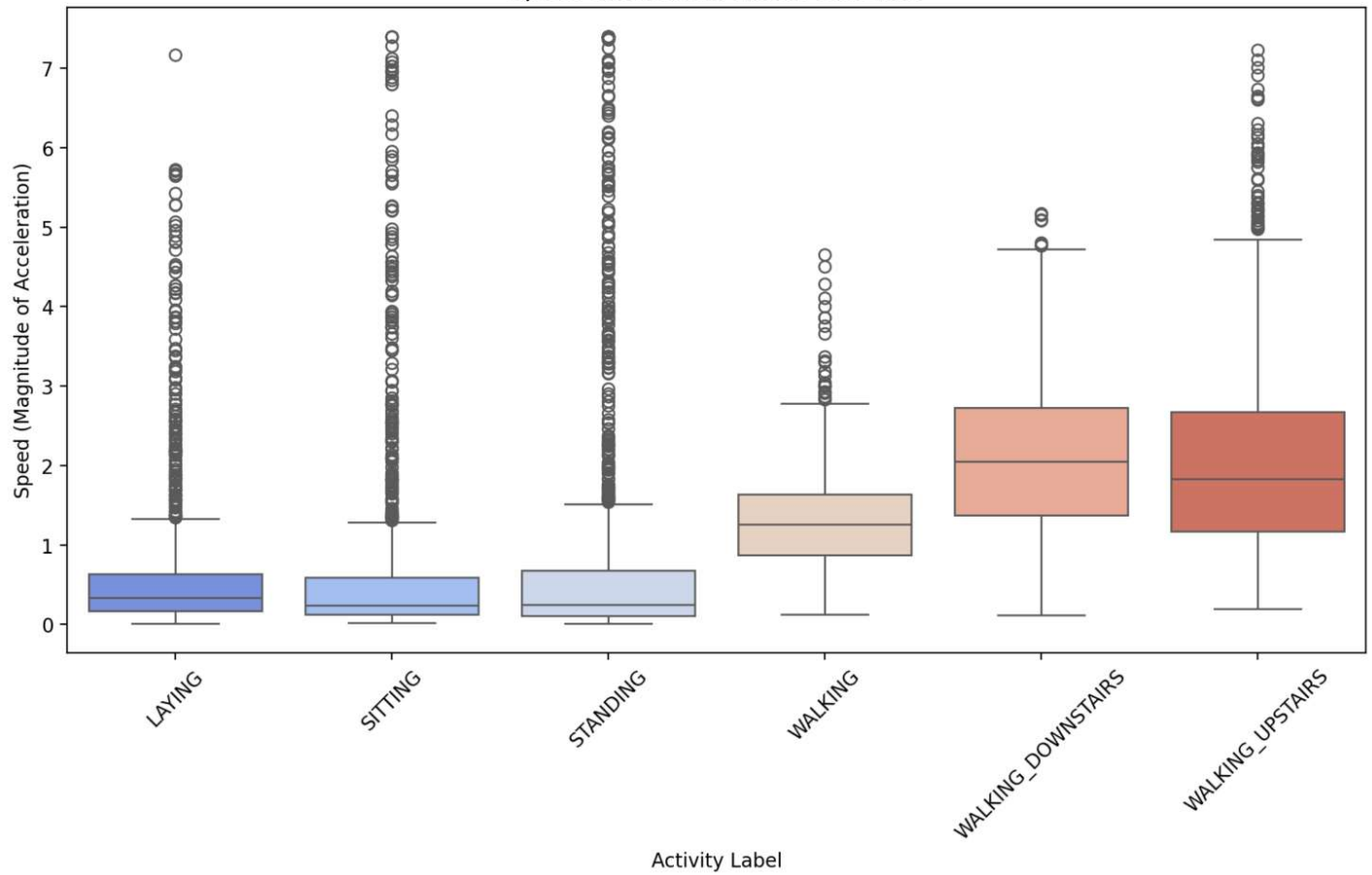🔍 View All Engineered Features   ⌄

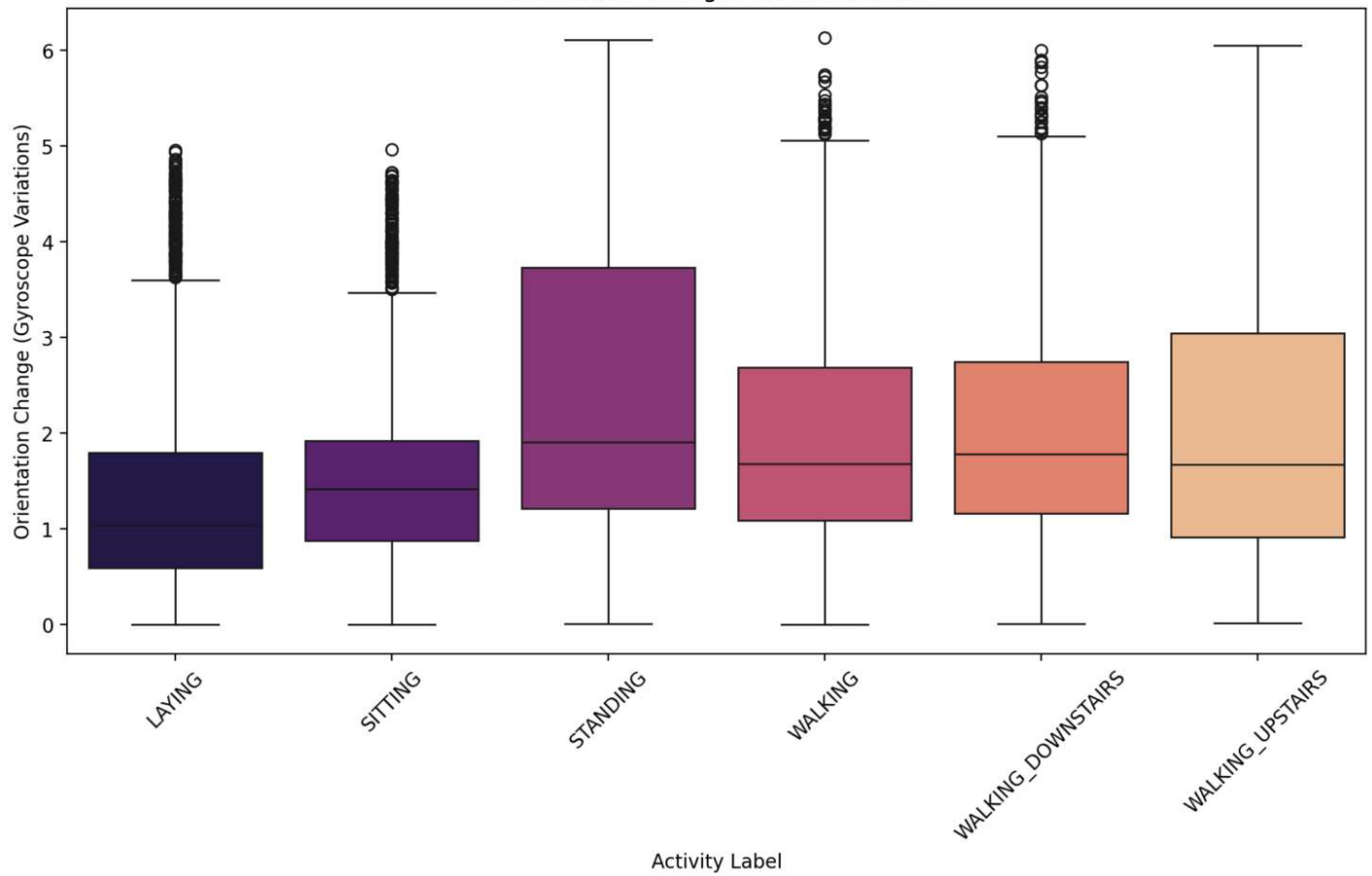⬇️ Download Engineered Train Features

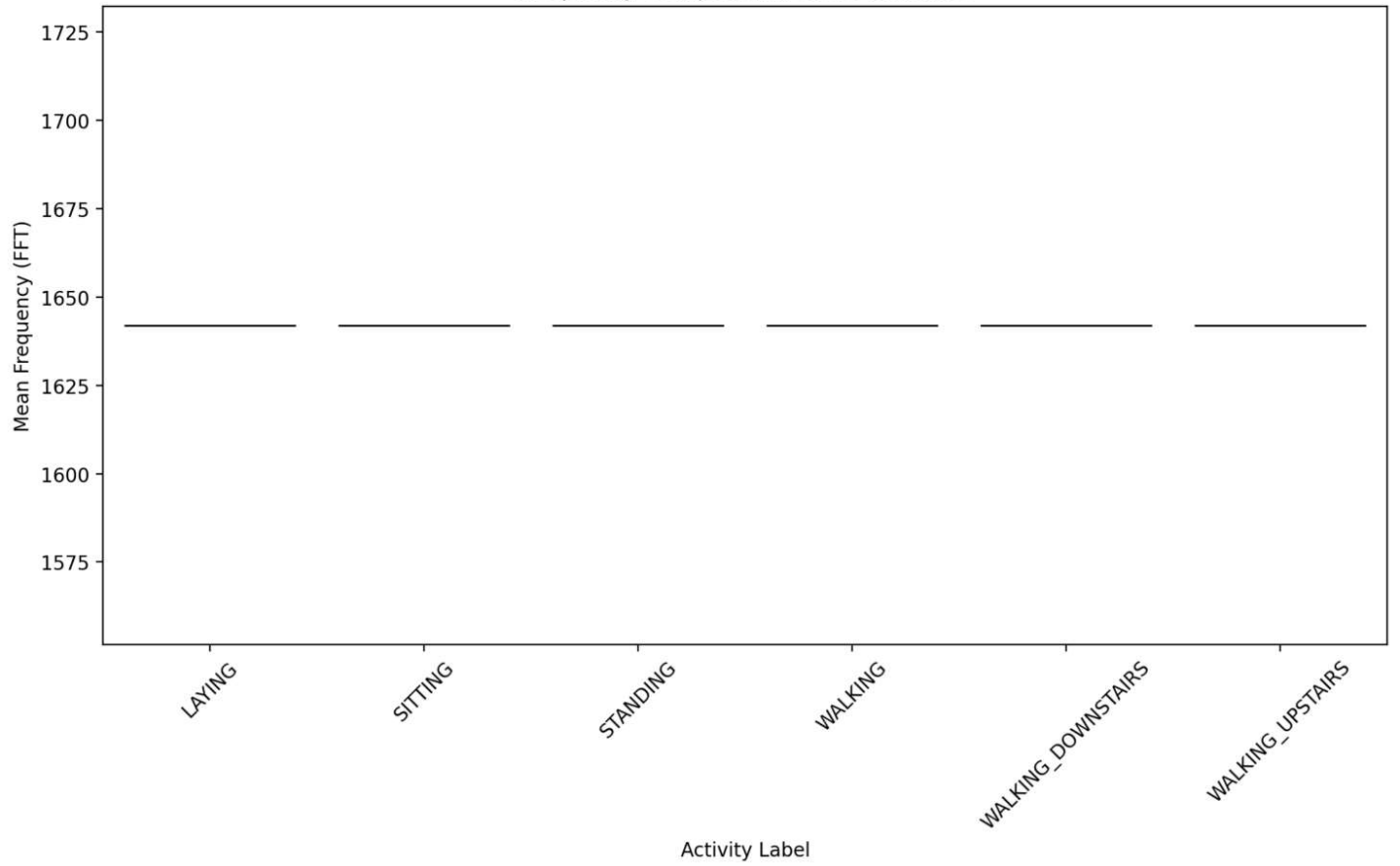Distribution of Activities in the Training Set
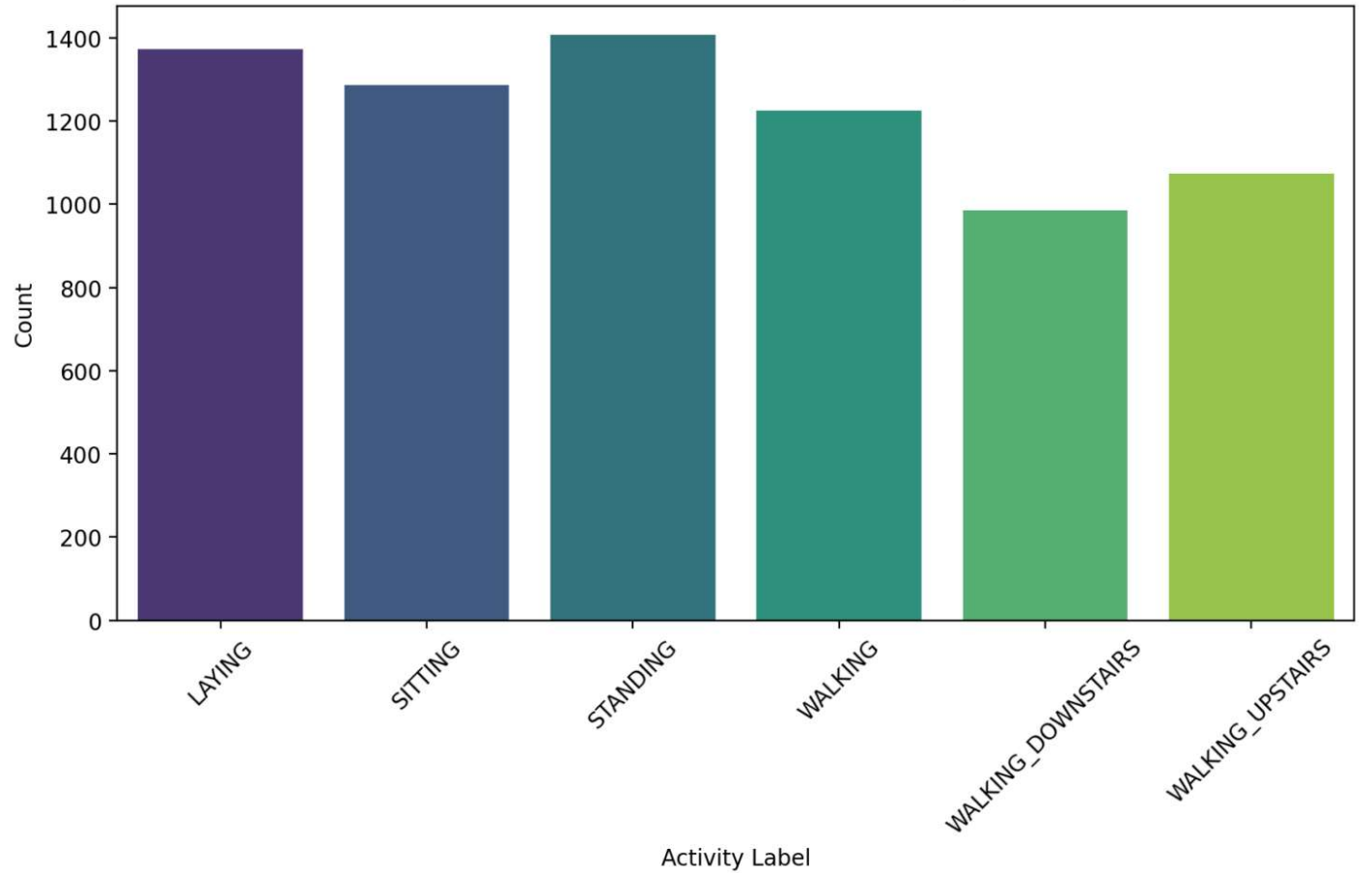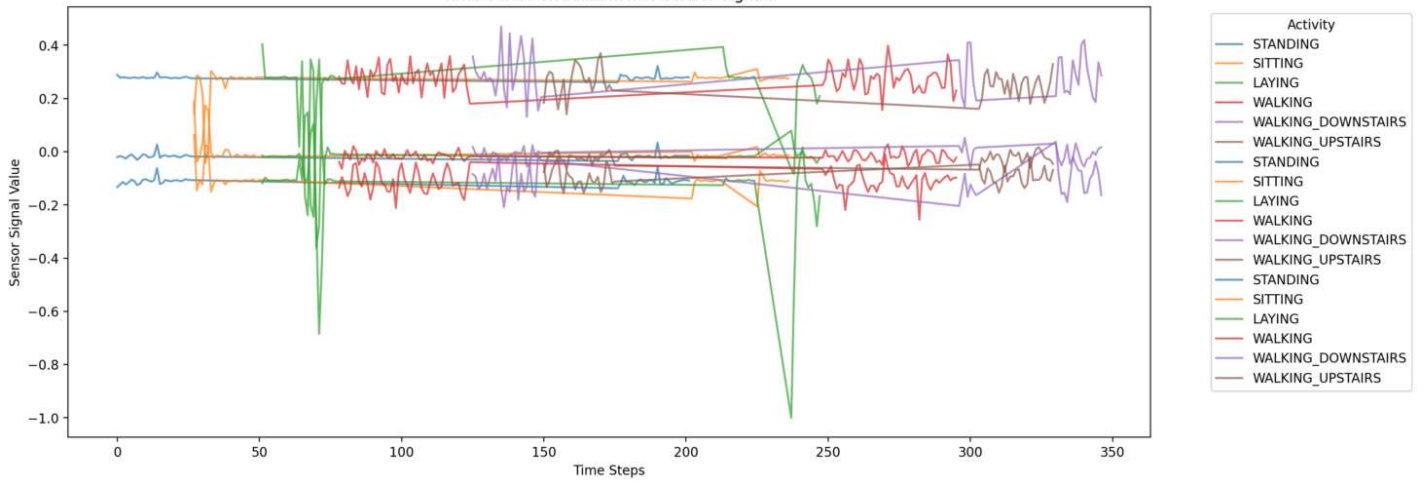
Speed Distribution Across Activities

Orientation Change Across Activities

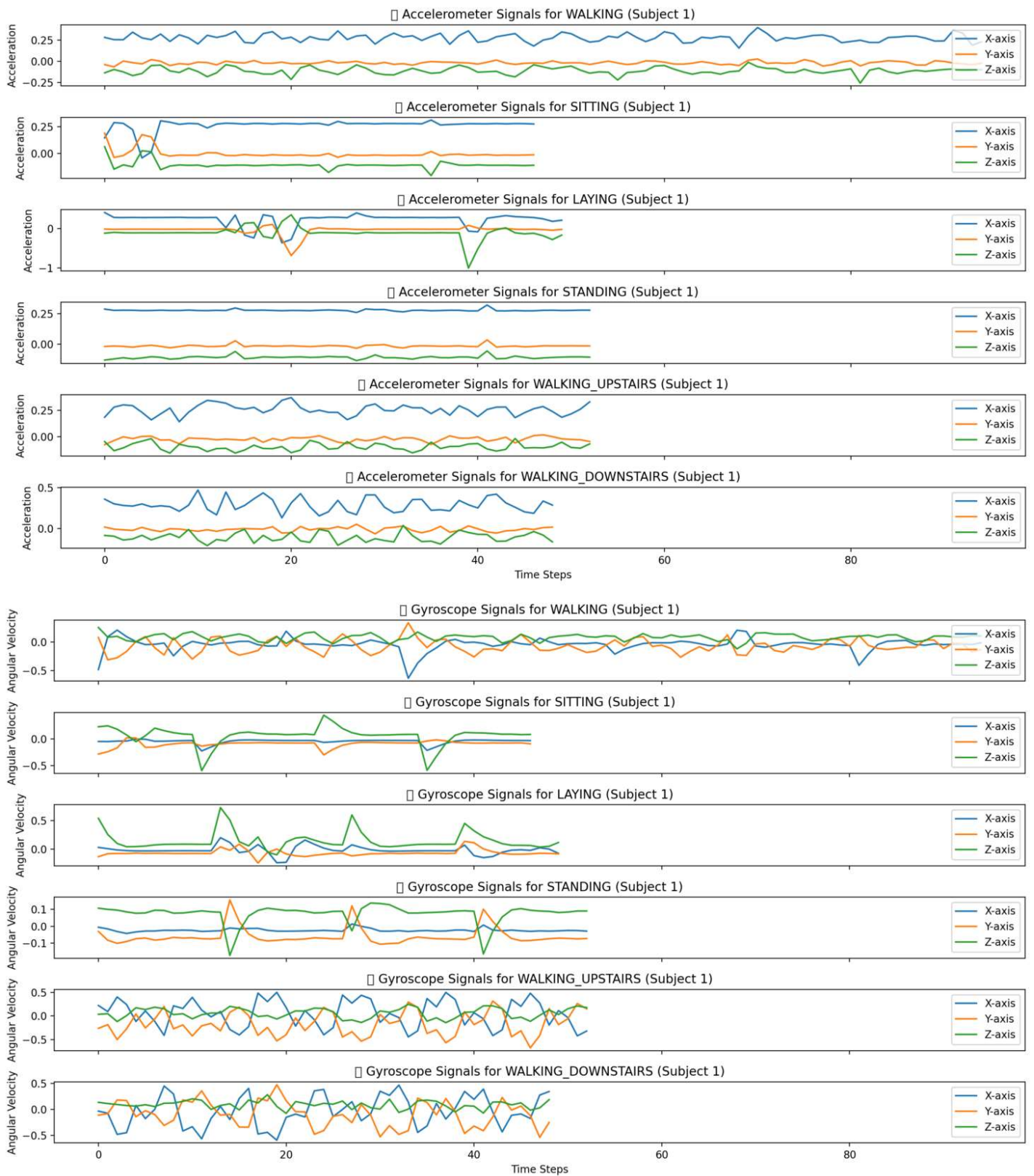# Frequency Component Across Activities

Time-Series Visualization of Sensor Signals

⬜ Accelerometer Signals for WALKING (Subject 1)

⬜ Accelerometer Signals for SITTING (Subject 1)

⬜ Accelerometer Signals for LAYING (Subject 1)

⬜ Accelerometer Signals for STANDING (Subject 1)

⬜ Accelerometer Signals for WALKING_UPSTAIRS (Subject 1)

⬜ Accelerometer Signals for WALKING_DOWNSTAIRS (Subject 1)

⬜ Gyroscope Signals for WALKING (Subject 1)

⬜ Gyroscope Signals for SITTING (Subject 1)

⬜ Gyroscope Signals for LAYING (Subject 1)

⬜ Gyroscope Signals for STANDING (Subject 1)

⬜ Gyroscope Signals for WALKING_UPSTAIRS (Subject 1)

⬜ Gyroscope Signals for WALKING_DOWNSTAIRS (Subject 1)

🤖 RBF SVM Activity Classifier

📁 Upload Training CSV

☁️	Drag and drop file here	Browse files
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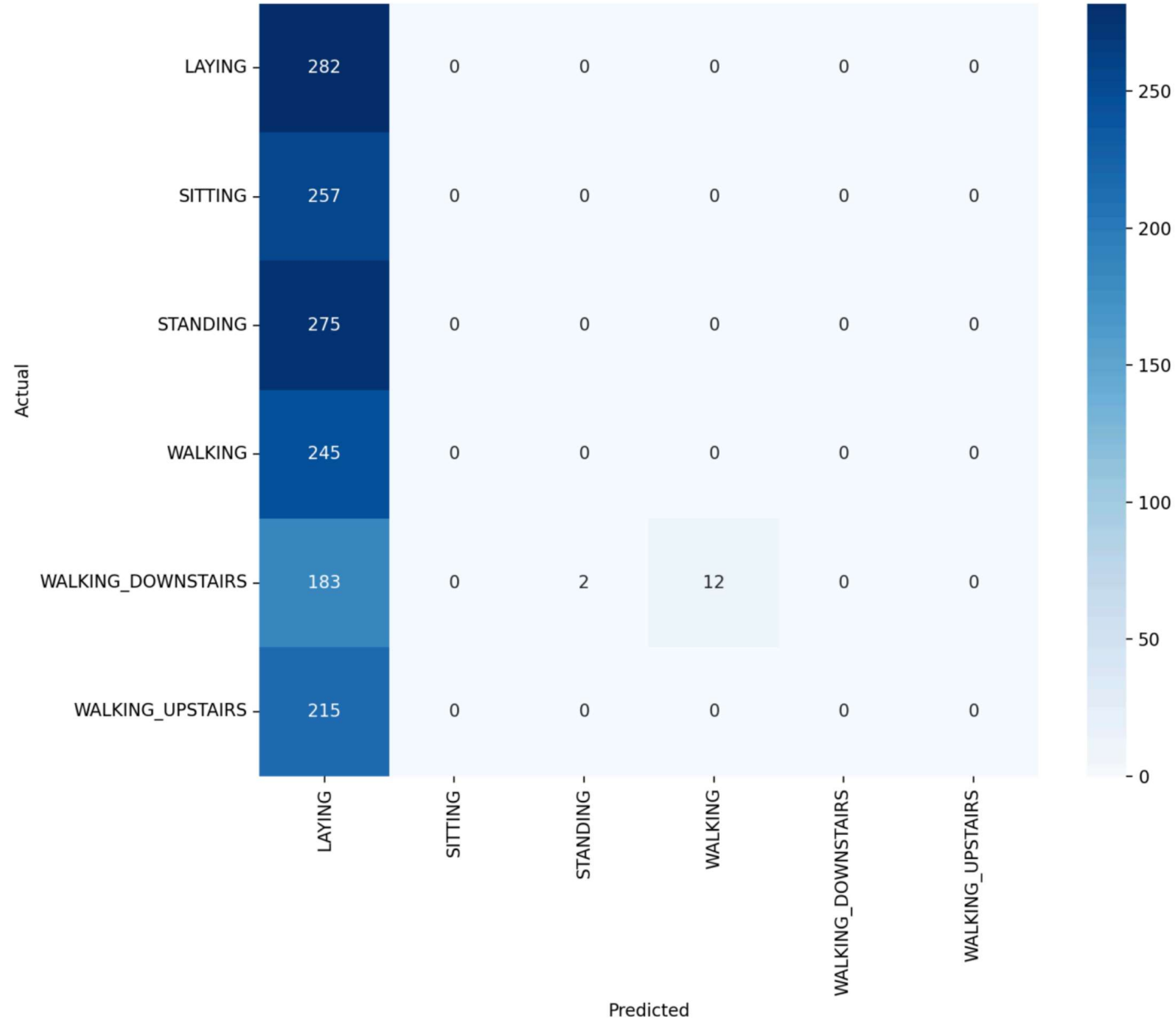📄 train.csv 45.9MB   ✕

✅ Data uploaded successfully!

🖥️ Training RBF SVM model...

🟦 **Confusion Matrix**

Confusion Matrix: RBF SVM

📋 Classification Report

	precision	recall	f1-score	support
LAYING	0.1935	1.0000	0.3243	282.0000
SITTING	0.0000	0.0000	0.0000	257.0000
STANDING	0.0000	0.0000	0.0000	275.0000
WALKING	0.0000	0.0000	0.0000	245.0000
WALKING_DOWNSTAIRS	0.0000	0.0000	0.0000	197.0000
WALKING_UPSTAIRS	0.0000	0.0000	0.0000	215.0000
accuracy	0.1917	0.1917	0.1917	0.1917
macro avg	0.0323	0.1667	0.0541	1471.0000
weighted avg	0.0371	0.1917	0.0622	1471.0000

🔧 RBF SVM Hyperparameter Tuning

✅ Grid search completed!

Best Parameters:

```
{
  "C" : 10
  "gamma" : 0.01
}
```

Best Cross-Validation Accuracy

0.9335

📉 Feature Selection: Variance Thresholding
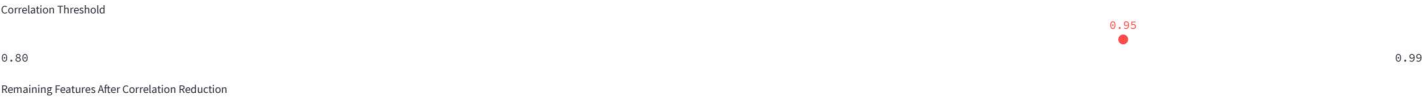
Retained Features After Variance Thresholding

524

⌖ Selected Feature Names ⌄

🔗 Feature Reduction via Correlation Analysis

Correlation Threshold

0.95

0.80   0.99

Remaining Features After Correlation Reduction

253

⬇ Dropped Correlated Features ⌄

🔢 Dimensionality Reduction with PCA

Retain Variance (%)

95

80   99

PCA Components Retained

94

📉 Explained Variance by Component ⌄

⊞ Feature Selection with RFE (Recursive Feature Elimination)

Select Top N Features

50

10   94

Features Selected by RFE

50

🧩 Encode Labels & Standardize Features

✅ Data encoded and standardized.

📄 X_train shape: (7352, 561)

📄 X_test shape: (2947, 561)

🎯 y_train shape: (7352,)

🎯 y_test shape: (2947,)

🔍 Preview Encoded Training Data ⌄

🧠 Model Training & Evaluation

✅ Model evaluation completed!

	Accuracy	Precision	Recall	F1-score
Logistic Regression	0.9667	0.9669	0.9667	0.9666
Random Forest	0.9415	0.9416	0.9415	0.9413
SVM (RBF Kernel)	0.9796	0.9797	0.9796	0.9796

🧪 Grid Search for SVM (RBF Kernel) After PCA

✅ Grid Search Completed!

Best Parameters:

```
{
  "C" : 10
  "gamma" : "scale"
}
```

Best Cross-Validation Accuracy

0.9823