

```
"D:\Programming Projects\Python Projects\Pre Thesis Work\Step Analysis  
Tool - (with Plotly)\venv\Scripts\python.exe" "D:/Programming Projects/  
Python Projects/Pre Thesis Work/Step Analysis Tool - (with Plotly)/model  
/feature_selection_cv.py"
```

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D:\Programming Projects\Python Projects\Pre Thesis Work\Step Analysis  
Tool - (with Plotly)\Features_Dataset\ds_all.csv
```

```
D:\Programming Projects\Python Projects\Pre Thesis Work\Step Analysis  
Tool - (with Plotly)\venv\lib\site-packages\numpy\lib\arraysetops.py:569  
: FutureWarning:
```

```
elementwise comparison failed; returning scalar instead, but in the  
future will perform elementwise comparison
```

```
>> Dataset loaded
```

```
>> Training set normalized.
```

```
>> Training the model & Performing feature ranking simultaneously
```

```
>> Model Trained!
```

```
>> Feature Ranking complete!
```

```
# of selected features:      51/51
```

```
Selected Features:
```

```
['Ax_energy', 'Ax_entropy', 'Ax_index_max', 'Ax_index_min', 'Ax_iqr', '  
Ax_kurtosis', 'Ax_mean', 'Ax_mean_abs_deviation', 'Ax_median', 'Ax_rms'  
, 'Ax_signal_magnitude_area', 'Ax_skewness', 'Ax_standard_deviation', '  
Ax_value_max', 'Ax_value_min', 'Ax_variance', 'Ay_energy', 'Ay_entropy'  
, 'Ay_index_max', 'Ay_index_min', 'Ay_iqr', 'Ay_kurtosis', 'Ay_mean', '  
Ay_mean_abs_deviation', 'Ay_median', 'Ay_rms', 'Ay_signal_magnitude_area'  
, 'Ay_skewness', 'Ay_standard_deviation', 'Ay_value_max', 'Ay_value_min'  
, 'Ay_variance', 'Az_energy', 'Az_entropy', 'Az_index_max', '  
Az_index_min', 'Az_iqr', 'Az_kurtosis', 'Az_mean', '  
Az_mean_abs_deviation', 'Az_median', 'Az_rms', 'Az_signal_magnitude_area'  
, 'Az_skewness', 'Az_standard_deviation', 'Az_value_max', 'Az_value_min'  
, 'Az_variance', 'corr_xy', 'corr_xz', 'corr_yz']
```

```
Optimal number of features : 51
```

```
>> File generated : feature ranking.csv
```

```
>> File generated : features selected.csv
```

```
>> File Generated : Number of features vs Model score.html
```

```
>> Testing model
```

```
Cross validation : Stratified 2-Fold
```

```
Performance metric used for model optimization : "f1_weighted"
```

Confusion Matrix:

```
[[679220  48783]
 [ 37282 441028]]
```

Score of the classifier on test data:

Accuracy = 92.865%

Precision = 90.040%

Recall = 92.205%

F1-score = 91.110%

ROC\_AUC = 92.752%

Operation took: 618.20 minutes.

>> Removing the previous Normalizer

>> Re-training the Normalizer

>> Normalizer re-trained

Path for 'Trained\_Model' already exists!

>> Model stored externally as "step\_detection\_model.pkl"

Path for 'Trained\_Model' already exists!

>> Model stored externally as "step\_detection\_min\_max\_norm.pkl"

Process finished with exit code 0