Matlab code for classification of seven activities using Euclidean Norm for setting S1 (Acceleration data with spatial domain features)

```
clear all
tic;
%% Passes
SegmentedTrials=["PP01passtrial35","PP01passtrial56","PP01passtrial75
","PP02passtrial16","PP02passtrial37","PP02passtrial56","PP02passtria
l77","PP10passtrial17","PP03passtrial17","PP03passtrial40","PP03passt
rial60","PP03passtrial85","PP04passtrial18","PP04passtrial39","PP04pa
sstrial60","PP04passtrial81","PP05passtrial16","PP05passtrial37","PP0
5passtrial59","PP05passtrial79","PP06passtrial16","PP06passtrial38","
PP06passtrial60","PP06passtrial83","PP07passtrial18","PP07passtrial39
","PP07passtrial62","PP07passtrial89","PP09passtrial23","PP09passtria
l46","PP09passtrial67","PP09passtrial89","PP11passtrial16","PP11passt
rial35","PP11passtrial56","PP11passtrial75","PP12passtrial17","PP12pa
sstrial36","PP12passtrial60","PP12passtrial82"];

for i=1:length(SegmentedTrials)


    load(SegmentedTrials(i))
    AuxiliaryMatrix1 =leftShank.accCal;
    AuxiliaryMatrix2=leftThigh.accCal;
    AuxiliaryMatrix3=pelvis.accCal;
    AuxiliaryMatrix4=rightShank.accCal;
    AuxiliaryMatrix5=rightThigh.accCal;
EucNormleftShank=sqrt(AuxiliaryMatrix1(:,1).^2+AuxiliaryMatrix1(:,2).
^2+AuxiliaryMatrix1(:,3).^2);
EucNormleftThigh=sqrt(AuxiliaryMatrix2(:,1).^2+AuxiliaryMatrix2(:,2).
^2+AuxiliaryMatrix2(:,3).^2);
EucNormpelvis=sqrt(AuxiliaryMatrix3(:,1).^2+AuxiliaryMatrix3(:,2).^2+
AuxiliaryMatrix3(:,3).^2);
EucNormrightShank=sqrt(AuxiliaryMatrix4(:,1).^2+AuxiliaryMatrix4(:,2)
.^2+AuxiliaryMatrix4(:,3).^2);
EucNormrightThigh=sqrt(AuxiliaryMatrix5(:,1).^2+AuxiliaryMatrix5(:,2)
.^2+AuxiliaryMatrix5(:,3).^2);

EuclleftShank{i}=EucNormleftShank;
EuclleftThigh{i}=EucNormleftThigh;
Euclpelvis{i}=EucNormpelvis;
EuclrightShank{i}=EucNormrightShank;
EuclrightThigh{i}=EucNormrightThigh;


end

MatrixOfFeaturesPasses=zeros(40,35);

Mean=zeros(40,5);
Median=zeros(40,5);
Std=zeros(40,5);
Skewness=zeros(40,5);
```

```
Kurtosis=zeros(40,5);
Min=zeros(40,5);
Max=zeros(40,5);


for i=1:length(SegmentedTrials)
    %Mean
    MeanLeftShank=mean(EuclleftShank{1,i});
    MeanLeftThigh=mean(EuclleftThigh{1,i});
    MeanPelvis=mean(Euclpelvis{1,i});
    MeanRightShank=mean(EuclrightShank{1,i});
    MeanRightThigh=mean(EuclrightThigh{1,i});
    %Median
    MedianLeftShank=median(EuclleftShank{1,i});
    MedianLeftThigh=median(EuclleftThigh{1,i});
    MedianPelvis=median(Euclpelvis{1,i});
    MedianRightShank=median(EuclrightShank{1,i});
    MedianRightThigh=median(EuclrightThigh{1,i});
    %Std
    StdLeftShank=std(EuclleftShank{1,i});
    StdLeftThigh=std(EuclleftThigh{1,i});
    StdPelvis=std(Euclpelvis{1,i});
    StdRightShank=std(EuclrightShank{1,i});
    StdRightThigh=std(EuclrightThigh{1,i});
    %Skewness
    SkewnessLeftShank=skewness(EuclleftShank{1,i});
    SkewnessLeftThigh=skewness(EuclleftThigh{1,i});
    SkewnessPelvis=skewness(Euclpelvis{1,i});
    SkewnessRightShank=skewness(EuclrightShank{1,i});
    SkewnessRightThigh=skewness(EuclrightThigh{1,i});
    %Kurtosis
    KurtosisLeftShank=kurtosis(EuclleftShank{1,i});
    KurtosisLeftThigh=kurtosis(EuclleftThigh{1,i});
    KurtosisPelvis=kurtosis(Euclpelvis{1,i});
    KurtosisRightShank=kurtosis(EuclrightShank{1,i});
    KurtosisRightThigh=kurtosis(EuclrightThigh{1,i});
    %Min
    MinLeftShank=min(EuclleftShank{1,i});
    MinLeftThigh=min(EuclleftThigh{1,i});
    MinPelvis=min(Euclpelvis{1,i});
    MinRightShank=min(EuclrightShank{1,i});
    MinRightThigh=min(EuclrightThigh{1,i});
    %Max
    MaxLeftShank=max(EuclleftShank{1,i});
    MaxLeftThigh=max(EuclleftThigh{1,i});
    MaxPelvis=max(Euclpelvis{1,i});
    MaxRightShank=max(EuclrightShank{1,i});
    MaxRightThigh=max(EuclrightThigh{1,i});


    Mean(i,:)=[MeanLeftShank MeanLeftThigh MeanPelvis MeanRightShank
MeanRightThigh];
    Median(i,:)=[MedianLeftShank MedianLeftThigh MedianPelvis
MedianRightShank MedianRightThigh];
    Std(i,:)=[StdLeftShank StdLeftThigh StdPelvis StdRightShank
StdRightThigh];
    Skewness(i,:)=[SkewnessLeftShank SkewnessLeftThigh SkewnessPelvis
SkewnessRightShank SkewnessRightThigh];
    Kurtosis(i,:)=[KurtosisLeftShank KurtosisLeftThigh KurtosisPelvis
KurtosisRightShank KurtosisRightThigh];
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```
    Min(i,:)=[MinLeftShank MinLeftThigh MinPelvis MinRightShank
MinRightThigh];
    Max(i,:)=[MaxLeftShank MaxLeftThigh MaxPelvis MaxRightShank
MaxRightThigh];

    MatrixOfFeaturesPasses(i,:)=[Mean(i,:) Median(i,:) Std(i,:)
Skewness(i,:) Kurtosis(i,:) Min(i,:) Max(i,:)];

end

G=[0];
[x,~]=size(MatrixOfFeaturesPasses);
for i=1:x-1
G=[G 0];
end

G=G';
MatrixOfFeaturesPasses=[MatrixOfFeaturesPasses G];

MatrixOfFeaturesPasses=array2table(MatrixOfFeaturesPasses,
'VariableNames',{'Mean1','Mean2','Mean3','Mean4','Mean5','Median1','M
edian2','Median3','Median4','Median5','Std1','Std2','Std3','Std4','St
d5','Skewness1','Skewness2','Skewness3','Skewness4','Skewness5','Kurt
osis1','Kurtosis2','Kurtosis3','Kurtosis4','Kurtosis5','Min1','Min2',
'Min3','Min4','Min5','Max1','Max2','Max3','Max4','Max5','Activity'});



 %% Shots

SegmentedTrials=["PP01shottrial18","PP01shottrial37","PP01shottrial58
","PP01shottrial77","PP02shottrial18","PP02shottrial39","PP02shottria
l58","PP02shottrial79","PP04shottrial83","PP06shottrial18","PP06shott
rial40","PP06shottrial62","PP07shottrial91","PP10shottrial81","PP11sh
ottrial77","PP12shottrial19","PP12shottrial38","PP12shottrial63","PP1
2shottrial84","shot1","shot2","shot3","shot4","shot5","shot6","shot7"
,"shot8","shot9","shot10","shot11","shot12","shot13","shot14","shot15
","shot16","shot17","shot18","shot19","shot20","shot21"];



for i=1:length(SegmentedTrials)



    load(SegmentedTrials(i))
    AuxiliaryMatrix1 =leftShank.accCal;
    AuxiliaryMatrix2=leftThigh.accCal;
    AuxiliaryMatrix3=pelvis.accCal;
    AuxiliaryMatrix4=rightShank.accCal;
    AuxiliaryMatrix5=rightThigh.accCal;
EucNormleftShank=sqrt(AuxiliaryMatrix1(:,1).^2+AuxiliaryMatrix1(:,2).
^2+AuxiliaryMatrix1(:,3).^2);
EucNormleftThigh=sqrt(AuxiliaryMatrix2(:,1).^2+AuxiliaryMatrix2(:,2).
^2+AuxiliaryMatrix2(:,3).^2);
EucNormpelvis=sqrt(AuxiliaryMatrix3(:,1).^2+AuxiliaryMatrix3(:,2).^2+
AuxiliaryMatrix3(:,3).^2);
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EucNormrightShank=sqrt(AuxiliaryMatrix4(:,1).^2+AuxiliaryMatrix4(:,2)
.^2+AuxiliaryMatrix4(:,3).^2);
EucNormrightThigh=sqrt(AuxiliaryMatrix5(:,1).^2+AuxiliaryMatrix5(:,2)
.^2+AuxiliaryMatrix5(:,3).^2);

EuclleftShank{i}=EucNormleftShank;
EuclleftThigh{i}=EucNormleftThigh;
Euclpelvis{i}=EucNormpelvis;
EuclrightShank{i}=EucNormrightShank;
EuclrightThigh{i}=EucNormrightThigh;


 end

MatrixOfFeaturesShots=zeros(40,35);

Mean=zeros(40,5);
Median=zeros(40,5);
Std=zeros(40,5);
Skewness=zeros(40,5);
Kurtosis=zeros(40,5);
Min=zeros(40,5);
Max=zeros(40,5);


for i=1:length(SegmentedTrials)
    %Mean
    MeanLeftShank=mean(EuclleftShank{1,i});
    MeanLeftThigh=mean(EuclleftThigh{1,i});
    MeanPelvis=mean(Euclpelvis{1,i});
    MeanRightShank=mean(EuclrightShank{1,i});
    MeanRightThigh=mean(EuclrightThigh{1,i});
    %Median
    MedianLeftShank=median(EuclleftShank{1,i});
    MedianLeftThigh=median(EuclleftThigh{1,i});
    MedianPelvis=median(Euclpelvis{1,i});
    MedianRightShank=median(EuclrightShank{1,i});
    MedianRightThigh=median(EuclrightThigh{1,i});
    %Std
    StdLeftShank=std(EuclleftShank{1,i});
    StdLeftThigh=std(EuclleftThigh{1,i});
    StdPelvis=std(Euclpelvis{1,i});
    StdRightShank=std(EuclrightShank{1,i});
    StdRightThigh=std(EuclrightThigh{1,i});
    %Skewness
    SkewnessLeftShank=skewness(EuclleftShank{1,i});
    SkewnessLeftThigh=skewness(EuclleftThigh{1,i});
    SkewnessPelvis=skewness(Euclpelvis{1,i});
    SkewnessRightShank=skewness(EuclrightShank{1,i});
    SkewnessRightThigh=skewness(EuclrightThigh{1,i});
    %Kurtosis
    KurtosisLeftShank=kurtosis(EuclleftShank{1,i});
    KurtosisLeftThigh=kurtosis(EuclleftThigh{1,i});
    KurtosisPelvis=kurtosis(Euclpelvis{1,i});
    KurtosisRightShank=kurtosis(EuclrightShank{1,i});
    KurtosisRightThigh=kurtosis(EuclrightThigh{1,i});
    %Min
    MinLeftShank=min(EuclleftShank{1,i});
    MinLeftThigh=min(EuclleftThigh{1,i});
```

```
    MinPelvis=min(Euclpelvis{1,i});
    MinRightShank=min(EuclrightShank{1,i});
    MinRightThigh=min(EuclrightThigh{1,i});
    %Max
    MaxLeftShank=max(EuclleftShank{1,i});
    MaxLeftThigh=max(EuclleftThigh{1,i});
    MaxPelvis=max(Euclpelvis{1,i});
    MaxRightShank=max(EuclrightShank{1,i});
    MaxRightThigh=max(EuclrightThigh{1,i});


    Mean(i,:)=[MeanLeftShank MeanLeftThigh MeanPelvis MeanRightShank
MeanRightThigh];
    Median(i,:)=[MedianLeftShank MedianLeftThigh MedianPelvis
MedianRightShank MedianRightThigh];
    Std(i,:)=[StdLeftShank StdLeftThigh StdPelvis StdRightShank
StdRightThigh];
    Skewness(i,:)=[SkewnessLeftShank SkewnessLeftThigh SkewnessPelvis
SkewnessRightShank SkewnessRightThigh];
    Kurtosis(i,:)=[KurtosisLeftShank KurtosisLeftThigh KurtosisPelvis
KurtosisRightShank KurtosisRightThigh];
    Min(i,:)=[MinLeftShank MinLeftThigh MinPelvis MinRightShank
MinRightThigh];
    Max(i,:)=[MaxLeftShank MaxLeftThigh MaxPelvis MaxRightShank
MaxRightThigh];

    MatrixOfFeaturesShots(i,:)=[Mean(i,:) Median(i,:) Std(i,:)
Skewness(i,:) Kurtosis(i,:) Min(i,:) Max(i,:)];

 end

G=[1];
[x,~]=size(MatrixOfFeaturesShots);
for i=1:x-1
G=[G 1];
end

G=G';
MatrixOfFeaturesShots=[MatrixOfFeaturesShots G];

MatrixOfFeaturesShots=array2table(MatrixOfFeaturesShots,
'VariableNames',{'Mean1','Mean2','Mean3','Mean4','Mean5','Median1','M
edian2','Median3','Median4','Median5','Std1','Std2','Std3','Std4','St
d5','Skewness1','Skewness2','Skewness3','Skewness4','Skewness5','Kurt
osis1','Kurtosis2','Kurtosis3','Kurtosis4','Kurtosis5','Min1','Min2',
'Min3','Min4','Min5','Max1','Max2','Max3','Max4','Max5','Activity'});


 %% 90degreeTurn


SegmentedTrials=["PP01turn90trial10","PP01turn90trial30","PP01turn90t
rial52","PP02turn90trial10","PP02turn90trial32","PP02turn90trial73","
PP03turn90trial34","PP03turn90trial55","PP03turn90trial80","PP04turn9
0trial12","PP04turn90trial33","PP04turn90trial55","PP04turn90trial56"
,"PP05turn90trial10","PP05turn90trial31","PP05turn90trial32","PP05tur
n90trial74","PP06turn90trial11","PP06turn90trial31","PP06turn90trial5
5","PP06turn90trial77","PP07turn90trial12","PP07turn90trial34","PP07t
urn90trial56","PP07turn90trial57","PP09turn90trial15","PP09turn90tria
```

```
l19","PP09turn90trial39","PP09turn90trial63","PP10turn90trial11","PP1
0turn90trial33","PP10turn90trial53","PP10turn90trial54","PP11turn90tr
ial51","PP11turn90trial70","PP12turn90trial11","PP12turn90trial31","P
P12turn90trial52","PP12turn90trial54","PP12turn90trial77"];


for i=1:length(SegmentedTrials)



    load(SegmentedTrials(i))
    AuxiliaryMatrix1 =leftShank.accCal;
    AuxiliaryMatrix2=leftThigh.accCal;
    AuxiliaryMatrix3=pelvis.accCal;
    AuxiliaryMatrix4=rightShank.accCal;
    AuxiliaryMatrix5=rightThigh.accCal;
EucNormleftShank=sqrt(AuxiliaryMatrix1(:,1).^2+AuxiliaryMatrix1(:,2).
^2+AuxiliaryMatrix1(:,3).^2);
EucNormleftThigh=sqrt(AuxiliaryMatrix2(:,1).^2+AuxiliaryMatrix2(:,2).
^2+AuxiliaryMatrix2(:,3).^2);
EucNormpelvis=sqrt(AuxiliaryMatrix3(:,1).^2+AuxiliaryMatrix3(:,2).^2+
AuxiliaryMatrix3(:,3).^2);
EucNormrightShank=sqrt(AuxiliaryMatrix4(:,1).^2+AuxiliaryMatrix4(:,2)
.^2+AuxiliaryMatrix4(:,3).^2);
EucNormrightThigh=sqrt(AuxiliaryMatrix5(:,1).^2+AuxiliaryMatrix5(:,2)
.^2+AuxiliaryMatrix5(:,3).^2);

EuclleftShank{i}=EucNormleftShank;
EuclleftThigh{i}=EucNormleftThigh;
Euclpelvis{i}=EucNormpelvis;
EuclrightShank{i}=EucNormrightShank;
EuclrightThigh{i}=EucNormrightThigh;


end

MatrixOfFeaturesTurn90=zeros(40,35);
Mean=zeros(40,5);
Median=zeros(40,5);
Std=zeros(40,5);
Skewness=zeros(40,5);
Kurtosis=zeros(40,5);
Min=zeros(40,5);
Max=zeros(40,5);


for i=1:length(SegmentedTrials)
    %Mean
    MeanLeftShank=mean(EuclleftShank{1,i});
    MeanLeftThigh=mean(EuclleftThigh{1,i});
    MeanPelvis=mean(Euclpelvis{1,i});
    MeanRightShank=mean(EuclrightShank{1,i});
    MeanRightThigh=mean(EuclrightThigh{1,i});
    %Median
    MedianLeftShank=median(EuclleftShank{1,i});
    MedianLeftThigh=median(EuclleftThigh{1,i});
    MedianPelvis=median(Euclpelvis{1,i});
    MedianRightShank=median(EuclrightShank{1,i});
    MedianRightThigh=median(EuclrightThigh{1,i});
```

```
    %Std
    StdLeftShank=std(EuclleftShank{1,i});
    StdLeftThigh=std(EuclleftThigh{1,i});
    StdPelvis=std(Euclpelvis{1,i});
    StdRightShank=std(EuclrightShank{1,i});
    StdRightThigh=std(EuclrightThigh{1,i});
    %Skewness
    SkewnessLeftShank=skewness(EuclleftShank{1,i});
    SkewnessLeftThigh=skewness(EuclleftThigh{1,i});
    SkewnessPelvis=skewness(Euclpelvis{1,i});
    SkewnessRightShank=skewness(EuclrightShank{1,i});
    SkewnessRightThigh=skewness(EuclrightThigh{1,i});
    %Kurtosis
    KurtosisLeftShank=kurtosis(EuclleftShank{1,i});
    KurtosisLeftThigh=kurtosis(EuclleftThigh{1,i});
    KurtosisPelvis=kurtosis(Euclpelvis{1,i});
    KurtosisRightShank=kurtosis(EuclrightShank{1,i});
    KurtosisRightThigh=kurtosis(EuclrightThigh{1,i});
    %Min
    MinLeftShank=min(EuclleftShank{1,i});
    MinLeftThigh=min(EuclleftThigh{1,i});
    MinPelvis=min(Euclpelvis{1,i});
    MinRightShank=min(EuclrightShank{1,i});
    MinRightThigh=min(EuclrightThigh{1,i});
    %Max
    MaxLeftShank=max(EuclleftShank{1,i});
    MaxLeftThigh=max(EuclleftThigh{1,i});
    MaxPelvis=max(Euclpelvis{1,i});
    MaxRightShank=max(EuclrightShank{1,i});
    MaxRightThigh=max(EuclrightThigh{1,i});


    Mean(i,:)=[MeanLeftShank MeanLeftThigh MeanPelvis MeanRightShank
MeanRightThigh];
    Median(i,:)=[MedianLeftShank MedianLeftThigh MedianPelvis
MedianRightShank MedianRightThigh];
    Std(i,:)=[StdLeftShank StdLeftThigh StdPelvis StdRightShank
StdRightThigh];
    Skewness(i,:)=[SkewnessLeftShank SkewnessLeftThigh SkewnessPelvis
SkewnessRightShank SkewnessRightThigh];
    Kurtosis(i,:)=[KurtosisLeftShank KurtosisLeftThigh KurtosisPelvis
KurtosisRightShank KurtosisRightThigh];
    Min(i,:)=[MinLeftShank MinLeftThigh MinPelvis MinRightShank
MinRightThigh];
    Max(i,:)=[MaxLeftShank MaxLeftThigh MaxPelvis MaxRightShank
MaxRightThigh];

    MatrixOfFeaturesTurn90(i,:)=[Mean(i,:) Median(i,:) Std(i,:)
Skewness(i,:) Kurtosis(i,:) Min(i,:) Max(i,:)];

 end

G=[3];
[x,~]=size(MatrixOfFeaturesTurn90);
for i=1:x-1
G=[G 3];
end

G=G';
MatrixOfFeaturesTurn90=[MatrixOfFeaturesTurn90 G];
```

```
MatrixOfFeaturesTurn90=array2table(MatrixOfFeaturesTurn90,
'VariableNames',{'Mean1','Mean2','Mean3','Mean4','Mean5','Median1','M
edian2','Median3','Median4','Median5','Std1','Std2','Std3','Std4','St
d5','Skewness1','Skewness2','Skewness3','Skewness4','Skewness5','Kurt
osis1','Kurtosis2','Kurtosis3','Kurtosis4','Kurtosis5','Min1','Min2',
'Min3','Min4','Min5','Max1','Max2','Max3','Max4','Max5','Activity'});


 %%  180degreeTurn

SegmentedTrials=["PP01turn180trial9","PP01turn180trial27","PP01turn18
0trial7","PP01turn180trial48","PP01turn180trial49","PP02turn180trial7
","PP02turn180trial9","PP02turn180trial47","PP02turn180trial48","PP02
turn180trial49","PP06turn180trial26","PP06turn180trial51","PP06turn18
0trial73","PP09turn180trial59","PP09turn180trial60","PP11turn180trial
7","PP11turn180trial27","PP11turn180trial49","PP11turn180trial66","PP
11turn180trial67","turn180_1","turn180_2","turn180_3","turn180_4","tu
rn180_5","turn180_6","turn180_7","turn180_8","turn180_9","turn180_10"
,"turn180_11","turn180_12","turn180_13","turn180_14","turn180_15","tu
rn180_16","turn180_17","turn180_18","turn180_19","turn180_20"];


for i=1:length(SegmentedTrials)



    load(SegmentedTrials(i))
    AuxiliaryMatrix1 =leftShank.accCal;
    AuxiliaryMatrix2=leftThigh.accCal;
    AuxiliaryMatrix3=pelvis.accCal;
    AuxiliaryMatrix4=rightShank.accCal;
    AuxiliaryMatrix5=rightThigh.accCal;
EucNormleftShank=sqrt(AuxiliaryMatrix1(:,1).^2+AuxiliaryMatrix1(:,2).
^2+AuxiliaryMatrix1(:,3).^2);
EucNormleftThigh=sqrt(AuxiliaryMatrix2(:,1).^2+AuxiliaryMatrix2(:,2).
^2+AuxiliaryMatrix2(:,3).^2);
EucNormpelvis=sqrt(AuxiliaryMatrix3(:,1).^2+AuxiliaryMatrix3(:,2).^2+
AuxiliaryMatrix3(:,3).^2);
EucNormrightShank=sqrt(AuxiliaryMatrix4(:,1).^2+AuxiliaryMatrix4(:,2)
.^2+AuxiliaryMatrix4(:,3).^2);
EucNormrightThigh=sqrt(AuxiliaryMatrix5(:,1).^2+AuxiliaryMatrix5(:,2)
.^2+AuxiliaryMatrix5(:,3).^2);

EuclleftShank{i}=EucNormleftShank;
EuclleftThigh{i}=EucNormleftThigh;
Euclpelvis{i}=EucNormpelvis;
EuclrightShank{i}=EucNormrightShank;
EuclrightThigh{i}=EucNormrightThigh;


end

MatrixOfFeaturesTurn180=zeros(40,35);

Mean=zeros(40,5);
Median=zeros(40,5);
Std=zeros(40,5);
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```
Skewness=zeros(40,5);
Kurtosis=zeros(40,5);
Min=zeros(40,5);
Max=zeros(40,5);


for i=1:length(SegmentedTrials)
    %Mean
    MeanLeftShank=mean(EuclleftShank{1,i});
    MeanLeftThigh=mean(EuclleftThigh{1,i});
    MeanPelvis=mean(Euclpelvis{1,i});
    MeanRightShank=mean(EuclrightShank{1,i});
    MeanRightThigh=mean(EuclrightThigh{1,i});
    %Median
    MedianLeftShank=median(EuclleftShank{1,i});
    MedianLeftThigh=median(EuclleftThigh{1,i});
    MedianPelvis=median(Euclpelvis{1,i});
    MedianRightShank=median(EuclrightShank{1,i});
    MedianRightThigh=median(EuclrightThigh{1,i});
    %Std
    StdLeftShank=std(EuclleftShank{1,i});
    StdLeftThigh=std(EuclleftThigh{1,i});
    StdPelvis=std(Euclpelvis{1,i});
    StdRightShank=std(EuclrightShank{1,i});
    StdRightThigh=std(EuclrightThigh{1,i});
    %Skewness
    SkewnessLeftShank=skewness(EuclleftShank{1,i});
    SkewnessLeftThigh=skewness(EuclleftThigh{1,i});
    SkewnessPelvis=skewness(Euclpelvis{1,i});
    SkewnessRightShank=skewness(EuclrightShank{1,i});
    SkewnessRightThigh=skewness(EuclrightThigh{1,i});
    %Kurtosis
    KurtosisLeftShank=kurtosis(EuclleftShank{1,i});
    KurtosisLeftThigh=kurtosis(EuclleftThigh{1,i});
    KurtosisPelvis=kurtosis(Euclpelvis{1,i});
    KurtosisRightShank=kurtosis(EuclrightShank{1,i});
    KurtosisRightThigh=kurtosis(EuclrightThigh{1,i});
    %Min
    MinLeftShank=min(EuclleftShank{1,i});
    MinLeftThigh=min(EuclleftThigh{1,i});
    MinPelvis=min(Euclpelvis{1,i});
    MinRightShank=min(EuclrightShank{1,i});
    MinRightThigh=min(EuclrightThigh{1,i});
    %Max
    MaxLeftShank=max(EuclleftShank{1,i});
    MaxLeftThigh=max(EuclleftThigh{1,i});
    MaxPelvis=max(Euclpelvis{1,i});
    MaxRightShank=max(EuclrightShank{1,i});
    MaxRightThigh=max(EuclrightThigh{1,i});


    Mean(i,:)=[MeanLeftShank MeanLeftThigh MeanPelvis MeanRightShank
MeanRightThigh];
    Median(i,:)=[MedianLeftShank MedianLeftThigh MedianPelvis
MedianRightShank MedianRightThigh];
    Std(i,:)=[StdLeftShank StdLeftThigh StdPelvis StdRightShank
StdRightThigh];
    Skewness(i,:)=[SkewnessLeftShank SkewnessLeftThigh SkewnessPelvis
SkewnessRightShank SkewnessRightThigh];
```

```
    Kurtosis(i,:)=[KurtosisLeftShank KurtosisLeftThigh KurtosisPelvis
KurtosisRightShank KurtosisRightThigh];
    Min(i,:)=[MinLeftShank MinLeftThigh MinPelvis MinRightShank
MinRightThigh];
    Max(i,:)=[MaxLeftShank MaxLeftThigh MaxPelvis MaxRightShank
MaxRightThigh];

    MatrixOfFeaturesTurn180(i,:)=[Mean(i,:) Median(i,:) Std(i,:)
Skewness(i,:) Kurtosis(i,:) Min(i,:) Max(i,:)];

 end

G=[2];
[x,~]=size(MatrixOfFeaturesTurn180);
for i=1:x-1
G=[G 2];
end

G=G';
MatrixOfFeaturesTurn180=[MatrixOfFeaturesTurn180 G];

MatrixOfFeaturesTurn180=array2table(MatrixOfFeaturesTurn180,
'VariableNames',{'Mean1','Mean2','Mean3','Mean4','Mean5','Median1','M
edian2','Median3','Median4','Median5','Std1','Std2','Std3','Std4','St
d5','Skewness1','Skewness2','Skewness3','Skewness4','Skewness5','Kurt
osis1','Kurtosis2','Kurtosis3','Kurtosis4','Kurtosis5','Min1','Min2',
'Min3','Min4','Min5','Max1','Max2','Max3','Max4','Max5','Activity'});

DATAfinal=[MatrixOfFeaturesPasses; MatrixOfFeaturesShots;
MatrixOfFeaturesTurn90; MatrixOfFeaturesTurn180];

%% Jumps

SegmentedTrials=["PP01jumptrial13","PP01jumptrial33","PP01jumptrial55
","PP01jumptrial73","PP02jumptrial13","PP02jumptrial35","PP02jumptria
l55","PP02jumptrial76","PP03jumptrial14","PP03jumptrial57","PP03jumpt
rial58","PP03jumptrial84","PP04jumptrial36","PP04jumptrial57","PP04ju
mptrial79","PP04jumptrial80","PP05jumptrial13","PP05jumptrial14","PP0
5jumptrial15","PP05jumptrial76","PP06jumptrial37","PP06jumptrial57","
PP06jumptrial58","PP06jumptrial78","PP07jumptrial15","PP07jumptrial86
","PP07jumptrial87","PP07jumptrial88","PP09jumptrial20","PP09jumptria
l43","PP09jumptrial65","PP09jumptrial66","PP11jumptrial14","PP11jumpt
rial32","PP11jumptrial72","PP11jumptrial74","PP12jumptrial55","PP12ju
mptrial57","PP12jumptrial59","PP12jumptrial78"];


for i=1:length(SegmentedTrials)


    load(SegmentedTrials(i))
    AuxiliaryMatrix1 =leftShank.accCal;
    AuxiliaryMatrix2=leftThigh.accCal;
    AuxiliaryMatrix3=pelvis.accCal;
    AuxiliaryMatrix4=rightShank.accCal;
    AuxiliaryMatrix5=rightThigh.accCal;
EucNormleftShank=sqrt(AuxiliaryMatrix1(:,1).^2+AuxiliaryMatrix1(:,2).
^2+AuxiliaryMatrix1(:,3).^2);
```

```
EucNormleftThigh=sqrt(AuxiliaryMatrix2(:,1).^2+AuxiliaryMatrix2(:,2).
^2+AuxiliaryMatrix2(:,3).^2);
EucNormpelvis=sqrt(AuxiliaryMatrix3(:,1).^2+AuxiliaryMatrix3(:,2).^2+
AuxiliaryMatrix3(:,3).^2);
EucNormrightShank=sqrt(AuxiliaryMatrix4(:,1).^2+AuxiliaryMatrix4(:,2)
.^2+AuxiliaryMatrix4(:,3).^2);
EucNormrightThigh=sqrt(AuxiliaryMatrix5(:,1).^2+AuxiliaryMatrix5(:,2)
.^2+AuxiliaryMatrix5(:,3).^2);

EuclleftShank{i}=EucNormleftShank;
EuclleftThigh{i}=EucNormleftThigh;
Euclpelvis{i}=EucNormpelvis;
EuclrightShank{i}=EucNormrightShank;
EuclrightThigh{i}=EucNormrightThigh;


end

MatrixOfFeaturesJumps=zeros(40,35);

Mean=zeros(40,5);
Median=zeros(40,5);
Std=zeros(40,5);
Skewness=zeros(40,5);
Kurtosis=zeros(40,5);
Min=zeros(40,5);
Max=zeros(40,5);


for i=1:length(SegmentedTrials)
    %Mean
    MeanLeftShank=mean(EuclleftShank{1,i});
    MeanLeftThigh=mean(EuclleftThigh{1,i});
    MeanPelvis=mean(Euclpelvis{1,i});
    MeanRightShank=mean(EuclrightShank{1,i});
    MeanRightThigh=mean(EuclrightThigh{1,i});
    %Median
    MedianLeftShank=median(EuclleftShank{1,i});
    MedianLeftThigh=median(EuclleftThigh{1,i});
    MedianPelvis=median(Euclpelvis{1,i});
    MedianRightShank=median(EuclrightShank{1,i});
    MedianRightThigh=median(EuclrightThigh{1,i});
    %Std
    StdLeftShank=std(EuclleftShank{1,i});
    StdLeftThigh=std(EuclleftThigh{1,i});
    StdPelvis=std(Euclpelvis{1,i});
    StdRightShank=std(EuclrightShank{1,i});
    StdRightThigh=std(EuclrightThigh{1,i});
    %Skewness
    SkewnessLeftShank=skewness(EuclleftShank{1,i});
    SkewnessLeftThigh=skewness(EuclleftThigh{1,i});
    SkewnessPelvis=skewness(Euclpelvis{1,i});
    SkewnessRightShank=skewness(EuclrightShank{1,i});
    SkewnessRightThigh=skewness(EuclrightThigh{1,i});
    %Kurtosis
    KurtosisLeftShank=kurtosis(EuclleftShank{1,i});
    KurtosisLeftThigh=kurtosis(EuclleftThigh{1,i});
    KurtosisPelvis=kurtosis(Euclpelvis{1,i});
    KurtosisRightShank=kurtosis(EuclrightShank{1,i});
```

```
    KurtosisRightThigh=kurtosis(EuclrightThigh{1,i});
    %Min
    MinLeftShank=min(EuclleftShank{1,i});
    MinLeftThigh=min(EuclleftThigh{1,i});
    MinPelvis=min(Euclpelvis{1,i});
    MinRightShank=min(EuclrightShank{1,i});
    MinRightThigh=min(EuclrightThigh{1,i});
    %Max
    MaxLeftShank=max(EuclleftShank{1,i});
    MaxLeftThigh=max(EuclleftThigh{1,i});
    MaxPelvis=max(Euclpelvis{1,i});
    MaxRightShank=max(EuclrightShank{1,i});
    MaxRightThigh=max(EuclrightThigh{1,i});


    Mean(i,:)=[MeanLeftShank MeanLeftThigh MeanPelvis MeanRightShank
MeanRightThigh];
    Median(i,:)=[MedianLeftShank MedianLeftThigh MedianPelvis
MedianRightShank MedianRightThigh];
    Std(i,:)=[StdLeftShank StdLeftThigh StdPelvis StdRightShank
StdRightThigh];
    Skewness(i,:)=[SkewnessLeftShank SkewnessLeftThigh SkewnessPelvis
SkewnessRightShank SkewnessRightThigh];
    Kurtosis(i,:)=[KurtosisLeftShank KurtosisLeftThigh KurtosisPelvis
KurtosisRightShank KurtosisRightThigh];
    Min(i,:)=[MinLeftShank MinLeftThigh MinPelvis MinRightShank
MinRightThigh];
    Max(i,:)=[MaxLeftShank MaxLeftThigh MaxPelvis MaxRightShank
MaxRightThigh];

    MatrixOfFeaturesJumps(i,:)=[Mean(i,:) Median(i,:) Std(i,:)
Skewness(i,:) Kurtosis(i,:) Min(i,:) Max(i,:)];

end

G=[4];
[x,~]=size(MatrixOfFeaturesJumps);
for i=1:x-1
G=[G 4];
end

G=G';
MatrixOfFeaturesJumps=[MatrixOfFeaturesJumps G];

MatrixOfFeaturesJumps=array2table(MatrixOfFeaturesJumps,
'VariableNames',{'Mean1','Mean2','Mean3','Mean4','Mean5','Median1','M
edian2','Median3','Median4','Median5','Std1','Std2','Std3','Std4','St
d5','Skewness1','Skewness2','Skewness3','Skewness4','Skewness5','Kurt
osis1','Kurtosis2','Kurtosis3','Kurtosis4','Kurtosis5','Min1','Min2',
'Min3','Min4','Min5','Max1','Max2','Max3','Max4','Max5','Activity'});


%% Long Passes

SegmentedTrials=["PP01sentratrial17","PP01sentratrial36","PP01sentrat
rial57","PP01sentratrial76","PP02sentratrial17","PP02sentratrial38","
PP02sentratrial57","PP02sentratrial78","PP03sentratrial18","PP03sentr
atrial41","PP03sentratrial61","PP03sentratrial86","PP04sentratrial19"
,"PP04sentratrial40","PP04sentratrial61","PP04sentratrial82","PP05sen
```

```
tratrial17","PP05sentratrial38","PP05sentratrial60","PP05sentratrial8
0","PP06sentratrial17","PP06sentratrial39","PP06sentratrial61","PP06s
entratrial84","PP07sentratrial19","PP07sentratrial40","PP07sentratria
l63","PP07sentratrial90","PP09sentratrial24","PP09sentratrial47","PP0
9sentratrial69","PP10sentratrial18","PP10sentratrial39","PP10sentratr
ial59","PP10sentratrial80","PP11sentratrial17","PP11sentratrial36","P
P11sentratrial57","PP11sentratrial76","PP12sentratrial83"];


for i=1:length(SegmentedTrials)


    load(SegmentedTrials(i))
    AuxiliaryMatrix1 =leftShank.accCal;
    AuxiliaryMatrix2=leftThigh.accCal;
    AuxiliaryMatrix3=pelvis.accCal;
    AuxiliaryMatrix4=rightShank.accCal;
    AuxiliaryMatrix5=rightThigh.accCal;
EucNormleftShank=sqrt(AuxiliaryMatrix1(:,1).^2+AuxiliaryMatrix1(:,2).
^2+AuxiliaryMatrix1(:,3).^2);
EucNormleftThigh=sqrt(AuxiliaryMatrix2(:,1).^2+AuxiliaryMatrix2(:,2).
^2+AuxiliaryMatrix2(:,3).^2);
EucNormpelvis=sqrt(AuxiliaryMatrix3(:,1).^2+AuxiliaryMatrix3(:,2).^2+
AuxiliaryMatrix3(:,3).^2);
EucNormrightShank=sqrt(AuxiliaryMatrix4(:,1).^2+AuxiliaryMatrix4(:,2)
.^2+AuxiliaryMatrix4(:,3).^2);
EucNormrightThigh=sqrt(AuxiliaryMatrix5(:,1).^2+AuxiliaryMatrix5(:,2)
.^2+AuxiliaryMatrix5(:,3).^2);

EuclleftShank{i}=EucNormleftShank;
EuclleftThigh{i}=EucNormleftThigh;
Euclpelvis{i}=EucNormpelvis;
EuclrightShank{i}=EucNormrightShank;
EuclrightThigh{i}=EucNormrightThigh;


end

MatrixOfFeaturesLongPasses=zeros(40,35);

Mean=zeros(40,5);
Median=zeros(40,5);
Std=zeros(40,5);
Skewness=zeros(40,5);
Kurtosis=zeros(40,5);
Min=zeros(40,5);
Max=zeros(40,5);


for i=1:length(SegmentedTrials)
    %Mean
    MeanLeftShank=mean(EuclleftShank{1,i});
    MeanLeftThigh=mean(EuclleftThigh{1,i});
    MeanPelvis=mean(Euclpelvis{1,i});
    MeanRightShank=mean(EuclrightShank{1,i});
    MeanRightThigh=mean(EuclrightThigh{1,i});
    %Median
    MedianLeftShank=median(EuclleftShank{1,i});
    MedianLeftThigh=median(EuclleftThigh{1,i});
```

```
    MedianPelvis=median(Euclpelvis{1,i});
    MedianRightShank=median(EuclrightShank{1,i});
    MedianRightThigh=median(EuclrightThigh{1,i});
    %Std
    StdLeftShank=std(EuclleftShank{1,i});
    StdLeftThigh=std(EuclleftThigh{1,i});
    StdPelvis=std(Euclpelvis{1,i});
    StdRightShank=std(EuclrightShank{1,i});
    StdRightThigh=std(EuclrightThigh{1,i});
    %Skewness
    SkewnessLeftShank=skewness(EuclleftShank{1,i});
    SkewnessLeftThigh=skewness(EuclleftThigh{1,i});
    SkewnessPelvis=skewness(Euclpelvis{1,i});
    SkewnessRightShank=skewness(EuclrightShank{1,i});
    SkewnessRightThigh=skewness(EuclrightThigh{1,i});
    %Kurtosis
    KurtosisLeftShank=kurtosis(EuclleftShank{1,i});
    KurtosisLeftThigh=kurtosis(EuclleftThigh{1,i});
    KurtosisPelvis=kurtosis(Euclpelvis{1,i});
    KurtosisRightShank=kurtosis(EuclrightShank{1,i});
    KurtosisRightThigh=kurtosis(EuclrightThigh{1,i});
    %Min
    MinLeftShank=min(EuclleftShank{1,i});
    MinLeftThigh=min(EuclleftThigh{1,i});
    MinPelvis=min(Euclpelvis{1,i});
    MinRightShank=min(EuclrightShank{1,i});
    MinRightThigh=min(EuclrightThigh{1,i});
    %Max
    MaxLeftShank=max(EuclleftShank{1,i});
    MaxLeftThigh=max(EuclleftThigh{1,i});
    MaxPelvis=max(Euclpelvis{1,i});
    MaxRightShank=max(EuclrightShank{1,i});
    MaxRightThigh=max(EuclrightThigh{1,i});


    Mean(i,:)=[MeanLeftShank MeanLeftThigh MeanPelvis MeanRightShank
MeanRightThigh];
    Median(i,:)=[MedianLeftShank MedianLeftThigh MedianPelvis
MedianRightShank MedianRightThigh];
    Std(i,:)=[StdLeftShank StdLeftThigh StdPelvis StdRightShank
StdRightThigh];
    Skewness(i,:)=[SkewnessLeftShank SkewnessLeftThigh SkewnessPelvis
SkewnessRightShank SkewnessRightThigh];
    Kurtosis(i,:)=[KurtosisLeftShank KurtosisLeftThigh KurtosisPelvis
KurtosisRightShank KurtosisRightThigh];
    Min(i,:)=[MinLeftShank MinLeftThigh MinPelvis MinRightShank
MinRightThigh];
    Max(i,:)=[MaxLeftShank MaxLeftThigh MaxPelvis MaxRightShank
MaxRightThigh];

    MatrixOfFeaturesLongPasses(i,:)=[Mean(i,:) Median(i,:) Std(i,:)
Skewness(i,:) Kurtosis(i,:) Min(i,:) Max(i,:)];

end

G=[5];
[x,~]=size(MatrixOfFeaturesLongPasses);
for i=1:x-1
G=[G 5];
end
```

```
G=G';
MatrixOfFeaturesLongPasses=[MatrixOfFeaturesLongPasses G];

MatrixOfFeaturesLongPasses=array2table(MatrixOfFeaturesLongPasses,
'VariableNames',{'Mean1','Mean2','Mean3','Mean4','Mean5','Median1','M
edian2','Median3','Median4','Median5','Std1','Std2','Std3','Std4','St
d5','Skewness1','Skewness2','Skewness3','Skewness4','Skewness5','Kurt
osis1','Kurtosis2','Kurtosis3','Kurtosis4','Kurtosis5','Min1','Min2',
'Min3','Min4','Min5','Max1','Max2','Max3','Max4','Max5','Activity'});




%% Runs

SegmentedTrials=["PP01runtrial1","PP01runtrial21","PP01runtrial40","P
P01runtrial41","PP02runtrial21","PP02runtrial42","PP02runtrial61","PP
02runtrial62","PP03runtrial1","PP03runtrial23","PP03runtrial45","PP03
runtrial68","PP04runtrial3","PP04runtrial23","PP04runtrial44","PP04ru
ntrial67","PP05runtrial1","PP05runtrial21","PP05runtrial44","PP05runt
rial65","PP06runtrial20","PP06runtrial45","PP06runtrial65","PP06runtr
ial67","PP07runtrial22","PP07runtrial74","PP07runtrial75","PP09runtri
al5","PP09runtrial6","PP09runtrial7","PP09runtrial29","PP10runtrial4"
,"PP10runtrial22","PP10runtrial62","PP10runtrial63","PP11runtrial3","
PP11runtrial20","PP11runtrial38","PP11runtrial60","PP12runtrial41"];

for i=1:length(SegmentedTrials)


    load(SegmentedTrials(i))
    AuxiliaryMatrix1 =leftShank.accCal;
    AuxiliaryMatrix2=leftThigh.accCal;
    AuxiliaryMatrix3=pelvis.accCal;
    AuxiliaryMatrix4=rightShank.accCal;
    AuxiliaryMatrix5=rightThigh.accCal;
EucNormleftShank=sqrt(AuxiliaryMatrix1(:,1).^2+AuxiliaryMatrix1(:,2).
^2+AuxiliaryMatrix1(:,3).^2);
EucNormleftThigh=sqrt(AuxiliaryMatrix2(:,1).^2+AuxiliaryMatrix2(:,2).
^2+AuxiliaryMatrix2(:,3).^2);
EucNormpelvis=sqrt(AuxiliaryMatrix3(:,1).^2+AuxiliaryMatrix3(:,2).^2+
AuxiliaryMatrix3(:,3).^2);
EucNormrightShank=sqrt(AuxiliaryMatrix4(:,1).^2+AuxiliaryMatrix4(:,2)
.^2+AuxiliaryMatrix4(:,3).^2);
EucNormrightThigh=sqrt(AuxiliaryMatrix5(:,1).^2+AuxiliaryMatrix5(:,2)
.^2+AuxiliaryMatrix5(:,3).^2);

EuclleftShank{i}=EucNormleftShank;
EuclleftThigh{i}=EucNormleftThigh;
Euclpelvis{i}=EucNormpelvis;
EuclrightShank{i}=EucNormrightShank;
EuclrightThigh{i}=EucNormrightThigh;


end

MatrixOfFeaturesRuns=zeros(40,35);
```

```
Mean=zeros(40,5);
Median=zeros(40,5);
Std=zeros(40,5);
Skewness=zeros(40,5);
Kurtosis=zeros(40,5);
Min=zeros(40,5);
Max=zeros(40,5);


for i=1:length(SegmentedTrials)
    %Mean
    MeanLeftShank=mean(EuclleftShank{1,i});
    MeanLeftThigh=mean(EuclleftThigh{1,i});
    MeanPelvis=mean(Euclpelvis{1,i});
    MeanRightShank=mean(EuclrightShank{1,i});
    MeanRightThigh=mean(EuclrightThigh{1,i});
    %Median
    MedianLeftShank=median(EuclleftShank{1,i});
    MedianLeftThigh=median(EuclleftThigh{1,i});
    MedianPelvis=median(Euclpelvis{1,i});
    MedianRightShank=median(EuclrightShank{1,i});
    MedianRightThigh=median(EuclrightThigh{1,i});
    %Std
    StdLeftShank=std(EuclleftShank{1,i});
    StdLeftThigh=std(EuclleftThigh{1,i});
    StdPelvis=std(Euclpelvis{1,i});
    StdRightShank=std(EuclrightShank{1,i});
    StdRightThigh=std(EuclrightThigh{1,i});
    %Skewness
    SkewnessLeftShank=skewness(EuclleftShank{1,i});
    SkewnessLeftThigh=skewness(EuclleftThigh{1,i});
    SkewnessPelvis=skewness(Euclpelvis{1,i});
    SkewnessRightShank=skewness(EuclrightShank{1,i});
    SkewnessRightThigh=skewness(EuclrightThigh{1,i});
    %Kurtosis
    KurtosisLeftShank=kurtosis(EuclleftShank{1,i});
    KurtosisLeftThigh=kurtosis(EuclleftThigh{1,i});
    KurtosisPelvis=kurtosis(Euclpelvis{1,i});
    KurtosisRightShank=kurtosis(EuclrightShank{1,i});
    KurtosisRightThigh=kurtosis(EuclrightThigh{1,i});
    %Min
    MinLeftShank=min(EuclleftShank{1,i});
    MinLeftThigh=min(EuclleftThigh{1,i});
    MinPelvis=min(Euclpelvis{1,i});
    MinRightShank=min(EuclrightShank{1,i});
    MinRightThigh=min(EuclrightThigh{1,i});
    %Max
    MaxLeftShank=max(EuclleftShank{1,i});
    MaxLeftThigh=max(EuclleftThigh{1,i});
    MaxPelvis=max(Euclpelvis{1,i});
    MaxRightShank=max(EuclrightShank{1,i});
    MaxRightThigh=max(EuclrightThigh{1,i});


    Mean(i,:)=[MeanLeftShank MeanLeftThigh MeanPelvis MeanRightShank
MeanRightThigh];
    Median(i,:)=[MedianLeftShank MedianLeftThigh MedianPelvis
MedianRightShank MedianRightThigh];
    Std(i,:)=[StdLeftShank StdLeftThigh StdPelvis StdRightShank
StdRightThigh];
```

```
    Skewness(i,:)=[SkewnessLeftShank SkewnessLeftThigh SkewnessPelvis
SkewnessRightShank SkewnessRightThigh];
    Kurtosis(i,:)=[KurtosisLeftShank KurtosisLeftThigh KurtosisPelvis
KurtosisRightShank KurtosisRightThigh];
    Min(i,:)=[MinLeftShank MinLeftThigh MinPelvis MinRightShank
MinRightThigh];
    Max(i,:)=[MaxLeftShank MaxLeftThigh MaxPelvis MaxRightShank
MaxRightThigh];

    MatrixOfFeaturesRuns(i,:)=[Mean(i,:) Median(i,:) Std(i,:)
Skewness(i,:) Kurtosis(i,:) Min(i,:) Max(i,:)];

end

G=[6];
[x,~]=size(MatrixOfFeaturesRuns);
for i=1:x-1
G=[G 6];
end

G=G';
MatrixOfFeaturesRuns=[MatrixOfFeaturesRuns G];

MatrixOfFeaturesRuns=array2table(MatrixOfFeaturesRuns,
'VariableNames',{'Mean1','Mean2','Mean3','Mean4','Mean5','Median1','M
edian2','Median3','Median4','Median5','Std1','Std2','Std3','Std4','St
d5','Skewness1','Skewness2','Skewness3','Skewness4','Skewness5','Kurt
osis1','Kurtosis2','Kurtosis3','Kurtosis4','Kurtosis5','Min1','Min2',
'Min3','Min4','Min5','Max1','Max2','Max3','Max4','Max5','Activity'});


DATAfinal=[MatrixOfFeaturesPasses; MatrixOfFeaturesShots;
MatrixOfFeaturesTurn90; MatrixOfFeaturesTurn180;
MatrixOfFeaturesJumps; MatrixOfFeaturesLongPasses;
MatrixOfFeaturesRuns];
toc;

%%  Sum of Confusion Matrices and Average Test and Train Errors

NumIterations=100;
SumOfConfMatrices=zeros(7,7);
tic;
for k=1:NumIterations

pt{k}=cvpartition(DATAfinal.Activity,"Holdout",0.3);
G=pt{k};
hdTrain{k}=DATAfinal(training(G),:);
hdTest{k}=DATAfinal(test(G),:);

% Selection of Classifier

mdl{k}=fitcnb(hdTrain{k},"Activity");
% mdl{k}=fitcknn(hdTrain{k},"Activity");
% mdl{k}=fitcecoc(hdTrain{k},"Activity");
% mdl{k}=fitcdiscr(hdTrain{k},"Activity");
% mdl{k}=fitctree(hdTrain{k},"Activity");
end
toc;
```

```
tic;
for k=1:NumIterations
S=hdTest{k};
T=mdl{k};

predGroups{k}=predict(T,S);
hdTestActivity=S.Activity;

predGroups{k}=string(predGroups{k});
hdTestActivity=string(hdTestActivity);

errTrain{k}=resubLoss(T);
errTest{k}=loss(T,S);
ClassesNames = {'Passes','Shots','Turns180','Turns90','Jumps','Long
Passes','Runs'};

ClassesNames = categorical(ClassesNames);
cm{k}=confusionchart(hdTestActivity,predGroups{k});
b=cm{k};
b=b.NormalizedValues;

A{k}=b;
SumOfConfMatrices=SumOfConfMatrices+A{k};

end
toc;

SumOfConfusionMatrices=SumOfConfMatrices;

SumOfConfusionMatrices=confusionchart(SumOfConfusionMatrices);
SumOfConfusionMatrices=SumOfConfusionMatrices.NormalizedValues;

SumOfConfusionMatrices=confusionchart(SumOfConfusionMatrices,ClassesN
ames);
SumOfConfusionMatrices.Title = 'Confusion Matrix';
SumOfConfusionMatrices.ColumnSummary = 'column-normalized';

% Average Errors

AverageTestError=mean(cell2mat(errTest));
AverageTrainError=mean(cell2mat(errTrain));
```