

4.

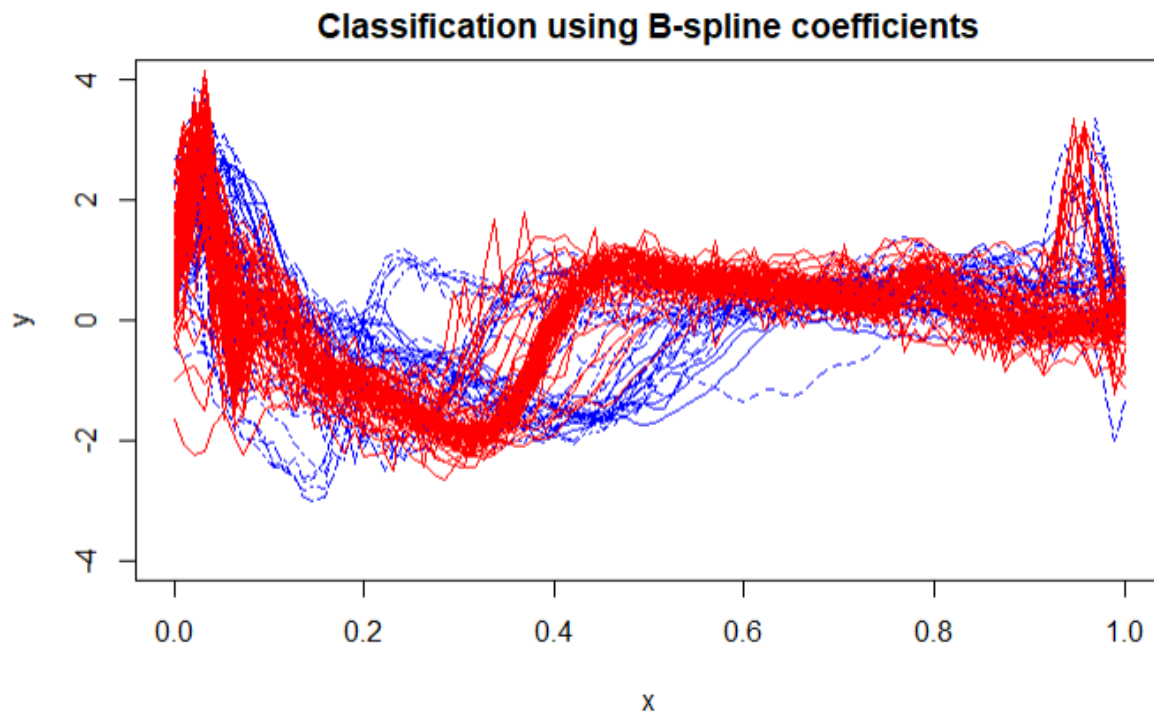


Figure 1: ECG Hearbeat Classification using B-spline

	Reference	
Prediction	0	1
0	30	6
1	6	58

Accuracy : 0.88
 95% CI : (0.7998, 0.9364)
 No Information Rate : 0.64
 P-Value [Acc > NIR] : 5.703e-08

 Kappa : 0.7396

 McNemar's Test P-Value : 1

 Sensitivity : 0.8333
 Specificity : 0.9062
 Pos Pred value : 0.8333
 Neg Pred value : 0.9063
 Prevalence : 0.3600
 Detection Rate : 0.3000
 Detection Prevalence : 0.3600
 Balanced Accuracy : 0.8698

 'Positive' Class : 0

Figure 2: Model Results RF for B-spline

We can see with an accuracy of 88% that our model using a b-spline basis matrix is performing well to identify abnormalities in the ECG dataset.

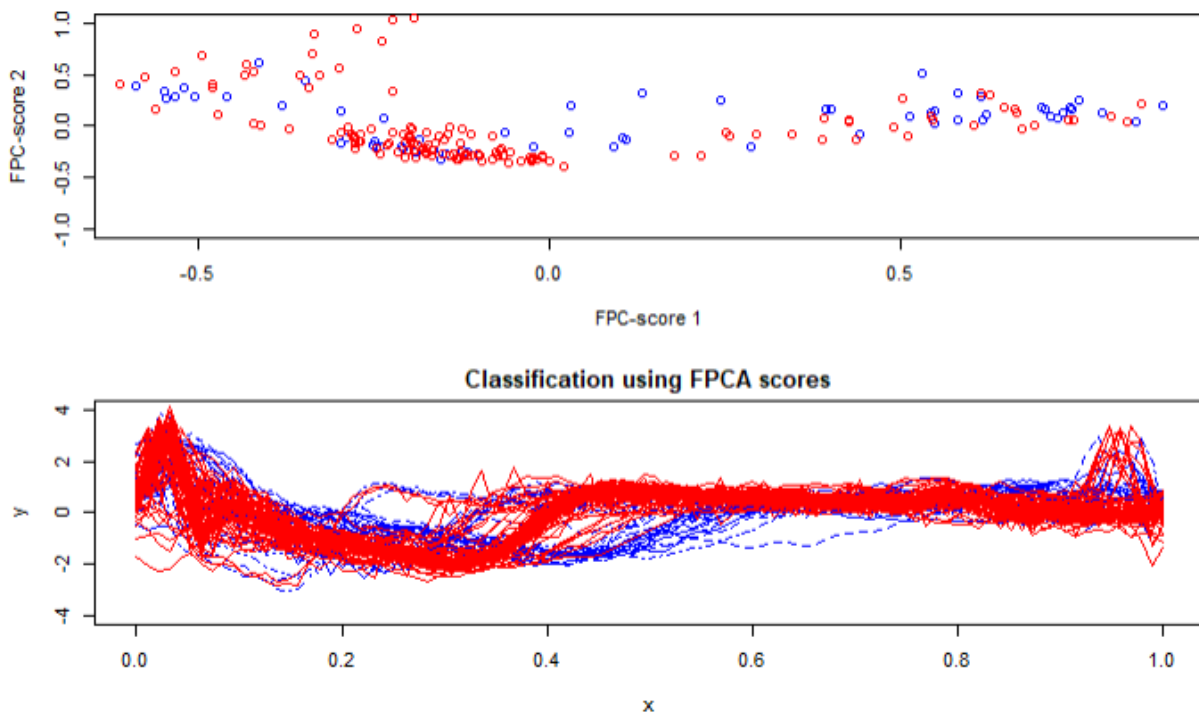


Figure 3: Results of 2 FPCA and Classification using FPCA

Confusion Matrix and Statistics

```

              Reference
Prediction  0   1
0      26   7
1      10  57

Accuracy : 0.83
95% CI : (0.7418, 0.8977)
No Information Rate : 0.64
P-Value [Acc > NIR] : 2.389e-05

Kappa : 0.6242

McNemar's Test P-Value : 0.6276

Sensitivity : 0.7222
Specificity : 0.8906
Pos Pred Value : 0.7879
Neg Pred Value : 0.8507
Prevalence : 0.3600
Detection Rate : 0.2600
Detection Prevalence : 0.3300
Balanced Accuracy : 0.8064

'Positive' Class : 0
```

Figure 4: Model Results RF for FPCA

We can see good results for the FPCA model with an accuracy of 82% when compared to the b-splines. This should be expected because smoothing basis matrix is derived from fewer number of features when compared to the b-spline basis matrix.