ISYE 8803 HDDA

Homework 1
May 31st, 2021

4.

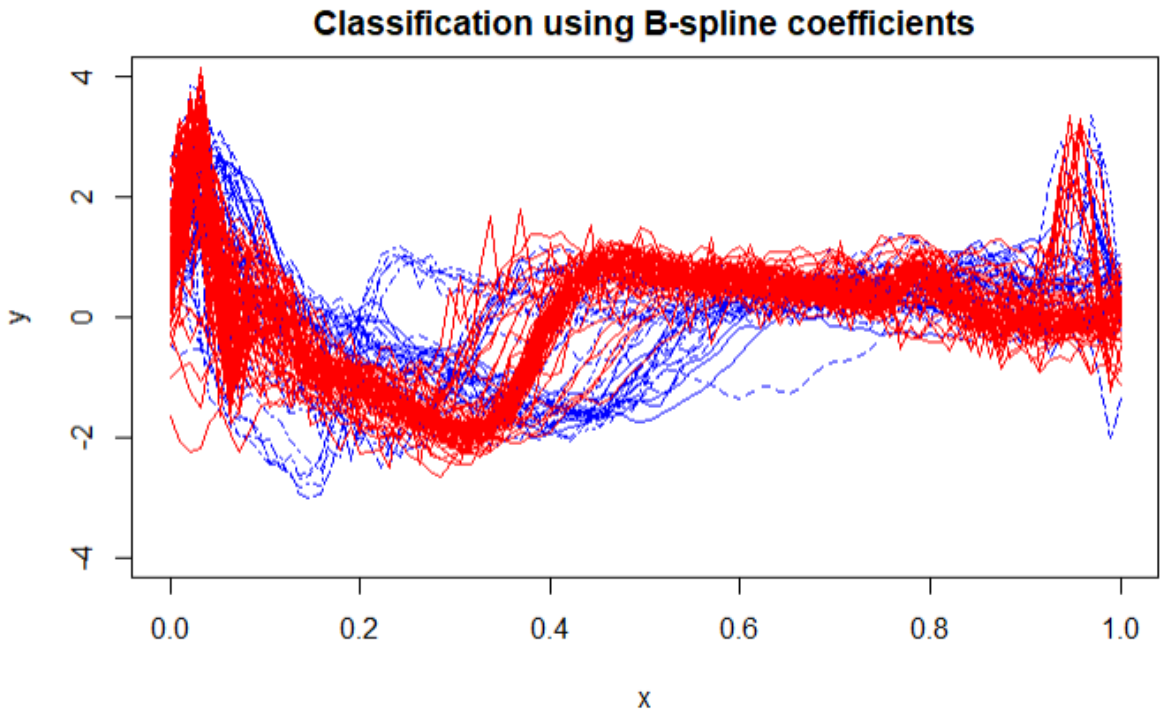

Figure 1: ECG Hearbeat Classification using B-spline

```
          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.

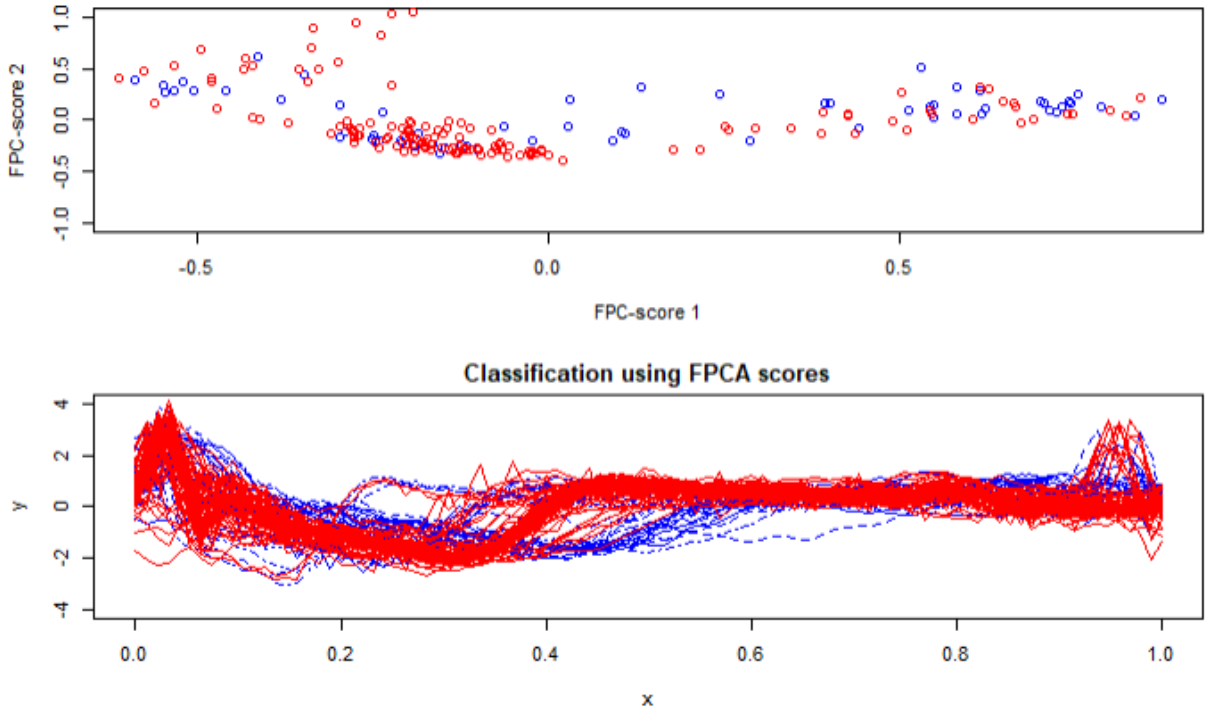

Figure 3: Results of 2 FPCA and Classification using FPCA

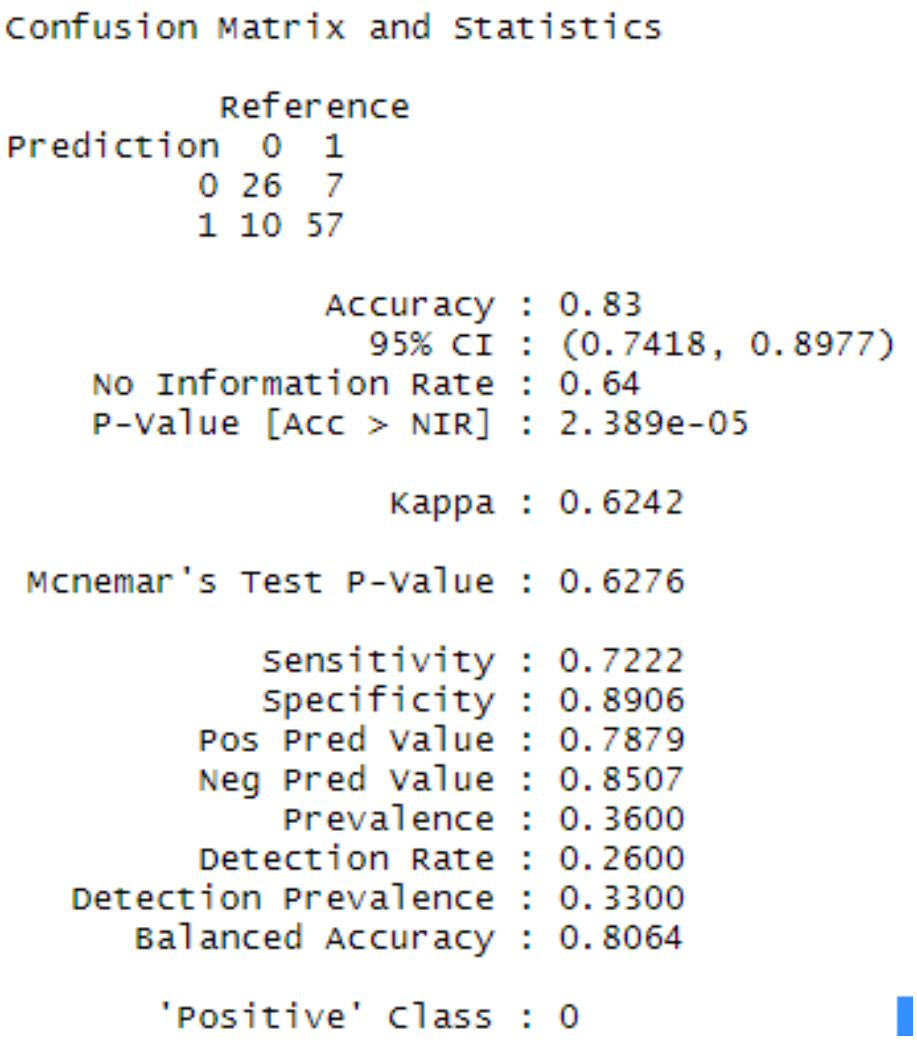

Figure 4: Model Results RF for FPCA

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.