Random Forest for predicting the Success Rate Levels Successful-Unsuccessful

All Data

```
##
##   Successful Unsuccessful
##          113           241
```

Train Data

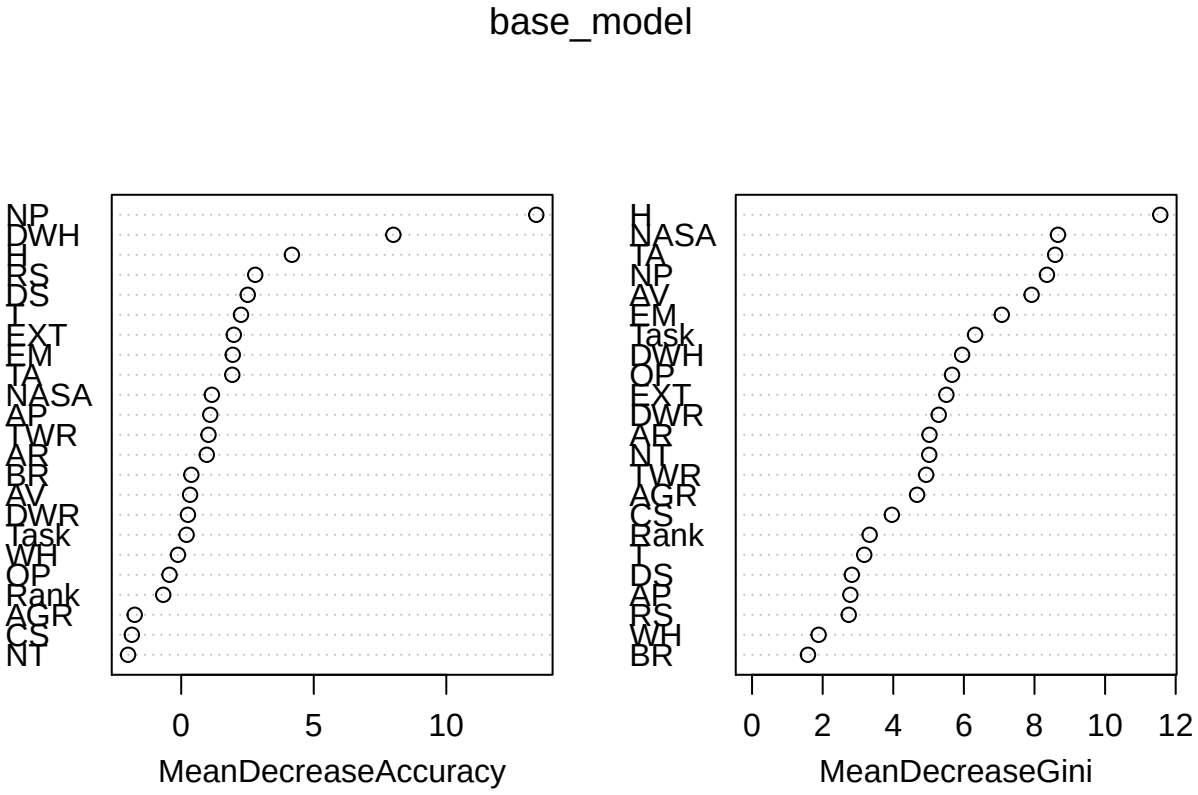
```
##
##   Successful Unsuccessful
##           91           192
```

Test Data

```
##
##   Successful Unsuccessful
##           22            49
```

Randomforest base model

```
##
## Call:
##  randomForest(formula = SR ~ ., data = train, proximity = TRUE,      importance = TRUE)
##                Type of random forest: classification
##                      Number of trees: 500
## No. of variables tried at each split: 4
##
##         OOB estimate of  error rate: 28.27%
## Confusion matrix:
##              Successful Unsuccessful class.error
## Successful           25           66  0.72527473
## Unsuccessful         14          178  0.07291667
```



Prediction on test data

```
## Confusion Matrix and Statistics
##
##               Reference
## Prediction     Successful Unsuccessful
##   Successful            7            2
##   Unsuccessful         15           47
##
##                Accuracy : 0.7606
##                  95% CI : (0.6446, 0.8539)
##     No Information Rate : 0.6901
##     P-Value [Acc > NIR] : 0.122722
##
##                   Kappa : 0.3313
##
##  Mcnemar's Test P-Value : 0.003609
##
##             Sensitivity : 0.31818
##             Specificity : 0.95918
##          Pos Pred Value : 0.77778
##          Neg Pred Value : 0.75806
##              Prevalence : 0.30986
##          Detection Rate : 0.09859
##    Detection Prevalence : 0.12676
##       Balanced Accuracy : 0.63868
##
##        'Positive' Class : Successful
##
```

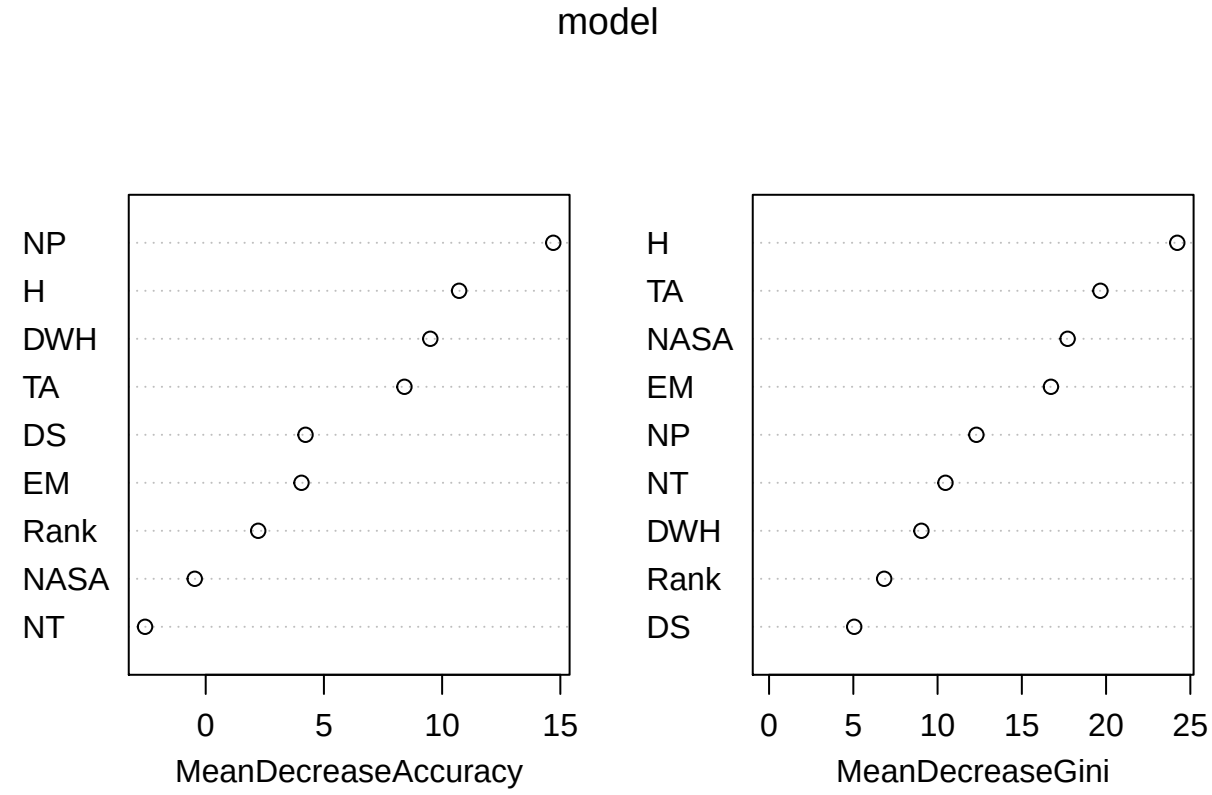
Sensitivity-Specificity-Precision-Recall-F1

```
##          Sensitivity          Specificity       Pos Pred Value
##            0.31818182           0.95918367           0.77777778
##       Neg Pred Value            Precision               Recall
##            0.75806452           0.77777778           0.31818182
##                   F1           Prevalence       Detection Rate
##            0.45161290           0.30985915           0.09859155
## Detection Prevalence    Balanced Accuracy
##            0.12676056           0.63868275
```

```
## Multi-class area under the curve: 0.7113
```

Randomforest extended model

```
##
## Call:
##  randomForest(formula = SR ~ NASA + H + NP + NT + TA + EM + DWH +      DS + Rank, data = train, proxi
##                Type of random forest: classification
##                      Number of trees: 500
## No. of variables tried at each split: 3
##
##         OOB estimate of  error rate: 26.5%
## Confusion matrix:
##              Successful Unsuccessful class.error
## Successful           38           53   0.5824176
## Unsuccessful         22          170   0.1145833
```



Prediction on test data

```
## Confusion Matrix and Statistics
##
##               Reference
## Prediction     Successful Unsuccessful
##   Successful            9            4
##   Unsuccessful         13           45
##
##                Accuracy : 0.7606
##                  95% CI : (0.6446, 0.8539)
##     No Information Rate : 0.6901
##     P-Value [Acc > NIR] : 0.12272
##
##                   Kappa : 0.3691
##
##  Mcnemar's Test P-Value : 0.05235
##
##             Sensitivity : 0.4091
##             Specificity : 0.9184
##          Pos Pred Value : 0.6923
##          Neg Pred Value : 0.7759
##              Prevalence : 0.3099
##          Detection Rate : 0.1268
##    Detection Prevalence : 0.1831
##       Balanced Accuracy : 0.6637
##
##        'Positive' Class : Successful
##
```

Sensitivity-Specificity-Precision-Recall-F1

```
##          Sensitivity          Specificity       Pos Pred Value
##            0.4090909            0.9183673            0.6923077
##       Neg Pred Value            Precision               Recall
##            0.7758621            0.6923077            0.4090909
##                   F1           Prevalence       Detection Rate
##            0.5142857            0.3098592            0.1267606
## Detection Prevalence    Balanced Accuracy
##            0.1830986            0.6637291
```

```
## Multi-class area under the curve: 0.701
```