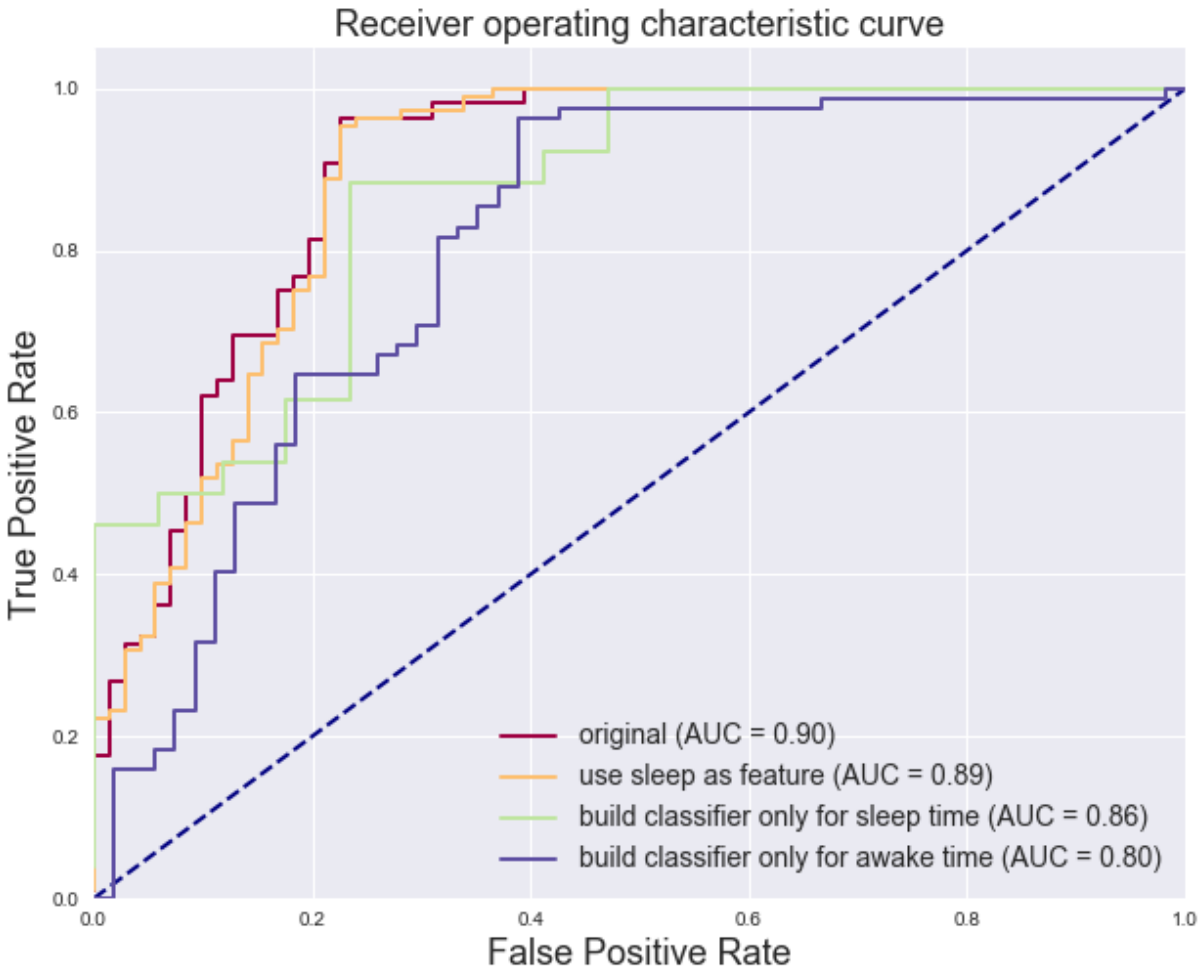
ROC curve for four methods to incorporate(or not) sleep as an element to provide information to the classifier. The ROC are from gradient boosting, gradient boosting, random forest and random forest respectively.



```
scores for original
```

| | Classifier | AUC |
|---|---|---|
| 0 | gradient boosting | 0.896453 |
| 1 | random forest | 0.887454 |
| 2 | Logistic Regression | 0.861763 |
| 3 | SVM | 0.850939 |
| 4 | decision tree | 0.841680 |

| | Classifier | Accuracy |
|---|---|---|
| 0 | gradient boosting | 0.871508 |
| 1 | random forest | 0.849162 |
| 2 | SVM | 0.793296 |
| 3 | Logistic Regression | 0.770950 |
| 4 | decision tree | 0.720670 |

```
scores for use sleep as feature
```

| | Classifier | AUC |
|---|---|---|
| 0 | gradient boosting | 0.889019 |
| 1 | random forest | 0.885889 |
| 2 | Logistic Regression | 0.858503 |
| 3 | decision tree | 0.841680 |
| 4 | SVM | 0.840376 |

| | Classifier | Accuracy |
|---|---|---|
| 0 | gradient boosting | 0.871508 |
| 1 | random forest | 0.849162 |
| 2 | Logistic Regression | 0.782123 |
| 3 | SVM | 0.776536 |
| 4 | decision tree | 0.720670 |

scores for build classifier only for sleep time

| | Classifier | AUC |
|---|---|---|
| 0 | random forest | 0.864253 |
| 1 | SVM | 0.830317 |
| 2 | decision tree | 0.811086 |
| 3 | gradient boosting | 0.782805 |
| 4 | Logistic Regression | 0.746606 |

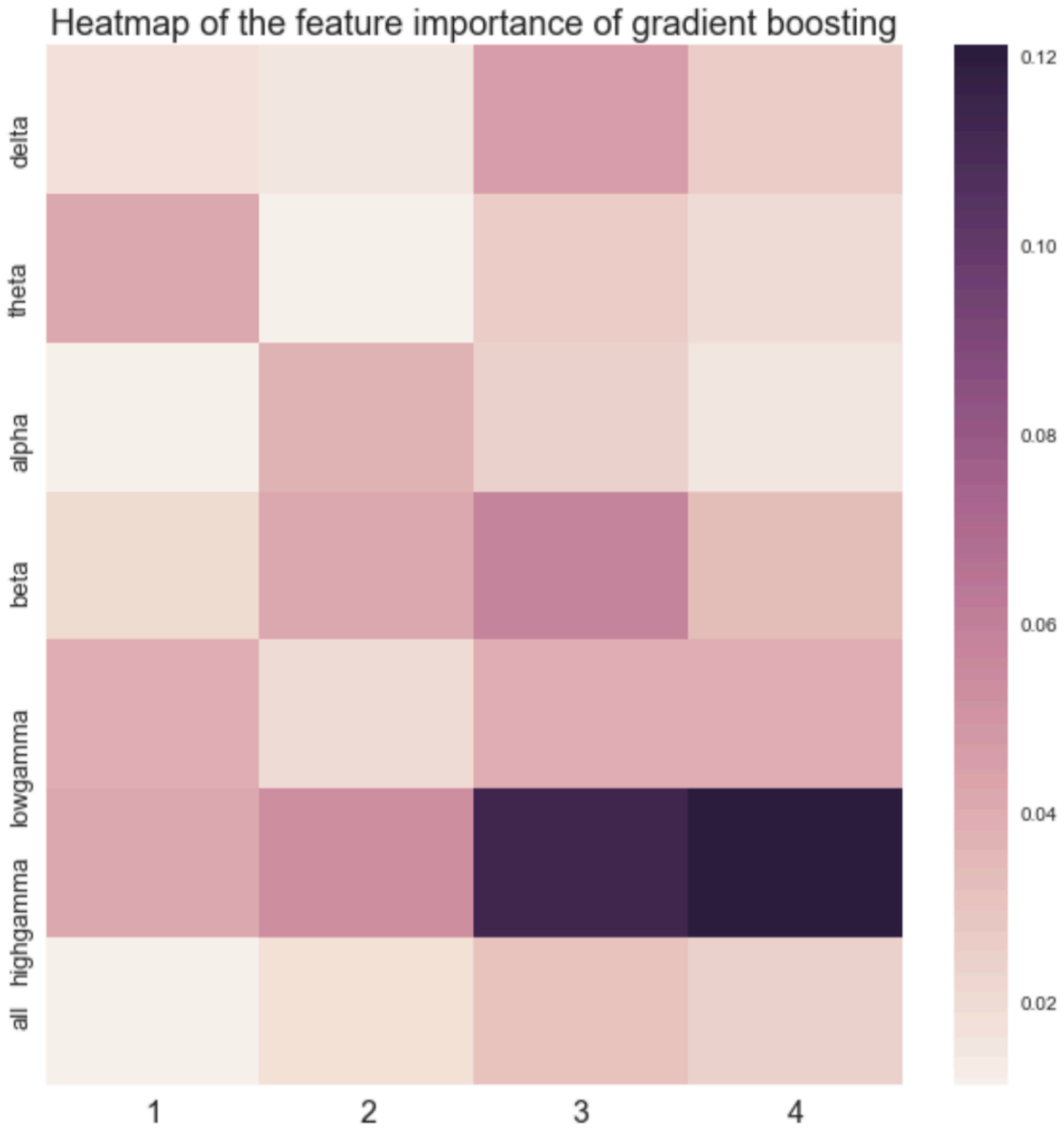
| | Classifier | Accuracy |
|---|---|---|
| 0 | random forest | 0.813953 |
| 1 | decision tree | 0.813953 |
| 2 | SVM | 0.767442 |
| 3 | gradient boosting | 0.744186 |
| 4 | Logistic Regression | 0.720930 |

scores for build classifier only for awake time

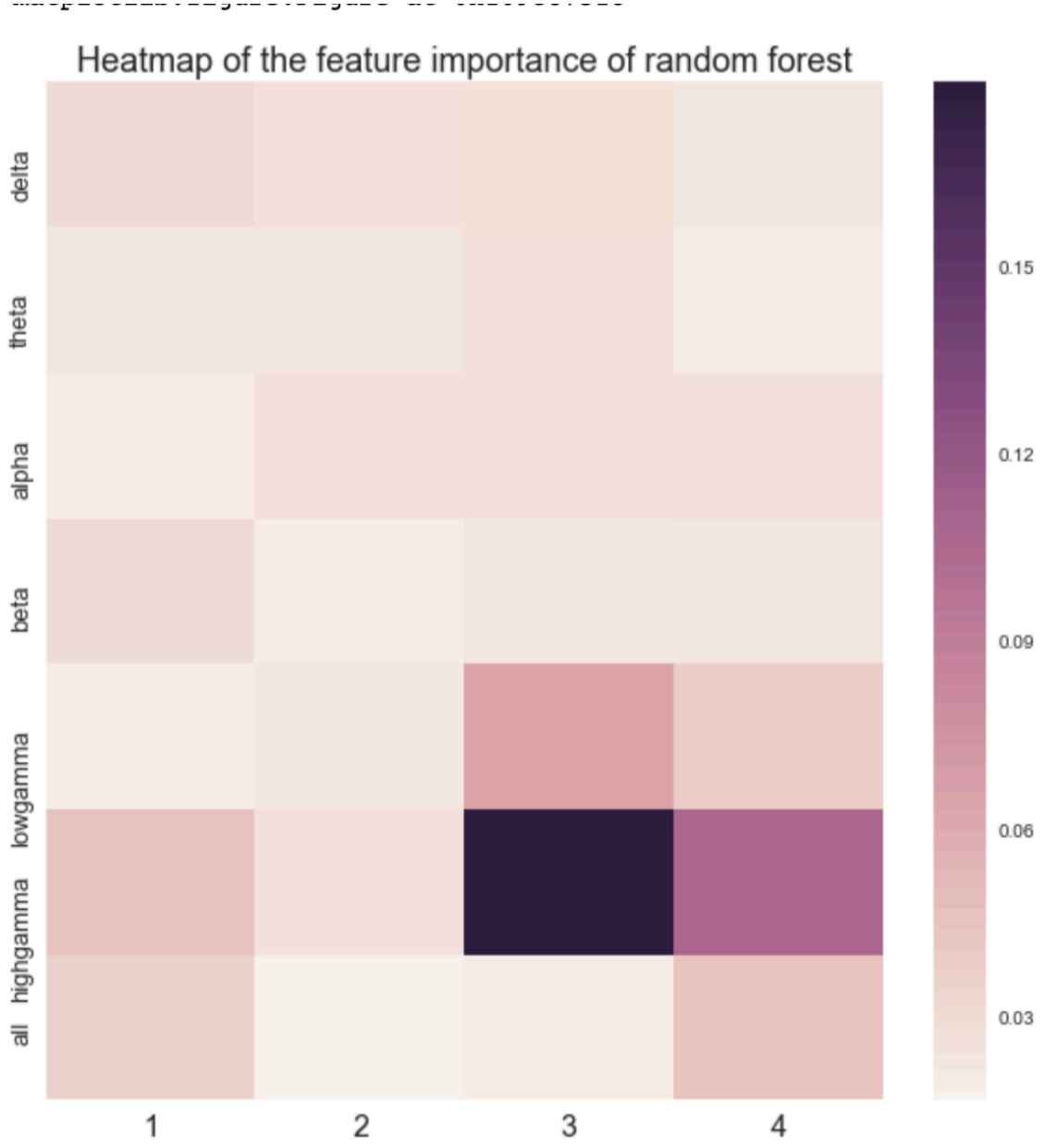
| | Classifier | AUC |
|---|---|---|
| 0 | SVM | 0.804201 |
| 1 | random forest | 0.803975 |
| 2 | gradient boosting | 0.795167 |
| 3 | decision tree | 0.776310 |
| 4 | Logistic Regression | 0.776197 |

| | Classifier | Accuracy |
|---|---|---|
| 0 | random forest | 0.772059 |
| 1 | SVM | 0.772059 |
| 2 | gradient boosting | 0.764706 |
| 3 | Logistic Regression | 0.735294 |
| 4 | decision tree | 0.698529 |

Feature importance for classifier that don’t include sleep



Feature importance for classifier that only for sleep time



Feature importance for classifier that only for awake time