**Project 2 Report**

**Team 10: Bhavesh Poddar, Nanda Kishore Sunki, Vineeth Chennapalli, Chuji Luo**

# **Member Roles**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | TrainMyClassifier | | | MyCrossValidate | TestMyClassifier | | | MyConfusionMatrix |
| RVM | SVM | GPR | RVM | SVM | GPR |
| B. Poddar |  | 1 |  |  |  | 1 |  |  |
| N. K. Sunki |  |  | 1 |  |  |  | 1 |  |
| V. Chennapalli | 1 |  |  |  | 1 |  |  |  |
| C. Luo |  |  |  | 1 |  |  |  | 1 |

# **Observations**

## **Support Vector Machines**

We performed 5-fold cross validation on the whole dataset (25,000 samples) and finally got the following results.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | Unseen |
|  | 0.99 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
|  | 0.00 | 0.97 | 0.00 | 0.02 | 0.00 | 0.00 |
|  | 0.01 | 0.00 | 0.98 | 0.00 | 0.01 | 0.00 |
|  | 0.00 | 0.01 | 0.00 | 0.97 | 0.01 | 0.01 |
|  | 0.00 | 0.00 | 0.00 | 0.00 | 0.99 | 0.00 |
| Unseen | NaN | NaN | NaN | NaN | NaN | NaN |

|  |  |
| --- | --- |
|  | # of support vectors |
| 1st Fold | 1143 |
| 2nd Fold | 1201 |
| 3rd Fold | 1182 |
| 4th Fold | 1183 |
| 5th Fold | 1182 |

Table 1 Overall Confusion Matrix for SVM.   
 Overall Accuracy = 98.18% Table Number of Support Vectors for Each Fold

## **Relevance Vector Machines**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | Unseen |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Unseen |  |  |  |  |  |  |

|  |  |
| --- | --- |
|  | # of relevance vectors |
| 1st Fold |  |
| 2nd Fold |  |
| 3rd Fold |  |
| 4th Fold |  |
| 5th Fold |  |

Table Overall Confusion Matrix for RVM.   
 Overall Accuracy Table 4 Number of Relevance Vectors for Each Fold

## **Gaussian Process Regression**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | Unseen |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Unseen |  |  |  |  |  |  |

Table 5 Overall Confusion Matrix for GPR. Overall Accuracy = ?

# **Conclusion**