**Linear SVM**

Definition: Linear SVM is the fast machine learning algorithm for solving multiclass classification problems from ultra large data sets that implements an original proprietary version of a cutting plane algorithm for designing a linear support vector machine. LinearSVM is a linearly scalable routine meaning that it creates an SVM model in a CPU time which scales linearly with the size of the training data set.

In our project, we use Linear SVM(LSVM) for multi-class classification. We used “LinearSVC()” from sklearn.svm to build multi-class classifiers. The most import part we did in random forest is parameter tuning.

Parameter Try:

**Mex\_inter:**

The maximum number of iterations to be run.

Results:

|  |  |  |
| --- | --- | --- |
| Max\_Inter | Train | Test |
| 5 | 0.874827153 | 0.751194368 |
| 10 | 0.904431175 | 0.758109127 |
| 100 | 0.933312382 | 0.764018104 |
| 1000 | 0.933123821 | 0.764395273 |

ROC max\_inter = 1000



**C : float, optional (default=1.0)**

Penalty parameter C of the error term.

|  |  |  |
| --- | --- | --- |
|  | Train | Test |
| 0.5 | 0.922187304 | 0.773824491 |
| 1 | 0.933123821 | 0.764395273 |
| 2 | 0.940383407 | 0.752325874 |

**Loss: ‘hinge’ or ‘squared\_hinge’**

|  |  |  |
| --- | --- | --- |
| loss | Train | Test |
| hing | 0.908516656 | 0.772567262 |
| squred\_hing | 0.933123821 | 0.764395273 |