Project discussion: Road traffic classification

Prepared
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19.07.2023

ML models used in the project

- Linear regression
- Classification tree
- SVM
- Random Forest

Data preprocessing

- Made 2 datasets:

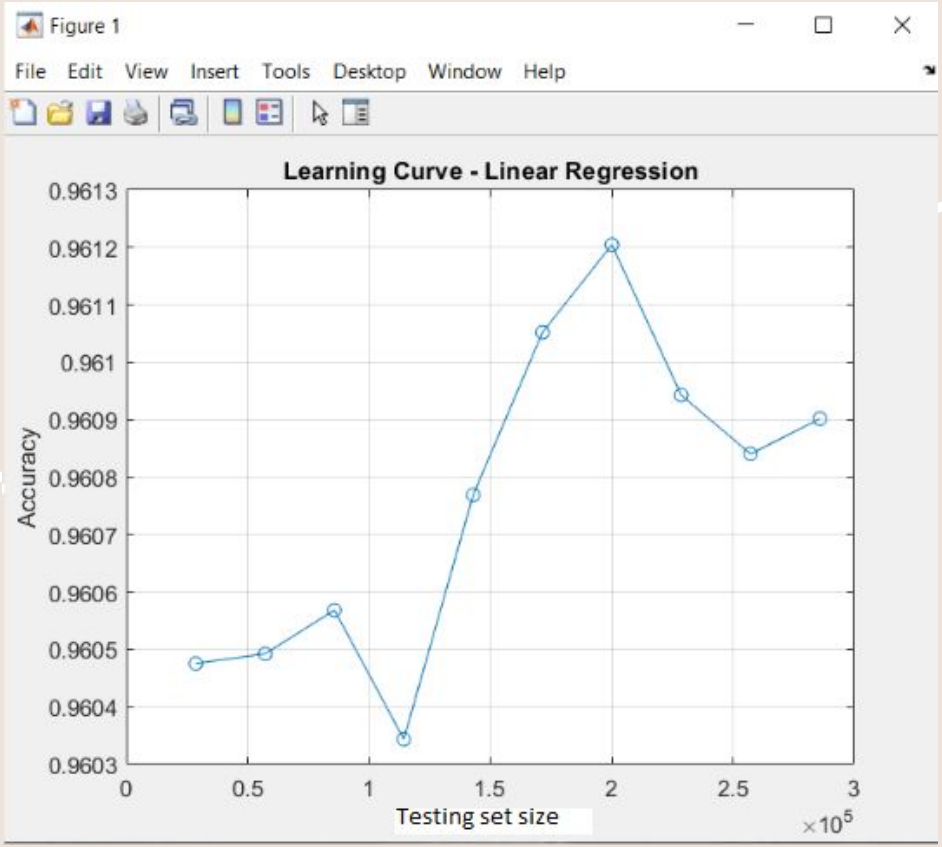
  Veicolo = VeicoloOK - conjugation

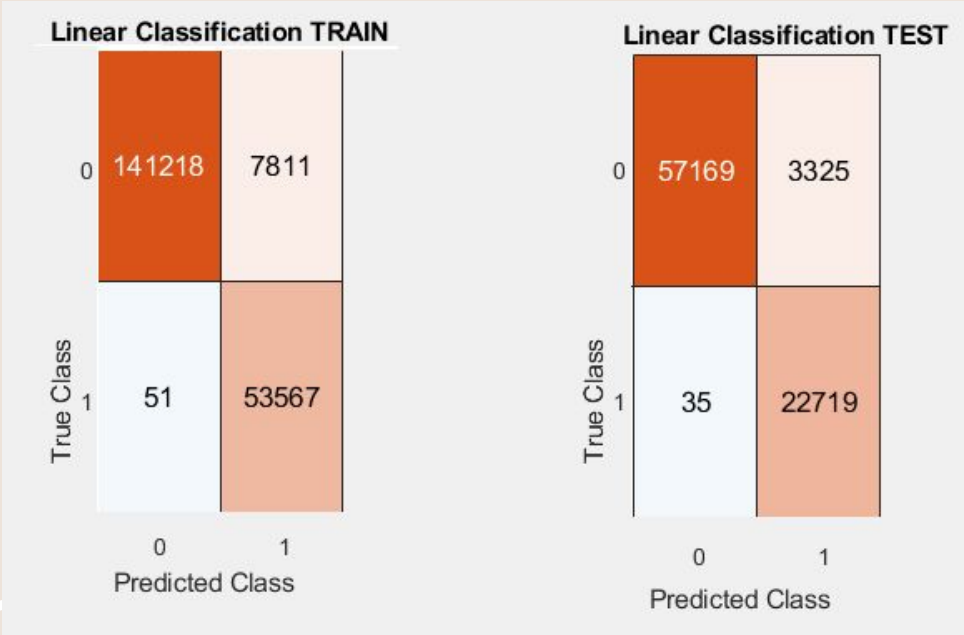
  VeicoloNot = VeicoloOKNoT - normal traffic
- Separate to training and test data (70% and 30%)
- Created lag matrix for datasets with duration 60 seconds and window-length 10
- Concatenated datasets with conjugation and normal traffic
- Created permutation of X_train, X_test, Y_train, Y_test

Linear regression

Missclassification for normal traffic 0.0010

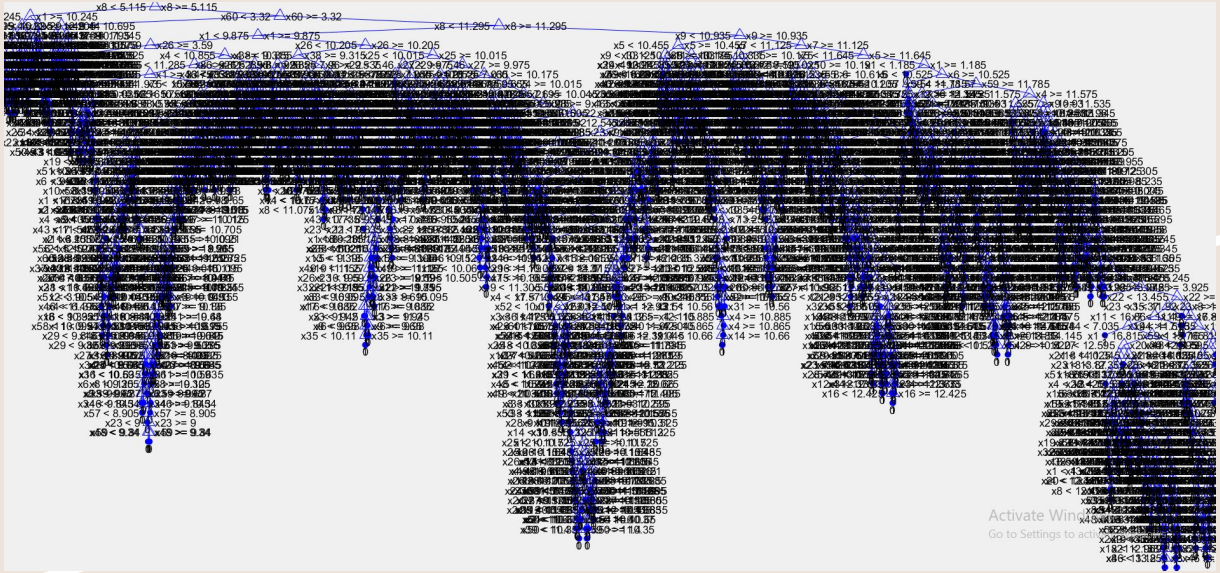
Missclassification for conjugation 0.0530

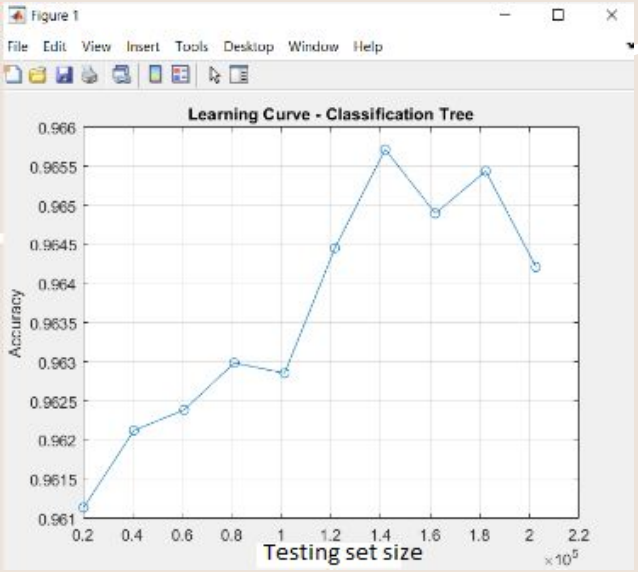


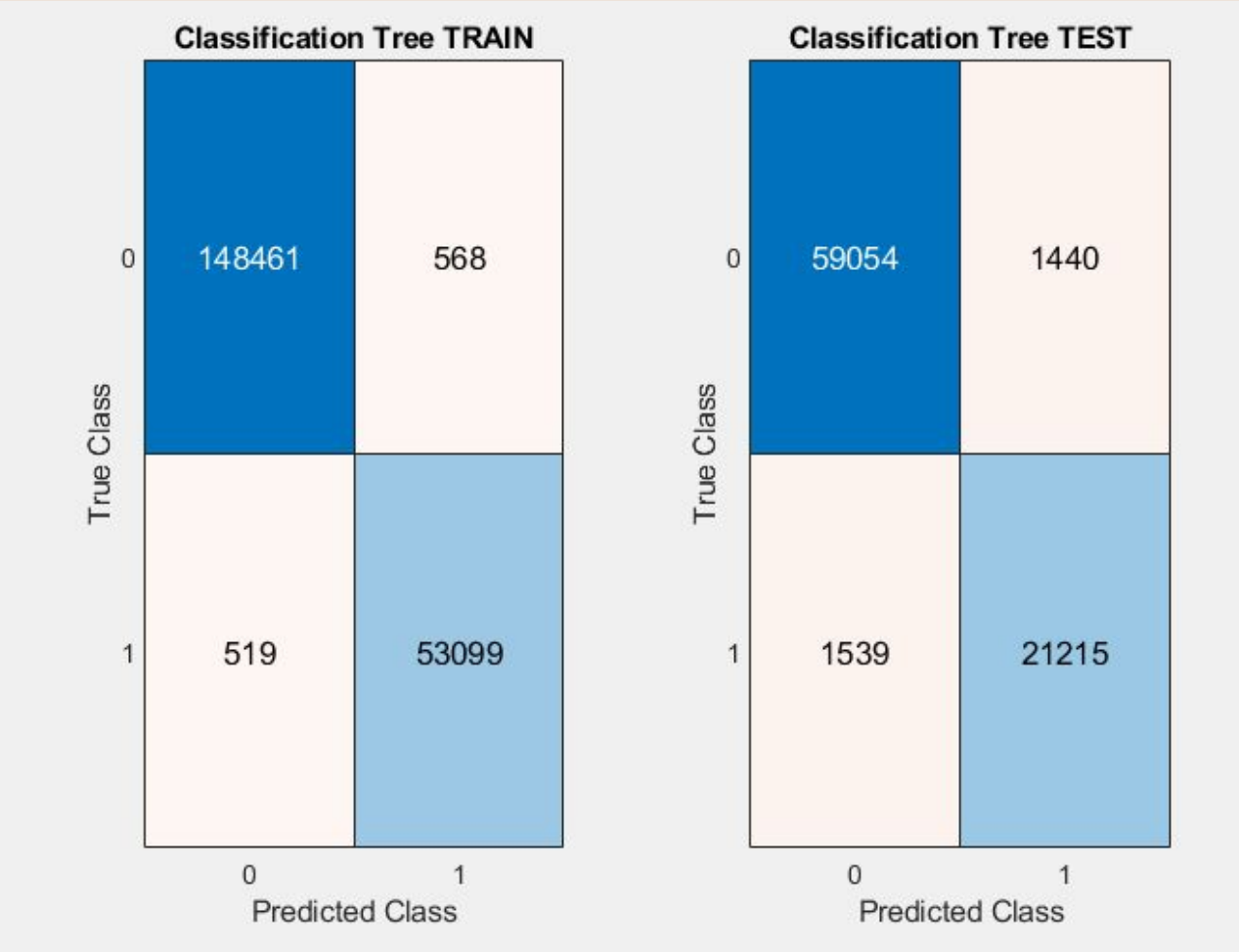

Linear Classification TRAIN
0
1
141218
7811
51
53567
True Class
0
1
Predicted Class
Linear Classification TEST
0
1
57169
3325
35
22719
True Class
0
1
Predicted Class

Classification tree

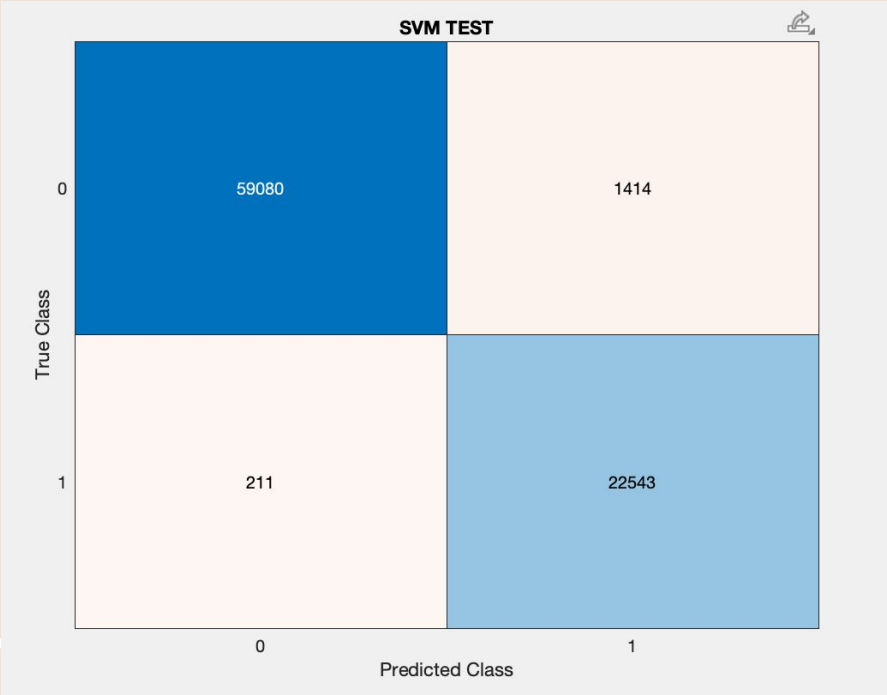
Accuracy 0.9642

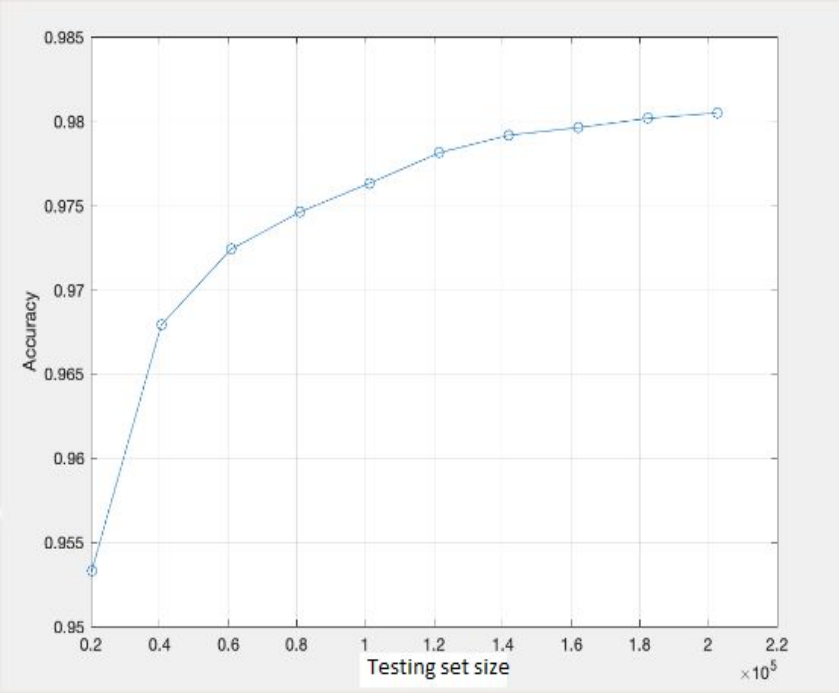





Classification Tree TRAIN
True Class
0
1
148461
568
519
53099
0
1
Predicted Class
Classification Tree TEST
True Class
0
1
59054
1440
1539
21215
0
1
Predicted Class

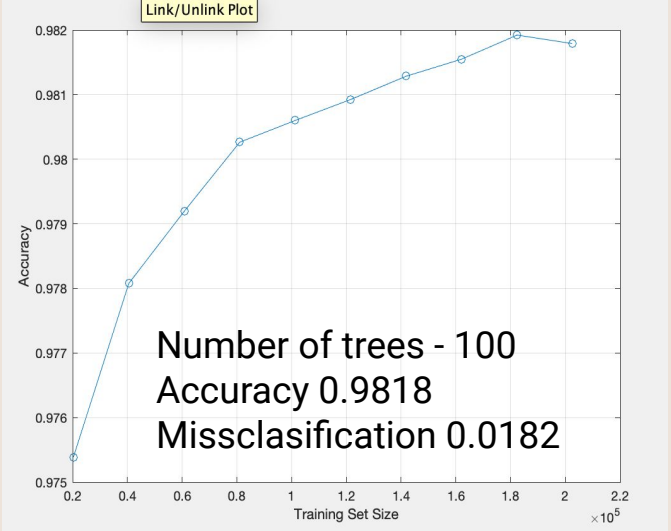
SVM

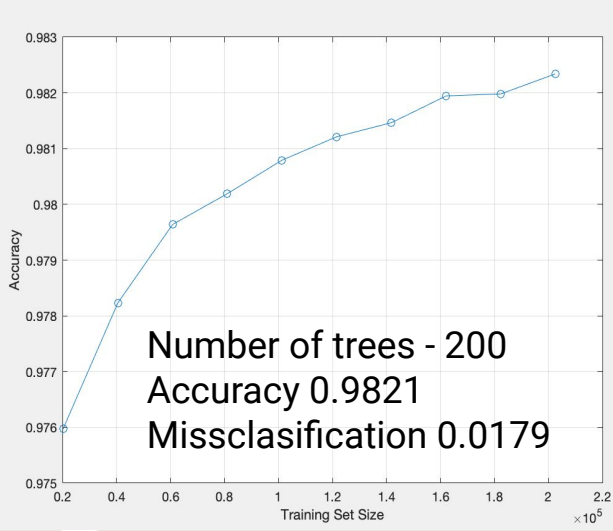


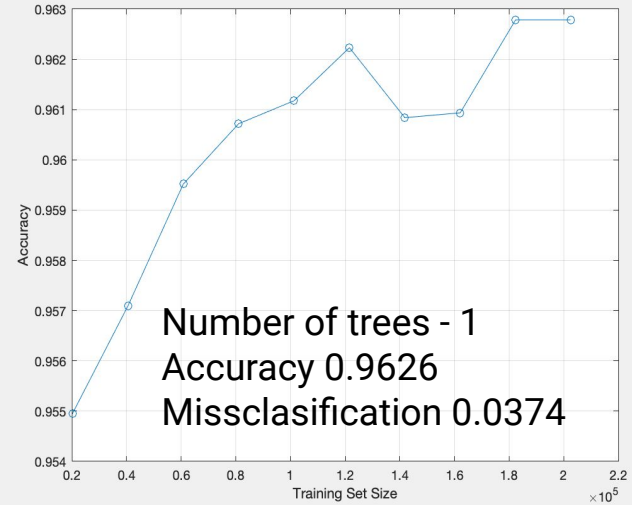


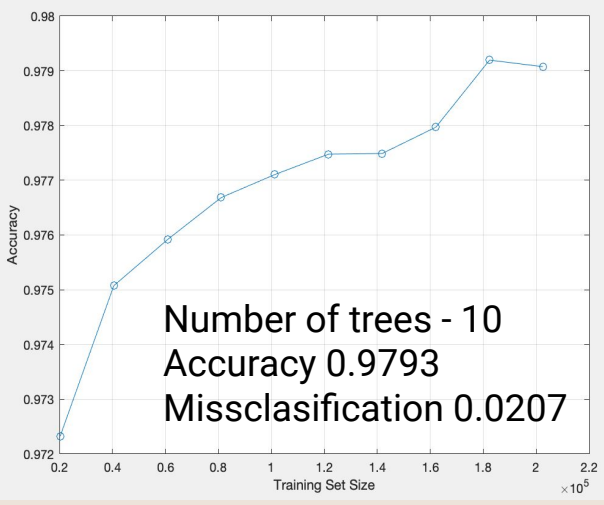
Kernel function- rbf
Accuracy_test 0.9805
Missclassification_test 0.0195
Accuracy_train
Missclassification_train

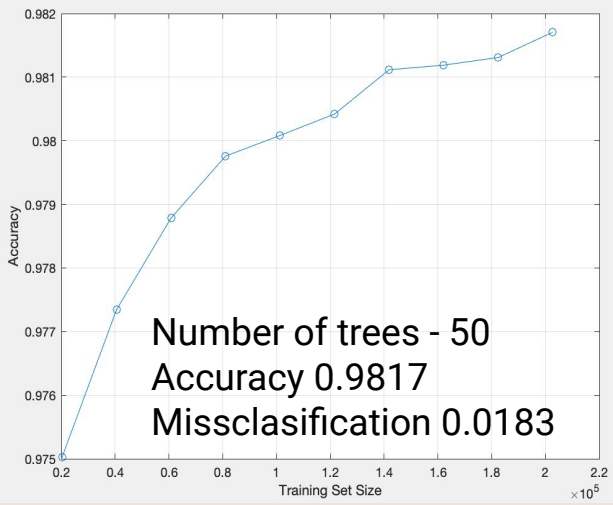
Random Forest



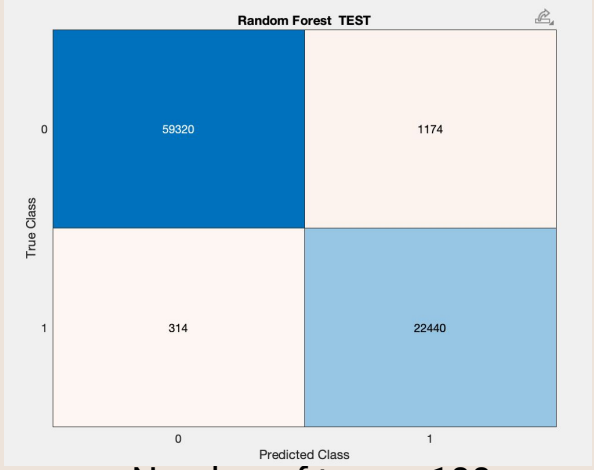




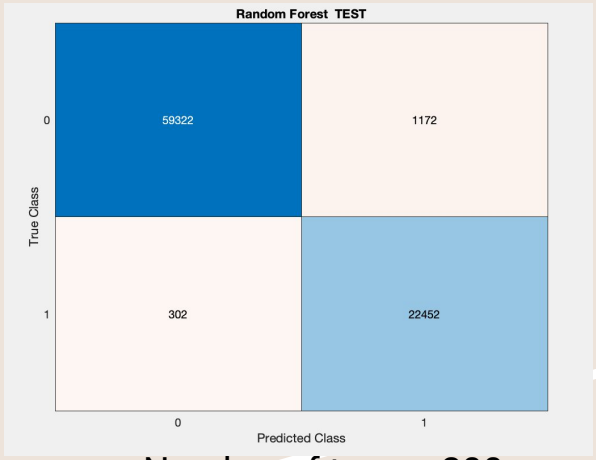




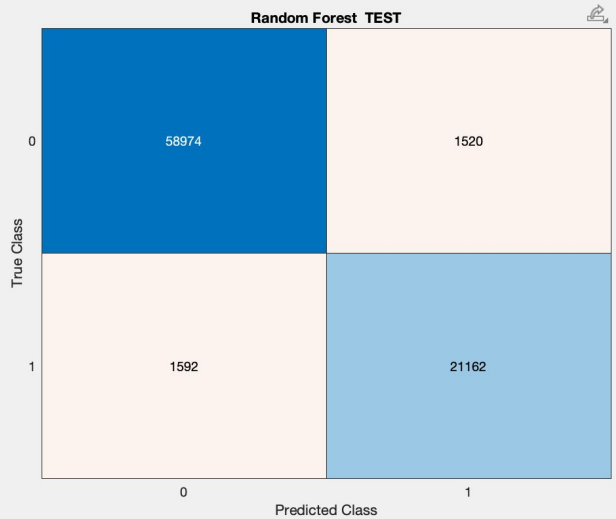
Random Forest



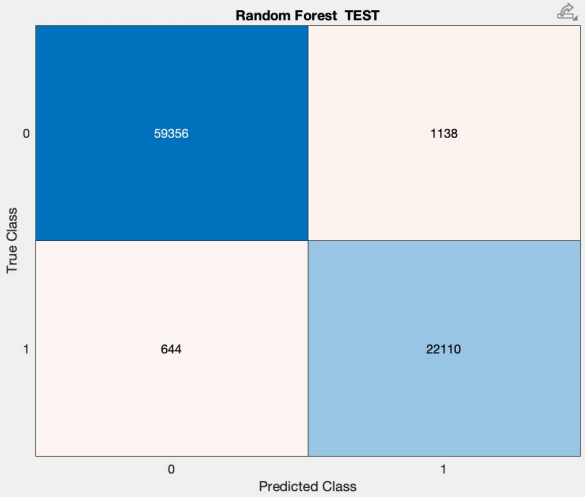
Number of trees - 100



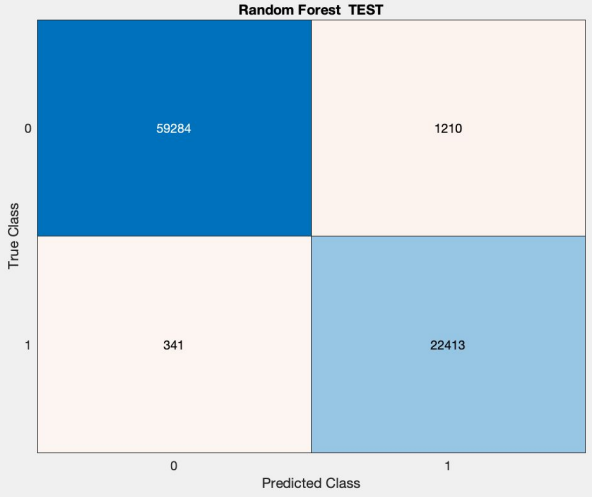
Number of trees - 200



Number of trees - 1



Number of trees - 10



Number of trees - 50

Thank you for attention!