Jordan University of Science and Technology

CPE597-SPECIAL TOPICS IN COMPUTER ENGINEERING

Assignment #3-SVMs

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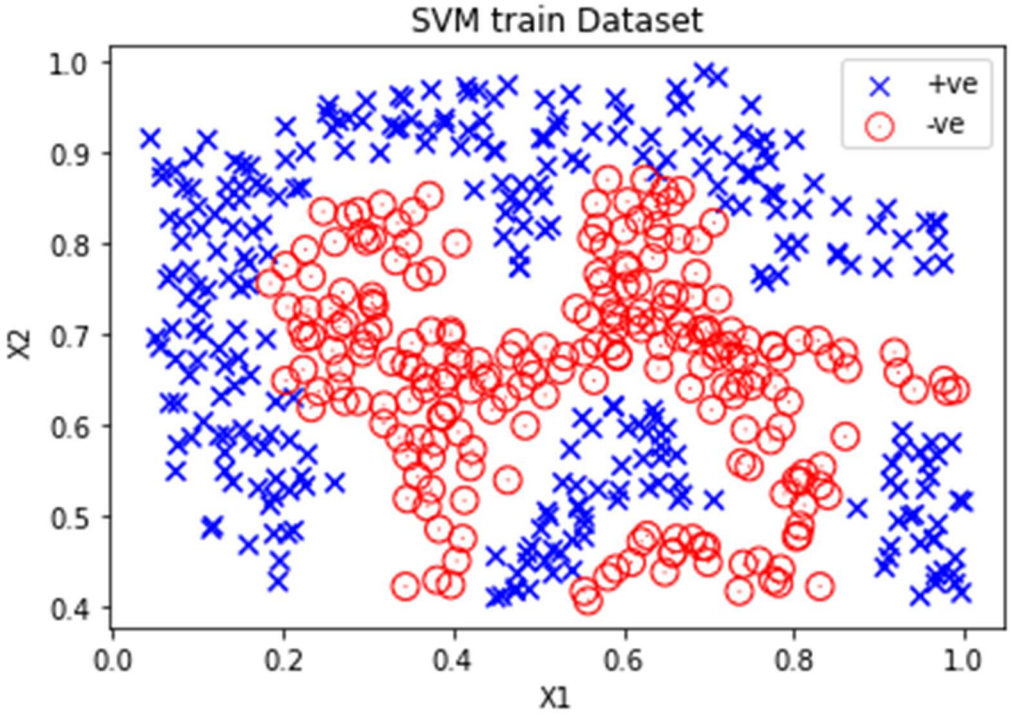
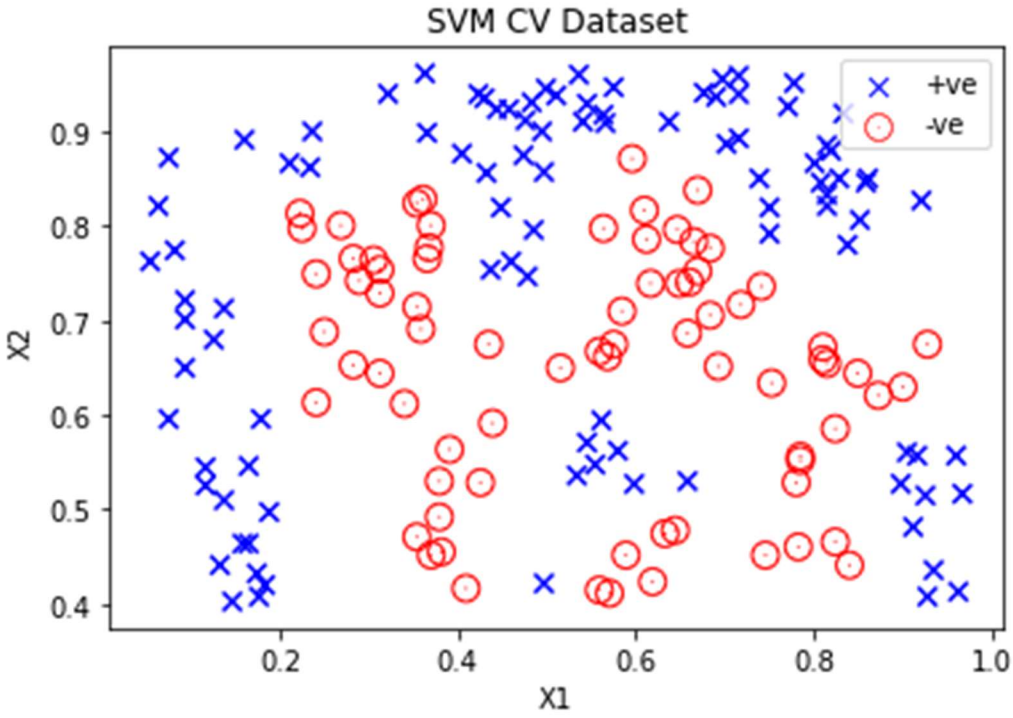
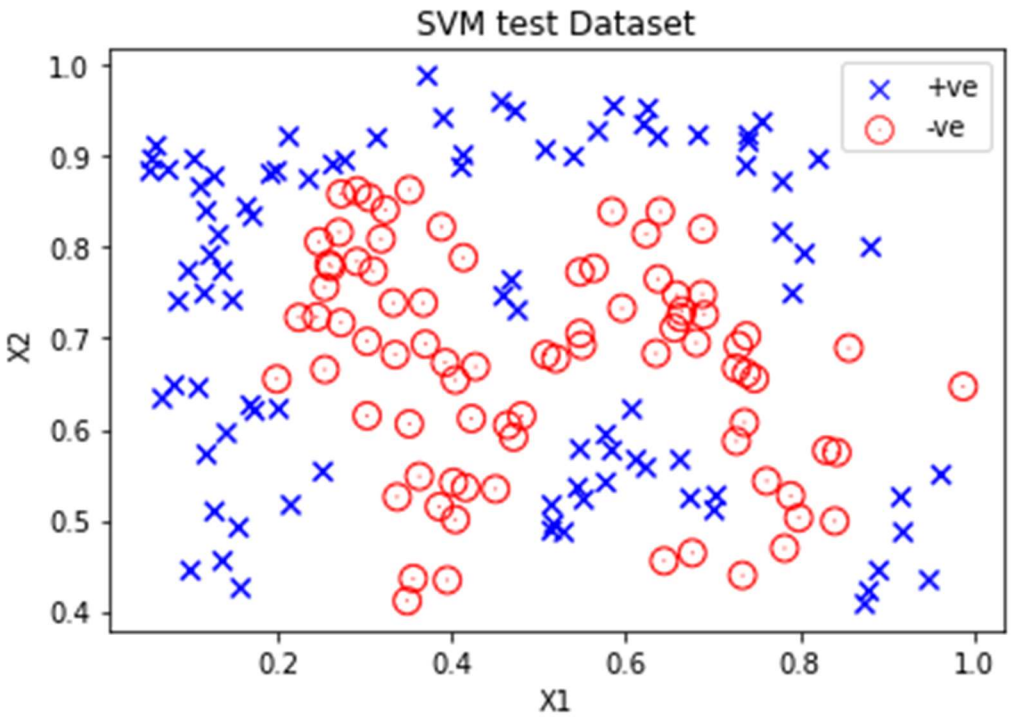
- Divide the data set into 3 categories (train 60%, CV 20% and test 20%) give us a good balanced distributed sample







- The data is NOT linearly separable
-

After testing C from 1 to 50 in linear kernel Best F1 value
is : 0.7232472324723248
when C = 1

and after testing C from 1 to 100 in gaussian kernel and trying gamma both **auto** and **scale** the Best F1 value is : 0.9637305699481866
when C = 70 and gamma = scale

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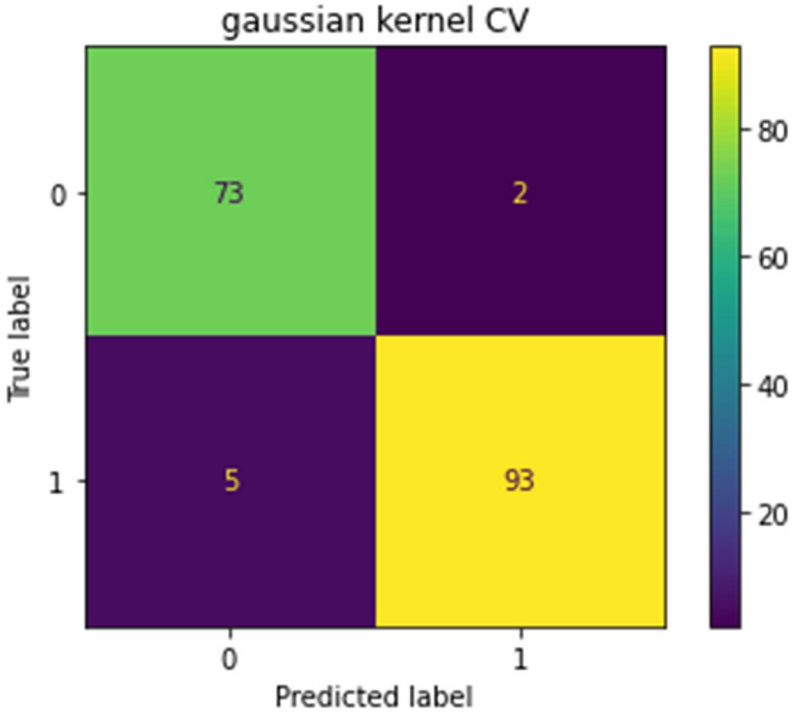
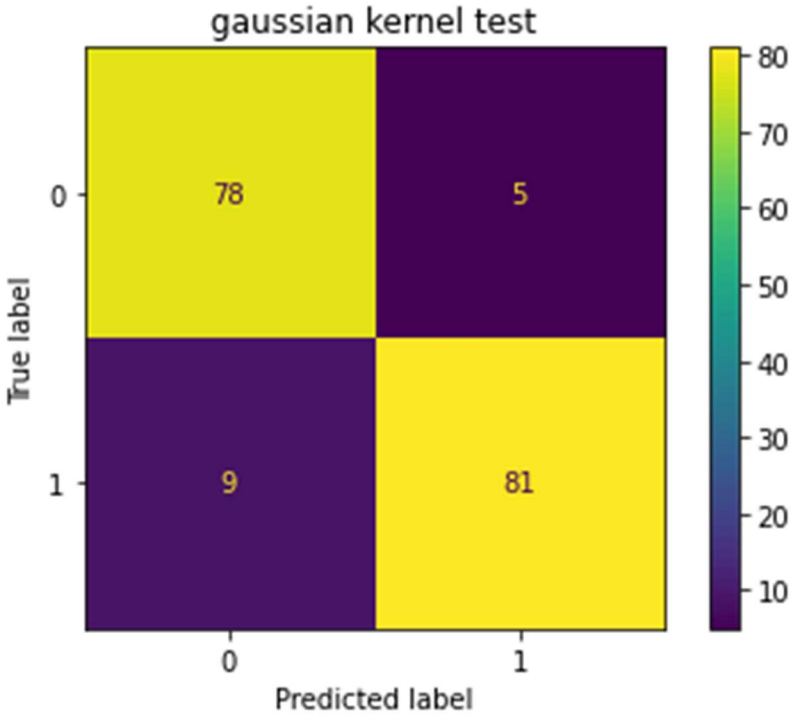
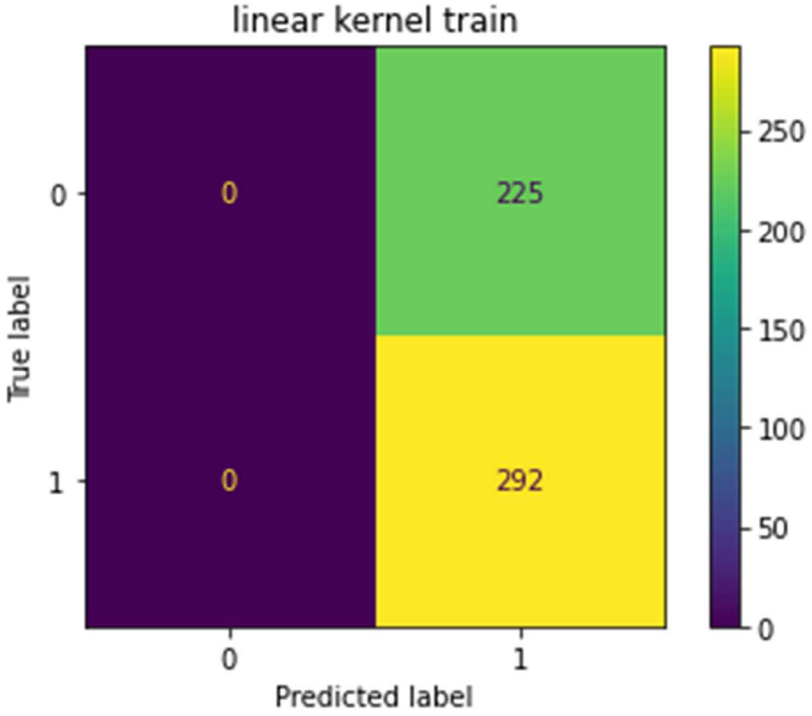
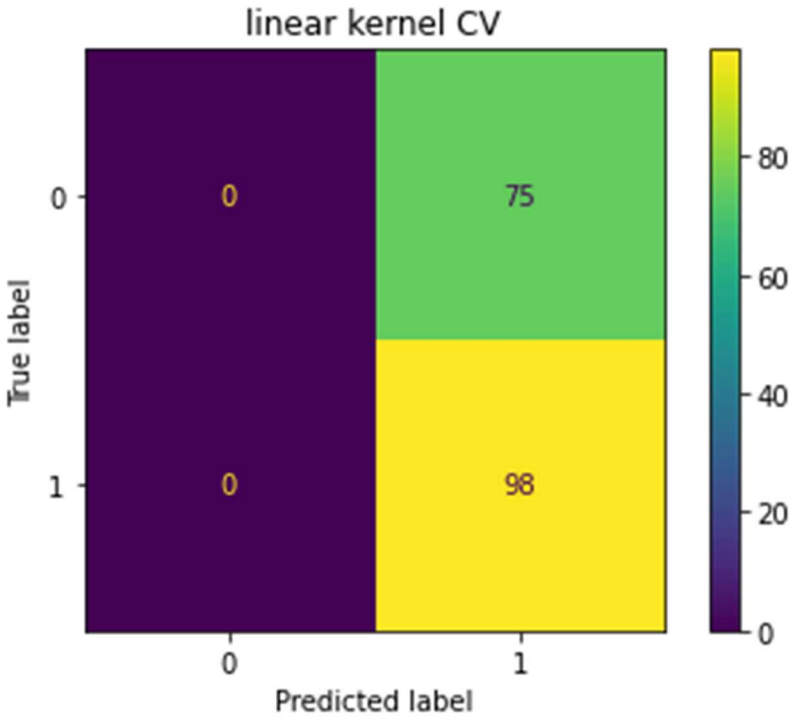
error is high in all linear category(train,CV and test) because the data is not linearly separable and after
In linear kernel when the code try it found that the best train is to give y=1 (positive) for all the dataset, and that's why there is no predicted negative (0) and the decision boundary plot is full blue

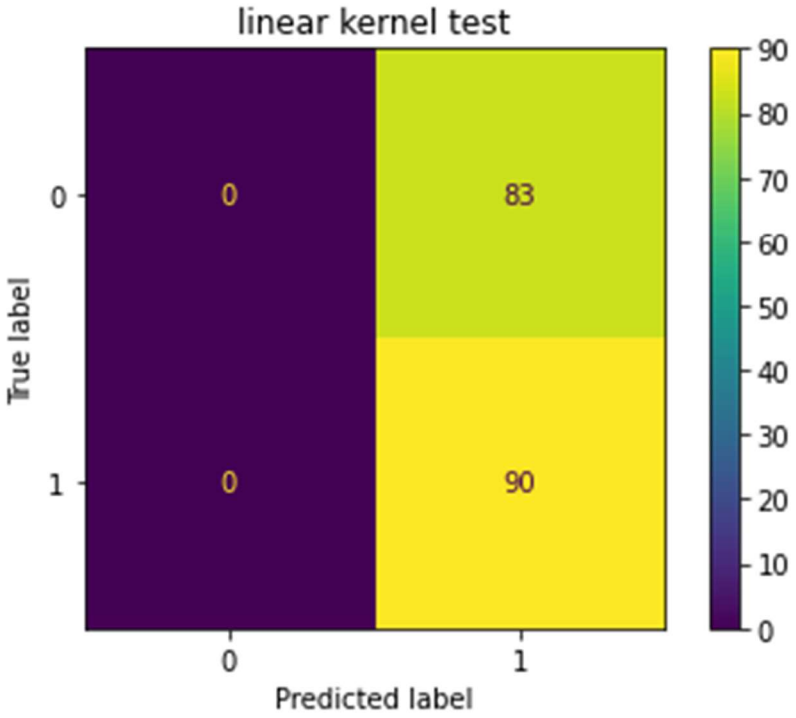

SVM test Dataset
220
5
12
280
0
1
True label
0
1
Predicted label
250
200
150
100
50

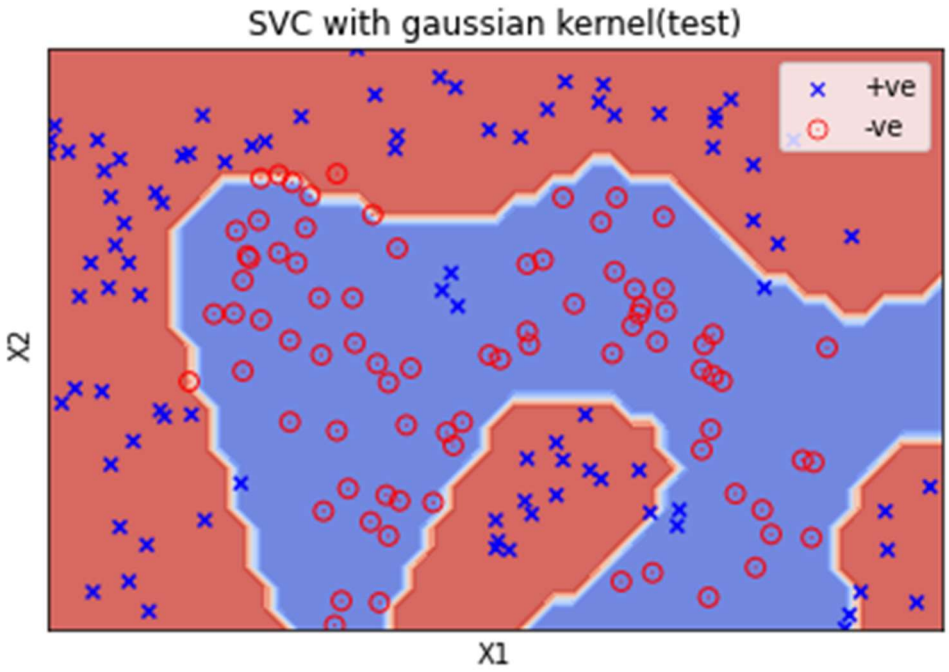

gaussian kernel CV
73
2
5
93
0
1
True label
0
1
Predicted label
80
60
40
20

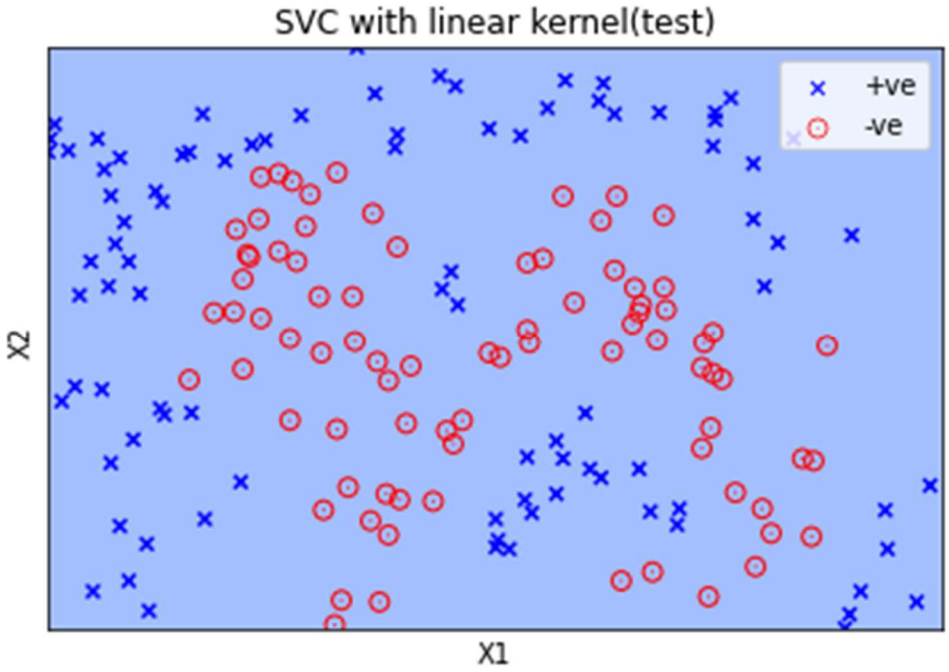

gaussian kernel test
78
5
9
81
0
1
True label
0
1
Predicted label
80
70
60
50
40
30
20
10

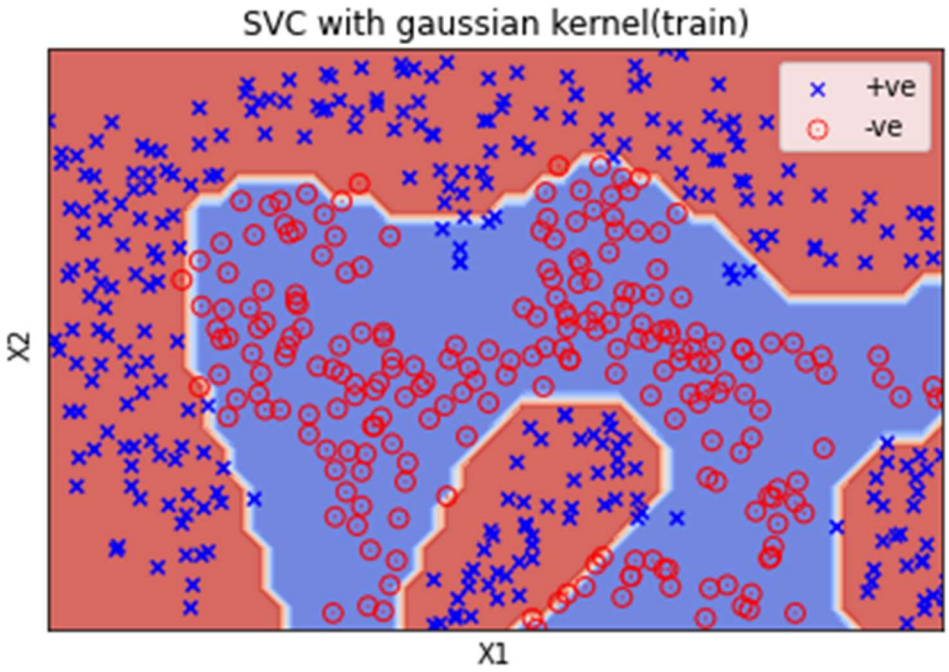

linear kernel train
0
225
0
292
0
1
True label
0
1
Predicted label
250
200
150
100
50
0

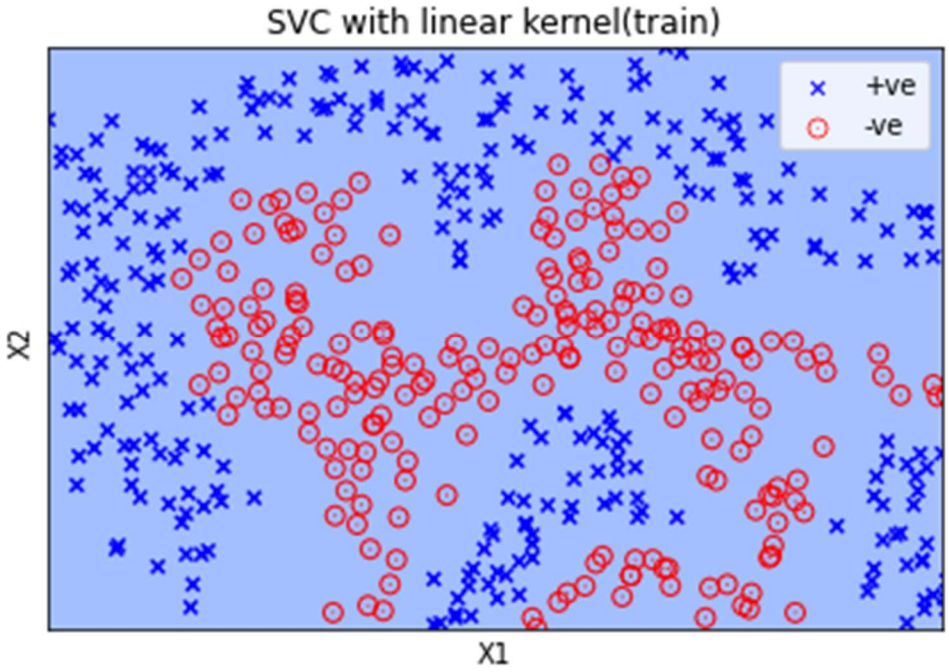

linear kernel CV
0
75
0
98
True label
0
1
Predicted label
80
60
40
20
0

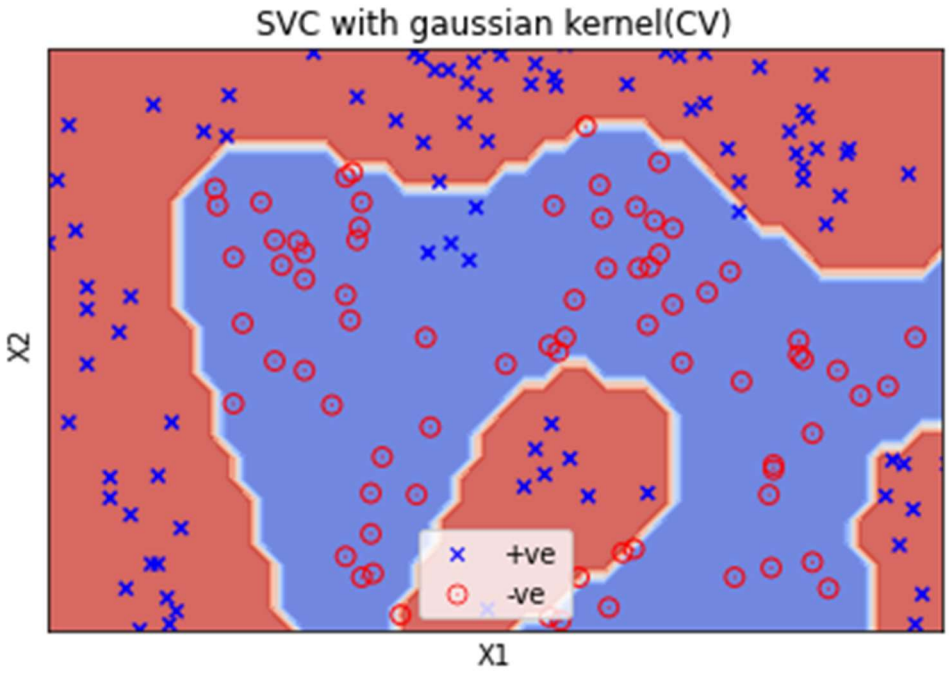

linear kernel test
0
83
0
90
True label
0
1
Predicted label
90
80
70
60
50
40
30
20
10
0

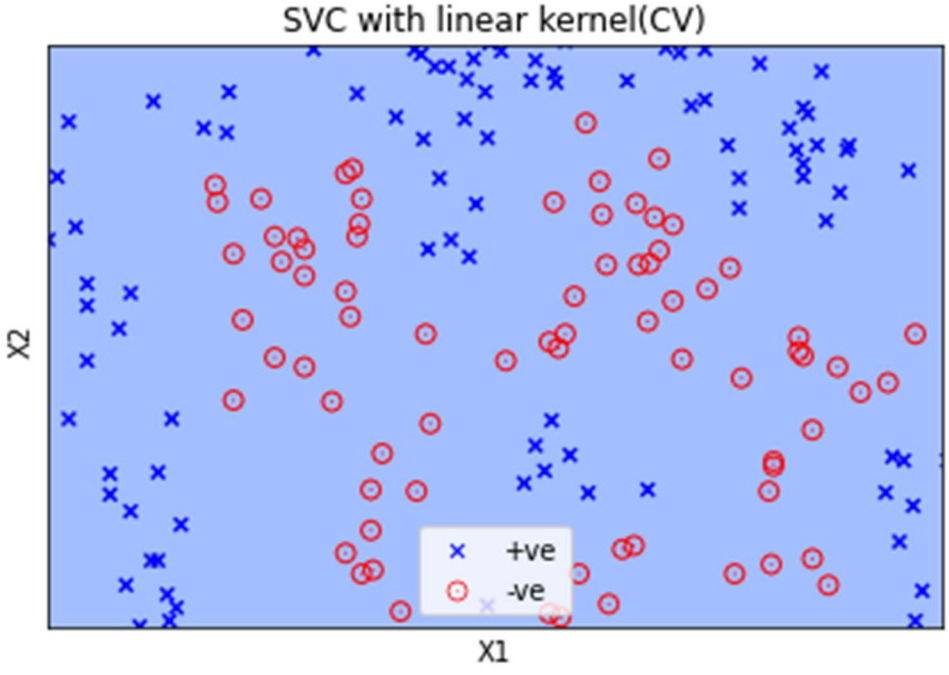

SVC with gaussian kernel(test)
+ve
-ve
X2
X1


SVC with linear kernel(test)
+ve
-ve
X2
X1


SVC with gaussian kernel(train)
+ve
-ve
X2
X1


SVC with linear kernel(train)
+ve
-ve
X2
X1


SVC with gaussian kernel(CV)
X2
X1
+ve
-ve


SVC with linear kernel(CV)
X2
X1
+ve
-ve