

2020

Machine Learning

Fourth Assignment

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?????

目录

1 ??

????????????????????????????, ??????????????. ?????????????? ???Stacking?????Boosting????.
 ??????????????????AdaBoost?????????GBDT??XGBoost.

1979?, Dasarathy ?????ensemble system???, ?????????NN?????????????. 1988?Kearns?1989
 ?????§????????T?????. 1990?Schapire?????, ???boosting. ?????Freund??AdaBoost,
 ?????, ???Adaboost?????????. 1996?, Breiman ?? Bagging ??, ?????????.

???, boosting????????????????????, ?????????boosting?????. ??????????????????????????????????????..
Boosting?????????????????????. ????????, ??????????????

2 ??????

???????, ?????????????, ??????????????. ?????????????????????, ??
 ????????bagging?????, ??boosting?????, ???stacking?????.

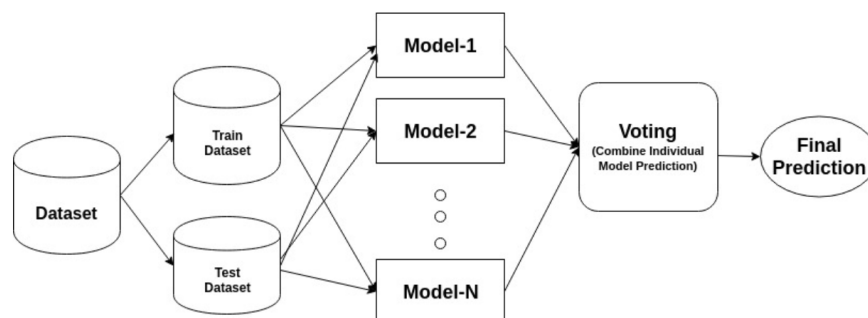


图 1: ????????

2.1 ???????

???????, ????????

Bagging??

Bagging???????Bootstrap aggregating?, ??????????????????. ??, ???????M???, ?????????????????M?????,
??????????. Bagging?????????????????, ??????????????, ??????????, ?????????.

Boosting??

Boosting????????????????, ??????????????. ???, boosting ?????????????, ?????????????????, ??????Û?????. ??Boosting????????????????????????, ??????????????????????????????. Boosting????????????, ?????????????????, ?????????????????.

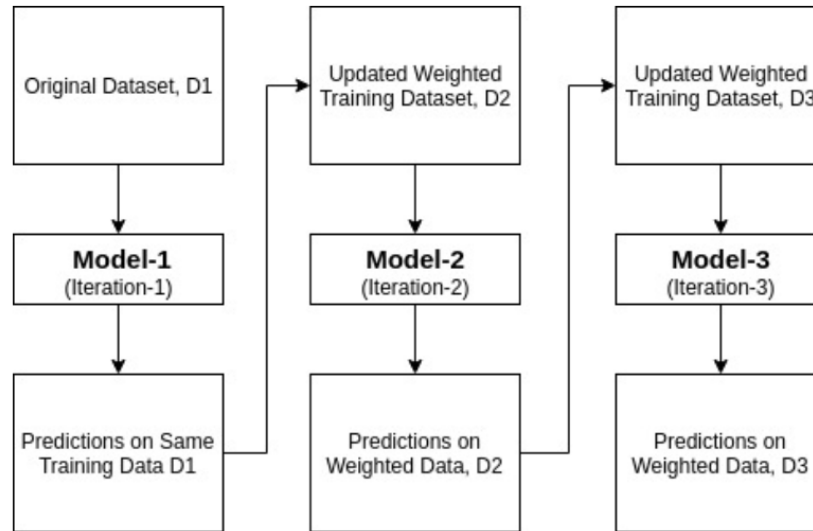


图 3: AdaBoost????.

3.2 ????

????sklearn?ensemble???AdaBoostClassifier?. ?????UCI????IRIS???. IRIS????????????, ?????????????(Iris Setosa-???, Iris Versicolour-???, ??Iris Virginica-?????, ???50???), ??????????(???, ???, ???, ???). ??????????, ?????????????????????????, ??????????????. ??????????, IRIS?????????????????????. ?????????????????????

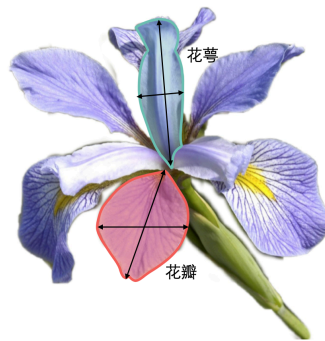


图 4: ?????????????????

4 ????

4.1 ????

4.1.1 ???????

????????50?????????, ?????????Sklearn?AdaboostClassifier?????????????????. ?????????87.6%???. ??????????????. ??????????????. ?????????????.

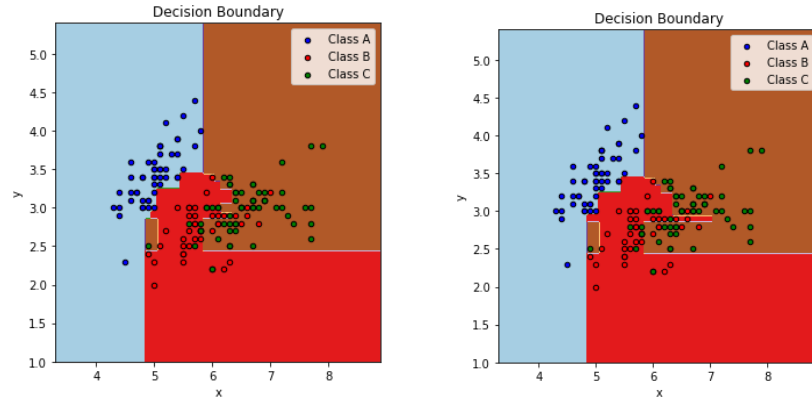


图 6: 50, 100, 150, 200. , , .

87.6%, 94.1%. .

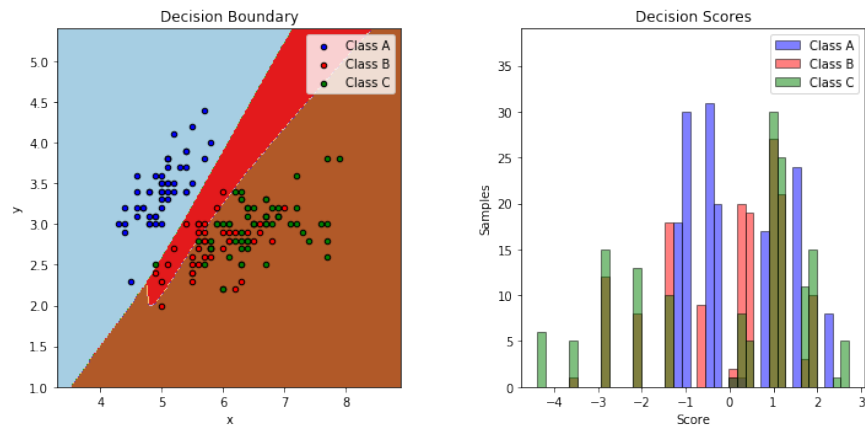


图 7: svm, adaboost. .

, , svm, adaboost.

, SVM, A?B?C??
B?C?. , .
.

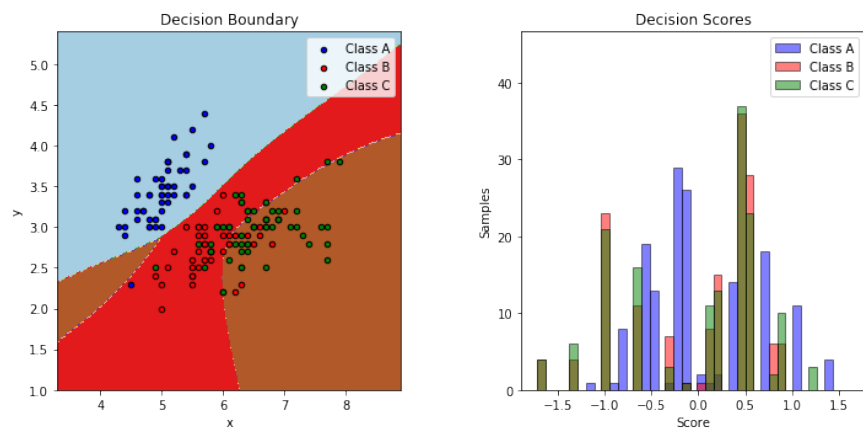


图 8: SVM????50??100, ??????????????????????, ???????????????.