On aciss data:

File: solver\_pc\_separate\_bgq\_1.arff

Petsc\_anamod\_bgq\_.1arff

17758 instances

17066 bad:, 692 good:

All features

68🡪57 feat (removeuseless)

With all features

solver

|  |  |  |
| --- | --- | --- |
| **ML mtd** | **With solver and pc together (Accuracy) single** | |
|  | **10-cv** | **66-34%split** |
| LibSVM | 1.0 | 0.0 |
| RF | 97.2 | 97.3 |
| BN | 79.2 | 74.7 |
| knn | 100 | 100 |
| ADT | 100 | 100 |
| J48 | 99.8 | 99.3 |

10cv BN

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 13771 77.5481 %

Incorrectly Classified Instances 3987 22.4519 %

Kappa statistic 0.0487

Mean absolute error 0.2265

Root mean squared error 0.4029

Relative absolute error 302.1921 %

Root relative squared error 208.2098 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

0.792 0.639 0.968 0.792 0.872 0.643 -1

0.361 0.208 0.066 0.361 0.111 0.643 1

Weighted Avg. 0.775 0.622 0.933 0.775 0.842 0.643

=== Confusion Matrix ===

a b <-- classified as

13521 3545 | a = -1

442 250 | b = 1

10 cv knn

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 17065 96.0975 %

Incorrectly Classified Instances 693 3.9025 %

Kappa statistic -0.0001

Mean absolute error 0.0691

Root mean squared error 0.1976

Relative absolute error 92.1637 %

Root relative squared error 102.0831 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

1 1 0.961 1 0.98 0.619 -1

0 0 0 0 0 0.619 1

Weighted Avg. 0.961 0.961 0.924 0.961 0.942 0.619

=== Confusion Matrix ===

a b <-- classified as

17065 1 | a = -1

692 0 | b = 1

10cv RF

== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 16627 93.631 %

Incorrectly Classified Instances 1131 6.369 %

Kappa statistic 0.0292

Mean absolute error 0.0677

Root mean squared error 0.2175

Relative absolute error 90.3345 %

Root relative squared error 112.3733 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

0.972 0.947 0.962 0.972 0.967 0.683 -1

0.053 0.028 0.072 0.053 0.061 0.683 1

Weighted Avg. 0.936 0.911 0.927 0.936 0.932 0.683

=== Confusion Matrix ===

a b <-- classified as

16590 476 | a = -1

655 37 | b = 1

10cv J48

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 17065 96.0975 %

Incorrectly Classified Instances 693 3.9025 %

Kappa statistic 0.0806

Mean absolute error 0.071

Root mean squared error 0.1926

Relative absolute error 94.733 %

Root relative squared error 99.535 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

0.998 0.952 0.963 0.998 0.98 0.586 -1

0.048 0.002 0.493 0.048 0.087 0.586 1

Weighted Avg. 0.961 0.915 0.944 0.961 0.945 0.586

=== Confusion Matrix ===

a b <-- classified as

17032 34 | a = -1

659 33 | b = 1

ADT 10 cv

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 17066 96.1032 %

Incorrectly Classified Instances 692 3.8968 %

Kappa statistic 0

Mean absolute error 0.1758

Root mean squared error 0.2235

Relative absolute error 234.5753 %

Root relative squared error 115.4947 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

1 1 0.961 1 0.98 0.699 -1

0 0 0 0 0 0.699 1

Weighted Avg. 0.961 0.961 0.924 0.961 0.942 0.699

=== Confusion Matrix ===

a b <-- classified as

17066 0 | a = -1

692 0 | b = 1

On aciss data:

File: solver\_pc\_separate\_aciss\_30.arff

17758 instances

15902 bad, 1856 good

All features

68🡪 57 feat (removeuseless)

With all features

Solver\_name + pc\_name solver

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ML mtd** | **With solver separate + pc separate (Accuracy)** | | **With solver and pc together (Accuracy)** | |
|  | **10-cv** | **66-34%split** | **10-cv** | **66-34%split** |
| LibSVM | 29.8 | 89.9(w16.8) | 10.0 | 0.0 |
| RF | 97.4(29.3 ??) | 97.1(28.1) | 93.6 ?? check | 93.2 |
| BN | 78.5 | 76.8 | 79.0 | 77.7 |
| knn | 98(w18) | 98.2(w14.0) | 99.5 | 99.5 |
| ADT | 98.7 | 99.5 | 99.8 | 99.5 |
| J48 | 96.7(w 31.2) | 96.3 | 96.5(W 35.8?) | 96.1 |
| VFI | 79.6 | 79.5 | 93.8 | 95.9 |

10cv J48 S+ P

Time taken to build model: 1.75 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 15960 89.875 %

Incorrectly Classified Instances 1798 10.125 %

Kappa statistic 0.3404

Mean absolute error 0.1355

Root mean squared error 0.2911

Relative absolute error 72.3486 %

Root relative squared error 95.1568 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

0.967 0.688 0.923 0.967 0.945 0.757 -1

0.312 0.033 0.526 0.312 0.392 0.757 1

Weighted Avg. 0.899 0.62 0.882 0.899 0.887 0.757

=== Confusion Matrix ===

a b <-- classified as

15381 521 | a = -1

1277 579 | b = 1

10cv VFI

Time taken to build model: 0.06 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 15082 84.9307 %

Incorrectly Classified Instances 2676 15.0693 %

Kappa statistic 0.0357

Mean absolute error 0.4986

Root mean squared error 0.4986

Relative absolute error 266.3082 %

Root relative squared error 162.9778 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

0.938 0.908 0.898 0.938 0.918 0.561 -1

0.092 0.062 0.147 0.092 0.113 0.561 1

Weighted Avg. 0.849 0.819 0.82 0.849 0.834 0.561

=== Confusion Matrix ===

a b <-- classified as

14911 991 | a = -1

1685 171 | b = 1

10cv knn

Time taken to build model: 0 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 15892 89.4921 %

Incorrectly Classified Instances 1866 10.5079 %

Kappa statistic 0.0497

Mean absolute error 0.166

Root mean squared error 0.3025

Relative absolute error 88.6797 %

Root relative squared error 98.8926 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

0.995 0.966 0.898 0.995 0.944 0.69 -1

0.034 0.005 0.463 0.034 0.063 0.69 1

Weighted Avg. 0.895 0.866 0.853 0.895 0.852 0.69

=== Confusion Matrix ===

a b <-- classified as

15829 73 | a = -1

1793 63 | b = 1

10CV J48

Time taken to build model: 3.26 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 16007 90.1397 %

Incorrectly Classified Instances 1751 9.8603 %

Kappa statistic 0.3802

Mean absolute error 0.1299

Root mean squared error 0.2935

Relative absolute error 69.3931 %

Root relative squared error 95.9273 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

0.965 0.642 0.928 0.965 0.946 0.747 -1

0.358 0.035 0.543 0.358 0.432 0.747 1

Weighted Avg. 0.901 0.578 0.888 0.901 0.892 0.747

=== Confusion Matrix ===

a b <-- classified as

15342 560 | a = -1

1191 665 | b = 1

10cv ADT

Time taken to build model: 7.18 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 15903 89.554 %

Incorrectly Classified Instances 1855 10.446 %

Kappa statistic 0.021

Mean absolute error 0.2781

Root mean squared error 0.3235

Relative absolute error 148.5501 %

Root relative squared error 105.7506 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

0.998 0.987 0.897 0.998 0.945 0.721 -1

0.013 0.002 0.51 0.013 0.026 0.721 1

Weighted Avg. 0.896 0.884 0.856 0.896 0.849 0.721

=== Confusion Matrix ===

a b <-- classified as

15878 24 | a = -1

1831 25 | b = 1

10cv RF

Time taken to build model: 19.42 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 15439 86.9411 %

Incorrectly Classified Instances 2319 13.0589 %

Kappa statistic 0.2543

Mean absolute error 0.1425

Root mean squared error 0.3108

Relative absolute error 76.13 %

Root relative squared error 101.5922 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

0.936 0.698 0.92 0.936 0.928 0.758 -1

0.302 0.064 0.354 0.302 0.326 0.758 1

Weighted Avg. 0.869 0.632 0.861 0.869 0.865 0.758

=== Confusion Matrix ===

a b <-- classified as

14878 1024 | a = -1

1295 561 | b = 1

10cv BN

Time taken to build model: 0.54 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 13434 75.6504 %

Incorrectly Classified Instances 4324 24.3496 %

Kappa statistic 0.1644

Mean absolute error 0.2601

Root mean squared error 0.4266

Relative absolute error 138.9249 %

Root relative squared error 139.4348 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

0.79 0.534 0.927 0.79 0.853 0.687 -1

0.466 0.21 0.206 0.466 0.286 0.687 1

Weighted Avg. 0.757 0.501 0.852 0.757 0.794 0.687

=== Confusion Matrix ===

a b <-- classified as

12570 3332 | a = -1

992 864 | b = 1

With RS1

Solver\_name + pc\_name solver

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ML mtd** | **With solver separate + pc separate (Accuracy)** | | **With solver and pc together (Accuracy) single** | |
|  | **10-cv** | **66-34%split** | **10-cv** | **66-34%split** |
| LibSVM | 10.0 | 0(w100) |  |  |
| RF | 96.5(33.9) | 96.1(w34.1) | 96.9 | 96.3(28.7) |
| BN | 99.6(w3.3) | 99.5(w2.4) | 99.4(4.5) | 99.9(3.9) |
| knn | 98.1(w16.8) | 98.5(w13) | 98.8(10.2) | 98.8(8.3) |
| ADT | 99.2(w5.1) | 97.1(w12.2) | 99.9 | 0.6 |
| J48 | 98.1(w18.8) | 98.6(w13.1) | 98.0 | 20.4 |
| VFI | 69.2 | 69.5 | 98.2(2.7) | 99.2(1.6) |

10cv RF

Time taken to build model: 6.59 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 15977 89.9707 %

Incorrectly Classified Instances 1781 10.0293 %

Kappa statistic 0.3624

Mean absolute error 0.1256

Root mean squared error 0.2755

Relative absolute error 67.0729 %

Root relative squared error 90.0419 %

Total Number of Instances 17758

=== Detailed Accuracy By Class ===

TP Rate FP Rate Precision Recall F-Measure ROC Area Class

0.965 0.661 0.926 0.965 0.945 0.857 -1

0.339 0.035 0.532 0.339 0.414 0.858 1

Weighted Avg. 0.9 0.595 0.885 0.9 0.89 0.857

=== Confusion Matrix ===

a b <-- classified as

15347 555 | a = -1

1226 630 | b = 1

With RS2

Solver\_name + pc\_name solver

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ML mtd** | **With solver separate + pc separate (Accuracy)** | | **With solver and pc together (Accuracy)** | |
|  | **10-cv** | **66-34%split** | **10-cv** | **66-34%split** |
| LibSVM |  |  |  |  |
| RF | 96.4(w33.9) | 96(w 34.1) | 93.7(w 30.2) | 93.4(w25.2) |
| BN | 99.9(w1.5) | 99.7(w1.6) | 79.8 | 79.0 |
| knn | 98.1(w16.2) | 98.4(w13.6) | 99.8(w1.3) | 99.5(W2.1) |
| ADT | 98.8(w7.7) | 97.9(w11.2) | 99.8(1.3) | 99.5(2.1) |
| J48 | 98.3(w16.4) | 98.7(w12) | 96.5(w 34.8) | 96.5 |
| VFI | 68.7 | 69.4 | 93.0(w10.0) | 95.8(6.8) |

On aciss data:

File: solver\_pc\_separate\_aciss\_35.arff

17758 instances

15712 bad, 2046 good

All features

🡪 56 feat (removeuseless)

With all features

Solver\_name + pc\_name solver

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ML mtd** | **With solver separate + pc separate (Accuracy)** | | **With solver and pc together (Accuracy)** | |
|  | **10-cv** | **66-34%split** | **10-cv** | **66-34%split** |
| LibSVM | 10(90) | 98.3(3.4) | 10.0(90) | 0(11.2) |
| RF | 96.9(31.7) | 96.8(29.7) | 91.3(36.7) | 91(31.1) |
| BN | 78.4(46.3) | 77.2(44.3) | 78.8(46.8) | 76.7(45.8) |
| knn | 97.6(20.9) | 97.8(17.4) | 88.9(46.6) | 89.2(47.2) |
| ADT | 98.1(10.8) | 99.3(3.7) | 99.7(2.3) | 99.3(3.7) |
| J48 | 96.3(34.5) | 95.8(32) | 96.1(37.9) | 95.4(51.6) |
| VFI | 80.6(61.6) | 80.9(62.3) | 88.8(19.7) | 89(19.1) |

With RS1

Solver\_name + pc\_name solver

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ML mtd** | **With solver separate + pc separate (Accuracy)** | | **With solver and pc together (Accuracy) single** | |
|  | **10-cv** | **66-34%split** | **10-cv** | **66-34%split** |
| LibSVM | 10.0(90) | 0(100) | 10.0(90) | 0(11.2) |
| RF | 96.0(36.7) | 95.7(34.9) | 96.1(34.8) | 95.6(31.8) |
| BN | 99.4(4.0) | 99.6(3.5) | 99.1(5.3) | 99.4(5.2) |
| knn | 97.9(19) | 98.2(14.9) | 98.6(12.2) | 98.7(8.2) |
| ADT | 99.4(4.2) | 98.0(13.3) | 99.9(0.5) | 99.9(0.4) |
| J48 | 97.3(22.8) | 96.9(25.2) | 97.0(27) | 96.3(29.6) |
| VFI | 69.5(75.2) | 70(76.4) |  |  |

With RS2

Solver\_name + pc\_name solver

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ML mtd** | **With solver separate + pc separate (Accuracy)** | | **With solver and pc together (Accuracy)** | |
|  | **10-cv** | **66-34%split** | **10-cv** | **66-34%split** |
| LibSVM | 10(90) | 0(100) | 10(90) | 0(100) |
| RF | 95.9(36.5) | 95.6(36.1) | 96.1(34.4) | 95.8(32.0) |
| BN | 99.8(1.8) | 100(0) | 99.8(1.7) | 99.5(2.7) |
| knn | 98.0(19.3) | 98.1(14.1) | 94.0(40.3) | 92.9(41.8) |
| ADT | 99.2(5.1) | 98.8(7.8) | 100(0) | 100(0) |
| J48 | 97.7(20.8) | 97.1(25) | 97.1(26.4) | 96.9(23.7) |