

Fetal cardiotocograms

Pre-processing Method:

Applied Attribute Selection – Totally 35 attributes. Feature Selection reduces to 19 attributes.

Applied Class Balancer – Number of Classes are very distributed. Could've been biased.

Classifiers Applied:

K-nearest algorithm

The screenshot shows the Weka Explorer interface with the 'Classify' tab selected. The classifier chosen is 'IBk - K 5 - W 0 - A "weka.core.neighboursearch.LinearNNSearch - A "weka.core.EuclideanDistance - R first-last"'. The 'Test options' section shows 'Cross-validation' with 'Folds' set to 10. The 'Classifier output' pane displays the following results:

```
Time taken to build model: 0 seconds
=== Stratified cross-validation ===
=== Summary ===
Correctly Classified Instances      2126           100 %
Incorrectly Classified Instances      0             0 %
Kappa statistic                      1
Mean absolute error                  0.0002
Root mean squared error              0.0004
Relative absolute error               0.1042 %
Root relative squared error          0.1321 %
Total Number of Instances           2126

=== Detailed Accuracy By Class ===
```

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1
1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	2
1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	3
1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	4
1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	5
1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	6
1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	7
1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	8
1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	9
1.000	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	10
Weighted Avg.	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	

The 'Result list' on the left shows two entries: '00:51:46 - lazy.IBk' and '00:52:00 - lazy.IBk'. The 'Status' bar at the bottom indicates 'OK'.

K=5

Support Vector Machines

The screenshot shows the Weka Explorer interface with the 'Classify' tab selected. The classifier chosen is 'SMO -C 1.0 -L 0.001 -P 1.0E-12 -N 0 -V 1 -W 1 -K "weka.classifiers.functions.supportVector.PolyKernel -E 1.0 -C 250007" -calibrator "weka.classifiers.functions.Logit"'. The test options are set to 'Cross-validation' with 'Folds' set to 10. The classifier output shows the following summary:

```
==== Stratified cross-validation ====
==== Summary ====

Correctly Classified Instances      2126      100 %
Incorrectly Classified Instances      0        0 %
Kappa statistic                      1
Mean absolute error                  0.16
Root mean squared error              0.2714
Relative absolute error              88.8871 %
Root relative squared error          90.4504 %
Total Number of Instances           2126
```

The detailed accuracy by class table is as follows:

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	2
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	3
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	4
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	5
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	6
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	7
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	8
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	9
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	10
Weighted Avg.	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	

The result list on the left shows the following entries:

- 00:51:46 - lazy.IBk
- 00:52:00 - lazy.IBk
- 00:53:10 - lazy.IBk
- 00:53:20 - trees.J48
- 00:53:59 - functions.SMO

Decision Tree

The screenshot shows the Weka Explorer interface with the 'Classify' tab selected. The classifier chosen is 'J48 -C 0.25 -M 2'. The test options are set to 'Cross-validation' with 'Folds' set to 10. The classifier output shows the following summary:

```
==== Stratified cross-validation ====
==== Summary ====

Correctly Classified Instances      2126      100 %
Incorrectly Classified Instances      0        0 %
Kappa statistic                      1
Mean absolute error                  0
Root mean squared error              0
Relative absolute error              0 %
Root relative squared error          0 %
Total Number of Instances           2126
```

The detailed accuracy by class table is as follows:

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	2
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	3
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	4
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	5
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	6
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	7
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	8
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	9
1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	10
Weighted Avg.	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	

The result list on the left shows the following entries:

- 00:51:46 - lazy.IBk
- 00:52:00 - lazy.IBk
- 00:53:10 - lazy.IBk
- 00:53:20 - trees.J48

Artificial Neural Networks

Weka Explorer

Preprocess Classify Cluster Associate Select attributes Visualize

Classifier

Choose MultilayerPerceptron -L 0.3 -M 0.2 -N 500 -V 0 -S 0 -E 20 -H a

Test options

☐ Use training set

☐ Supplied test set Set...

☒ Cross-validation Folds 10

☐ Percentage split % 66

More options...

(Nom) Class

Start Stop

Result list (right-click for options)

- 00:51:46 - lazy.IBk
- 00:52:00 - lazy.IBk
- 00:53:10 - lazy.IBk
- 00:53:20 - trees.J48
- 00:53:59 - functions.SMO
- 00:54:42 - functions.MultilayerPerceptron

Classifier output

Time taken to build model: 9.68 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances	2126	100	%
Incorrectly Classified Instances	0	0	%
Kappa statistic	1		
Mean absolute error	0.0018		
Root mean squared error	0.003		
Relative absolute error	0.9744	%	
Root relative squared error	0.995	%	
Total Number of Instances	2126		

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
1	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	1
2	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	2
3	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	3
4	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	4
5	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	5
6	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	6
7	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	7
8	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	8
9	1.000	0.000	1.000	1.000	1.000	1.000	1.000	1.000	9

Status

OK Log x0

More Time Consuming than others.