

14.

## SMO ALGORITHM:

**Weka Explorer**

Preprocess **Classify** Cluster Associate Select attributes Visualize

Classifier: Choose **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.Logistic -R 1.0E-8 -M -1 -num-decimal-places 4"

Test options

- ☐ Use training set
- ☐ Supplied test set
- ☒ Cross-validation Folds **10**
- ☐ Percentage split % **66**

More options...

(Nom) Class

Start Stop

Result list (right-click for options)

12:00:25 - functions.SMO

Classifier output

=== Run information ===

Scheme: weka.classifiers.functions.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.Logistic -R 1.0E-8 -M -1 -num-decimal-places 4"

Relation: vote

Instances: 435

Attributes: 17

handicapped-infants

water-project-cost-sharing

adoption-of-the-budget-resolution

physician-fee-freeze

el-salvador-aid

religious-groups-in-schools

anti-satellite-test-ban

aid-to-nicaraguan-contras

mx-missile

immigration

synfuels-corporation-cutback

education-spending

superfund-right-to-sue

crime

duty-free-exports

export-administration-act-south-africa

Class

Test mode: 10-fold cross-validation

=== Classifier model (full training set) ===

SMO

Kernel used:

Linear Kernel:  $K(x,y) = \langle x,y \rangle$

Classifier for classes: democrat, republican

BinarySMO

Machine linear: showing attribute weights, not support vectors.

0.0421 \* (normalized) handicapped-infants=y

+ -0.2607 \* (normalized) water-project-cost-sharing=y

+ -0.7819 \* (normalized) adoption-of-the-budget-resolution=y

+ 2.563 \* (normalized) physician-fee-freeze=y

+ 0.3041 \* (normalized) el-salvador-aid=y

+ -0.3026 \* (normalized) religious-groups-in-schools=y

+ 0.5204 \* (normalized) anti-satellite-test-ban=y

+ -0.5213 \* (normalized) mx-missile=y

+ 0.5213 \* (normalized) immigration=y

+ -0.7815 \* (normalized) synfuels-corporation-cutback=y

+ 0.2167 \* (normalized) education-spending=y

+ 0.0425 \* (normalized) superfund-right-to-sue=y

+ 0.2601 \* (normalized) crime=y

+ -0.5204 \* (normalized) duty-free-exports=y

+ 0.2609 \* (normalized) export-administration-act-south-africa=y

- 1.5637

Status

OK

Log x 0

Classifier output

+ 2.563 \* (normalized) physician-fee-freeze=y

+ 0.3041 \* (normalized) el-salvador-aid=y

+ -0.3026 \* (normalized) religious-groups-in-schools=y

+ 0.2616 \* (normalized) anti-satellite-test-ban=y

+ 0.5204 \* (normalized) aid-to-nicaraguan-contras=y

+ -0.5213 \* (normalized) mx-missile=y

+ 0.5213 \* (normalized) immigration=y

+ -0.7815 \* (normalized) synfuels-corporation-cutback=y

+ 0.2167 \* (normalized) education-spending=y

+ 0.0425 \* (normalized) superfund-right-to-sue=y

+ 0.2601 \* (normalized) crime=y

+ -0.5204 \* (normalized) duty-free-exports=y

+ 0.2609 \* (normalized) export-administration-act-south-africa=y

- 1.5637

Number of kernel evaluations: 17182 (78.602% cached)

Time taken to build model: 0.03 seconds

=== Stratified cross-validation ===

=== Summary ===

Correctly Classified Instances 418 96.092 %

Incorrectly Classified Instances 17 3.908 %

Kappa statistic 0.9178

Mean absolute error 0.0391

Root mean squared error 0.1977

Relative absolute error 8.2405 %

Root relative squared error 40.6018 %

Total Number of Instances 435

=== Detailed Accuracy By Class ===

	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area	Class
	0.963	0.042	0.973	0.963	0.968	0.918	0.960	0.960	democrat
	0.958	0.037	0.942	0.958	0.950	0.918	0.960	0.918	republican
Weighted Avg.	0.961	0.040	0.961	0.961	0.961	0.918	0.960	0.944	

=== Confusion Matrix ===

a b <-- classified as

257 10 | a = democrat

7 161 | b = republican