|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test | Softmax Regression | | | Multiclass SVM | | |
| Accuracy | Precision | Recall | Accuracy | Precision | Recall |
| Training | 78.30% | 76.20% | 76.44% | 98.89% | 98.76% | 98.88% |
| 2-fold CV | 66.21% | 63.33% | 63.35% | 80.70% | 79.43% | 78.70% |
| 5-fold CV | 68.52% | 66.34% | 66.27% | 84.56% | 83.82% | 83.09% |
| 10-fold CV | 68.36% | 66.08% | 66.13% | 84.47% | 83.62% | 83.08% |

2-fold 66.72% 80.87%

5-fold CV 70.67% 84.91%

10-fold CV 84.30%

SVM confusion matrices and results

|  |  |  |  |
| --- | --- | --- | --- |
| Test | Accuracy | Precision | Recall |
| Training | 98.89% | 98.76% | 98.88% |
| 2-fold CV | 80.70% | 79.43% | 78.70% |
| 5-fold CV | 84.56% | 83.82% | 83.09% |
| 10-fold CV | 84.47% | 83.62% | 83.08% |
| 10-fold CV CK | 81.69% | 76.28% | 71.47% |
| 10-fold CV TFEID | 82.50% | 80.66% | 80.79% |
| 10-fold CV JAFFE | 94.85% | 95.07% | 94.81% |

Actual\predicted

Training 98.89%, 98.76% precision, 98.88% recall

143 0 0 0 0 3 0 0

0 108 0 0 0 0 0 0

1 0 167 0 0 0 1 0

0 0 0 132 0 0 1 0

0 2 0 0 179 0 0 0

0 0 0 1 0 134 0 0

1 0 0 1 1 0 113 0

0 0 0 1 0 0 0 177

2-fold all 204 features 80.70%, 79.43% precision, 78.70% recall

113 1 9 0 0 12 9 2

2 79 1 2 9 11 3 1

12 1 143 5 2 2 3 1

5 4 3 101 4 5 4 7

0 4 1 0 176 0 0 0

13 7 2 7 0 101 5 0

14 1 9 13 1 13 61 4

1 0 0 8 1 0 1 167

5-fold all 204 features 84.56%, 83.82% precision, 83.09% recall

120 2 6 1 0 11 4 2

0 82 3 2 4 12 4 1

11 1 146 3 1 3 2 2

4 4 2 101 4 7 3 8

0 3 0 0 177 0 0 1

8 5 1 3 0 113 5 0

10 1 4 6 1 12 80 2

0 1 0 8 1 0 1 167

10-fold all 204 features 84.47%, 83.62% precision, 83.08% recall

117 1 8 0 0 12 6 2

0 86 1 1 4 12 3 1

11 1 146 3 2 2 3 1

4 4 3 101 4 6 4 7

0 3 1 0 177 0 0 0

7 5 1 3 0 113 6 0

10 1 4 8 1 12 78 2

0 1 0 8 1 0 1 167

10-fold all 204 features CK 81.69%, 76.28% precision, 71.47% recall

30 0 5 0 0 5 3 2

0 6 0 0 1 10 1 0

4 0 52 0 2 0 0 1

1 1 0 13 4 2 2 2

0 0 1 0 68 0 0 0

1 4 1 0 0 58 2 0

4 0 0 3 0 6 13 2

0 1 0 0 0 0 0 77

10-fold all 204 features TFEID 82.50%, 80.66% precision, 80.79% recall

58 1 2 0 0 7 3 0

0 80 1 1 3 2 2 1

5 1 67 3 0 2 3 0

3 3 3 57 0 4 2 4

0 3 0 0 78 0 0 0

6 1 0 2 0 26 4 0

6 1 4 3 0 6 37 0

0 0 0 7 0 0 0 64

10-fold all 204 features JAFFE 94.85%, 95.07% precision, 94.81% recall

29 0 1 0 0 0 0 0

0 0 0 0 0 0 0 0

2 0 27 0 0 0 0 0

0 0 0 31 0 0 0 1

0 0 0 0 31 0 0 0

0 0 0 1 0 29 0 0

0 0 0 2 1 0 28 0

0 0 0 1 1 0 1 27

Softmax confusion matrices and results

|  |  |  |  |
| --- | --- | --- | --- |
| Test | Accuracy | Precision | Recall |
| Training | 78.30% | 76.20% | 76.44% |
| 2-fold CV | 66.21% | 63.33% | 63.35% |
| 5-fold CV | 68.52% | 66.34% | 66.27% |
| 10-fold CV | 68.36% | 66.08% | 66.13% |

softmax training 78.30%, 76.20% precision, 76.44% recall

100 6 8 4 2 12 13 1

3 88 1 5 2 5 3 1

8 1 151 1 0 3 4 1

4 7 1 94 5 12 3 7

0 7 1 1 170 2 0 0

14 5 4 11 0 78 16 7

15 3 7 8 3 15 65 0

1 2 0 6 1 1 0 167

softmax 2-fold train all angles 66.21%, 63.33% precision, 63.35% recall

83 9 10 7 3 12 18 4

7 52 2 13 14 13 5 2

10 3 140 3 0 4 6 3

6 11 5 78 7 8 6 12

3 9 5 1 160 3 0 0

15 6 5 19 3 62 16 9

18 3 7 10 4 20 51 3

2 4 1 14 1 8 2 146

softmax 5-fold all angles 68.52%, 66.34% precision, 66.27% recall

86 9 12 6 3 12 16 2

5 65 2 12 5 11 7 1

14 1 133 4 1 7 7 2

5 9 2 80 5 15 5 12

1 12 2 3 160 2 1 0

16 6 4 13 2 68 15 11

16 4 8 10 3 15 57 3

3 1 2 12 1 8 1 150

softmax 10-fold all angles 68.36%, 66.08% precision, 66.13% recall

84 9 12 5 3 14 16 3

4 67 1 12 5 11 6 2

11 2 134 5 1 5 9 2

6 9 4 81 5 13 4 11

1 14 2 3 159 2 0 0

16 7 4 15 1 66 14 12

19 3 8 9 3 16 56 2

4 2 2 11 1 6 2 150