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CS 4342

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Homework 1

n trainingAccuracy testingAccuracy

400 0.7355 0.7112

800 0.7675 0.7407

1200 0.7790 0.7495

1600 0.7755 0.7637

2000 0.7825 0.7642

In general, we can say that both trainingAccuracy and testingAccuracy increase as the number of training samples (n) increases. Both accuracies increase at roughly the same rate, save for the case with n=1600 where the trainingAccuracy is lower than n=1200 but the testingAccuracy still increased.

Script output:

Training Model with 400 image samples:

Predictors selected:

[(20, 17, 17, 7), (13, 4, 11, 14), (21, 8, 16, 8), (12, 5, 16, 17), (10, 6, 12, 6)]

Training accuracy on 400 samples of training data = 0.7355

Testing accuracy on entire test set = 0.7111597374179431

Training Model with 800 image samples:

Predictors selected:

[(20, 7, 17, 7), (13, 5, 11, 13), (18, 12, 16, 17), (12, 19, 10, 14), (19, 9, 13, 17)]

Training accuracy on 800 samples of training data = 0.7675

Testing accuracy on entire test set = 0.7407002188183808

Training Model with 1200 image samples:

Predictors selected:

[(20, 7, 17, 7), (13, 5, 11, 13), (20, 17, 16, 17), (12, 19, 12, 13), (10, 7, 14, 7)]

Training accuracy on 1200 samples of training data = 0.779

Testing accuracy on entire test set = 0.74945295404814

Training Model with 1600 image samples:

Predictors selected:

[(20, 7, 17, 7), (13, 6, 16, 17), (18, 12, 16, 7), (13, 5, 0, 19), (19, 12, 15, 17)]

Training accuracy on 1600 samples of training data = 0.7755

Testing accuracy on entire test set = 0.7636761487964989

Training Model with 2000 image samples:

Predictors selected:

[(20, 7, 17, 7), (12, 5, 10, 13), (20, 17, 16, 17), (11, 19, 12, 12), (19, 11, 14, 7)]

Training accuracy on 2000 samples of training data = 0.7825

Testing accuracy on entire test set = 0.7642231947483589

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Training completed. Final results:

Final accuracy of model = 0.7642231947483589

Final predictors selected:

[(20, 7, 17, 7), (12, 5, 10, 13), (20, 17, 16, 17), (11, 19, 12, 12), (19, 11, 14, 7)]

Chart

Description automatically generated