MLP

100-5

sets of experiments0 SGD(lr=0.0001, decay=1e-6, momentum=0.9, nesterov=True)

epochs=100, batch\_size=20

train\_time:169.23605036735535 test\_time:0.19782638549804688 Test loss:0.6040209007263183 Test accuracy:0.8399999737739563

Precise: 0.8055555555555556,0.9090909090909091,0.8653846153846154,0.8421052631578947,0.7868852459016393,

Recall: 0.725,0.851063829787234,0.8035714285714286,0.8275862068965517,0.9795918367346939, F1 Score: 0.7631578947368421,0.879120879120879,0.8333333333333334,0.8347826086956522,0.8727272727272728,

us\_map258.jpg,3,4\china\_map181.jpg,1,4\us\_map201.jpg,3,0\us\_map206.jpg,3,0\china\_map138.jpg,1,3

AWOWA.png,0,2\south\_korea\_map173.jpg,2,0\carusel-imag-2.jpg,0,2\POL\_MAP\_15M\_with\_watermark.png,0,4

south\_korea\_map163.jpg,2,4\allas-tx-map.jpg,0,3\us\_map176.jpg,3,1\us\_map19.jpg,3,0\political-map-of-australia (1).jpg,0,2

china\_map220.jpg,1,3

south\_korea\_map209.jpg,2,4

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south\_korea\_map70.jpg,2,4

china\_map204.jpg,1,3

south\_korea\_map245.jpg,2,4

us\_map103.jpg,3,2

us\_map218.jpg,3,1

south\_korea\_map223.jpg,2,0

china\_map100.jpg,1,2

Maps.me\_screenshot\_7.0.5.png,0,1

world\_map137.jpg,4,0

india\_physio-2001.jpg,0,3

south\_korea\_map203.jpg,2,4

us\_map24.jpg,3,0

us\_map286.jpg,3,4

china\_map265.jpg,1,3

south\_korea\_map149.jpg,2,4

south\_korea\_map151.jpg,2,4

groundwaterLevels.jpg,0,4

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china\_map188.jpg,1,3

A1P+plkB7cL.\_AC\_SL1500\_.jpg,0,3

south\_korea\_map200.jpg,2,4

south\_korea\_map3.jpg,2,1

SVM

Polynomial kernel: value of c is: 0.125 value of alpha is: 0.125 value of r is: 256 Training acc:100.0 Testing acc:83.6

Precise: 0.7924528301886793,0.8863636363636364,0.8518518518518519,0.8269230769230769,0.8297872340425532,

Recall: 0.7636363636363637,0.8478260869565217,0.8679245283018868,0.7962962962962963,0.9285714285714286,

F1 Score:0.7777777777777779,0.8666666666666667,0.8598130841121495,0.8113207547169812,0.8764044943820225,

train\_time:30.885470390319824 test\_time:17.278802633285522

world\_map117.jpg,4,0.0

canada.jpg,0,3.0

world\_map113.jpg,4,3.0

us\_map177.jpg,3,0.0

south\_korea\_map160.jpg,2,1.0

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china\_map244.jpg,1,3.0

us\_map210.jpg,3,0.0

europe-map-anthems.jpg,0,2.0

India\_map.jpg,0,4.0

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disputed-kashmir\_ED.jpg,0,3.0

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ogimage.png,0,2.0

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south\_korea\_map181.jpg,2,1.0

us\_map168.jpg,3,4.0

south\_korea\_map203.jpg,2,0.0

us\_map302.jpg,3,4.0

south\_korea\_map158.jpg,2,4.0

south\_korea\_map215.jpg,2,0.0

china\_map229.jpg,1,0.0

south\_korea\_map194.jpg,2,1.0

china\_map78.jpg,1,3.0

world\_map273.jpg,4,2.0

groundwaterLevels.jpg,0,4.0

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us\_map280.jpg,3,4.0

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south\_korea\_map182.jpg,2,3.0

us\_map176.jpg,3,0.0

china\_map118.jpg,1,2.0

us\_map194.jpg,3,1.0

china\_map246.jpg,1,0.0

CNN (from scratch)

64-128

Sets of experiments1 optimizer=keras.optimizers.SGD(lr=0.01) epochs=100, batch\_size=20 train\_time:3605.802811861038 test\_time:2.8774850368499756 Test loss:0.6211368513107299 Test accuracy:0.871999979019165

Precise: 0.7884615384615384,0.9591836734693877,0.8545454545454545,0.8823529411764706,0.8837209302325582,

Recall: 0.7735849056603774,0.9038461538461539,0.8703703703703703,0.8653846153846154,0.9743589743589743,

F1 Score: 0.7809523809523811,0.9306930693069306,0.8623853211009175,0.8737864077669903,0.9268292682926829,

china\_map202.jpg,1,0

us\_map245.jpg,3,2

south\_korea\_map209.jpg,2,4

south\_korea\_map3.jpg,2,4

south\_korea\_map250.jpg,2,3

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sp-shs-map\_0.png,0,3

us\_map157.jpg,3,0

world\_map234.jpg,4,2

us\_map251.jpg,3,0

political-map-of-australia (1).jpg,0,2

1644 blaeu.jpg,0,4

us\_map280.jpg,3,0

Population-Density-Map-Example.jpg,0,4

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china\_map175.jpg,1,0

Screen-Shot-2020-04-06-at-11.00.45-AM.jpg,0,2

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china\_map226.jpg,1,3

neweurope\_ad2005.jpg,0,2

south\_korea\_map151.jpg,2,3

south\_korea\_map121.jpg,2,0

POL\_MAP\_15M\_with\_watermark.png,0,4

us\_map3.jpg,3,1

us\_map296.jpg,3,1

south\_korea\_map70.jpg,2,0

us\_map172.jpg,3,0

south\_korea\_map183.jpg,2,0

map-of-finland.jpg,0,2

maxresdefault (1).jpg,0,2

Transfer Learning (VGG19)

Precise: 0.8809523809523809,1.0,0.9818181818181818,1.0,0.96875,

Recall: 0.9736842105263158,0.95,0.9642857142857143,0.9622641509433962,0.9841269841269841,

F1 Score: 0.9249999999999999,0.9743589743589745,0.972972972972973,0.9807692307692308,0.9763779527559056,

layer\_inx: -5

Batch\_size: 32 epochs: 50

[INFO] loss=0.2875, accuracy: 96.8000%

Training time: 692.2411375045776

china\_map235.jpg,1,0

us\_map184.jpg,3,4

south\_korea\_map111.jpg,2,0

world\_map113.jpg,4,2

us\_map214.jpg,3,0

1499178020-map2.jpg,0,4

south\_korea\_map223.jpg,2,0

china\_map226.jpg,1,0

|  |  |  |
| --- | --- | --- |
| **Image** | **Desired Label** | **Desired Label** |
|  | **1** | **0** |
|  | 3 | 4 |
|  | 2 | 0 |
|  | 4 | 2 |
|  | 3 | 0 |
|  | 0 | 4 |
|  | 2 | 0 |
|  | 2 | 0 |
|  | 0 | 1 |
|  | 0 | 1 |
|  | 0 | 1 |
|  | 0 | 1 |
|  | 0 | 4 |
|  | 4 | 0 |
|  | 3 | 0 |