Giovanni Mueco

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CS489\_1001

HW 4 - SVM and KFold

For this homework assignment, we needed to implement the different kernel methods of SVM in order to compare them to each other to see which of them is the most accurate for our given data, which is MNIST. The different kernels we implemented were Linear, RBF, and Poly. We tested our training model using KFold cross-validation. The data showed that the most accurate of the three kernel methods was RBF, only having tied with the Linear method during the 3rd fold. The second most accurate kernel was Linear. And the least accurate in each cross-validation was Poly. So we can conclude based on these results that for image data such as MNIST, the best kernel when implementing SVM would be RBF. This would explain why it is the default method when using the SVM library from sklearn. On the second page is a table of the data from this assignment.

=============== 1 ===============

LINEAR:

Accuracy 0.875

RBF:

Accuracy 0.895

POLY:

Accuracy 0.86

=============== 2 ===============

LINEAR:

Accuracy 0.89

RBF:

Accuracy 0.92

POLY:

Accuracy 0.845

=============== 3 ===============

LINEAR:

Accuracy 0.865

RBF:

Accuracy 0.865

POLY:

Accuracy 0.84

=============== 4 ===============

LINEAR:

Accuracy 0.8592964824120602

RBF:

Accuracy 0.8894472361809045

POLY:

Accuracy 0.8241206030150754

=============== 5 ===============

LINEAR:

Accuracy 0.8743718592964824

RBF:

Accuracy 0.8894472361809045

POLY:

Accuracy 0.8492462311557789