SELECTED-2
PRESENTATION

Architecture used in the paper

they model a deep learning architecture that can be effectively apply to recognizing Arabic handwritten characters. A Convolutional Neural Network (CNN) is a special type of feed-forward multilayer trained in supervised mode. The CNN trained and tested our dataset that contain 16800 of handwritten Arabic characters.

In this paper, the optimization methods implemented to increase the performance of CNN. The use of CNN leads to significant improvements across different machine-learning classification algorithms. Our proposed CNN is giving an average 5.1% misclassification error on testing data.

Dataset details

name of dataset

Arabic handwritten digit recognizer

number of samples

70,000

dimantion of images

28 * 28

number of classes

10

lables

0, 1, 2, 3, 4, 5, 6, 7, 8, 9

implementation details

split dataset into

60,000 training data, 10,000 testing data, 0.1(1000) of the testing for validation.

CNN model

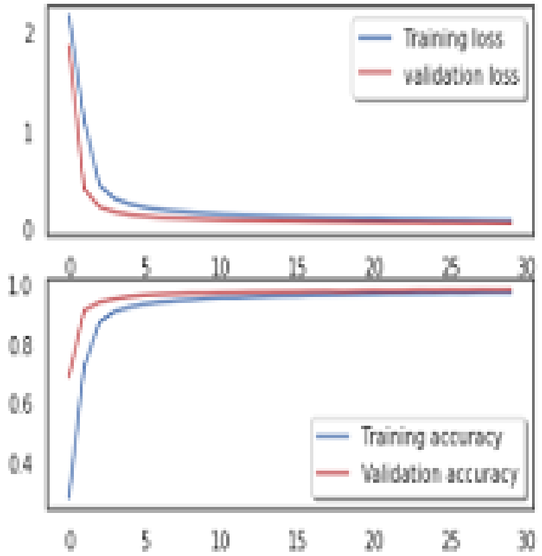
consists of :

2 convolutional layers
2 MAX pooling layers
1 fully connected layed

Hyperparameters

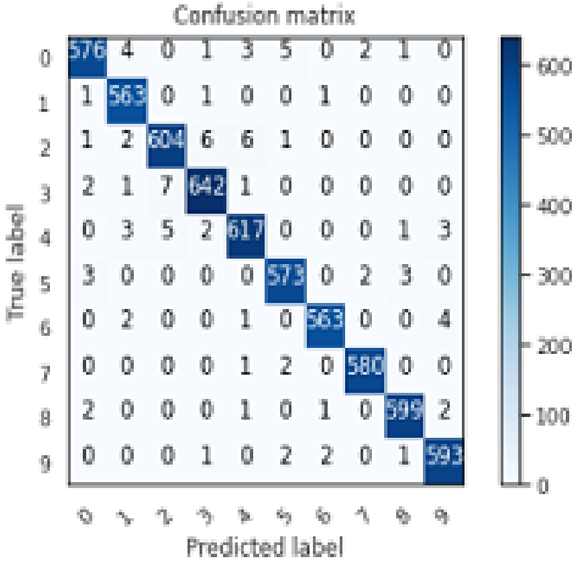
1)test_size = 0.1
2) random state = 4
3) filters in first convolutional layer = 80
4) filters in second convolutional layer = 64
5) kernel_size = 5 * 5
6) pool_size = 2 * 2
7) Dropout = 0.25
8) nodes in dense = 128
9) learning rate (Lr) = 0.001
10) momentum = 0.3

Results and visualizations



Training validation curve

graph that describe the loss and accuracy of the training set and the validation set



Confusion matrix

graph that describe the predicted values of each class in the validation data

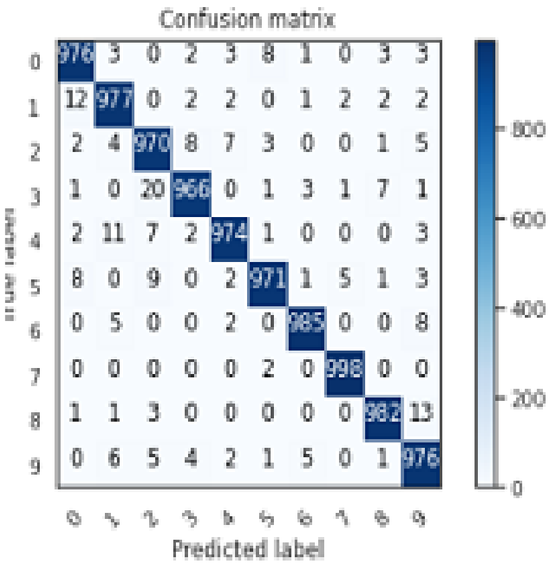
```
# Evaluate model
score = model.evaluate(test , y_test,verbose=3)

print('Test accuracy: %.2f%%' % round((score[1] * 100),5))
print('Loss accuracy: %.2f%%' % round((score[0] * 100),0))
```

Test accuracy: 97.73317%

Loss accuracy: 7.0000%

Evaluation of the model



Confusion matrix

graph that describe the predicted values of each class in the testing data