機器學習概論作業

範圍： Implementing CNN model using Keras

銘傳大學電腦與通訊工程系

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作業成果	應繳作業共 1 題，每題 100 分 我共完成 1 題，應得 94 分
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■ 請確實填寫自己寫完成題數，填寫不實者(如上傳與作業明顯無關的答案，或是計算題數有誤者)，本次作業先扣 50 分。

一、 試建立一個 VGG 模型來實現 Fashion-MNIST 的辨識:

程式碼:

```
from keras.optimizers import SGD
import numpy as np
import keras
from keras.datasets import mnist
from keras.utils import np_utils
from keras.models import Sequential
from keras.layers import Dense, Activation, Conv2D, MaxPooling2D
, Flatten,Dropout
from keras.optimizers import Adam

# load train and test dataset

# load dataset
(trainX, trainY), (testX, testY) = fashion_mnist.load_data()
# reshape dataset to have a single channel
trainX = trainX.reshape((trainX.shape[0], 28, 28, 1))
testX = testX.reshape((testX.shape[0], 28, 28, 1))
# one hot encode target values
trainY = to_categorical(trainY)
testY = to_categorical(testY)

# scale pixels
# convert from integers to floats
train_norm = trainX.astype('float32')
test_norm = testX.astype('float32')
# normalize to range 0-1
train_norm = train_norm / 255.0
test_norm = test_norm / 255.0



model = Sequential()
model.add(Conv2D(32,(3,3),strides=(1,1),input_shape=(28,28,1),pa
dding='same',activation='relu'))
model.add(MaxPooling2D((2, 2)))
```

```
model.add(Conv2D(64,(3,2),strides=(1,1),padding='same',activatio
n='relu'))
model.add(Conv2D(64,(3,3),strides=(1,1),padding='same',activatio
n='relu'))
model.add(MaxPooling2D((2, 2)))
model.add(Flatten())
model.add(Dense(100, activation='relu'))
model.add(Dropout(0.5))
model.add(Dense(10, activation='softmax'))
# compile model
opt = SGD(lr=0.01, momentum=0.9)
model.compile(optimizer=Adam(lr=0.001, beta_1=0.7, beta_2=0.999,
epsilon=1e-
8),loss = 'categorical_crossentropy',metrics=['accuracy'])


model.fit(train_norm, trainY, epochs=10, batch_size=32, validati
on_data=(test_norm, testY), verbose=1)
test_loss, test_acc = model.evaluate(test_norm, testY)
print('Test accuracy:', test_acc)
```

輸出結果擷圖: