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1 from keras.utils import np_utils
2 from keras.datasets import mnist
3 from keras.models import Sequential
4 from keras.layers import Conv2D, pooling, Flatten, Dense
5 # MNIST data
6 (train_images, train_labels), (test_images, test_labels) = mnist.load_data()
7 print(train_images.shape, train_labels.shape, test_images.shape, test_labels.shape)
8 train_images = train_images.reshape(train_images.shape[0], 28,28,1).astype('float32')/255.0
9 test_images = test_images.reshape(test_images.shape[0], 28,28,1).astype('float32')/255.0
10 train_labels = np_utils.to_categorical(train_labels) # One-Hot Encoding
11 test_labels = np_utils.to_categorical(test_labels) # One-Hot Encoding
12 # Model
13 model = Sequential()
14 model.add(Conv2D(32, (3,3), padding='same', strides=(1,1), activation='relu', input_shape=(28,28,1)))
15 print(model.output_shape)
16 model.add(Conv2D(64, (3,3), padding='same', strides=(1,1), activation='relu'))
17 print(model.output_shape)
18 model.add(Flatten())
19 model.add(Dense(10, activation='softmax')) # units=10, activation='softmax'
20 model.compile(loss='categorical_crossentropy', optimizer='sgd', metrics=['accuracy'])
21 # Training
22 model.fit(train_images, train_labels, epochs=15, batch_size=100, verbose=1)
23 # Testing
24 _, accuracy = model.evaluate(test_images, test_labels)
25 print('Accuracy: ', accuracy)
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