

8. Deep Learning – Best Model with Check Pointing

Contents

1. Check point	2
----------------------	---

8. Deep Learning – Best Model with Check Point

1. Check point

- ✓ Deep learning models can take hours, days or even weeks to train and if a training run is stopped unexpectedly, you can lose a lot of work.
- ✓ Now we need to learn how to how we can checkpoint the deep learning models during training.
- ✓ The checkpoint captures the weights of the model.
- ✓ These weights can be used to make predictions for ongoing training.

Program Name	Checkpoint Neural Network Model Improvements
Input file	demo1.py pima-indians-diabetes.csv

```
# importing required libraries
from numpy import loadtxt
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense
from keras.callbacks import ModelCheckpoint

# load the dataset
dataset = loadtxt('pima-indians-diabetes.csv', delimiter = ',')

# split into input (X) and output (y) variables
X = dataset[:, 0:8]
y = dataset[:, 8]

# define the keras model

model = Sequential()

model.add(Dense(12, input_shape = (8, ), activation = 'relu'))
model.add(Dense(8, activation = 'relu'))
model.add(Dense(1, activation = 'sigmoid'))

# compile the keras model
model.compile(loss = 'binary_crossentropy', optimizer = 'adam', metrics =
['accuracy'])

# checkpoint
filepath = "weights-improvement-{epoch:02d}-{val_accuracy:.2f}.keras"

checkpoint = ModelCheckpoint(filepath, monitor= 'val_accuracy' , verbose=1,
save_best_only = True, mode= 'max' )

callbacks_list = [checkpoint]

model.fit(X, y, validation_split=0.33, epochs=150, batch_size=10, callbacks =
callbacks_list, verbose=0)

print("Done")
```

Output

```
.....  
.....  
Epoch 102: val_accuracy did not improve from 0.74016  
Epoch 103: val_accuracy did not improve from 0.74016  
  
Epoch 104: val_accuracy improved from 0.74016 to 0.74803, saving model  
to weights-improvement-104-0.75.hdf5  
  
Epoch 105: val_accuracy did not improve from 0.74803  
  
Epoch 106: val_accuracy did not improve from 0.74803  
  
Epoch 107: val_accuracy did not improve from 0.74803  
  
Epoch 108: val_accuracy did not improve from 0.74803
```