

Tensorflow代码实例

该课程主要为大家讲授如下的内容：

- Tensorflow代码实例

1. 范例模型

范例模型是一个word embeddings+LSTM+Dense处理情感分析任务的模型。数据导入自tf.keras.datasets中的IMDB影评数据集，经过对齐处理后输入模型进行训练，得到的是一个连续的标量。最后自定义编码函数录入实时定义的字符串，得到预测结果。

presentation... (2) - jupyter... x +
localhost:8888/lab/tree/presentation.ipynb#to-migrate-model-with-tensorflow

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PRESENTATION.IPYNB

- 5.3.2. to build a model with custom layer
 - 5.3.2.1. to define a new `tf.keras.layers.Layer`
 - 5.3.2.2. what happened inside this layer?
 - 5.3.2.3. to compose existing layers into a single one
- 5.3.3. to build a more complicated model (non-linear model)
- 5.4. to migrate model with tensorflow
 - 5.4.1. to fully save and load a model (snapshot or checkpoint)
 - 5.4.2. to save and load the architecture of a model
 - 5.4.3. to save and load the weights of a model
- 6. examples
 - 6.1. A simple LSTM neural network for manipulating IMDB samples

6. examples

6.1. A simple LSTM neural network for manipulating IMDB samples

```
[3]: VOCAB_SIZE = 88584
MAXLEN = 250
BATCH_SIZE = 64

(train_data, train_labels), (test_data, test_labels) = tf.keras.datasets.imdb.load_data(num_words = VOCAB_SIZE)

[ ]: print(len(train_data[0]))
print(len(train_data[2]))

[ ]: # As the samples are of varied length,
# we have to make them in the same length,
# elsewhere the model could have issues to accept the input data
# The function 'tf.keras.preprocessing.sequence.pad_sequences()'
# cut off the ending part of a sequence beyond the maximum length we set
# and fill up those shorter than it with '0'.

train_data = tf.keras.preprocessing.sequence.pad_sequences(sequences=train_data, maxlen=MAXLEN)
test_data = tf.keras.preprocessing.sequence.pad_sequences(sequences=test_data, maxlen=MAXLEN)

[ ]: print(len(train_data[0]))
print(len(train_data[2]))

[5]: model = tf.keras.Sequential([
    tf.keras.layers.Embedding(
        input_dim=VOCAB_SIZE,
        output_dim=32
    ),
    tf.keras.layers.LSTM(units=32),
```

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PRESENTATION.IPYNB

- 3.1. what is tensor
- 3.2. what is dataflow graph
- 3.3. tensor as the operand in TensorFlow 2.x, with GPU acceleration
- 4. its advantages
- 5. to use tensorflow, a common way (rather high-level, with detailed practice)
 - 5.1. tensorflow workflow
 - 5.2. to process data with tensorflow (image processing)
 - 5.2.1. basic image processing with tensorflow (from image file and reshaping)
 - 5.2.2. load data from tfds
 - 5.3. to build a deep learning model with tensorflow
 - 5.3.1. to build a simple sequential model (image classification)
 - 5.3.2. to build a model with custom layer
 - 5.3.2.1. to define a new

6. examples

6.1. A simple LSTM neural network for manipulating IMDB samples

```
PAD = 0
text = ""
for num in integers:
    if num != PAD:
        text += reverse_word_index[num] + " "
    return text[:-1]

[ ]: print(decode_integers(encoded))

[14]: def predict(text):
    encoded_text = encode_text(text)
    pred = np.zeros((1, 250))
    pred[0] = encoded_text
    result = model.predict(pred)
    print(result[0])

[15]: positive_review = "Good movie. It's beautiful."
predict(positive_review)

negative_review = "Bad movie. It's awesome."
predict(negative_review)

[0.37648147]
[0.16378728]

[16]: positive_review = "That movie was! really loved it and would great watch it again because it was amazingly great"
predict(positive_review)

negative_review = "that movie really sucked. I hated it and wouldn't watch it again. Was one of the worst things I've ever watched"
predict(negative_review)

[0.9307585]
[0.5017161]
```

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