

COMP9444 Report

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The task of our assignment sentiment analysis involves taking in an input sequence of words and determining whether the sentiment is positive, negative, or neutral.

In preprocess() method: I clean the remove the words in stop words and punctuations. I also lower the case of each reviews and output as a list format.

In define_graph() method:

Firstly, I specify two placeholders one is one for the inputs into the network, and one for the labels.

```
input_data= tf.placeholder(dtype=tf.float32,shape=[BATCH_SIZE,MAX_WORDS_IN_REVIEW, EMBEDDING_SIZE], name='input_data')
labels = tf.placeholder(dtype=tf.float32,shape=[BATCH_SIZE,2], name='labels')
```

The *input_data* is a placeholder to hold each training example that we include in our batch. The *labels* placeholder represents a set of values, each either [1, 0] or [0, 1] which represent whether each training example is positive or negative.

```
lstm = tf.nn.rnn_cell.BasicLSTMCell(64, forget_bias=1.0, state_is_tuple=True, dtype=tf.float32)
lstm = tf.contrib.rnn.DropoutWrapper(cell=lstm, output_keep_prob=dropout_keep_prob)
|
init = lstm.zero_state(BATCH_SIZE, dtype=tf.float32)
outputs, states= tf.nn.dynamic_rnn(lstm, input_data, initial_state=init)
```

Then I'll feed both the LSTM cell and the 3-D tensor full of input data into a function called `tf.nn.dynamic_rnn`. This function is in charge of unrolling the whole network and creating a pathway for the data to flow through the RNN graph.

```
logits= tf.layers.dense(inputs=states.h, units=2, activation=None)
```

Logits will get the of except output of size 2 densely-connected layer function interface.

```
loss=tf.reduce_mean(tf.nn.softmax_cross_entropy_with_logits_v2(logits=logits,labels=labels), name='loss')
optimizer = tf.train.AdamOptimizer(learning_rate=0.0001).minimize(loss)
```

I define a standard cross entropy loss with a softmax layer put on top of the final prediction values. For the optimizer, we'll use Adam and the assigned learning rate of .0001 in order to get the more accuracy weight to improve the total accuracy.

```
correct_prediction = tf.equal(tf.argmax(logits,1),tf.argmax(labels,1))
accuracy=tf.reduce_mean(tf.cast(correct_prediction,tf.float32), name='accuracy')
```

I define the correct prediction and accuracy metrics to track how the network is doing. The correct prediction formulation works by looking at the index of the maximum value of the 2 output values, and then seeing whether it matches with the training labels.

Talk about multiple layers

During test, I find picking stack multiple LSTM cells into our project can increasing the training time dramatically. And the chance of overfitting also increase a lot.