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Loading two models from Saver in the same Tensorflow session

I have two networks: a `Model` which generates output and an `Adversary` which grades the output.

Both have been trained separately but now I need to combine their outputs during a single session.

I've attempted to implement the solution proposed in this post: [Run multiple pre-trained Tensorflow nets at the same time](#)

My code

```
with tf.name_scope("model"):
    model = Model(args)
with tf.name_scope("adv"):
```

```

adversary = Adversary(adv_args)

#...

with tf.Session() as sess:
    tf.global_variables_initializer().run()

    # Get the variables specific to the `Model`
    # Also strip out the superfluous ":0" for some reason not saved in the
    checkpoint
    model_varlist = {v.name.lstrip("model/")[:-2]: v
                     for v in tf.global_variables() if v.name[:5] == "model"}
    model_saver = tf.train.Saver(var_list=model_varlist)
    model_ckpt = tf.train.get_checkpoint_state(args.save_dir)
    model_saver.restore(sess, model_ckpt.model_checkpoint_path)

    # Get the variables specific to the `Adversary`
    adv_varlist = {v.name.lstrip("adv/")[:-2]: v
                  for v in tf.global_variables() if v.name[:3] == "adv"}
    adv_saver = tf.train.Saver(var_list=adv_varlist)
    adv_ckpt = tf.train.get_checkpoint_state(adv_args.save_dir)
    adv_saver.restore(sess, adv_ckpt.model_checkpoint_path)

```

The problem

The call to the function `model_saver.restore()` appears to be doing nothing. In another module I use a saver with `tf.train.Saver(tf.global_variables())` and it restores the checkpoint fine.

The model has `model.tvvars = tf.trainable_variables()`. To check what was happening I used `sess.run()` to extract the `tvvars` before and after restore. Each time the initial randomly assigned variables are being used and the variables from the checkpoint are not being assigned.

Any thoughts on why `model_saver.restore()` appears to be doing nothing?

python tensorflow

asked Jan 12 at 7:12



TheCriticalImperitive

766 2 12

1 Answer

Solving this problem took a long time so I'm posting my likely imperfect solution in case anyone else needs it.

To diagnose the problem I manually looped through each of the variables and assigned them one by one. Then I noticed that after assigning the variable the name would change. This is described here: [TensorFlow checkpoint save and read](#)

Based on the advice in that post I ran each of the models in their own graphs. It also means that I had to run each graph in its own session. This meant handling the session management differently.

First I created two graphs

```
model_graph = tf.Graph()
with model_graph.as_default():
    model = Model(args)

adv_graph = tf.Graph()
with adv_graph.as_default():
    adversary = Adversary(adv_args)
```

Then two sessions

```
adv_sess = tf.Session(graph=adv_graph)
sess = tf.Session(graph=model_graph)
```

Then I initialised the variables in each session and restored each graph separately

```
with sess.as_default():
    with model_graph.as_default():
        tf.global_variables_initializer().run()
        model_saver = tf.train.Saver(tf.global_variables())
        model_ckpt = tf.train.get_checkpoint_state(args.save_dir)
        model_saver.restore(sess, model_ckpt.model_checkpoint_path)

with adv_sess.as_default():
    with adv_graph.as_default():
        tf.global_variables_initializer().run()
        adv_saver = tf.train.Saver(tf.global_variables())
        adv_ckpt = tf.train.get_checkpoint_state(adv_args.save_dir)
        adv_saver.restore(adv_sess, adv_ckpt.model_checkpoint_path)
```

From here whenever each session was needed I would wrap any `tf` functions in that session with `with sess.as_default():`. At the end I manually close the sessions

```
sess.close()  
adv_sess.close()
```

[edited Jan 14 at 3:58](#)

answered Jan 14 at 3:15



[TheCriticalImperitive](#)

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