Parallelizing Deep CNN on GPU/CPU using Keras(theano backend)

ankitrai   **7d**

Hi **@Adrian** and others,

Does anyone know how can we parallelize the CNN keras implementation from Module 8 on CPU/GPU cluster using Keras and Theano backend in terms of data parallelism and model parallelism ?

Thanks in advance!

Adrian   Chief PyImageSearcher   **7d**

The short answer is that you *can* use Keras with multiple GPUs, but not with Theano as the backend -- you would need to use TensorFlow instead:

> ### Issue: Does Keras support using multiple GPUs?
>
> opened by **henry0312** on **2016-04-21**
>
> ```
> Theano has supported multiple GPUs since v0.8.0.
> (cf. Using multiple GPUs — Theano 0.8.0 documentation )
> Does Keras also support using multiple GPUs?
> For...
> ```

François Chollet (author/chief maintainer) of Keras actually has a blueprint for using TensorFlow + Keras with multiple GPUs. He gave me a link to it, but I honestly can't share it since he marked it as a "Secret" GitHub Gist (I don't feel comfortable sharing Gists that the authors mark as "Secret"). I know he plans to make it public in the future. The code also needs to be a bit more cleaned up and made more API-like.

At this point Theano *does* support multiple GPUs:

http://deeplearning.net/software/theano/tutorial/using_multi_gpu.html

But it's unclear if this is replicated inside of Keras as well. This is still in the works.

In the meantime, you might want to take a look at mxnet which natively works out-of-the-box with multiple GPUs:

https://github.com/dmlc/mxnet

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ankitrai   **7d**

Thanks **@Adrian** for detailed response on this. I think it will be useful to work with tensor flow, since i see lot of industries using tf.

Meanwhile, I will look at mxnet.

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ankitrai   **6d**

Hi **@Adrian** , What significant changes one need to do in your implementation of CNN (module 8) for using tensorflow as backend in keras instead of theano?

Thanks in advance!

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tuomo   **6d**

Edit your Keras configuration file at:

```
~/.keras/keras.json
```

Change the variable "backend" from "theano" to "tensorflow":

```
"backend": "tensorflow"
```

Adrian Chief PyImageSearcher   **5d**

@ankitrai - Literally what @tuomo said. You might also have the change `image_dim_ordering` to `tf` instead of `th`. But that's literally it.

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ankitrai   **4d**

Thanks @tuomo and @Adrian for your help. Sorry for late response since was busy in submitting an assignment which required to use CNN on ImageNet