Distributed Deep Learning on AWS/AZURE

andrea.egger 2016-10-14 10:54:12 UTC #1

Hi Adrian,

I'm currently working on a CNN, with around 10,000 training images for binary classification and wondering what the best approach would be in terms of tools to use. My boss wants me to implement a distributed solution but I can't find much material about that. From my understanding this automatically excludes Theano and Keras as they don't support distributed computing so it seems only Tensorflow is left.

Do you think using an AWS/Azure GPU with Theanos/Keras would be enough for this project or do I really have to use a distributed solution with Tensorflow? What do you recommend?

Also, I need to create my own training images from satellite maps. I'm wondering which image size I should use? Do you have any advice regarding that?

Thanks,
Andrea

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tuomo 2016-10-15 13:52:47 UTC #2

My apologies for jumping in ... based on my very limited experience with deep learning, mainly coming from pet projects such as **this**, which used roughly the same amount of training data as your project, I'd say AWS/Azure GPU with Keras on Theano backend is sufficient.

Does your boss plan to scale up the volume of data well beyond 10 000 images? If that's the case, switch to Tensorflow for distributed computing. Otherwise, take the easy way with Theano.

Adrian 2016-10-15 14:34:21 UTC #3

I'd also like to say 10,000 images is not a lot. Given that amount of images you likely won't be using larger network architectures in which case you don't even need the higher end GPUs. You can easily spin up a AWS instance with GPU support and use Keras + Theano.

As **@tuomo** mentioned, if your boss wants to scale up to 100,000 or 1,000,000 images using larger CNN architecture and have training distributed, then yes, use TensorFlow over Theano. But in the meantime, a single AWS instance with GPU support using only Theano + Keras is more than enough.

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andrea.egger 2016-10-16 00:54:49 UTC #4

Great, thank you **@Adrian** **@tuomo** for your feedback. It won't exceed around 10,000 images so I'm going with Keras/Theano. Do you have any recommendation regarding image sizes (32x32, 64x64 etc.) as I need to define them myself. Are there any best practices around this that I need to consider?

Adrian 2016-10-16 11:33:32 UTC #5

> andrea.egger:
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> Do you have any recommendation regarding image sizes (32x32, 64x64 etc.) as I need to define them myself. Are there any best practices around this that I need to consider?

When it comes to machine learning and deep learning: Test, test, test 🙂 It really depends on the size of the objects in your image and their scale. If the objects of interest take up the entire scene of your image and the classes are visually different than each other, than lower resolutions will work better. For other images were you see a lot of scale variation *and/or* the details are important when making a classification (i.e,. "fine-grained classification") then you'll need larger resolutions.

I didn't see this in your original posts, but you mentioned having 10,000 images -- how many classes are you working with?

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andrea.egger 2016-10-17 23:09:14 UTC #6

Thank you Adrian. I'm working with 2 classes.
