06.05.2017

DNN hands on challenge - HW 3

Goals of this HW

1. Make sure you know how to code a network in tensorflow and submit it to the testing server.
2. Learn one small subject thoroughly and present to class

Q1 - Code, train and submit a tensorflow net

1. Code a tensorflow network which is trained on the data provided to you, and submit it to the testing server (using the instructions from the course website)
   The data you use for the training should include the Glucose values from 12 hours before given timestamp (as explained in class).
   (In the next phase you should use at least one more feature other than glucose in your data. This is not mandatory for next class, but will be for the one after next class. By now, most of you should already have everything working so it just means adding another non-glucose feature to your network input and training data)

2. Write a brief report of what you did:
   a. Describe your work with the following terms:

      Input - what data did you use?
      Architecture:
          Layers: how many? what size?
          Activation functions
      Initialization - how did you initialize your weights?
      Optimizer - which one did you use? What parameters did you use?

   b. Whenever possible, write the reasons why you chose this parameter - “theoretical”, “intuition” or trial and error. explain briefly what you tried or what was your intuition about it.

Q2 - Super-Mini-Presentation

Here is a list of subjects that we would discuss during the next meeting (taken from tensorflow documentation):

1. All types of Relu activations: relu, relu6, crelu, elu, (leaky relu, prelu)
2. Other activations: sigmoid, tanh, softsign, softplus
3. Dropout
4. Batch normalizations
5. Gradient descent, stochastic gradient descent (how does it work with batches)
6. Ada-delta
7. Ada-grad
8. Adam
9. xavier_initializer_conv2d, xavier_initializer
10. Variance_scaling_initializer
11. momentum, learning rate, weight decay

Guidance:
Most subjects are taken from the tensorflow documentation. Start from there and expand briefly accordingly. Touch what it is, what is the motivation for using this, the parameters (which and what it does), and if relevant a **short** code sample showing the usage.
You should make a super-mini presentation about one subject from the list - **no more than 4 minutes, 1-2 slides**.

Choosing a subject:
Send back a list of all subjects from above ordered according to your priority.
We would assign one subject each and let you know asap (the assignment is first come first served, so be quick to reply to keep your chances of getting your choices higher (but don't worry, all subjects are equally interesting :))).

General Submission Notes

1. Q1 in pdf format
2. Q2 in powerpoint format or (better..) a link to google slides presentation.
3. Submit both Q1 and Q2 in one mail together.
4. Submission in pairs (one per group).
5. Send everything to both: niv.haim at weizmann ac il & hadar.gorodissky at weizmann ac il

Have fun! :)
Hadar & Niv