Lab Course: Distributed Data Analytics
Exercise Sheet 6

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Submission deadline: Friday June 17, 23:59PM (on LearnWeb, course code: 3116)

Instructions

Please following these instructions for solving and submitting the exercise sheet.

1. You should submit a zip or a tar file containing two things a) python scripts and b) a pdf document.
2. In the pdf document you will explain your approach (i.e. how you solved a given problem), and present your results in the form of graphs and tables.
3. The submission should be made before the deadline, only through learnweb.

Tensorflow in Research

In this lab, we will be starting with non-toy example implementations of neural networks. This is an extended lab, you have two weeks to implement this lab.

The lab is broken down in two parts. Part 1 deals with the research paper while Part 2 is the implementation.

Part 1: Research Paper (5 Points)

- You can find the paper on learnweb.
- Read the paper and summarize the architecture design.
- You are supposed to use the paper and explain section 3.2. This does NOT mean you have to rewrite what is already in the paper.Please expand on what you understand from it, specifically, How the backpropogation pass works.

Part 2: Research Paper Implementation (15 points)

Plagiarism: Submitting plagiarized work will not be tolerated in this lab by any means.

Data: The paper talks about using the PAMPA2 dataset, you can find the dataset at `http://archive.ics.uci.edu/ml/datasets/pamap2+physical+activity+monitoring`. The authors have talked about their choice of a subset of the data and the preprocessing steps that they have applied. Treat the raw data in a similar manner. **Please Show this both your report and the code.**

- Implement the model as described by the authors using tensorflow.
- If you have made ANY changes to the author's approach, mention it and state why you chose differently.
- Use the examples posted on the learnweb and include tensorboards in your report. Include, gradient information, histograms, loss, and accuracies.
- You should be able to reproduce the results of the author.
- You are NOT allowed to use Keras for any purpose, using keras will not get your any credits.
- Present your results and compare them against the author's, if you have not been able to reproduce the results, investigate and report what caused this.

Annex

1. TensorFlow Tutorial CNNs: https://www.tensorflow.org/tutorials/deep_cnn
2. CNNs: http://cs231n.github.io/convolutional-networks/
3. CNNs: http://cs231n.github.io/convolutional-networks-1/
4. Data preprocess http://cs231n.github.io/neural-networks-2/
5. http://cs231n.github.io/neural-networks-3/
6. CNN Lecture 1 https://www.youtube.com/watch?v=bNb2fEVKeEo&t=833s&list=PL3FW7Lu3i5JvHM8ljYj-zLfQRF index=6
7. CNN Lecture 2 mini-batch http://cs231n.stanford.edu/slides/2017/cs231n_2017_lecture6.pdf