ECS795P 2020: Coursework3

Description of Coursework 3

- ➢ Task
  - **Deeper Networks for Image Classification:** Performing and evaluating image classification tasks with deeper networks (related to Week-11 Lecture)
- ➢ Requirements
  1) You should use *at least* two deep networks including VGG, ResNet, GoogleNet.
  2) You *MUST* use MNIST dataset for the image classification task. Moreover, we encourage you to use extra datasets (such as CIFAR, Tiny-Imagenet) to further evaluate the deeper networks.
  3) You should submit a 6-page report including
     1) Critical analysis of models;
     2) Implementation of model training and test settings, including the model training/testing process (the loss changing during training period, the train/test accuracy, etc.), to support your experimental results;
     3) Evaluation on your experimental results;
     4) Run-time screenshots.
  4) You should submit your codes together with your report above.
- ➢ Timetable
  1) You should complete and submit all materials in a single zip file by the DEADLINE on Friday 08/05/2020 at 23:55 via QM+.
  2) One week late-submission with standard penalty applied is allowed (late-submission deadline 23:55 Friday 15/05/2020).
- ➢ Suggestions
  1) For more details on the deeper networks, i.e. VGG, ResNet, GoogleNet, you can access the original papers in http://www.eecs.qmul.ac.uk/~sgg/_ECS795P_/papers/.
  2) If you have made improvements on the base networks, please highlight, and this will get extra marks.
  3) For the submitted materials of cousework3, please make sure that it is small enough to be within the limit of QM+ online submission limit (DON'T include the datasets in your submitted materials).
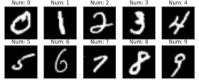 4) You must use python + TensorFlow (can also with Keras) or + Pytorch. Any version is acceptable.

An example template of a coursework 3 report:

Deeper Networks for Image Classification

Author

1. Introduction

2. Critical Analysis / Related Work

3. Method / Model Description

In this paper, I use various deeper networks for evaluating the effectiveness of deeper CNN models for image classification on MNIST.

3.1 Model Architecture

(I) VGG-16

(II) ResNet

(III) GoogLeNet

3.2 XXX

3.3 XXX

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4. Experiments

4.1 Datasets

The MNIST database [1] of handwritten digits, available from this page, has a training set of 60,000 examples, and a test set of 10,000 examples. It is a subset of a larger set available from NIST. The digits have been size-normalized and centred in a fixed-size image.

4.2 Testing Results

4.3 Further Evaluation

4.4 XXX

5. Conclusion

Reference

[1] Y. LeCun, L. Bottou, Y. Bengio, and P. Haffner. "Gradient-based learning applied to document recognition." Proceedings of the IEEE, 86(11):2278-2324, November 1998.