ECS795P CW3 Mini-Project

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CW3 will be made available on Wednesday 7th April 2021. The <u>submission deadline is Sunday 16th May</u>, to be submitted by QM Plus. A submission portal on QM Plus will be made available. We will also allow for one-week <u>late submission with standard penalty applied up-to Sunday 23rd May 2021</u>.

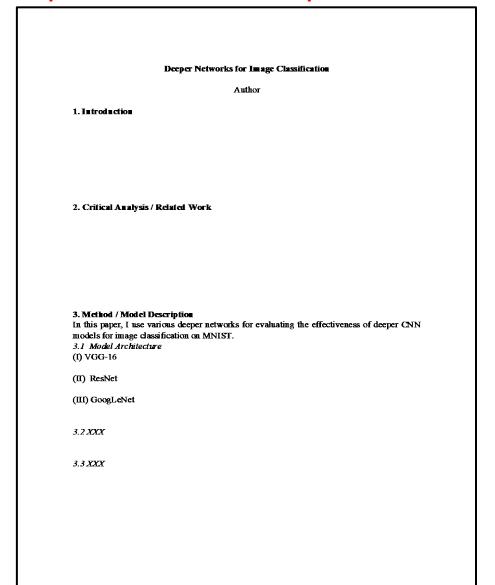
CW3 assessment weighting in relation to all other assessments:

- (1) The <u>coursework 3 mini-project has a weighting of 50</u>% of the total course assessment
- (2) The coursework 2 has a weighting of 15%
- (3) The coursework 1 has a weighting of 15%
- (4) The two critical reports have a weighting of 10% each

Description of ECS795P CW3 Mini-Project

- Task: **Deeper Networks for Image Classification** Performing and evaluating image classification tasks with deeper networks
- 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 (a research paper) 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.
 - 5) Report format: Please use the same LaTeX style as required for your MSc final project report (double-column, 11pt font size)
 - 4) You should submit (a) your codes for model building, data loading & processing, training, evaluation, and visualisation; (b) evidence of model training and inference/test including text logs, tensorboard logs, run-time screenshots, any other logs demonstrating the training process with explicit **timestamps** recorded in a file/files (no need to submit the trained weights); (c) your six pages report.
- > Timetable
 - 1) Submit all materials above ((a)-(c)) in a single zip file by the DEADLINE on Sunday 16/05/2021 at 23:55 via QM+.
 - 2) One week late-submission with standard penalty applied is allowed (late-submission deadline 23:55 Sunday 23/05/2021).
- Suggestions
 - 1) For more details on the deeper networks, i.e. VGG, ResNet, GoogleNet, you can access the original papers on coursework webpages.
 - 2) If you make any improvement on the base networks, please highlight them in the intro, method and experiment sections of your report.
 - 3) For the submitted materials of this project, 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).

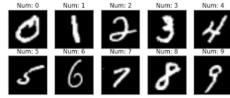
An example template of a coursework 3 report:



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.

Marking Criteria of ECS795P CW3

- Visualisation (e.g. image examples of success & failure cases, screenshot of classification input & output, visualisation of model training & testing processes) 15 marks
- Literature critical review, Model aims, and Report organisation 10 marks
- Implementation, Code training & testing, and Scope (e.g. how many different models trained and tested) 15 marks
- Report writing and clarity 25 marks
- Experiment analysis and testing, including the number of datasets used for testing & analysis 25 marks
- Model design and/or performance improvement (e.g. new model training strategy, modifications to existing models, new model design, new learning tasks beyond classification) 10 marks

Total 100 marks (for a 50% of the total assessment)