CW1 – Movie Poster Genre Prediction

- Due 30 Apr by 12:00
- Points 50
- Submitting an external tool
- Available 22 Mar at 18:00 - 7 May at 12:00

Weighting %:	50	**Submission deadline (for students):**	See Canvas
Authorship:	Individual	**Target date for returning marked coursework:**	
Tutor setting the work:	Ashley Spindler	**Number of hours you are expected to work on this assignment:**	

This Assignment assesses the following module Learning Outcomes (from Definitive Module Document):

1. have knowledge of and understand how gpus can accelerate data processing

2. be able to write data procession pipelines that explot tensorflow

3. have knowledge of and understand how to develop GPU accelerated data processing pipelines using tensorflow

Assignment Tasks:

This is an image recognition task, where you will build a neural network capable of predicting the genre of a movie from its poster. You will need to prepare an image preprocessing pipeline, define the neural network architecture, and finally train and test the model. Use the google colab notebook provided, and prepare a 1-2 page report that critically evaluates the model.

Notebook: **Keras_Assignment_Feb24.ipynb (https://herts.instructure.com/courses/110656/files/8515705?wrap=1)** **(https://herts.instructure.com/courses/110656/files/8515705/download?download_frd=1)**

Dataset: **Multi_Label_dataset.zip (https://herts.instructure.com/courses/110656/files/8478204?wrap=1)** **(https://herts.instructure.com/courses/110656/files/8478204/download?download_frd=1)**

The assignment is broken up into sections and you need to complete each section successively. The sections are:

1. Data Processing - You will need to write a small image processing function and then utilise the tensorflow tf.data API to build an efficient and optimised data processing pipeline.

2. Model Definition - Given a predefined model summary, you need to construct and compile a convolutional neural network. You will need to discern the correct layer settings from the model summary by inspecting the output shapes and number of parameters in each layer.

3. Model Training - You will define a set of callbacks to log the model process, and then train it for a given number of epochs.

4. Model Evaluation - You will inspect and analyse the models performance by creating plots and discussing them with a critical eye in a 1-2 page written report.

In addition to this coding exercise, you must write a 1-2 page report analysing and critically evaluating your model's results. Marks for the report will be awarded for depth of analysis and critical thinking skills. You should consider how well your model performs and WHY it does that—give specific examples and comment on their importance.

Submission Requirements:

Submission for this assignment is done via CodeGrade. You should submit your notebook via the upload option. You may submit your work three times, and will be able to see the preliminary results of the automated tests—as such, you are encouraged to start your work early so that you can resubmit if some of the tests fail. You should also submit your report as a pdf on CodeGrade.

Marks awarded for:

Completion of the tasks above as assessed by the CodeGrade AutoTests, quality of plots and depth of critical analysis in the report.

Exercise 1 – 10 marks, automated tests in CodeGrade, completion of the data prcoessing pipeline including using optimisation strategies

Exercise 2 – 10 marks, automated tests in CodeGrade, model definition and set up

Exercise 3 – 5 marks, automated tests in CodeGrade, model training

Exercise 4b – 2 marks, automated tests in CodeGrade, loading best model weights from checkpoints

Plots – 8 marks, Plots should be well formatted, relevant, and include a range of example images from the dataset along with the classifications

Analysis – 10 marks, analysis should be thorough a critical, demonstrating and understanding of the model architecture and give explanations as to how and why the results come about

Writing Quality – 5 marks, writing should be clear and understandable, with good use of academic language and correct spelling and grammar

Type of Feedback to be given for this assignment:

You will receive feedback from the AutoTest feature on whether each section of your assignment passes the tests. Limited additional feedback is available at request, and solutions for the assignment will be released once the grades are finalized.

Additional information:

· Regulations governing assessment offences including Plagiarism and Collusion are available from **https://www.herts.ac.uk/__data/assets/pdf_file/0007/237625/AS14-Apx3-Academic-Misconduct.pdf**

(https://www.herts.ac.uk/__data/assets/pdf_file/0007/237625/AS14-Apx3-Academic-Misconduct.pdf) (UPR AS14).

· Guidance on avoiding plagiarism can be found here: **https://herts.instructure.com/courses/61421** (https://herts.instructure.com/courses/61421) (see the **Referencing** section)

· For **postgraduate modules**:

o a score of 50% or above represents a pass mark.

o late submission of any item of coursework for each day or part thereof (or for hard copy submission only, working day or part thereof) for up to five days after the published deadline, coursework relating to modules at Level 7 submitted late (including deferred coursework, but with the exception of referred coursework), will have the numeric grade reduced by 10 grade points until or unless the numeric grade reaches or is 50. Where the numeric grade awarded for the assessment is less than 50, no lateness penalty will be applied.

This tool needs to be loaded in a new browser window

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