Project
Artificial Intelligence

1 Introduction

The objective of this project is to help you gain a better understanding of deep learning methods for image classification.

2 Project Format

This is a group assessment with individual components. Students are to work in groups of two students.

3 Data sets

You have to prepare the datasets. You may get it from the internet, or you search for online or use mobile free application to take burst shot of the fake or real object. You have to ensure sufficient number of images in the training and test datasets to prevent underfitting. Justify the number of images that you had decided. For examplem, if your assignment object is mushroom you will be required to include datasets of all common types of mushroom.

4 Presentation and submission of work

You are required to prepare a video presentation using TEAMs. Two students per group and each student to present for 5 min. You have to upload your work before midnight of 3rd July(Sun). **10% deduction of total marks per day of late submission.**

Zip all your submissions and name it as:

pxxxxxxx_1st Stud_name_pxxxxxxx_2nd Stud_name.zip

Your submissions should include:

(1) You presentation video named as:

- pxxxxxxx_1st Stud_name_pxxxxxxx_2nd Stud_name.mp4

(2) The following files:

- PPT
- Training ipynb or py files
- Datasets
- Weight file
- Requirements – library dependencies, installation requirements, etc

5 Progression

1. You have been given a pre-trained working model to recognize the hand gestures of rock-paper-scissor. As a start, you can replace the input images with your assigned object (your datasets) to be recognized. Bear in mind that the r-p-s model has 3 classifications so if you are required to recognize 4 classifications then you will need to modify the program accordingly.

2. You can also explore to replace the inceptionv3 model with vgg16 (or other model) and make comparison of the training time, accuracy and performance. Present your findings and conclusions.

3. Finally you have to create a simple model from scratch (build layers by layers) you may refer to Huawei's deep learning lab sheets on CNN and you also may consult available online solutions but make sure to provide reference and you are required to explain the code in your video presentation. You are free to use any open source framework e.g. tensorflow, etc. You must discuss and analyze the performance of your model in terms of evaluating its performance indicators.

4. Explain the pre-processing methods and data exploratory methods you have used and why you have chosen them.

5. Your code must be well structured and clear with comments where necessary.

6. Work with your teammates for shared tasks building model, visualization graph, selections of hyperparameter, optimizer, conclusions and any recommendations.

7. There will be Q&A session to assess your understanding and depth of learning.

6 Marking Scheme

Component	Marks	Remarks
Dataset preparation	15	0 if all data captured from internet
Model building	20	0 if only use pre-trained model
Adequate visualizations	10	
Performance and evaluation (real time recognition)	15	If 2 classes – 3 classifications as one will be unknown
Video presentation	15	Clear voice, video and systematic & good flow and thorough presentation
Q&A	5	
Conclusions (submission of work)	10	
Extra wow factor (outstanding, demonstrate deep learning, etc)	10	

Notes:

- If you are not able to build a simple model from scratch but able to use the given inceptionV3 to work with your datasets and sufficient visualization. Maximum is 45%
- Presentation time: 5 min per student, clear video and voice and able to explain coding clearly& demo the inference.

Upload this page with your signatures in the submission

SP SCHOOL OF ELECTRICAL & ELECTRONIC ENGINEERING

Non-Plagiarism Declaration Form

SECTION A. PLAGIARISM WARNING

1. No student shall submit source code from another person as his/her own assignment.
2. No student shall copy work found in print in books and articles or on the Web without giving proper credit to the original sources.
3. No student shall download or copy, in part or in their entirety, source code found on the Internet and submit the source code as his/her own work.
4. No student shall contribute any work to another student within the class or from another class if he/she knows or should know that the latter may submit the work in part or whole as his/her own.
5. Any student found to have committed the offence plagiarism may be subject to the following disciplinary actions.
   a. The student shall receive no marks or a reduction of marks for his/her assignment.
   b. The student shall fail the module, course or program of study.

SECTION B. DECLARATION BY STUDENT

For a group project, all members are required to sign on the same form.

I declare that all material in this assignment is my own work and does not involve plagiarism.

Module Code and Title: _____

Semester and Academic Year: _____

1. Signature of Student: _____

Name of Student: _____

Date: _____

2. Signature of Student: _____

Name of Student: _____

Date: _____

3. Signature of Student: _____

Name of Student: _____

Date: _____