CSC14003 - Artificial Intelligence
PROJECT 02 – Image Classification

August 13, 2021

I Problem

I.1 Dog vs Cat Classification

In this section, you need to learn and build an image classifier from scratch to distinguish cat photos from dog photos.

I.1.1 Tutorials

You can refer to the following tutorials:

- **Beginner-friendly Project Cat and Dog classification using CNN**
- **Build a Convnet for Cat vs Dog Classification**
- **How to Classify Photos of Dogs and Cats (with 97% accuracy)**

I.1.2 Dataset

You must use the **"Dogs vs. Cats" dataset** available on Kaggle, which contains 25,000 images.

I.1.3 Network architecture

In this project, you are allowed to use any neural network model that contains only the following layers: Convolutional layer, Pooling layer, Fully connected layer.

I.1.4 Report

In the report of this section, you should include the following:

- Distinguish 3 types of training set, validation set, test set. Describe how to detect and prevent overfitting and underfitting problem.
- Describe the components of the model you use and why you chose it. Point out the advantages and disadvantages of the model.
- Present the results you achieved, explain the reasons for that result. Suggest ideas for improvement.
- All links and books related to your submission must be mentioned.

I.2 Dog and Cat Detection

You are not required to do this section.

In this part, you are asked to write a program that uses the results of the previous section to draw bounding boxes around dogs and cats in pictures. You can refer to the tutorial on **sliding window** technique.

I.2.1 Report

In the report of this section, you should include the following:

- Describe how to compile and use the program.
- Present the results you achieved, explain the reasons for that result. Suggest ideas for improvement.
- Point out the bad points of the program. (Does the data and model of the previous part match the requirements of the program, does the drawn bounding box fit the subject,...). Show how to fix it.
- All links and books related to your submission must be mentioned.

II Submission regulation

- This project is for a group of 3 students and needs to be completed in 2 weeks.
- Students create a folder <Student's ID 1>_<Student's ID 2>_<Student's ID 3> containing the contents following:
  - <Code> folder: contains the whole project.
  - Executable file (optinal).
  - Report.pdf
- Compress the above folder into <Student's ID 1>_<Student's ID 2>_<Student's ID 3>.zip for submission.
- Submission with wrong regulation will result in a "0" (zero).
- Plagiarism and Cheating will result in a "0" (zero) for the entire course and will be subject to appropriate referral to the Management Board for further action.