

COS30082 Assignment– Bird Species Classification

Weighting: 20%
Individual Assignment

1. Details

In this assignment, you will work on multi-class classification. You can use any of the techniques you have learned so far to solve this problem.

2. Dataset

Caltech-UCSD Birds 200 (CUB-200) is an image dataset with photos of **200 bird species** (mostly North American). The training images consists of 4829 number of images. You may download the images and annotation file in Canvas's *Assignment information page*.

Caltech-UCSD Birds 200

<http://www.vision.caltech.edu/visipedia/CUB-200.html>



3. Image and Annotation files

You can find the training images in the **Train.zip** folder and the annotation file in **train.txt**. The format of the **train.txt** file is as follows:

image's name{space}class label

Here is an example:

```
Black_footed_Albatross_0019_416160254.jpg 0
Black_footed_Albatross_0005_2755588934.jpg 0
Laysan_Albatross_0014_174432783.jpg 1
Sooty_Albatross_0005_340127050.jpg 2
.
```

You can also find the testing images in the **Test.zip** folder and the annotation file in **test.txt**. Its format is the same as the one of the training.

4. Evaluation metric

You have to report your results with these two evaluation metrics: the *Top-1 accuracy* and the *Average accuracy per class*. You can also include additional evaluation metrics subject to proper justification.

The *Top-1 accuracy* is used to evaluate the overall classification performance of the models in this competition.

$$\text{Top-1 accuracy} = \frac{1}{N} \sum_{k=1}^N 1\{\text{argmax}(y) == \text{groudtruth}\}$$

where N = total number of testing images, y is the output probabilities of 200 classes.

Also, the *Average accuracy per class* is used to assess the performance of an individual class:

$$\text{Ave} = \frac{1}{C} \sum_{i=1}^C T_i$$

where T_i is the average accuracy for all test images related to the C_i class and the C is the total number of classes.

5. Required Submission

Submit to Canvas page under Assignment submission link.

Report:

A report (PDF) consisting of two sections: *Methodology* and *Result and Discussion*.

There is a high probability that you will run into *overfitting* problems, so if this is the case, your model design should take into account how to minimize this problem. You should describe your models' architecture, loss function, hyperparameters, and any other details of interest, and discuss the performance differences between them. You should also justify which model gave you the best result.

Please limit the report to *4 pages*. And, report must include your *name* and *ID*.

Python program source code:

Create a single zip file with your code, and submit together with the report.

*Please comment generously to show that you understand your code.

Video Presentation:

Your presentation should:

- Explain key concepts you are using and your model design. Slides are Recommended.
- Present and explain your code.
- Demonstrate the training and results generated.
- Present your AI model web application via Hugging face.
- Max 10 mins

Please attach the video link (Youtube link) in your report. Also, please attach the hugging face link in your report too.