

**SCHOOL OF COMPUTER TECHNOLOGY**

AASD 4014 Deep Learning II

**Project 1**

**Classifying Images using CNN**

In this exercise students are expected to build a CNN to classify images.

**Application:**

Image classification has a lot of applications, and we see different implementations in our daily life around us, like health, security etc.

**Database:**

Students are free on the choice of databases. You can build your own database by downloading images from internet or use databases such as ImageNet. The database need to meet the following criteria:

1. Database need to have at least 5 classes (more is recommended like 10)
2. Database should at least have 800 images (1000 images or more is recommended)

**Report:**

Put your results in a report. Report need to include:

* Problem statement,
* Database (how you have created it, or where did you get it,
* The CNN model and
* Results, the model performance (test, valid), the loss, predictions…

Use confusion matrices

In your results please comment and discuss the following:

1. Evaluate the model, how?
2. How your model change when you have a deeper model or change number of nodes (try optimizing your model architecture)?
3. The best performance (i.e what are the model hyperparameters or structure that you will get the best performance, or most optimized model)

Important Note:

You have to make sure to perform your training in 3 steps:

1. Only train your data with 200 images and evaluate model
2. Use the same original images in part I) and augment 300 more images from them. Now train your model on the 500 set of images
3. Train your model with 1000 original images (or total number of images if your dataset has less)
4. Augment 1000 more images and train your data in the 2000 (1000 original plus 1000 augment)