MSBD6000B Project 2 Report

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- **Data Preprocessing**
  - Data Loading
    I used OpenCV to load the data. As the images are not the same size, basically from around 150X150 to around 350X350, I resize them into the same size of 231X231.

- **Model Training and Selection**

I split the training data in to batches with batch size of 64, since the memory utilization will be largely consumed when I change the batch size to 128 and the training time will also be tripled.

To design the CNN. I adopted 3 convolutional layers and 2 fully connected layers.

- Conv1
  In the first convolutional layer. I will produce 64 feature maps from the original 3 input channel. Each convolutional kernel is 3X3 and the stride is 1 (with padding). After the transformation, this layer will output a shape of (64, 231, 231, 64) to the next layer.
- Pool1
  Right after Conv1, I applied a 2X2 pooling layer. After transformation, the output shape is (64, 116, 116, 64)
- Conv2
  In the next convolutional layer, I still use 64 as the feature map number. The kernel size is still 3X3. The output shape is (64, 116, 116, 64).
- Pool2
  Pool2 is also 2X2 pooling. The output shape is (64, 58, 58, 64)
- Conv3
  In Conv3, I still use 64 as the feature map number. The kernel size is still 3X3. The output shape is (64, 58, 58, 64).
- Pool3
  Pool3 is also 2X2 pooling. The output shape is (64, 29, 29, 64). And after flattening it, the shape becomes (64, 53824).
- FC1/FC2
  The final two fully connected layers both have 1024 nodes, connected the final output with 5 labels.

- **Experiment and result**

The experiment last for around 1.5 hours (last time my own laptop spend around 14 hour to train, and this time I use another machine in the university' s library) and only 6 epochs have been run. The training accuracy is 25% and the validation accuracy is around 23.2422%. Both of them are very closed, but still have a great fluctuation, and can still both drop to around 15%. Apparently, the model is still underfit and need more

time to train.