

Homework #5

You must report your results clearly and answer all questions to receive full credit.

Please complete the assignment using Jupyter Notebook or Google Colab and implement your code using PyTorch.

Please email your completed assignment as a single PDF file to `mmarini2@Central.UH.EDU`.

Transfer Learning

This problem involves 5-class classification using the Cats breed dataset (<https://www.kaggle.com/datasets/yapwh1208/cats-breed-dataset>) that was presented in class using a transfer learning model from AlexNet.

1. Download the pre-trained classification model built on the AlexNet architecture (see https://pytorch.org/hub/pytorch_vision_alexnet/) for multi-class classification.
2. Apply transfer learning by freezing the first section of the architecture (including the input layer) and only tuning the last section of the architecture (the last FCC layer). Note that you will also need to modify the output later since the number of classes is 5. Use 80% data for training and the rest for testing. Evaluate the model's performance by plotting the training and test loss function and the **classification accuracy** on the test set with respect to the number of epochs (you can run 5 or more epochs). Be careful in choosing the learning rate small enough to ensure you are tuning your pre-trained model.
3. (This part is for extra-credit) Fully train AlexNet and compare the classification performance with the result obtained using the pre-trained model.