AML 2024

CMI

Assignment 1

(**Due Date**: Sep 28, 2024)

1) Classifier for Fashion MNIST: This dataset contain (see below) contains images of 10 types of clothing, shoes, or other material. Your task is to build a classifier for this dataset using CNN.
    a) Classify each image into one of 3 classes {clothes, shoes and others}. For this you have to look the 10 labels and group them into one of these 3 classes.
        i) First label the images in the training and the test dataset using these 3 labels
        ii) Then, train your neural network with to predict one of these 3 labels
        iii) Finally show the performance on the test set
    b) Show the effect of permuting the image pixels on CNN classifiers, as we saw in the lectures

    Fashion-MNIST Dataset: https://github.com/zalandoresearch/fashion-mnist

2) Build a Resnet-18 classifier for the Emotion Detection Dataset (https://www.kaggle.com/datasets/ananthu017/emotion-detection-fer/data)
    a) First train a classifier from scratch.
    NOTE: Resnet-18 and other models are built-in Pytorch and you can use those if you like.
    b) Next, fine-tune a pretrained Resnet-18 on this dataset.
    As before, pytorch has a pre-trained Resnet-18 built-in
    c) For both cases show the performance on the Test set, and compare results
    d) Note that Resnet expects images to have size 224x224 pixels, and color.
    You have to pre-process the images in the dataset accordingly.

Instructions:

- You have to submit a jupyter notebook (ipynb) with all your code and outputs of the code
- You have to submit a 1 page writeup documenting what you have done
- You have to upload these files on moodle, so make sure they are not larger then 8mb.
    - Contact the TAs if you face any issues
- If you don't include the outputs in the ipynb you will get partial credit
- You can work in groups of 2 or 3
    - Only one member of the group should submit the assignment
    - Please mention the names and roll-numbers of all group members
- You are free to build upon examples shown in class
- Please check and confirm with the TAs that your submission has been received on time and **there are no issues with the uploaded file.**
    - No requests for re-submitting the assignment later because of any reason will be accepted after the due date.