CS-898 BD- Deep Learning
Assignment-1
Convolutional Neural Network

Due date: 25th September 2023 (11.59 pm)

Dogs vs Cats is a Kaggle challenge for image classification link. Make an attempt at training the best CNN classifier for this task. Use the script to download, extract and process the raw data to 64×64 images. You may also do your own cropping, but state the image sizes you are using. This question is meant to give you a chance to play with the methods seen in class and apply them to a real classification task. Show your efforts by recording what you have tried on the report.

(a) Describe the architecture (number of layers, filter sizes, pooling, etc.), and report the number of parameters. You can take inspiration from some modern deep neural network architectures such as the VGG, RESNET networks to improve the performance.

(b) Plot the training error and validation error. You can use the optimization techniques you learned in the class, such as different optimizers or feature normalization, to accelerate training. In particular, try Batch Normalization.

(c) Compare different hyperparameter settings and report the final results of performance on test set. Aside from quantitative results, also include some visual analysis, such as visualizing the feature maps or kernels or showing examples where the images are
[i] clearly misclassified and
[ii] where the classifier predicts around 50% on both classes.

Explain your observation and/or suggest any improvements you think may help.