Project 1 – Scene Classification

Dataset: This dataset contains about 3.5k images from a wide range of natural scenes from all around the world. Dataset can be found here.

Task: Goal is to identify which kind of scene can the image be categorized into. This is a 6 class problem with the classes being Buildings, Forests, Mountains, Glacier, Street, Sea.

Implementation:

- Implement a CNN using the Keras framework to accomplish the task.
- Perform the below 4 experiments in the notebook. For each experiment perform data augmentation, use relu activations and max pooling.
- Plot training and validation accuracy, and training and validation loss.
- Display overall categorical accuracy and display precision, recall, Fscore for each class.

Experiments:

Experiment 1: 4 CNN layers, no dropout

Experiment 2: 4 CNN layers, dropout=0.2, add batchnorm

Experiment 3: 4 CNN layers, dropout=0.2, add batchnorm, add glorot uniform ie Xavier uniform initialization

For first 3 experiments use rmsprop optimizer

Experiment 4: Try to beat the performance of the above 3 models. You can use any technique or a combination of techniques like more CNN layers, dropout, batchnorm, weight initialization, change optimizer, etc

Discussion: Please discuss the results of the experiments and analyze the results.