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Special Topics in Information Systems

Image Classification

Session # 4 (2018-2019)

Objectives

1. understand the basic **Image Classification pipeline** and the data-driven approach (train/predict stages)
2. understand the train/val/test **splits** and the use of validation data for **hyperparameter tuning**.
3. develop proficiency in writing efficient **vectorized** code with numpy
4. implement and apply a k-Nearest Neighbor (**kNN**) classifier, (**SVM**) classifier, **Softmax** classifier and a **Two layer neural network** classifier
5. understand the differences and tradeoffs between these classifiers
6. get a basic understanding of performance improvements from using **higher-level representations** than raw pixels (e.g. color histograms, Histogram of Gradient (HOG) features)

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Problem Statement

In this lab session, you will be doing the assignment given in Stanford university for the CS231n Convolutional Neural Networks for Visual Recognition Course: https://cs231n.github.io/assignments2018/assignment1/

Lab session

Implement the requirements set in the knn.ipynb ,svmipynb, softmax.ipynb, two_layer_net.ipynb and features.ipynb and corresponding python files

Report Requirements

- You should submit a report showing your work and the pseudocodes you followed.
- You should change the tuning parameters used in cross validation and report best accuracy.
- You should explain how data is presented in each classifier.
- You should report models accuracies and results.

Notes

- **This lab session needs more time. So, try to start working on it early.**
- You should work in groups of two. Each student should answer any questions in the lab session.
- You should deliver well documented code as well as a report showing all your work and conclusions.
- Copied assignments will be penalized; so not delivering the assignment would be much better.
- You should write your code in python.