Assignment-3
CSL7360 - Computer Vision

NOTE:

1. This assignment has 4 problems.
2. **Deadline:** April 9, 2023, 10:30 PM.
3. **Maximum Points:** 100

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1. **Eigen faces from scratch:** Use the subset of the LFW dataset provided with this assignment, include 1 face photograph of your favorite Indian sportsperson from the web to augment the dataset, and implement Eigen face recognition from scratch. You may use the PCA library, but other functionalities should be originally written. Show top-K Eigen's faces of the favorite Indian sportsperson you considered in for different values of K. The report should also contain a detailed quantitative and qualitative analysis. (Use provided data as train set and a test set will be provided separately)
2. **Visual BoW** Develop an Image Search Engine for CIFAR-10 that takes the image as a query and retrieves top-5 similar images using Visual BoW. Report Precision, Recall, and AP. Draw the P-R curve. Write down each step of implementation in clear and precise terms with an appropriate illustration.
3. **Viola Jones Face detection:** Write down Viola Jones's face detection steps in detail.
4. **Sliding window object detection using HOG:**. You are given a few deer train images with this assignment. Manually crop them to find out tight bounding boxes for Deer and also obtain some non-deer image patches of different sizes and aspect ratios. Compute HOG features for deer and non-deer image patches and build an SVM classifier to classify deer vs non-deer. Now, implement a sliding window object detection to find out deer in the test images. Write down each step in the report. Also, objectively evaluate your detection performance.

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