

Homework 4 Writeup

Instructions

- Provide an overview about how your project functions.
- Describe any interesting decisions you made to write your algorithm.
- Show and discuss the results of your algorithm.
- Feel free to include code snippets, images, and equations.
- List any extra credit implementation and result (optional).
- Use as many pages as you need, but err on the short side.
- **Please make this document anonymous.**

Project Overview

In this project, we were responsible for creating a program that performs scene recognition. We were asked to classify scenes into one of 15 categories. To do this, we trained and tested on 15 scene databases.

Implementation Detail

This project consisted of multiple tasks:

Tiny Images:

The tiny image feature, by Torralba et al., is responsible for running the simplest possible image representations. It resizes each image to a small fixed resolution. In this project, we resized it to be 16×16 .

Nearest Neighbor Classification:

Here, we were asked to find the "nearest" training example. As described in the handout, it represents an arbitrarily complex decision boundaries and it also supports multi-class problems.

Bag of Words:

This method is a popular technique for image classification. The model uses word arrangements to classify based on a histogram of the frequency of visual words.

Multi-class SVM:

In this task, we had to train 1-vs-all linear SVMs to classify the bag of words feature space. We are then asked to evaluate the bag of words paired with 1-vs-all linear SVMs to hopefully get an accuracy ranging from 50% to 60%.