

Project Proposal
On
Scene Classification of Man Made vs Nature Scenes

Module:- CS 5339



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1 Objective

The objective of this project is to apply machine learning algorithms to perform scene classification. We wish to perform binary classification on an image data set and classify whether a given scene is a man made scene or a nature scene.

2 Motivation

With advances in computer science, computers are becoming increasingly human like. One of the primary capabilities of humans is their ability to view objects and classify them. We are able to identify objects and link them to our prior knowledge based on viewing them. While this is something which comes inherently to humans, it is not something which is easy for a machine to accomplish. In this project, we target one of the basic objectives of computer vision which is to enable machines to see and interpret images in the same way humans do. Here we aim to train a machine to be able to classify images such that they can distinguish between nature scenes and man made scenes.

3 Data Set

The proposed dataset comprises of 665 images of which 500 images make up the training set and the 165 images make up the test data set. The images are gray scale images of size 256*256.

4 Proposed Methodology

- Apply Rosenblatt's perceptron which is a single layer perceptron to try and classify the images.
- Aim to compress the image from 256*256 to a smaller size without much loss of information.
- Apply multilayer perceptron approach to classify the image data set.
- Apply SVM with lda to classify the image sets.
- Apply CNN to the data set.
- Compare accuracy of classification of the different models applied.
- Check that overfitting does not occur. If it does occur, then to identify when it occurs and how best to remove it.

5 Expected Outcome

Our expected outcome is to compare and contrast between the accuracy obtained by using different models and identify which model performs the best. We also aim to come up with a model which will be able to classify the image dataset with a high degree of accuracy.

6 References

1. Dutt, BVV Sri Raj, Pulkit Agrawal, and Sushoban Nayak. "Scene Classification in images."
2. VEERANJANEYULU, N., et al. "SCENE CLASSIFICATION USING SUPPORT VECTOR MACHINES WITH LDA." *Journal of Theoretical & Applied Information Technology* 63.3 (2014).
3. Zhou, Bolei, et al. "Learning deep features for scene recognition using places database." *Advances in neural information processing systems*. 2014.