Indian Institute of Technology, Indore
Computer Science & Engineering
Write_ up

190001003	190001029	190001036
Anikeit Sethi	Krishanu Saini	Sai Mounika

Problem Statement

This project aims at the application of CNN for image classification.

Introduction

Image classification is the process of categorizing and labelling groups of pixels or vectors within an image based on specific rules. (It is a process of assigning labels to images according to their types.).
Since the first digital image scanner, image classification has become one of the most influential innovations in Computer Vision. Developing models that can classify images has made tremendous advances in the way people interact (social media, search engines & image processing), retail (both in-person and online), marketing, theatre & the performing arts, government, surveillance, law enforcement, etc. We can receive notifications on social media when someone has posted a picture that may look like us or object recognition in self-driving cars thanks to image classification algorithms.

Convolutional Neural Networks

A Convolutional Neural network (CNN) is a class of deep learning neural networks that uses a series of filters to extract features from a particular data set. CNN is a variant of Multi-Layer Perceptron (MLPs) inspired by biology. These filters are local in input space and are thus better suited to exploit the strong spatially local correlation present in natural images. Convolutional neural networks are designed to process two-dimensional (2-D) images.

DataSet

We will initially be using CIFAR-10, a dataset of natural RGB images of 32 × 32 pixels. It contains ten classes with 50,000 training images and 10,000 test images. All of these images have different backgrounds with different light sources. Objects in the image are not restricted to the one at the centre, and these objects have different sizes that range in orders of magnitude.

& if this dataset passes without problem, we will try to use imagenet, which is a notch higher.

Supervised classification

Supervised image classification is a procedure for identifying spectrally similar areas on an image by identifying 'training' sites of known targets and then extrapolating those spectral signatures to other areas of unknown targets. It requires training data that are typical and homogeneous and the application of a set of methods or decision rules.

Further scope and learning

Through this minor project, we want to build our basics, which could help us start our BTP and gain knowledge about neural networks and various algorithms involved. We also aim to build a simple user interface that could take user input and display the category/label after classification.