Convolutional Neural Networks for Image Classification

Abstract

The goal of this project is to build a deep neural network that can recognize objects in photographs and to recognize new objects.

Design

Recognizing photos is one of the most common problems. I will build machine learning model that can classify images using CNN from CIFAR-10 dataset, which consists of 60,000 with the size of 32 by 32 pixels color images in 10 classes. I will use Keras API to download CIFAR-10 datasets.

Data

I will use CIFAR-10 dataset, which consists of 60,000 32x32 pixels colour images in 10 classes. The 10 different classes represent airplanes, cars, birds, cats, deer, dogs, frogs, horses, ships, and trucks, in which each of those classes consists of 6000 images. You can download the CIFAR-10 dataset here.

Algorithms

Feature Engineering

- Convert categorical features to numerical values

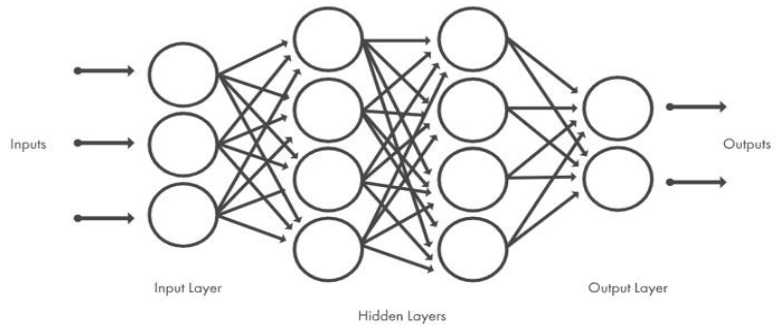

Figure 1: The architecture of a neural network, each layer consists of nodes. The number of hidden layers is optional. Source MathWorks

Tools

- Numpy and Pandas for data manipulation.
- Keras, Pytorch and TensorFlow for modeling.
- Matplotlib for visualizations.