Convolutional Neural Networks (CNN)

Ehtisham Ur Rehman

ehtishamrehman@uetpeshawar.edu.pk

Contents

- Introduction
- Implementation

Introduction

- Within Deep Learning, a Convolutional Neural Network or CNN is a type of artificial neural network, which is widely used for image/object recognition and classification. Deep Learning thus recognizes objects in an image by using a CNN.

- A typical neural network will have an input layer, hidden layers, and an output layer.

- CNNs are inspired by the architecture of the brain. Just like a neuron in the brain processes and transmits information throughout the body, artificial neurons or nodes in CNNs take inputs, processes them and sends the result as output.

- The image is fed as input. The input layer accepts the image pixels as input in the form of arrays.

- In CNNs, there could be multiple hidden layers, which perform feature extraction from the image by doing calculations. This could include convolution, pooling, rectified linear units, and fully connected layers.

- Convolution is the first layer that does feature extraction from an input image. The fully connected layer classifies the object and identifies it in the output layer.

- CNN architectures come in several variations; however, in general, they consist of convolutional and pooling (or subsampling) layers, which are grouped into modules.
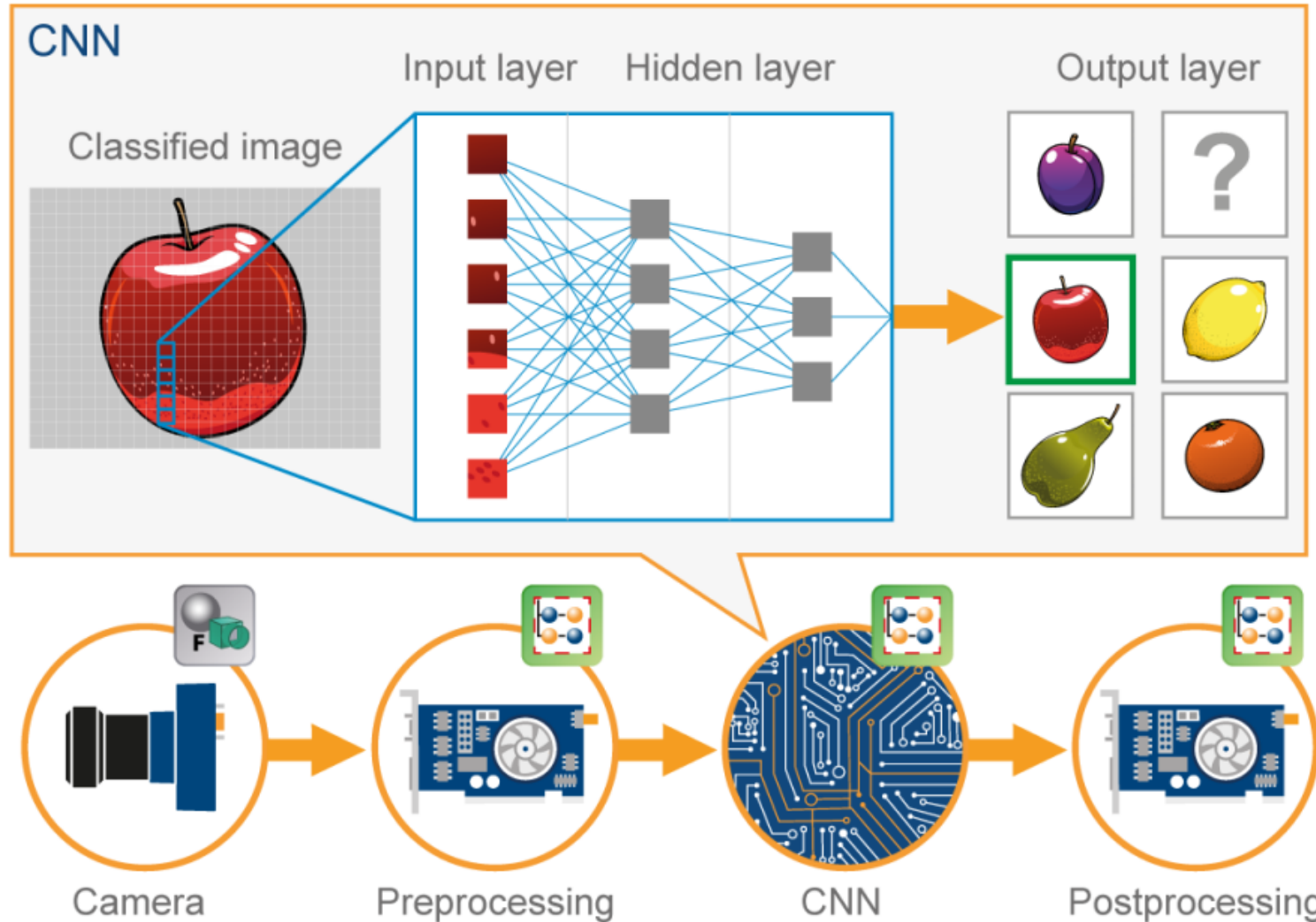
Implementation

- Google Colab.

- Programing Language- Python

- Dataset- CIFAR10 dataset- The CIFAR10 (Canadian Institute For Advanced Research) dataset contains 60,000 color images in 10 classes, with 6,000 images in each class. The dataset is divided into 50,000 training images and 10,000 testing images.