**Project Requirement and Specification**

**On**

**Face Recognition using Deep CNN**

(CSE’5’ Semester Mini project PCS-504)

2021-2022



Submitted by:

Sumit Singh

Roll No – 2015556

CSE-C-5-SEM

Guided by:

Mr. Vishan Gupta

Session: 2021 – 22

(Resource Person)

* 1. **About Project:**

Problem Statement:

The goal of the project is to detect and recognise a person’s face in the provided image. Though the aim of the project is to create a model which can find and detect a person’s face form the provided image. The objective is to understand the concept of Convolution Neural Network (CNN).

* 1. **Requirement of Project**:
     1. Hardware Requirement
        + 8 GB RAM
        + 64 Bit Operating System
     2. Coding Language Required
        + Python
        + HTML
        + CSS
     3. Software Requirement
        + Jupyter Notebook
        + Anaconda Prompt
     4. Libraries Required
        + Numpy
        + Pandas
        + Sci-kit learn
        + Keras
        + Tensorflow
        + Bing\_image\_downloader
  2. **Introduction:**

Deep Learning is an algorithm consisting of multiple layers for computation of a data, inspired from the brain cells in human beings, thus also known as Artificial Neural Network.

*Using brain simulations, hope to:*

*– Make learning algorithms much better and easier to use.*

*– Make revolutionary advances in machine learning and AI.*

*I believe this is our best shot at progress towards real AI*

* Andrew Ng

Convolution Neural Network is a Deep Learning algorithm consisting of various convolutional layers and neural network linked to each other and help model/neural network to learn the relationship/pattern among the values of an array of integers provided as an input to it. The array of integers provided to the Neural Network is basically the pixel values of the image whose classification is to be done by the neural network. Convolution network is capable of easily capturing the Spatial and Temporal dependencies in an image using relevant filters.

* 1. **Algorithm Used** :
* **Covolution Neural Network:**

Convolution network is a complex neural network algorithm used to extract relationship among different elements of an array or we can say image converted in the form of a numpy array, by visualising the data. Due to its capability of understanding Spatial and Temporal dependencies, the network can be trained to understand the sophisticated images and extract the needful information weather it’s somebody’s face, object detection, face detection etc.

There are numerous layers involved in a convolutional neural network that are as flows:

1. Input Layer:

The input layer in CNN should contain image data. Image data is represented by a three-dimensional matrix. We have to reshape the image into a single column.

Example: If we want to

1. Convolution Layer:

This layer is also known as the **Kernel.** It combines the linear data provided into a form of quantum matrix, as compared to the original matrix, so that the features of the image could be analysed.

1. ReLU Layer:

This layer introduces the non-linearity to the network and converts all the negative pixels to zero. The final output is a rectified feature map.

1. Pooling Layer:

Pooling is a down-sampling operation that reduces the dimensionality of the feature map.

1. Fully Connected Layer:

This layer identifies and classifies the objects in the image.

1. Softmax/Logistic Layer:

The Softmax or Logistic layer is the last layer of CNN. It resides at the end of the FC layer. Logistic is used for binary classification problem statement and softmax is for multi-classification problem statement.

1. Output Layer:

This layer contains the label in the form of an array which represents the

* 1. **REFERENCES:**

1. An Improved RSA Variant By Seema Verma, Deepak Garg Department of Computer Science, Thapar University, Patiala, India.
2. IJCSNS International Journal of Computer Science and Network Security, VOL.16 No.8, August 2016
3. International Journal of Computer Applications (0975 – 8887) Volume 74– No. 20, July 2013
4. IJCSI International Journal of Computer Science Issues, Vol. 9, Issue 2, No 2, March 2012
5. Denning, Dorothy E., (Dorothy Elizabeth), 1945- Cryptography and data security.