

A Project/Dissertation Review-1 Report
on
FACE EMOTION DETECTION USING MACHINE LEARNING

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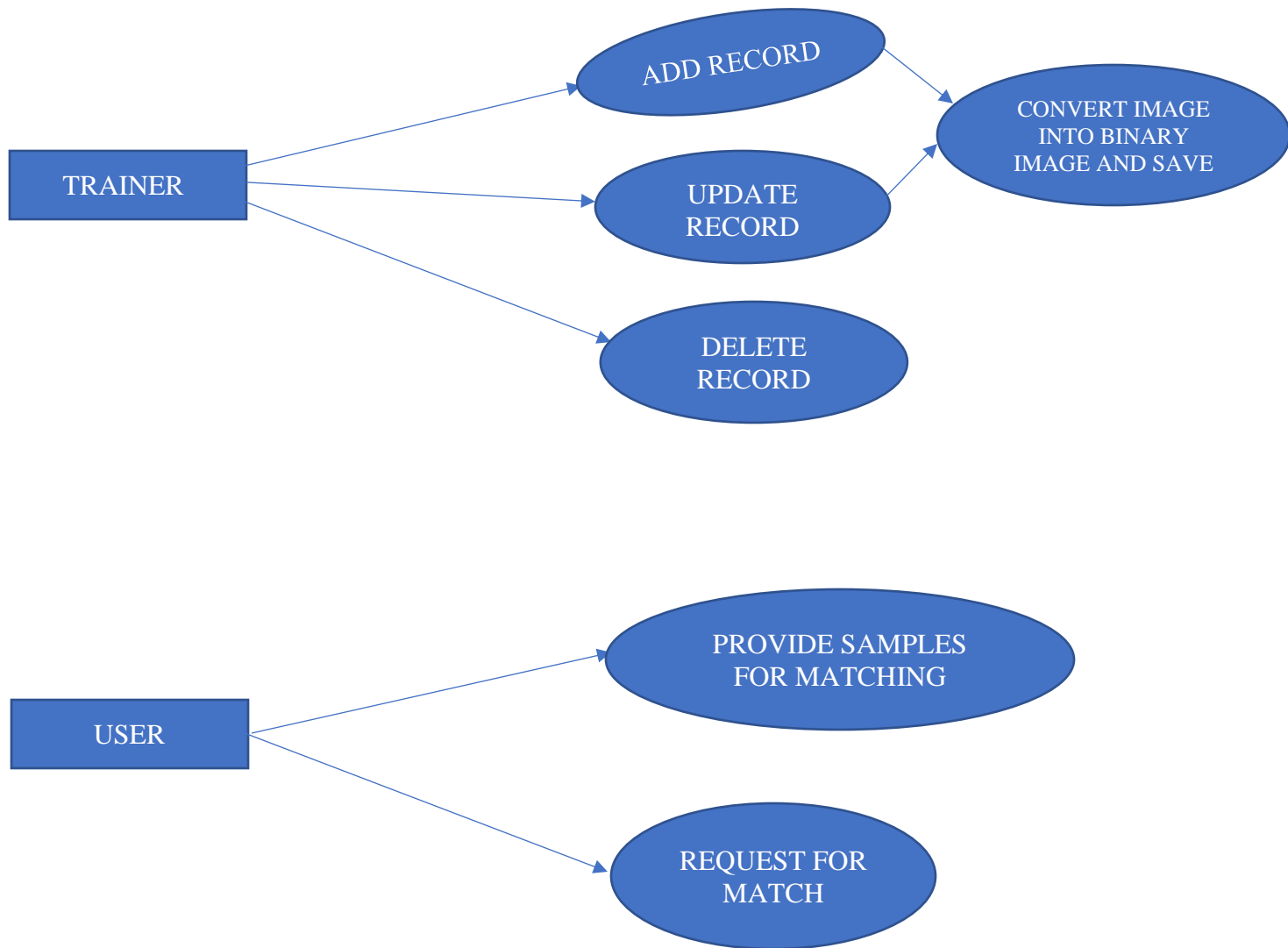
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Abstract

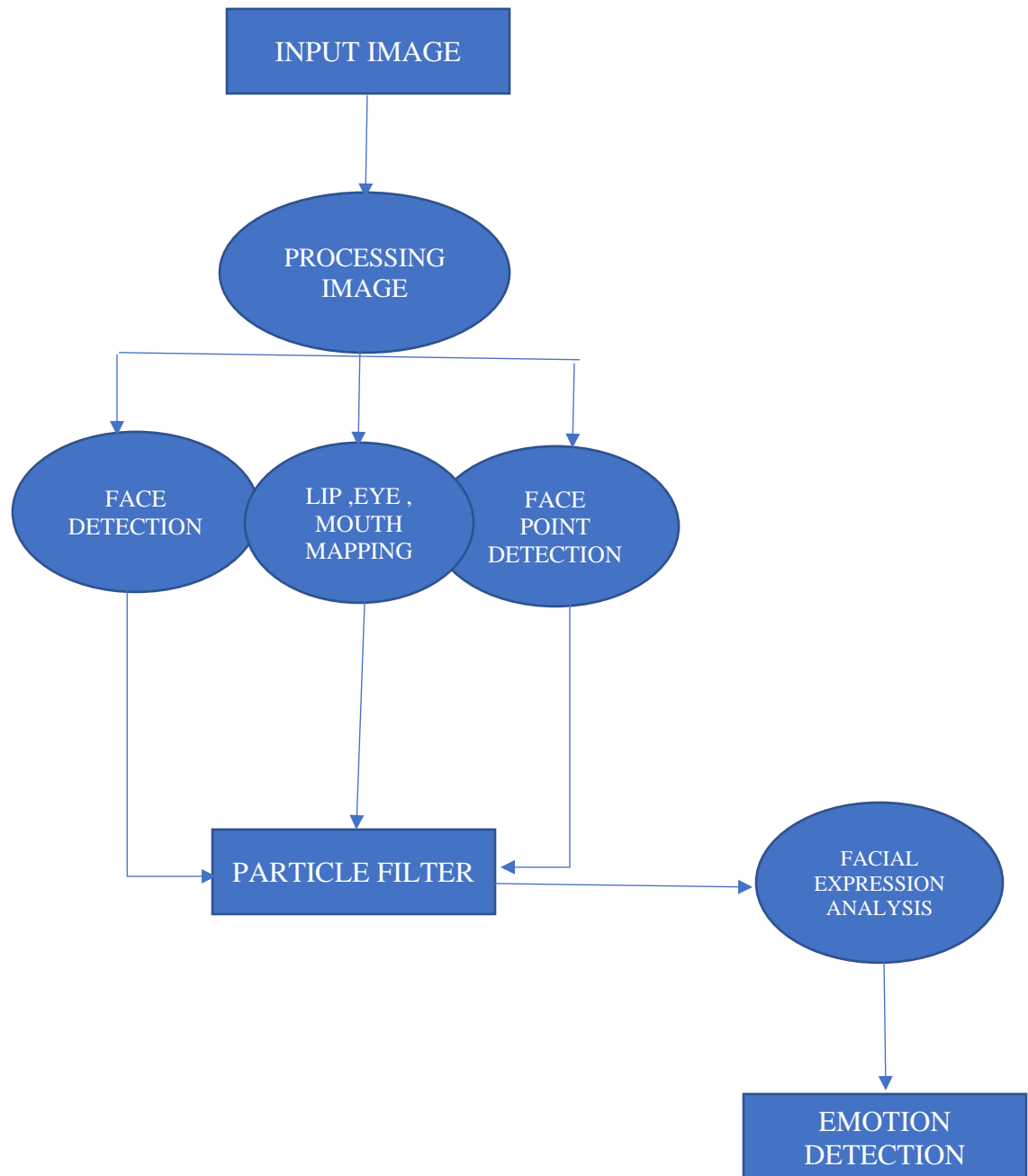
In computer vision as the modern world keep on getting better, one essential problem we are trying to figure out is to automatically detect objects in an image without human intervention. Automatic object detection not only decrease the human involvement, it also provide precise management. As the load of responsibility increase it is very important to get the right output. These detection software primarily relies on intelligent algorithms that biometrical map out facial characteristics acquired in pictures and video frames, as opposed to simple machine learning algorithms. Once the biometric map is complete, it is compared to a large database of faces to determine its accuracy. The algorithms can identify if the person is happy or sad, angry or silent. When the software finds a face or a group of faces present in the picture, it detects the locations of faces and frames around the observed face or group of faces. These features allow a lot of departments where constant observation is required of people especially in hospitals

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CHAPTER-1

Introduction

Face detection, also known as facial detection, is briefly a computer technology that relies on artificial intelligence (AI) and is used to detect human faces in images or videos. Thanks to face detection algorithms, It is possible to detect faces in an image or video regardless of the camera angles, the position of the subject's head, the lighting, or the color of the skin. Another feature of face detection is face emotion recognition providing details if the entity in the image is happy, sad , angry and so on. To classify your emotions in real-time using just you camera and some lines of code is actually a big step towards Advanced Human Computer interaction. If you want to do things like emotion detection using python, or if you're training machine learning systems to read human emotions that takes an image as an input and outputs a list of human emotions that the image invokes. To do this, a package called Deepface is used.

It is useful to make the interaction effectively utilizing responding to the opponent's reaction. Psychological studies are one of the major reasons behind understanding human emotions and are mostly used to enhance these emotion recognition concepts. Face emotion recognition applications such as emotion predictors examines the facial expression with the former inputs to detect probabilities/likelihood.

Formulation Of Problem

The problem statements we have are having robust and automated face detection, analysis of the captured image and its meaningful analysis by facial expressions, creating data sets for test and training and then the designing and the implementation of perfectly fitted classifiers to learn underlying classifiers to learn the vectors of the facial descriptors. We propose a model design which is capable of recognising upto six models which are considered universal among all walks of cultures. Mainly being fear, happiness, sadness, surprise, disgust and lastly surprise. Our system would be to understand a face and its characteristics and then make a weighted assumption of the identity of the person. This algorithm is mainly helped from the most widely used algorithms at this task, known as the Viola-Jones algorithm source . Despite being an outdated framework, Viola-Jones is quite powerful, and its application has proven to be exceptionally notable in real-time face detection. This algorithm is painfully slow to train but can detect faces in real-time with impressive speed.

Tool and Technology Used

To understand emotion detection thoroughly there is requirement of basic knowledge of :

- Python, is a high-level, general-purpose programming language. Its design philosophy emphasizes code readability with the use of significant indentation. Python is commonly used for developing websites and software, task automation, data analysis, and data visualization
- OpenCV, is a process by which we can understand the images and videos how they are stored and how we can manipulate and retrieve data from them. It is the base or mostly used for Artificial Intelligence. It is playing a major role in self-driving cars, robotics as well as in photo correction apps.
- Convolution Neural Network (CNN) and the various layers used to make it, ..
A convolutional neural network(CNN) is a type of Artificial Neural Network(ANN) used in image recognition and processing which is specially designed for processing data(pixels).
- NumPy is a Python library used for working with arrays. In this project, use of the following algorithms as: 1) HOG Vector algorithm for feature extraction from an image. 2) Viola Jones for face detection 3) K-Nearest Neighbors for classification of the emotion.

CHAPTER-2

Literature Survey

Many researches had already been analyzed in emotion detection and feature extraction. Some of the important methods are as discussed below:

A. Linear Discriminate Analysis LDA is a procedure of finding a linear mixture of elements that separate or divide more categories of things or occasion. Line layout can be achieved from the result. A higher amount of pixels are used to represent the emotion on a computer screen . Pre-segmentation Analysis by line is used to minimize traits and make it manageable. The new dimension is a linear mixture of the pixel values that make up the template.

B. Principal Component Analysis PCA involves an arithmetical process that converts a number of fickle that may be associated with a small number of unconnected variables. Data conflicts are calculated by the first major components and subsequent components cause further variability.

Another project is designed to help children with autism spectrum disorder understand the feelings of others. The system is installed on Google Glass. When another person is near the child, the glasses use graphics and sound to suggest that person's emotions. Tests have shown that children socialize faster with such a "digital advisor."

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