Detect Faces And Analyse Emotions Using Facial Emotion Recognition API

INTRODUCTION:

OVERVIEW:

With the advent of modern technology our desires went high and it binds no bounds. In the present era a huge research is going on Artificial networks and its intelligence and machine learning. The way of progression is exponential and it is ever increasing.

The Objective of our project is to Detect faces and Analyse Emotions using facial emotion recognition API using IBM Cloud. In this project the facial emotion of a person is detected, the IBM Cloud Facial Recognition Service uses deep learning algorithms to analyse images and to

give the required output using Application Programming Interface (API). The emotion status is displayed on the User Interface which is developed using Flask.

PURPOSE:

The purpose of the Project is to detect Human Emotions from their Facial Expressions.

LITERATURE SURVEY:

EXISTING PROBLEM:

The problem is to Identify the human emotions using API and other machine learning algorithms.

Proposed solution:

The Solution for this project is to develop Automatic Facial Expression Recognition System which can take human facial images containing some expression as input and recognize and classify it into seven different expression class such as:

1.Neutral

2.Angry

3.Disgust

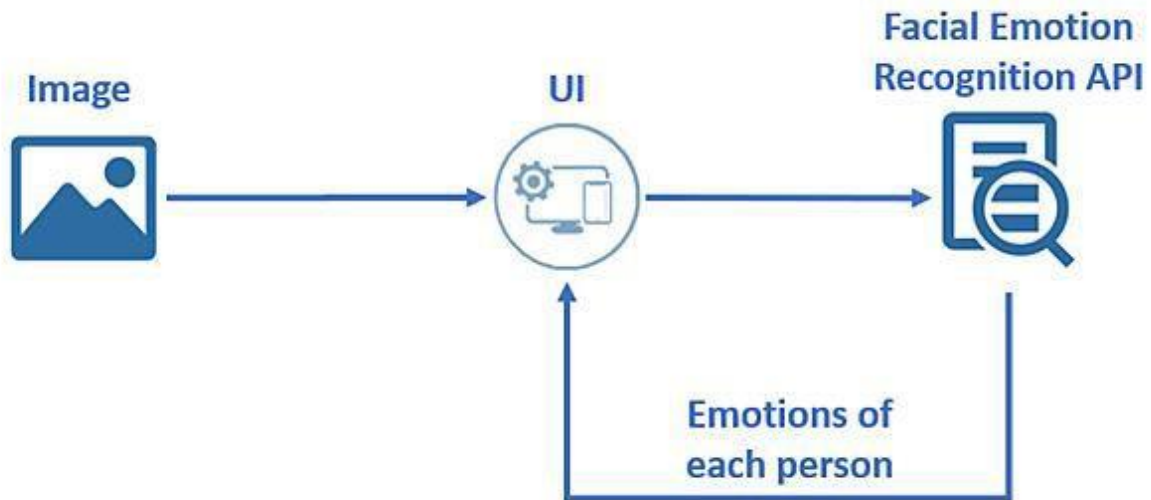**4.Fear**

5.Happy

6.Sadness

7.Suprise

TH EO RE TIC

AL ANALYSIS:

BLOCK DIAGRAM:

SOFTWARE REQUIREMENTS:

1..Anaconda

2.Spyder
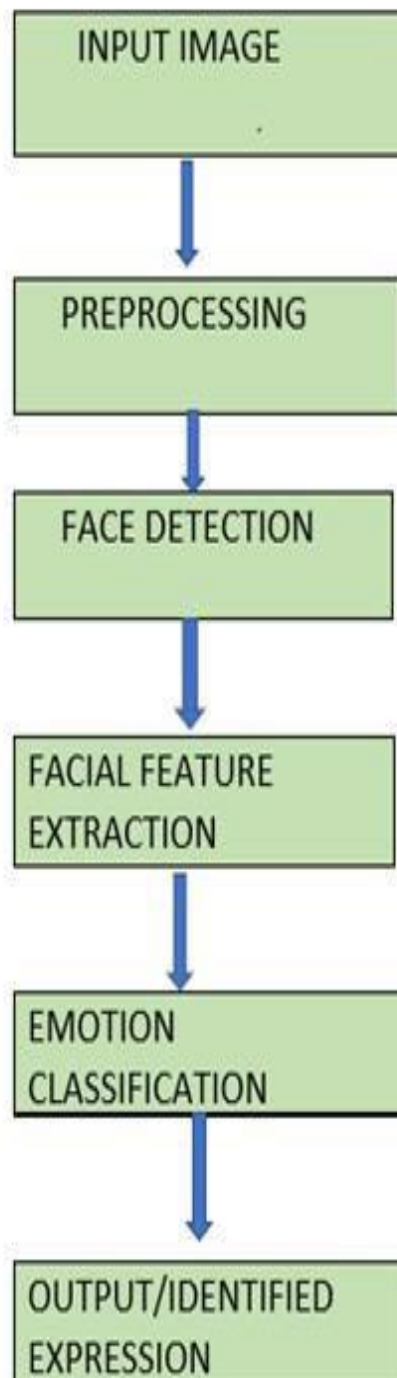
3.Google Chrome(or any browser)

HARDWARE REQUIREMENTS:

The minimum hardware requirements for this project are:

1.Processor - Intel® Core™ i3-2350M CPU @ 2.24GHz

2.Installed Memory - 2GB

3.System Type - 64-bit operating system
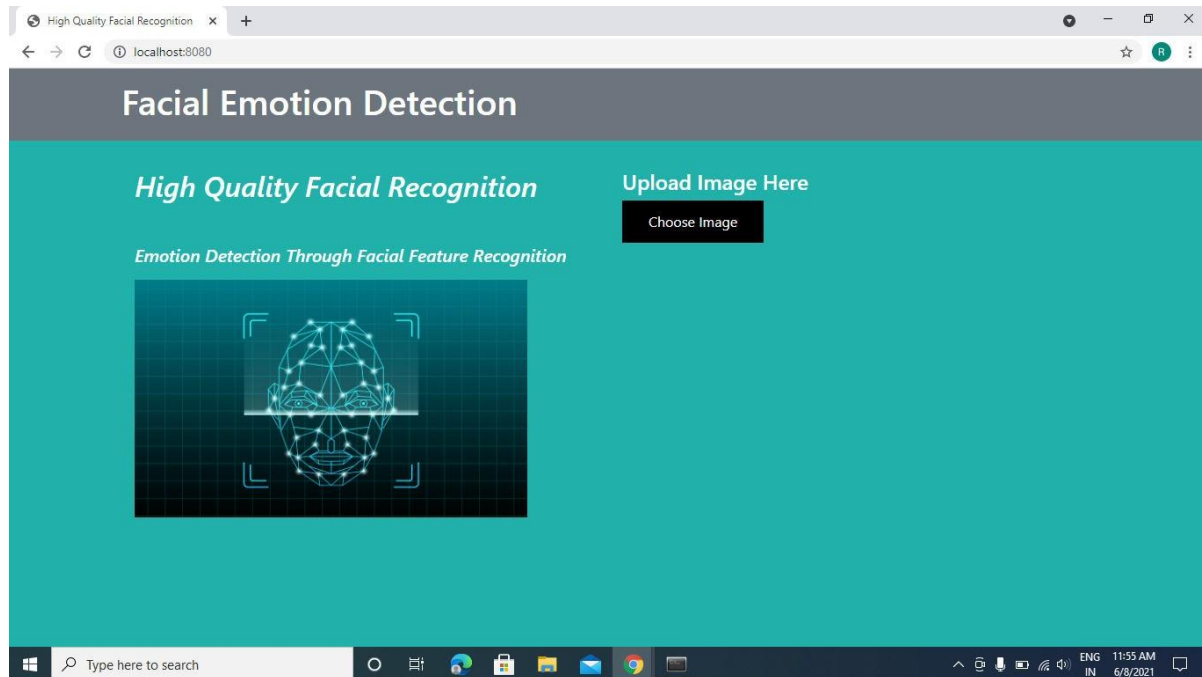
EXPERIMENTAL INVESTIGATION:

During the project execution we experimentally found that the Application User Interface has predefined python codes and formats to run the app. IBM Cloud had inbuilt machine learning convolution neural network and many important algorithms which made the task easier and faster.
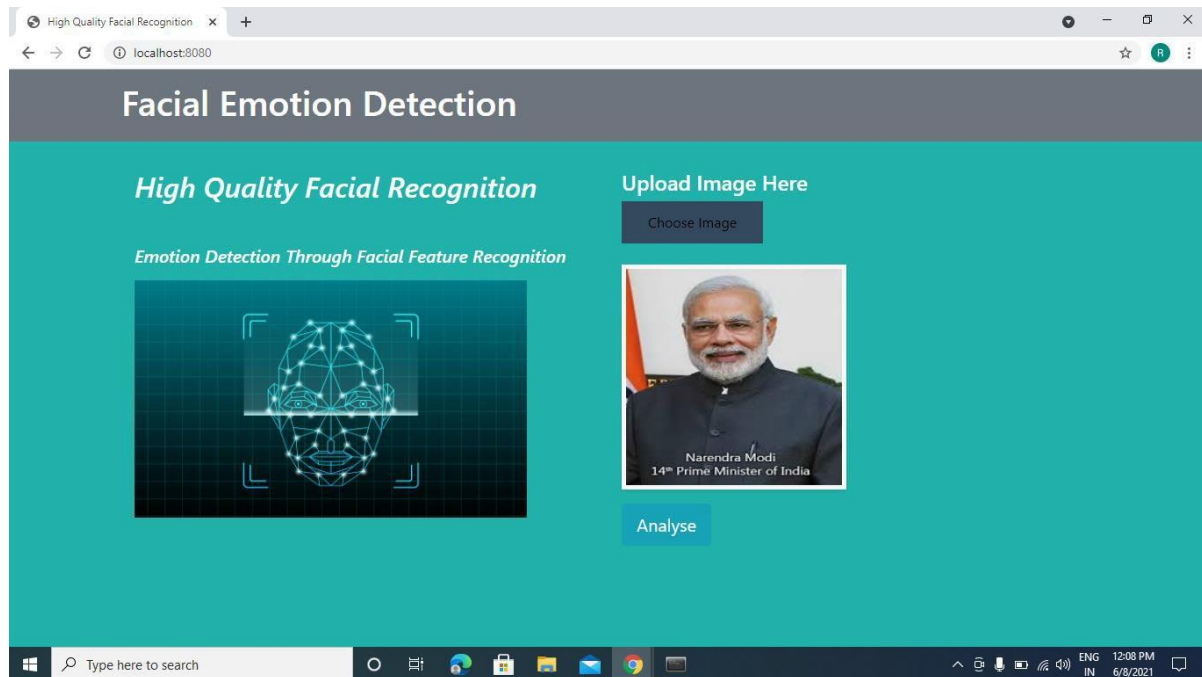
FLOWCHART:

```
┌─────────────────────┐
│    INPUT IMAGE      │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│   PREPROCESSING     │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│   FACE DETECTION    │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│  FACIAL FEATURE     │
│  EXTRACTION         │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│  EMOTION            │
│  CLASSIFICATION     │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│  OUTPUT/IDENTIFIED  │
│  EXPRESSION         │
└─────────────────────┘
```
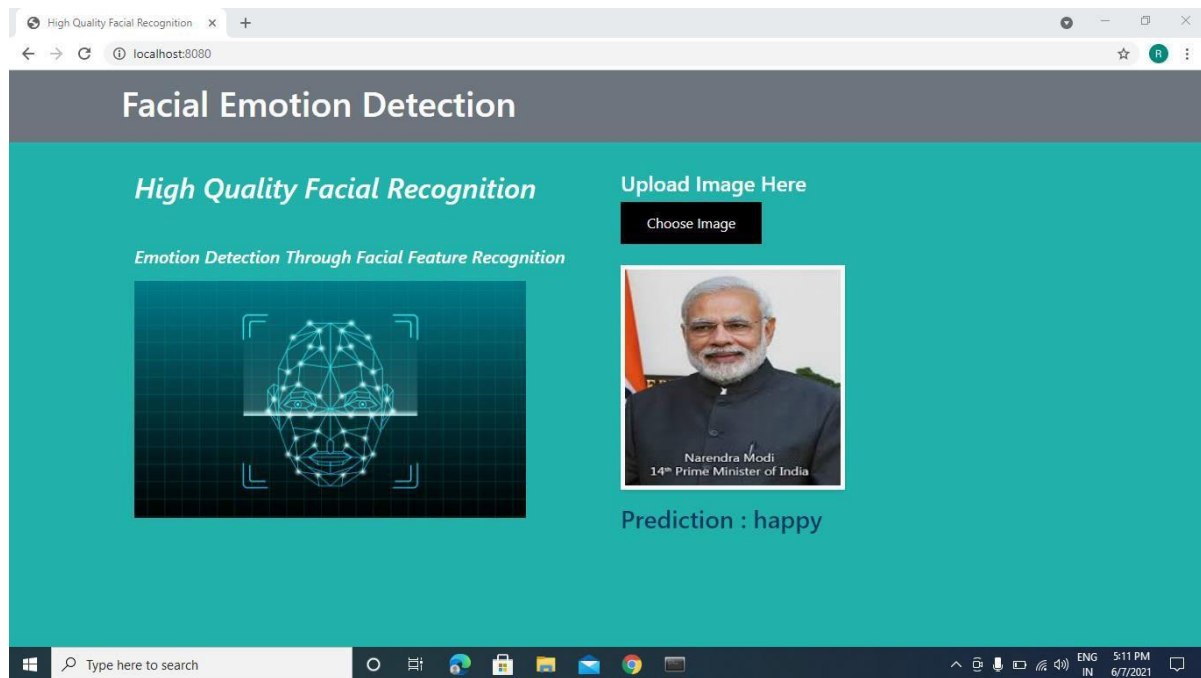
RESULT:

1. This is the home page.

2. We can upload image by clicking on choose image button.

3. By clicking Analyse button we can get our prediction.

ADVANTAGES:

1.HR and managers can recognize positive and negative moods of the employees and customers which help businesses to grow.

2.This technology does not require any additional expensive hardware to adopt.

3.This helps companies establish deep emotional connections with their customers.

DISADVANTAGES:

1.Performance and results of the emotion sensing depends on accuracy of the sensors such as cameras and so on.

2.Highly accurate system will be expensive due to the use of costly components.

3.It is a challenge to make emotion available in different languages.

APPLICATIONS:

Facial emotion recognition is an emerging field which we use in many applications such as in social robots, neuromarketing and games. Non-verbal communication methods like facial expressions, eye movement and gestures are used in many applications of human computer interaction, which among them facial emotion is widely used because it conveys the emotional states and feelings of persons. We can also get into understanding human behaviour, detecting mental disorders and synthesising human expressions by using our project as the basis.

CONCLUSION:

Facial expression plays an important role in communication and thus identifying the correct expression is as essential as knowing the exact matter of the communication. This project proposes an approach for recognizing the category of facial expressions.In this project, seven different facial expressions of different persons' images from different datasets have been analyzed.
I hope our project was very insightful and you could garner utmost information from it.

FUTURE SCOPE:

1.In future more and more companies will use it to know the positive and negative emotions of their employees to develop once companies.

2.The ability to detect and track a user's state of mind has the potential to allow a computing system to offer relevant information when a user needs help – not just when the user requests help, for instance, the change in the Room Ambience by judging the mood of the person entering it.

BIBLIOGRAPHY:

1.https://towardsdatascience.com/face-detection-recognition-and-emotion- detection

2.https://youtu.be/PulKIAZRoAY

APPENDIX:

A. **SOURCE CODE**

PYTHON CODE:

```python
from keras.models import load_model
from time import sleep
from keras.preprocessing.image import
img_to_array
from keras.preprocessing import image
import cv2
import numpy as np

face_classifier =
cv2.CascadeClassifier(r'C:\Users\sahaj\.curs
or-
tutor\project001\em_pictures\haarcascade_fr
ontalface_default.xml')
classifier
=load_model(r'C:\Users\sahaj\.cursor-
tutor\project001\em_pictures\model.h5')

emotion_labels =
['Angry','Disgust','Fear','Happy','Neutral',
'Sad', 'Surprise']

cap = cv2.VideoCapture(0)
```

```python
while True:
    _, frame = cap.read()
    labels = []
    gray = cv2.cvtColor(frame,cv2.COLOR_BGR2GRAY)
    faces = face_classifier.detectMultiScale(gray)

    for (x,y,w,h) in faces:

cv2.rectangle(frame,(x,y),(x+w,y+h),(0,255,255),2)
        roi_gray = gray[y:y+h,x:x+w]
        roi_gray = cv2.resize(roi_gray,(48,48),interpolation=cv2.INTER_AREA)
```

```python
        if np.sum([roi_gray])!=0:
            roi = roi_gray.astype('float')/255.0
            roi = img_to_array(roi)
            roi = np.expand_dims(roi,axis=0)

            prediction = classifier.predict(roi)[0]

            label=emotion_labels[prediction.argmax()]
            label_position = (x,y)

            cv2.putText(frame,label,label_position,cv2.FONT_HERSHEY_SIMPLEX,1,(0,255,0),2)
        else:
            cv2.putText(frame,'No Faces',(30,80),cv2.FONT_HERSHEY_SIMPLEX,1,(0,255,0),2)
    cv2.imshow('Emotion Detector',frame)
    if cv2.waitKey(1) & 0xFF == ord('q'):
        break

cap.release()
cv2.destroyAllWindows()
```