In [2]:
```
import cv2
```

In [3]:
```
from deepface import DeepFace
```

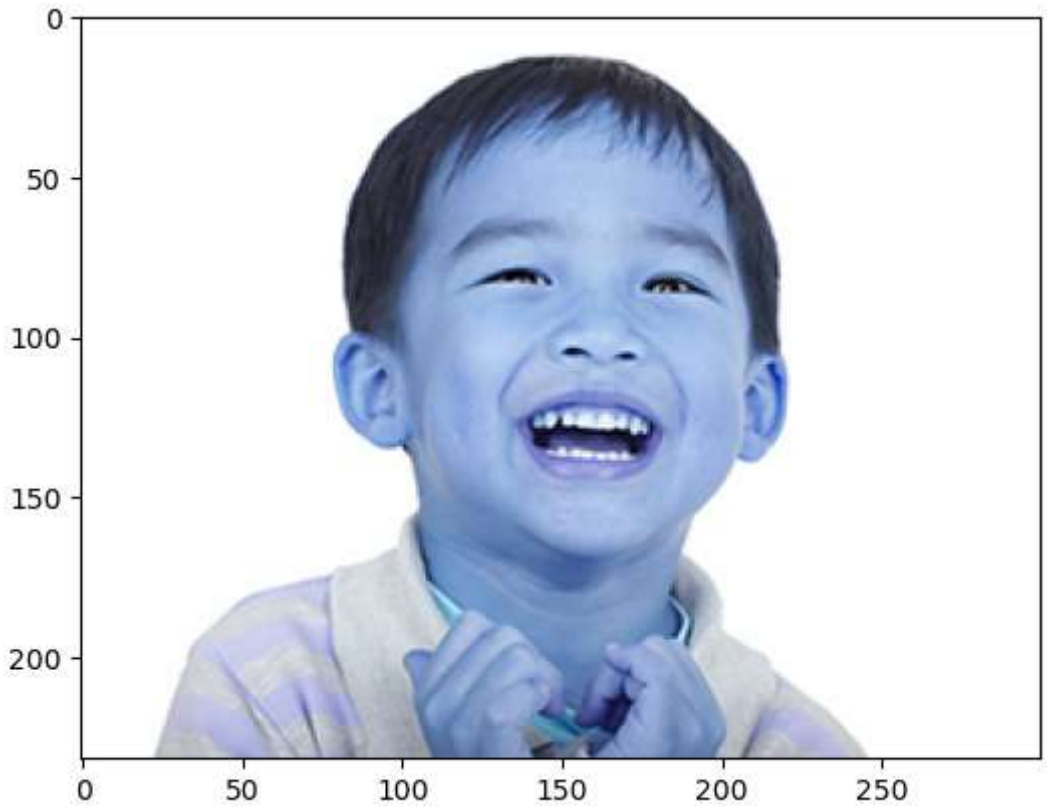
```
WARNING:tensorflow:From C:\Users\sachi\anaconda3\Lib\site-packages\keras\src\losse
s.py:2976: The name tf.losses.sparse_softmax_cross_entropy is deprecated. Please u
se tf.compat.v1.losses.sparse_softmax_cross_entropy instead.
```

In [2]:
```
img = cv2.imread('happy-boy.jpg')
```

In [4]:
```
import matplotlib.pyplot as plt
```

In [4]:
```
plt.imshow(img)
```

Out[4]:
```
<matplotlib.image.AxesImage at 0x189d22595d0>
```




In [6]:
```
pre = DeepFace.analyze(img)
```

```
24-01-06 12:24:44 - facial_expression_model_weights.h5 will be downloaded...
Downloading...
From: https://github.com/serengil/deepface_models/releases/download/v1.0/facial_ex
pression_model_weights.h5
To: C:\Users\sachi\.deepface\weights\facial_expression_model_weights.h5
100%|
| 5.98M/5.98M [00:02<00:00, 2.78MB/s]
24-01-06 12:25:01 - age_model_weights.h5 will be downloaded...
Downloading...
From: https://github.com/serengil/deepface_models/releases/download/v1.0/age_model
_weights.h5
To: C:\Users\sachi\.deepface\weights\age_model_weights.h5
100%|
| 539M/539M [02:51<00:00, 3.13MB/s]
24-01-06 12:28:21 - gender_model_weights.h5 will be downloaded...
```

```
Downloading...
From: https://github.com/serengil/deepface_models/releases/download/v1.0/gender_mo
del_weights.h5
To: C:\Users\sachi\.deepface\weights\gender_model_weights.h5
100%|
| 537M/537M [02:28<00:00, 3.63MB/s]
24-01-06 12:31:20 - race_model_single_batch.h5 will be downloaded...
Downloading...
From: https://github.com/serengil/deepface_models/releases/download/v1.0/race_mode
l_single_batch.h5
To: C:\Users\sachi\.deepface\weights\race_model_single_batch.h5
100%|
| 537M/537M [02:25<00:00, 3.69MB/s]
Action: race: 100%|
| 4/4 [00:29<00:00,  7.29s/it]
```

In [15]:
```
pre
```

Out[15]:
```
[{'emotion': {'angry': 6.107392927014836e-16,
   'disgust': 5.690413868697148e-32,
   'fear': 2.5075295260600263e-17,
   'happy': 99.99998807907104,
   'sad': 2.0470224907503942e-10,
   'surprise': 9.660542366063396e-08,
   'neutral': 1.3001603349493962e-05},
  'dominant_emotion': 'happy',
  'region': {'x': 94, 'y': 33, 'w': 128, 'h': 128},
  'face_confidence': 8.257004057231825,
  'age': 22,
  'gender': {'Woman': 0.4476659931242466, 'Man': 99.55233335494995},
  'dominant_gender': 'Man',
  'race': {'asian': 95.63245747282848,
   'indian': 0.41689805377412165,
   'black': 0.009151107769618647,
   'white': 0.5729436284568088,
   'middle eastern': 0.00747965867975555,
   'latino hispanic': 3.361071846549025},
  'dominant_race': 'asian'}]
```

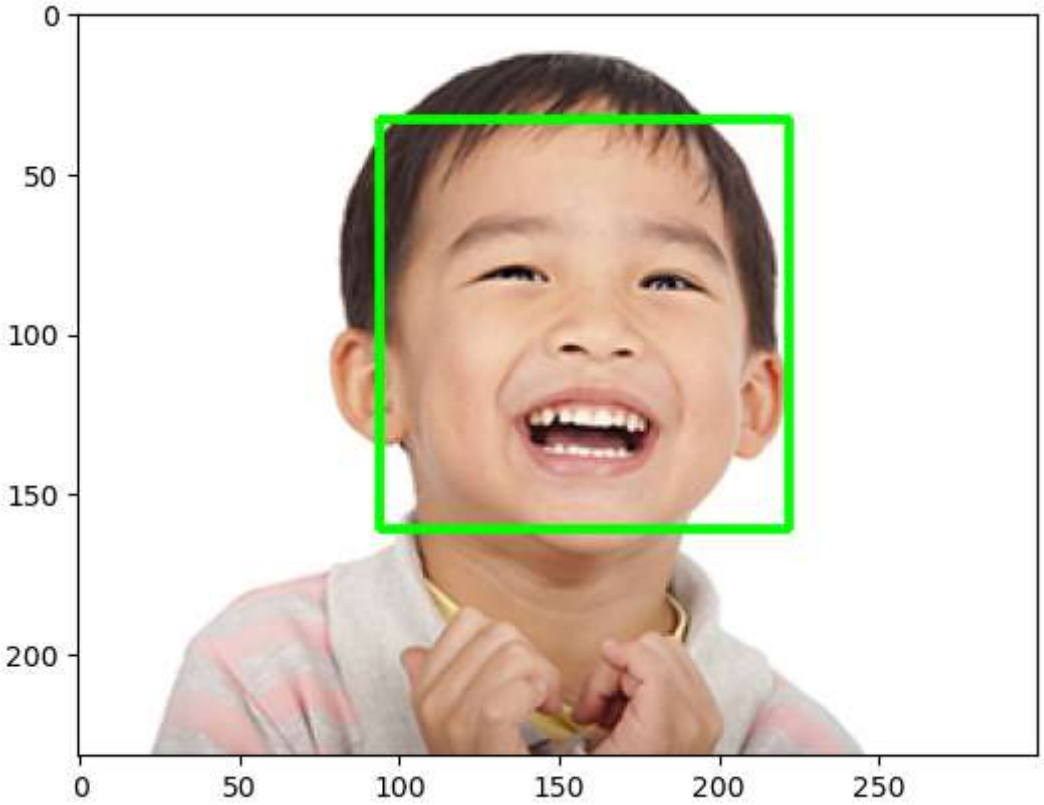
In [28]:
```
pre1= pre[0]
```

In [8]:
```
fc = cv2.CascadeClassifier(cv2.data.haarcascades+'haarcascade_frontalface_default.x
```

In [10]:
```
gray = cv2.cvtColor(img,cv2.COLOR_BGR2GRAY)
faces = fc.detectMultiScale(gray,1.1,4)
#drawing rectangle around the face
for(x,y,w,h) in faces:
    cv2.rectangle(img,(x,y),(x+w,y+h),(0,255,0),2)
```

In [11]:
```
plt.imshow(cv2.cvtColor(img,cv2.COLOR_BGR2RGB))
```

Out[11]:
```
<matplotlib.image.AxesImage at 0x189def11790>
```




In [29]:
```
font = cv2.FONT_HERSHEY_SIMPLEX

cv2.putText(img,pre1['dominant_emotion'],(0,50),font,1,(255,0,0),2,cv2.LINE_4)
```

Out[29]:
```
array([[[255, 255, 255],
        [255, 255, 255],
        [255, 255, 255],
        ...,
        [255, 255, 255],
        [255, 255, 255],
        [255, 255, 255]],

       [[255, 255, 255],
        [255, 255, 255],
        [255, 255, 255],
        ...,
        [255, 255, 255],
        [255, 255, 255],
        [255, 255, 255]],

       [[255, 255, 255],
        [255, 255, 255],
        [255, 255, 255],
        ...,
        [255, 255, 255],
        [255, 255, 255],
        [255, 255, 255]],

       ...,

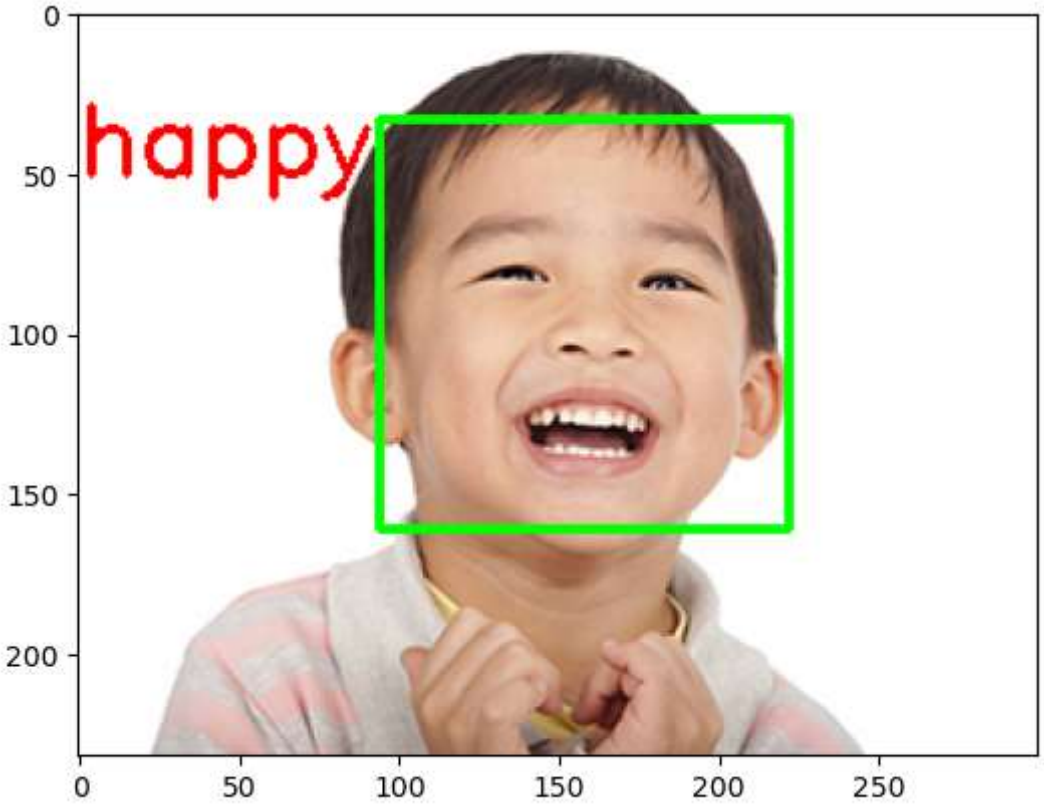
       [[255, 255, 255],
        [255, 255, 255],
        [255, 255, 255],
        ...,
        [255, 255, 255],
        [255, 255, 255],
        [255, 255, 255]],

       [[255, 255, 255],
        [255, 255, 255],
        [255, 255, 255],
        ...,
        [255, 255, 255],
        [255, 255, 255],
        [255, 255, 255]],

       [[255, 255, 255],
        [255, 255, 255],
        [255, 255, 255],
        ...,
        [255, 255, 255],
        [255, 255, 255],
        [255, 255, 255]]], dtype=uint8)
```

In [30]:
```
plt.imshow(cv2.cvtColor(img,cv2.COLOR_BGR2RGB))
```

Out[30]:
```
<matplotlib.image.AxesImage at 0x18a347b3490>
```




In [55]:
```
img = cv2.imread('sad.jpg')
```

In [56]:
```
plt.imshow(img)
```

Out[56]:
```
<matplotlib.image.AxesImage at 0x18a3923a9d0>
```

In [57]:
```
pre = DeepFace.analyze(img)
```

```
Action: race: 100%|
| 4/4 [00:30<00:00,  7.55s/it]
```

In [58]:
```
pre
```

Out[58]:
```
[{'emotion': {'angry': 0.8320650581756269,
   'disgust': 3.69712176261107e-06,
   'fear': 6.474976627527274,
   'happy': 1.2681397133315424e-06,
   'sad': 90.1225680185895,
   'surprise': 1.7107042136674057e-05,
   'neutral': 2.5703685027580563},
  'dominant_emotion': 'sad',
  'region': {'x': 244, 'y': 69, 'w': 136, 'h': 136},
  'face_confidence': 10.884711124119349,
  'age': 31,
  'gender': {'Woman': 99.98588562011719, 'Man': 0.014111364725977182},
  'dominant_gender': 'Woman',
  'race': {'asian': 39.27014470100403,
   'indian': 4.67449426651001,
   'black': 0.8988240733742714,
   'white': 36.44702732563019,
   'middle eastern': 10.934705287218094,
   'latino hispanic': 7.774808257818222},
  'dominant_race': 'asian'}]
```

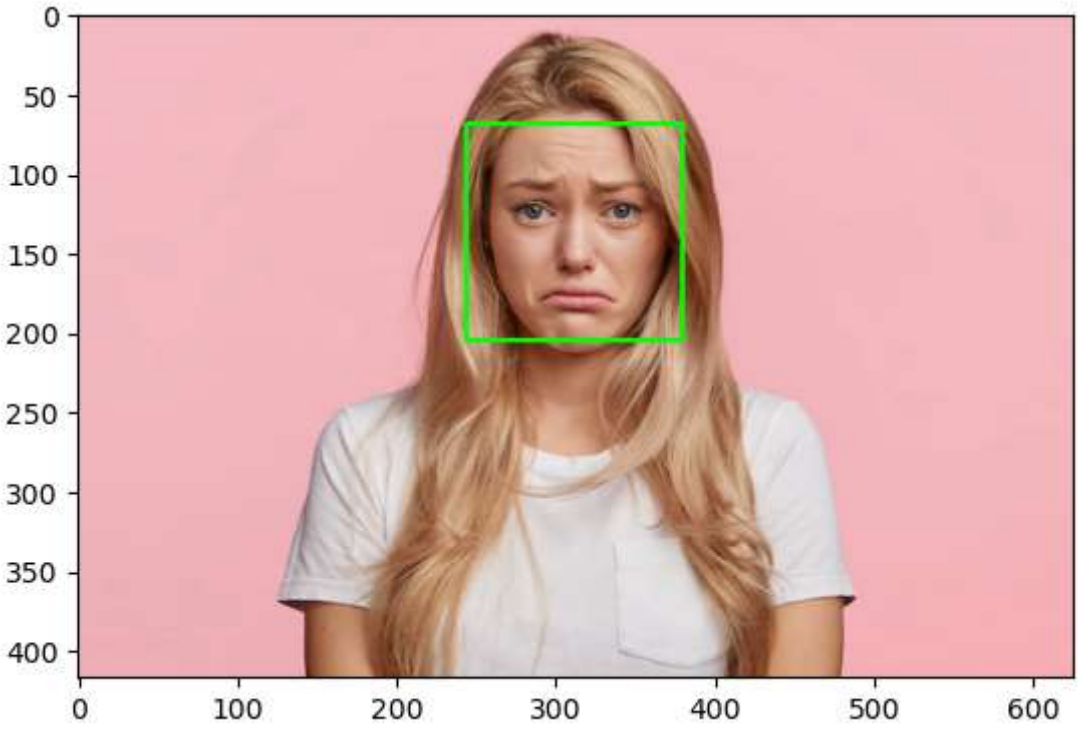
In [59]:
```
pre1= pre[0]
```

In [60]:
```
fc = cv2.CascadeClassifier(cv2.data.haarcascades+'haarcascade_frontalface_default.x
```

In [61]:
```
gray = cv2.cvtColor(img,cv2.COLOR_BGR2GRAY)
faces = fc.detectMultiScale(gray,1.1,4)
#drawing rectangle around the face
for(x,y,w,h) in faces:
    cv2.rectangle(img,(x,y),(x+w,y+h),(0,255,0),2)
```

In [62]:
```
plt.imshow(cv2.cvtColor(img,cv2.COLOR_BGR2RGB))
```

Out[62]:
```
<matplotlib.image.AxesImage at 0x18a39278d90>
```




In [63]:
```
font = cv2.FONT_HERSHEY_SIMPLEX

cv2.putText(img,pre1['dominant_emotion'],(0,50),font,1,(255,0,0),2,cv2.LINE_4)
```

Out[63]:
```
array([[[193, 188, 243],
        [193, 188, 243],
        [193, 188, 243],
        ...,
        [190, 185, 243],
        [189, 183, 241],
        [189, 183, 241]],

       [[193, 188, 243],
        [193, 188, 243],
        [193, 188, 243],
        ...,
        [190, 185, 243],
        [189, 183, 241],
        [189, 183, 241]],

       [[193, 188, 243],
        [193, 188, 243],
        [193, 188, 243],
        ...,
        [190, 185, 243],
        [189, 183, 241],
        [189, 183, 241]],

       ...,

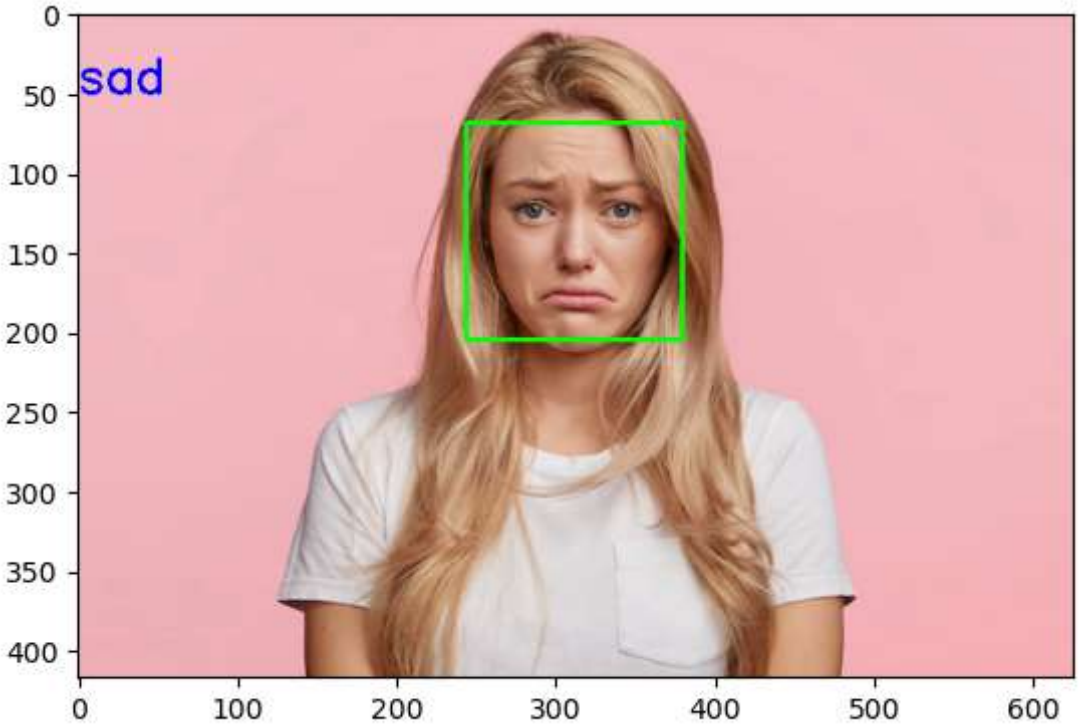
       [[182, 174, 239],
        [182, 174, 239],
        [182, 174, 239],
        ...,
        [178, 172, 246],
        [176, 171, 247],
        [176, 171, 247]],

       [[182, 174, 239],
        [182, 174, 239],
        [182, 174, 239],
        ...,
        [177, 170, 244],
        [176, 171, 247],
        [176, 171, 247]],

       [[181, 172, 240],
        [181, 172, 240],
        [181, 173, 238],
        ...,
        [175, 171, 244],
        [175, 170, 246],
        [175, 170, 246]]], dtype=uint8)
```

In [64]:
```
plt.imshow(cv2.cvtColor(img,cv2.COLOR_BGR2RGB))
```

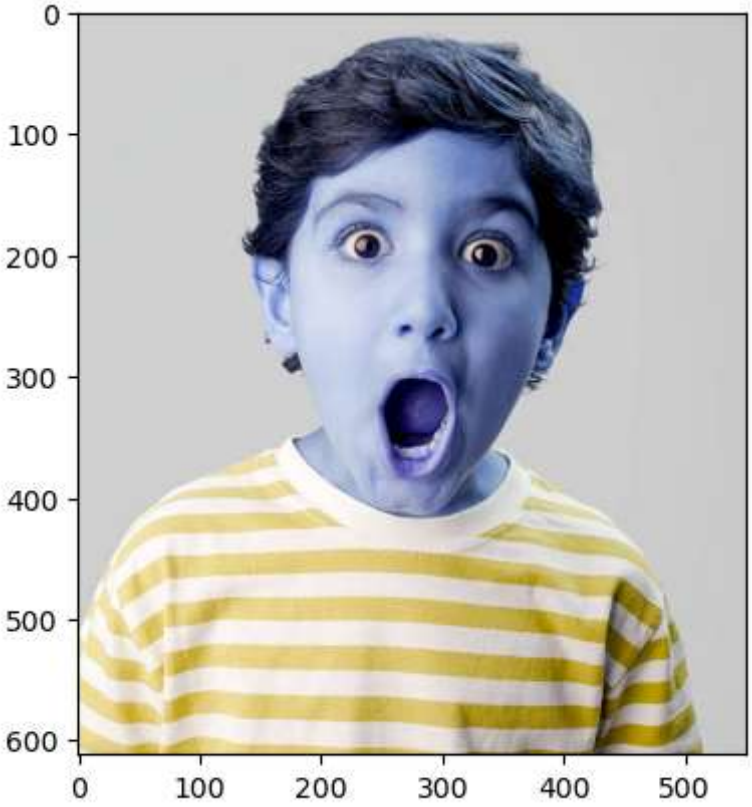
Out[64]:
```
<matplotlib.image.AxesImage at 0x18a39331350>
```




In [5]:
```
img = cv2.imread('suprise.jpg')
```

In [6]:
```
plt.imshow(img)
```

Out[6]:
```
<matplotlib.image.AxesImage at 0x1cfb1c23bd0>
```




In [7]:
```
pre = DeepFace.analyze(img)
```

```
Action: race: 100%|
| 4/4 [00:23<00:00,  5.78s/it]
```

In [8]:
```
pre
```

Out[8]:
```
[{'emotion': {'angry': 4.951772498984486e-10,
   'disgust': 6.0900590264065425e-15,
   'fear': 0.019549549324437976,
   'happy': 1.6294195159805014e-08,
   'sad': 1.5783854258322183e-10,
   'surprise': 99.98045563697815,
   'neutral': 1.0927000470724455e-15},
  'dominant_emotion': 'surprise',
  'region': {'x': 141, 'y': 81, 'w': 287, 'h': 287},
  'face_confidence': 8.010982100327965,
  'age': 32,
  'gender': {'Woman': 98.35047721862793, 'Man': 1.6495252028107643},
  'dominant_gender': 'Woman',
  'race': {'asian': 1.80186927318573,
   'indian': 3.0529264360666275,
   'black': 0.1799742691218853,
   'white': 21.180589497089386,
   'middle eastern': 18.940603733062744,
   'latino hispanic': 54.84403371810913},
  'dominant_race': 'latino hispanic'}]
```

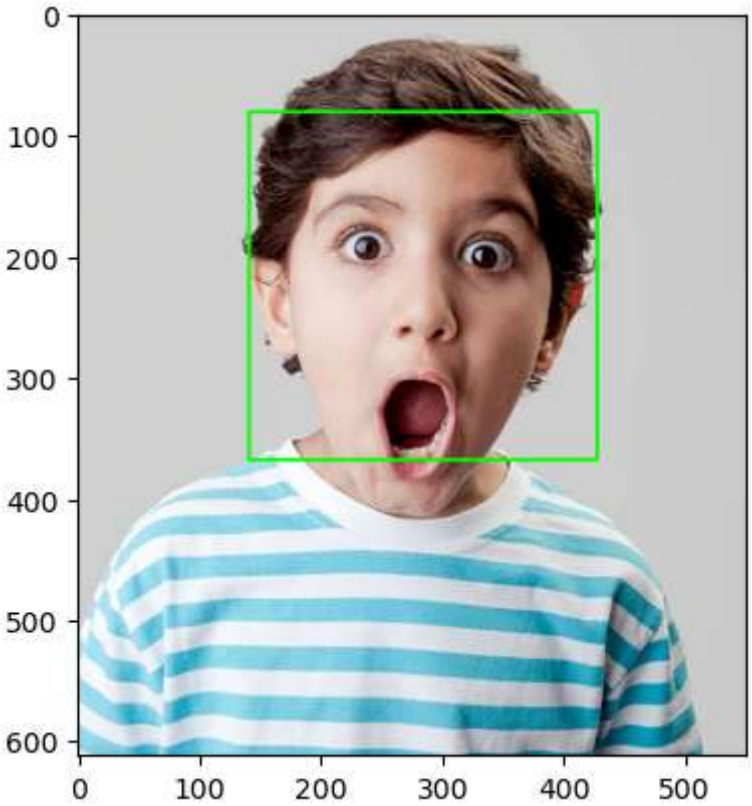
In [9]:
```
pre1=pre[0]
```

In [10]:
```
fc = cv2.CascadeClassifier(cv2.data.haarcascades+'haarcascade_frontalface_default.x
```

In [11]:
```
gray = cv2.cvtColor(img,cv2.COLOR_BGR2GRAY)
faces = fc.detectMultiScale(gray,1.1,4)
#drawing rectangle around the face
for(x,y,w,h) in faces:
    cv2.rectangle(img,(x,y),(x+w,y+h),(0,255,0),2)
```

In [12]:
```
plt.imshow(cv2.cvtColor(img,cv2.COLOR_BGR2RGB))
```

Out[12]:
```
<matplotlib.image.AxesImage at 0x1d03fd87590>
```



In [13]:
```
font = cv2.FONT_HERSHEY_SIMPLEX

cv2.putText(img,pre1['dominant_emotion'],(0,50),font,1,(255,0,0),2,cv2.LINE_4)
```

Out[13]:
```
array([[[207, 207, 207],
        [207, 207, 207],
        [207, 207, 207],
        ...,
        [199, 199, 199],
        [199, 199, 199],
        [199, 199, 199]],

       [[207, 207, 207],
        [207, 207, 207],
        [207, 207, 207],
        ...,
        [199, 199, 199],
        [199, 199, 199],
        [199, 199, 199]],

       [[207, 207, 207],
        [207, 207, 207],
        [207, 207, 207],
        ...,
        [199, 199, 199],
        [199, 199, 199],
        [199, 199, 199]],

       ...,

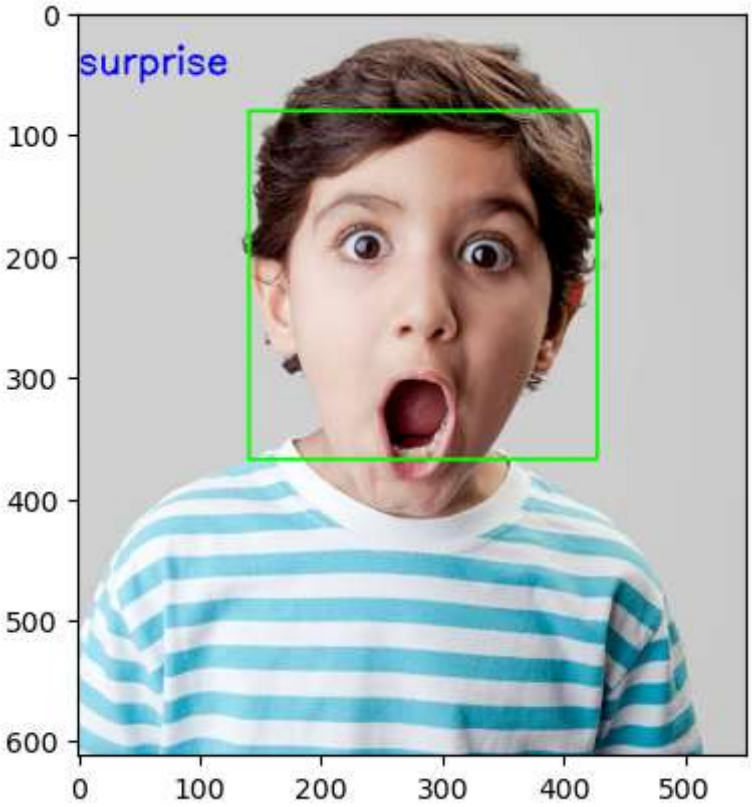
       [[243, 241, 240],
        [245, 240, 241],
        [248, 240, 240],
        ...,
        [199, 201, 201],
        [199, 201, 201],
        [199, 201, 201]],

       [[244, 237, 242],
        [244, 236, 243],
        [246, 235, 243],
        ...,
        [199, 201, 201],
        [199, 201, 201],
        [199, 201, 201]],

       [[248, 240, 241],
        [246, 238, 239],
        [244, 236, 237],
        ...,
        [199, 201, 201],
        [199, 201, 201],
        [199, 201, 201]]], dtype=uint8)
```

In [14]:
```
plt.imshow(cv2.cvtColor(img,cv2.COLOR_BGR2RGB))
```

Out[14]:
```
<matplotlib.image.AxesImage at 0x1d0470d0e10>
```




In [2]:
```
import cv2
from deepface import DeepFace

model = DeepFace.build_model("Emotion")

emotion_labels = ['angry', 'disgust', 'fear', 'happy', 'sad', 'surprise', 'neutral'

# Load face cascade classifier
face_cascade = cv2.CascadeClassifier(cv2.data.haarcascades + 'haarcascade_frontalfa

cap = cv2.VideoCapture(0)

while True:
    # Capture frame-by-frame
    ret, frame = cap.read()

    # Convert frame to grayscale
    gray_frame = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)

    # Detect faces in the frame
    faces = face_cascade.detectMultiScale(gray_frame, scaleFactor=1.1, minNeighbors

    for (x, y, w, h) in faces:
        # Extract the face-Region of Interest
        face_roi = gray_frame[y:y + h, x:x + w]

        # Resize the face ROI to match the input shape of the model
        resized_face = cv2.resize(face_roi, (48, 48), interpolation=cv2.INTER_AREA)

        # Normalize the resized face image
        normalized_face = resized_face / 255.0


        reshaped_face = normalized_face.reshape(1, 48, 48, 1)

        # Predict emotions using the pre-trained model
        preds = model.predict(reshaped_face)[0]
```

```
        emotion_idx = preds.argmax()
        emotion = emotion_labels[emotion_idx]

        # Drawing rectangle around face and label with predicted emotion
        cv2.rectangle(frame, (x, y), (x + w, y + h), (0, 255, 0), 2)
        cv2.putText(frame, emotion, (x, y - 10), cv2.FONT_HERSHEY_SIMPLEX, 0.9, (25

    # Display the resulting frame
    cv2.imshow('Real-time Emotion Detection', frame)

    # Press 'q' to exit
    if cv2.waitKey(1) & 0xFF == ord('q'):
        break

# Release the capture and close all windows
cap.release()
cv2.destroyAllWindows()
```

```
1/1 [==============================] - 0s 457ms/step
1/1 [==============================] - 0s 33ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 27ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 32ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 32ms/step
1/1 [==============================] - 0s 34ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 32ms/step
1/1 [==============================] - 0s 18ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 32ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 15ms/step
1/1 [==============================] - 0s 32ms/step
1/1 [==============================] - 0s 25ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 32ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 29ms/step
1/1 [==============================] - 0s 11ms/step
1/1 [==============================] - 0s 32ms/step
1/1 [==============================] - 0s 27ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 23ms/step
1/1 [==============================] - 0s 25ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 35ms/step
1/1 [==============================] - 0s 20ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 21ms/step
1/1 [==============================] - 0s 18ms/step
1/1 [==============================] - 0s 32ms/step
1/1 [==============================] - 0s 30ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 23ms/step
1/1 [==============================] - 0s 14ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 24ms/step
1/1 [==============================] - 0s 24ms/step
1/1 [==============================] - 0s 26ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 17ms/step
1/1 [==============================] - 0s 27ms/step
1/1 [==============================] - 0s 22ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 21ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 32ms/step
1/1 [==============================] - 0s 33ms/step
1/1 [==============================] - 0s 26ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 19ms/step
1/1 [==============================] - 0s 24ms/step
1/1 [==============================] - 0s 16ms/step
```

```
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 32ms/step
1/1 [==============================] - 0s 17ms/step
1/1 [==============================] - 0s 31ms/step
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1/1 [==============================] - 0s 18ms/step
1/1 [==============================] - 0s 19ms/step
1/1 [==============================] - 0s 32ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 32ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 24ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 18ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 27ms/step
1/1 [==============================] - 0s 24ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 29ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 23ms/step
1/1 [==============================] - 0s 22ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 10ms/step
1/1 [==============================] - 0s 21ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 26ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 31ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 11ms/step
1/1 [==============================] - 0s 24ms/step
1/1 [==============================] - 0s 19ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 40ms/step
1/1 [==============================] - 0s 17ms/step
1/1 [==============================] - 0s 24ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 39ms/step
1/1 [==============================] - 0s 20ms/step
1/1 [==============================] - 0s 19ms/step
1/1 [==============================] - 0s 21ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 16ms/step
1/1 [==============================] - 0s 27ms/step
1/1 [==============================] - 0s 31ms/step
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