Volume control using fingers.....

In [1]:
```
import cv2
```

In [2]:
```
pip install mediapipe
```

```
Requirement already satisfied: mediapipe in c:\users\saiku\anaconda3\lib\site-packages (0.8.9)
Requirement already satisfied: six in c:\users\saiku\anaconda3\lib\site-packages (from mediapipe) (1.15.0)
Requirement already satisfied: protobuf>=3.11.4 in c:\users\saiku\anaconda3\lib\site-packages (from mediapipe) (3.19.1)
Requirement already satisfied: attrs>=19.1.0 in c:\users\saiku\anaconda3\lib\site-packages (from mediapipe) (20.3.0)
Requirement already satisfied: matplotlib in c:\users\saiku\anaconda3\lib\site-packages (from mediapipe) (3.3.4)
Requirement already satisfied: wheel in c:\users\saiku\anaconda3\lib\site-packages (from mediapipe) (0.36.2)
Requirement already satisfied: numpy in c:\users\saiku\anaconda3\lib\site-packages (from mediapipe) (1.20.1)
Requirement already satisfied: absl-py in c:\users\saiku\anaconda3\lib\site-packages (from mediapipe) (1.0.0)
Requirement already satisfied: opencv-contrib-python in c:\users\saiku\anaconda3\lib\site-packages (from mediapipe) (4.5.4.58)
Requirement already satisfied: kiwisolver>=1.0.1 in c:\users\saiku\anaconda3\lib\site-packages (from matplotlib->mediapipe) (1.3.1)
Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.3 in c:\users\saiku\anaconda3\lib\site-packages (from matplotlib->mediapipe) (2.4.7)
Requirement already satisfied: cycler>=0.10 in c:\users\saiku\anaconda3\lib\site-packages (from matplotlib->mediapipe) (0.10.0)
Requirement already satisfied: python-dateutil>=2.1 in c:\users\saiku\anaconda3\lib\site-packages (from matplotlib->mediapipe) (2.8.1)
Requirement already satisfied: pillow>=6.2.0 in c:\users\saiku\anaconda3\lib\site-packages (from matplotlib->mediapipe) (8.2.0)
Note: you may need to restart the kernel to use updated packages.
```

In [3]:
```
import mediapipe as mp
```

In [4]:
```
from math import hypot
```

In [5]:
```
from ctypes import cast,POINTER
```

In [6]:
```
from comtypes import CLSCTX_ALL
```

In [7]:
```
pip install pycaw
```

```
Requirement already satisfied: pycaw in c:\users\saiku\anaconda3\lib\site-packages (20181226)
Requirement already satisfied: enum34 in c:\users\saiku\anaconda3\lib\site-packages (from pycaw) (1.1.10)
Requirement already satisfied: psutil in c:\users\saiku\anaconda3\lib\site-packages (from pycaw) (5.8.0)
Requirement already satisfied: future in c:\users\saiku\anaconda3\lib\site-packages (from pycaw) (0.18.2)
Requirement already satisfied: comtypes in c:\users\saiku\anaconda3\lib\site-packages (from pycaw) (1.1.9)
Note: you may need to restart the kernel to use updated packages.
```

In [8]:
```
from pycaw.pycaw import AudioUtilities,IAudioEndpointVolume
```

In [9]:
```
import numpy as np
```

In [ ]:
```
cap = cv2.VideoCapture(0)

mpHands = mp.solutions.hands
hands = mpHands.Hands()
mpDraw = mp.solutions.drawing_utils

devices =AudioUtilities.GetSpeakers()
interface =devices.Activate(IAudioEndpointVolume._iid_,CLSCTX_ALL,None)
volume = cast(interface,POINTER(IAudioEndpointVolume))
volMin,volMax = volume.GetVolumeRange()[:2]

while True:
    success,img = cap.read()
    imgRGB = cv2.cvtColor(img,cv2.COLOR_BGR2RGB)
    results = hands.process(imgRGB)

    lmlist = []
    if results.multi_hand_landmarks:
        for handlandmark in results.multi_hand_landmarks:
            for id,lm in enumerate(handlandmark.landmark):
                h,w,_ = img.shape
                cx,cy = int(lm.x*w),int(lm.y*h)
                lmlist.append([id,cx,cy])
            mpDraw.draw_landmarks(img,handlandmark,mpHands.HAND_CONNECTIONS)

    if lmlist !=[]:
        x1,y1 = lmlist[4][1],lmlist[4][2]
        x2,y2 = lmlist[8][1],lmlist[8][2]

        cv2.circle(img,(x1,y1),4,(255,0,0),cv2.FILLED)
        cv2.circle(img,(x2,y2),4,(255,0,0),cv2.FILLED)

        cv2.line(img,(x1,y1),(x2,y2),(255,0,0),3)

        length = hypot(x2-x1,y2-y1)

        vol = np.interp(length,[15,220],[volMin,volMax])
        print(vol,length)
        volume.SetMasterVolumeLevel(vol,None)

cv2.imshow('Image',img)
if cv2.Waitkey(1) & 0xff == ord('q'):
        break
```

In [ ]:
```

```

In [ ]:
```

```