

```
In [1]: !pip install mediapipe
```

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Requirement already satisfied: mediapipe in c:\users\hp\anaconda3\lib\site-packages (0.10.9)
Requirement already satisfied: absl-py in c:\users\hp\anaconda3\lib\site-packages (from mediapipe) (2.1.0)
Requirement already satisfied: attrs>=19.1.0 in c:\users\hp\anaconda3\lib\site-packages (from mediapipe) (22.1.0)
Requirement already satisfied: flatbuffers>=2.0 in c:\users\hp\anaconda3\lib\site-packages (from mediapipe) (23.5.26)
Requirement already satisfied: matplotlib in c:\users\hp\anaconda3\lib\site-packages (from mediapipe) (3.7.2)
Requirement already satisfied: numpy in c:\users\hp\anaconda3\lib\site-packages (from mediapipe) (1.24.3)
Requirement already satisfied: opencv-contrib-python in c:\users\hp\anaconda3\lib\site-packages (from mediapipe) (4.9.0.80)
Requirement already satisfied: protobuf<4,>=3.11 in c:\users\hp\anaconda3\lib\site-packages (from mediapipe) (3.20.3)
Requirement already satisfied: sounddevice>=0.4.4 in c:\users\hp\anaconda3\lib\site-packages (from mediapipe) (0.4.6)
Requirement already satisfied: CFFI>=1.0 in c:\users\hp\anaconda3\lib\site-packages (from sounddevice>=0.4.4->mediapipe) (1.15.1)
Requirement already satisfied: contourpy>=1.0.1 in c:\users\hp\anaconda3\lib\site-packages (from matplotlib->mediapipe) (1.0.5)
Requirement already satisfied: cyclor>=0.10 in c:\users\hp\anaconda3\lib\site-packages (from matplotlib->mediapipe) (0.11.0)
Requirement already satisfied: fonttools>=4.22.0 in c:\users\hp\anaconda3\lib\site-packages (from matplotlib->mediapipe) (4.25.0)
Requirement already satisfied: kiwisolver>=1.0.1 in c:\users\hp\anaconda3\lib\site-packages (from matplotlib->mediapipe) (1.4.4)
Requirement already satisfied: packaging>=20.0 in c:\users\hp\anaconda3\lib\site-packages (from matplotlib->mediapipe) (23.1)
Requirement already satisfied: pillow>=6.2.0 in c:\users\hp\anaconda3\lib\site-packages (from matplotlib->mediapipe) (9.4.0)
Requirement already satisfied: pyparsing<3.1,>=2.3.1 in c:\users\hp\anaconda3\lib\site-packages (from matplotlib->mediapipe) (3.0.9)
Requirement already satisfied: python-dateutil>=2.7 in c:\users\hp\anaconda3\lib\site-packages (from matplotlib->mediapipe) (2.8.2)
Requirement already satisfied: pycparser in c:\users\hp\anaconda3\lib\site-packages (from CFFI>=1.0->sounddevice>=0.4.4->mediapipe) (2.21)
Requirement already satisfied: six>=1.5 in c:\users\hp\anaconda3\lib\site-packages (from python-dateutil>=2.7->matplotlib->mediapipe) (1.16.0)
```

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In [2]: import mediapipe as mp
import cv2
import numpy as np
import uuid
import os
```

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

```
In [3]: mp_drawing = mp.solutions.drawing_utils
mp_hands = mp.solutions.hands
```

DRAW HANDS

```
In [26]: cap = cv2.VideoCapture(0)
```

```

with mp_hands.Hands(min_detection_confidence=0.8, min_tracking_confidence=0.5) as hands:
    while cap.isOpened():
        ret, frame = cap.read()

        #BGR 2 RGB
        image = cv2.cvtColor(frame, cv2.COLOR_BGR2RGB)

        #flip on horizontal
        image = cv2.flip(image, 1)
        #Set flag
        image.flags.writeable = False

        #Detections
        results = hands.process(image)

        #set flag to true
        image.flags.writeable = True

        #RGB 2 BGR
        image = cv2.cvtColor(image, cv2.COLOR_RGB2BGR)

        #Detections
        print(results)

        # Rendering results
        if results.multi_hand_landmarks:
            for num, hand in enumerate(results.multi_hand_landmarks):
                mp_drawing.draw_landmarks(image, hand, mp_hands.HAND_CONNECTIONS,
                                           mp_drawing.DrawingSpec(color=(121, 22, 76), thickness=2, joint_type=mp_hands.JOINT_TYPE_LANDMARK),
                                           mp_drawing.DrawingSpec(color=(250, 44, 250), thickness=2, joint_type=mp_hands.JOINT_TYPE_CONNECTION))

        cv2.imshow('Hand Tracking', image)

        if cv2.waitKey(10) & 0xFF == ord('q'): #if cv2.waitKey(1) or 0xFF==ord('q'):
            break

cap.release()
cv2.destroyAllWindows()

```

[illegible]

[illegible]


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In [16]: mp_drawing.DrawingSpec??
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In [29]: #os.mkdir('OutPut Images')
```

```
In [41]: cap = cv2.VideoCapture(0)
```

```

with mp_hands.Hands(min_detection_confidence=0.8, min_tracking_confidence=0.5) as hands:
    while cap.isOpened():
        ret, frame = cap.read()

        #BGR 2 RGB
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        #RGB 2 BGR
        image = cv2.cvtColor(image, cv2.COLOR_RGB2BGR)

        #Detections
        print(results)

        # Rendering results
        if results.multi_hand_landmarks:
            for num, hand in enumerate(results.multi_hand_landmarks):
                mp_drawing.draw_landmarks(image, hand, mp_hands.HAND_CONNECTIONS,
                                          mp_drawing.DrawingSpec(color=(121, 22, 76), thickness=2, jointType=mp_hands.JointType.WRIST,
                                                                    landmarkType=mp_hands.LandmarkType.WRIST),
                                          mp_drawing.DrawingSpec(color=(250, 44, 250), thickness=2, jointType=mp_hands.JointType.WRIST,
                                                                    landmarkType=mp_hands.LandmarkType.WRIST))

        # Save our image
        cv2.imwrite(os.path.join('Output Images', '{}.jpg'.format(uuid.uuid1())), image)

        cv2.imshow('Hand Tracking', image)

        if cv2.waitKey(10) & 0xFF == ord('q'): #if cv2.waitKey(1) or 0xFF==ord('q'):
            break

cap.release()
cv2.destroyAllWindows()

```


[illegible]

[illegible]

[illegible]

