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1 #import the used libraries
2 import mediapipe as mp
3 import cv2
4 import time
5
6 #Create the hand detector class
7 class handDetector():
8     #Initialize it's own variables
9     def __init__( self, mode=False, maxHands=4, modelComplex = 1, detectionCon = 0.5,
trackCon=0.5):
10         self.mode = mode
11         self.maxHands = maxHands
12         self.modelComplex = modelComplex
13         self.detectionCon = detectionCon
14         self.trackCon = trackCon
15
16         #Initialize the hands solution object
17         self.mpHands = mp.solutions.hands
18         #Initialize the Hands object from inside the other object with the handDetector
variables as operators
19         self.hands = self.mpHands.Hands(self.mode, self.maxHands, self.modelComplex,
self.detectionCon, self.trackCon)
20         #Initialize the drawing object from mediapipe which draws on a image with cv2
21         self.mpDraw = mp.solutions.drawing_utils
22
23         #Create a function that process the image with the Landmarks of every point on the
hands detected
24         def findHands(self, img, drawCon = True, drawLan = True):
25             #convert the bgr from cv2 to rgb that mediapipe is able to scan
26             imgRGB = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
27             #store the scanned image on a variable
28             self.results = self.hands.process(imgRGB)
29             #if there is some results on the variable, meaning that there is hands found on the
image
30             if self.results.multi_hand_landmarks:
31                 #For each Landmark in the list
32                 for handLms in self.results.multi_hand_landmarks:
33                     #If the operator says it, draws a scheme over the image to show the hand
found
34                     if drawCon:
35                         self.mpDraw.draw_landmarks(img, handLms, self.mpHands.HAND_CONNECTIONS)
36                     elif drawLan:
37                         self.mpDraw.draw_landmarks(img, handLms)
38
39             #return the image
40             return img
41         #Create a function that returns a list of coordinates from everi hand landmark on a
image
42         def findPosition(self, img, handNo = 0, draw = True):
43             #initialize the list
44             lmList = []
45             #if there is any landmarks on the image
46             if self.results.multi_hand_landmarks:
47                 #find the hand specified above landmarks
48                 myHand = self.results.multi_hand_landmarks[handNo]
49                 #for every landmark and it's id in the list of landmarks
50                 for id, lm in enumerate(myHand.landmark):
51                     #calculate the image shape
52                     h, w, c = img.shape
53                     #convert it to pixels
54                     cx, cy = int(lm.x*w), int(lm.y*h)
55                     #append a list of each id and coordinates to the main list

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56         lmList.append( [id, cx, cy])
57         #if it has to draw a circle on a specific landmark it does
58         if draw and id ==8 :
59             cv2.circle(img, (cx,cy), 15, (0,255,0), cv2.FILLED)
60     #Return the list
61     return lmList
62 #create the main function
63 def main():
64     pTime = 0
65     cTime = 0
66     #initialize the webcam object
67     cap = cv2.VideoCapture(0)
68
69     #initialize the hand detector object
70     detector = handDetector()
71
72     #endlessly
73     while True:
74         #get a capture from the webcam
75         success, img = cap.read()
76
77         #find the hands that there could be on the image
78         img = detector.findHands(img)
79
80         #find the positions of that hands
81         lmList = detector.findPosition(img)
82         #if that list is full that means that there are some hands on the image
83         if len(lmList) != 0:
84             #Print it's coordinates
85             print(lmList[4])
86
87         #Calculate fps
88         cTime = time.time()
89         fps = 1/(cTime - pTime)
90         pTime = cTime
91
92         #insert the text of the fps in the images
93         cv2.putText(img, str(int(fps)), (10,70), cv2.FONT_HERSHEY_PLAIN,3,(255,0,255),3)
94
95         #show the images
96         cv2.imshow("Image",img)
97         cv2.waitKey(1)
98
99
100
101
102
103 #if it is the main call
104 if __name__ == "__main__":
105     main()
```