Computer Vision Project

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Intelligent Systems

Report of action recognition

I will **detect landmarks** for face, body and hand poses

Steps:

1) Import dependencies

Import **mediapipe** as it gives a holistic model as well as some drawing utilities

Mediapipe is a python library comes with a bunch of pre-trained deep learning models and the model that I will use is called mediapipe holisticit

import **cv2** as it access web camera and do all of image based visualizations

2) Set up functions in mediapipe

Drawing_utils: draw different detections from holistic model to opencv

Holistic: a full body detection model as It's made up of three different models:

1. Detect facial landmarks
2. Detect all the joints within hands (hand tracking)
3. Detect the poses within body

3) Draw landmarks for face, hands and body poses

Open camera with holistic model that takes two certain values which control accuracy of detecting and tracking , and if we need higher accuracy we increase these values

First: We need to convert image from BGR to RGB to pass it to holistic model to make Detections but after that we need to return it back ro BGR to be able to render using opencv

Second: draw face landmarks by function **draw_landmarks** it takes 3 parameters: processed image , the result of holistic model and third parameter show which landmarks connect to other landmarks and I repeat that function 4 times: for face , right hand , left hand and Poses
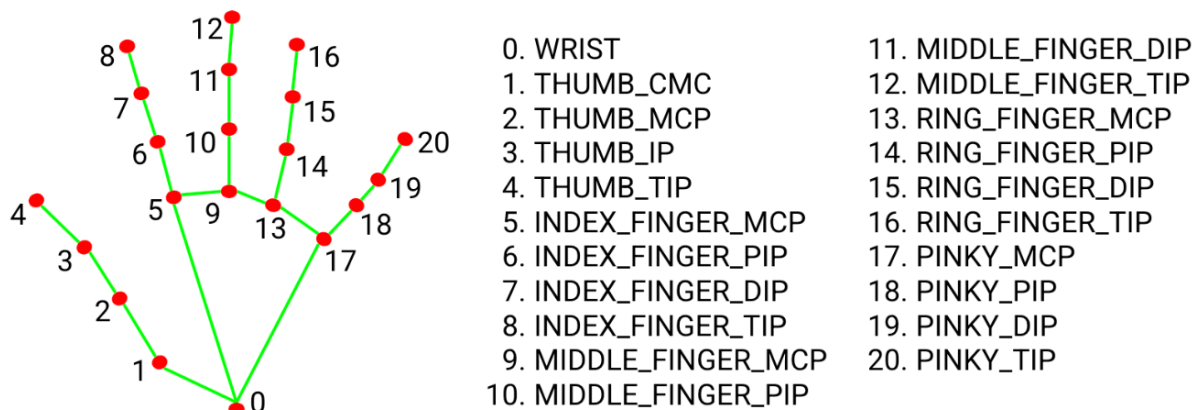
Now we can detect landmarks perfectly

4) Styling the drawing landmarks

as the output of previous functions doesn't made it clear which landmarks for face and which for poses and so on, so we need to style the landmarks to made it clear:

I made same steps in **step3** beside **DrawingSpec** function that is in **drawing_utils** ,this is the function which solve the problem thanks to it's 3 parameters as we can change values of them as we like, and those parameters are**: color, thickness and circle_radius**

after we change the values as we like now we can clearly see which landmarks for hand and which for poses and so on…

For example this picture show to us landmarks of hand:

0. WRIST
1. THUMB_CMC
2. THUMB_MCP
3. THUMB_IP
4. THUMB_TIP
5. INDEX_FINGER_MCP
6. INDEX_FINGER_PIP
7. INDEX_FINGER_DIP
8. INDEX_FINGER_TIP
9. MIDDLE_FINGER_MCP
10. MIDDLE_FINGER_PIP
11. MIDDLE_FINGER_DIP
12. MIDDLE_FINGER_TIP
13. RING_FINGER_MCP
14. RING_FINGER_PIP
15. RING_FINGER_DIP
16. RING_FINGER_TIP
17. PINKY_MCP
18. PINKY_PIP
19. PINKY_DIP
20. PINKY_TIP

Reference of helper resources

https://www.youtube.com/watch?v=pG4sUNDOZFg&list=RDCMUCHXa4OpASJEwrHrLeIzw7Yg&index=5