Project 1 Report

Markerless Hand Tracking in Video

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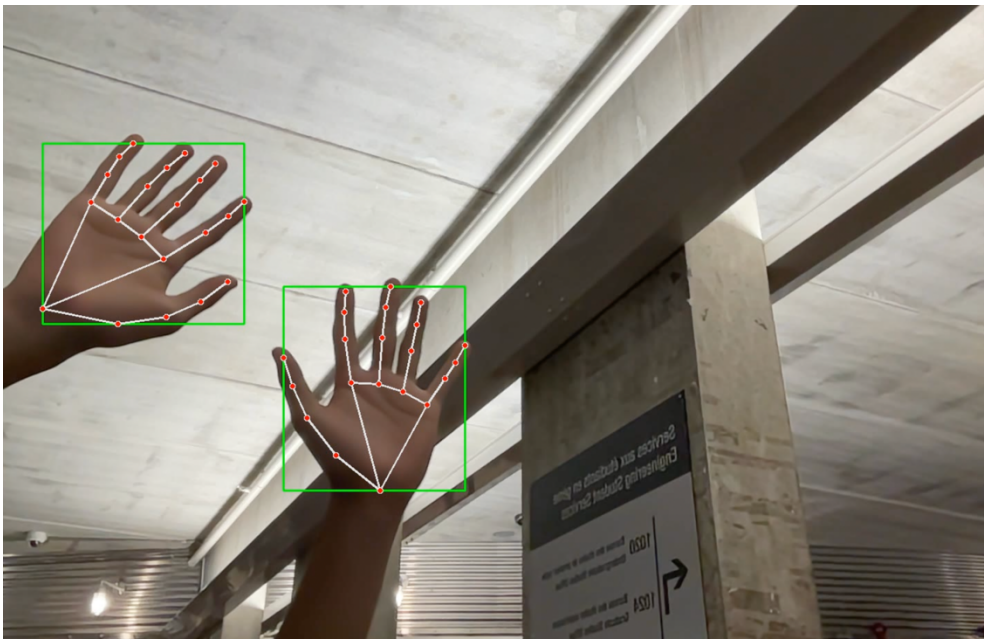
Procedure:

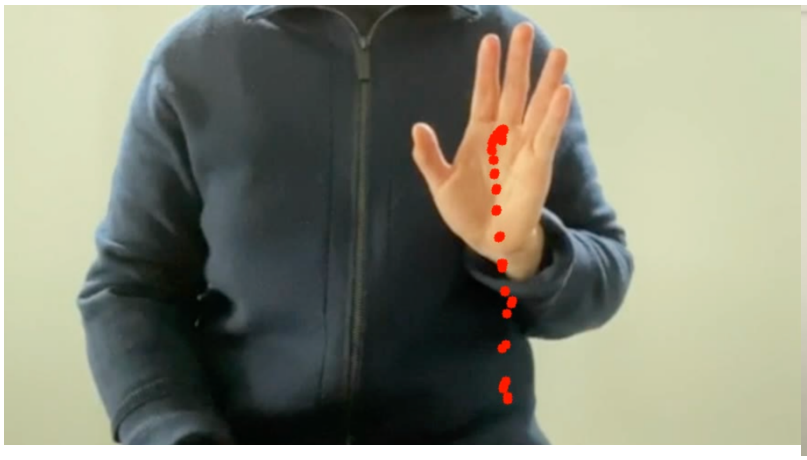
Part A：

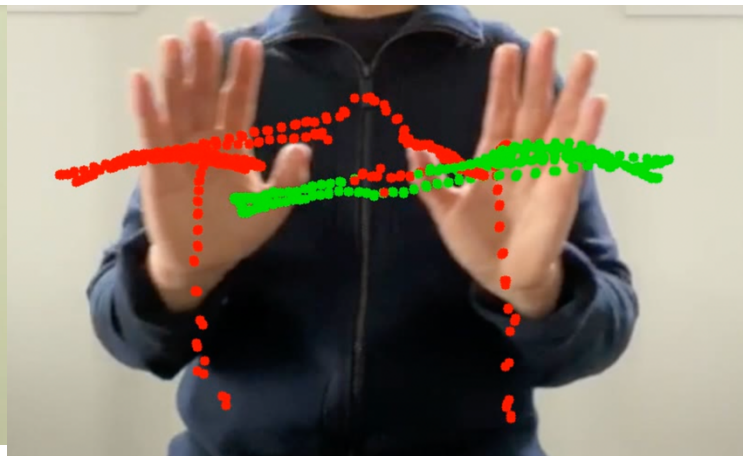
1. Open up really time video capture
2. Set up drawing util, drawing style, and solution hand
3. Obtain frame size(width, height)
4. Set up fps
5. Create a video writer
6. For each frame, flip the image and convert to rgb, process the image and convert to RGB again.
7. Then for each hand, get x_min, y_min, x_max, y_max
8. Draw rectangles according to the results from previous step.
9. Draw hand landmarks
10. Write each drew frame into the writer



Part B：

1. Import video from folder
2. Set up drawing util, drawing style, and solution hand
3. Obtain frame size(width, height)
4. Set up fps
5. Create a video writer
6. For each frame, convert to rgb, process the image and convert to RGB again.
7. Then for each hand, get the 9th landmark which corresponds to the center of the hand.
8. (In the coloring mechanism, I tries to set the dots of the hand with different color, but the program can't recognize which hand it is, so when the hands are crossed or went out of the screen the color might switch)
9. Draw the dot in the current coordinate and store these dots into a list, with x,y corrdinates and its color.
10. Draw previous dots, the ordering of step 10 and step 9 is mixed.
11. output the frame to videowriiter.





References:

Writing mp4 video
https://stackoverflow.com/questions/30509573/writing-an-mp4-video-using-python-opencv

media-pipe landmarks
https://stackoverflow.com/questions/66876906/create-a-rectangle-around-all-the-points-returned-from-mediapipe-hand-landmark-d

read write video:
https://learnopencv.com/reading-and-writing-videos-using-opencv/

mediapipe
https://google.github.io/mediapipe/solutions/hands.html

draw dots
https://stackoverflow.com/questions/49799057/how-to-draw-a-point-in-an-image-using-given-co-ordinate-with-python-opencv