CSI 4133

Final Project Part A

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Methodology

Prior to processing the video, the height and width of the frame are read, the media pipe hands module is initialized, and a dictionary, *positions*, is defined, with two keys: left and right, each associated with an empty list. The output writer object is also initialized. The video is read and then processed frame by frame. Hands are found using media pipe. A utility function *getHands* was written to iterate over all hands found in the frame and draw a bounding box by finding the min/max x and y values on the detected hands. The center of the hand is calculated by finding the middle of the bounding box. The handedness (left or right) of the hand is then found using mediapipe. A list of hands is then formed, with each entry containing the coordinates needed to draw the bounding box, the center coordinates, and the handedness of each found hand. This list is then returned, and its value is assigned to the *detectedHands* variable. The *detectedHands* variable is then iterated over, the bounding rectangle for each hand is drawn, and the center coordinates are added to the corresponding array in the *positions* dictionary. After this, the list of positions for the right and left hands are passed into the OpenCV line function to draw the path of the hand leading up to the current frame. This frame is then displayed, and written to the output video. The program closes when all the frames of the video have been processed, or the escape key is pressed.

Results

Figure 1 includes screenshots from the Initial testing using webcam input to test mediapipe hand detection

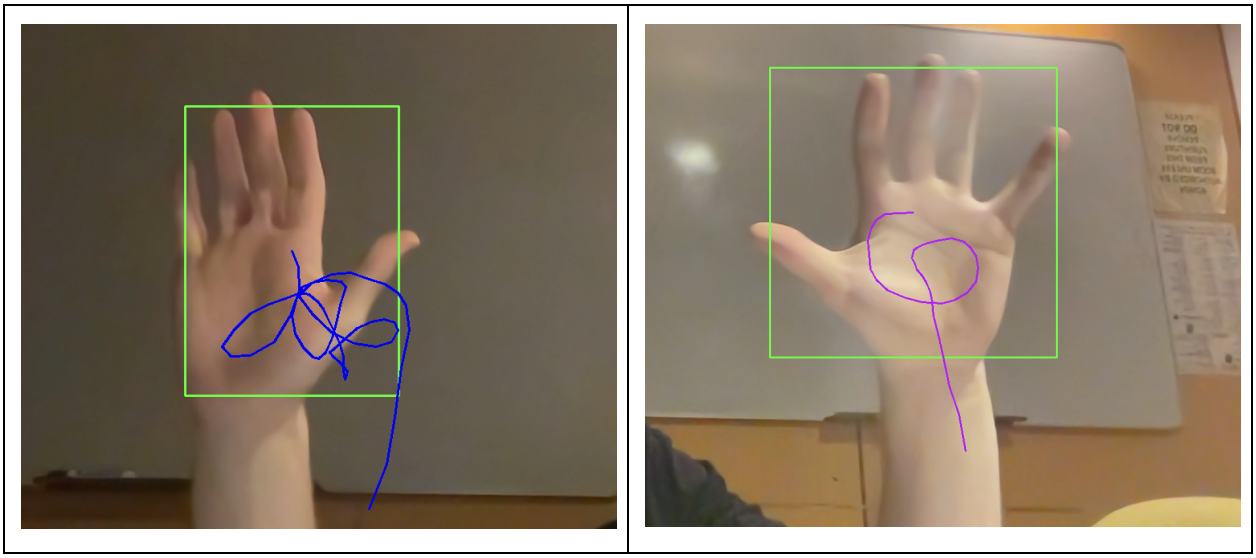

Figure 1

After initial testing with webcam input, the provided video was processed using the same code, figure 2 includes screenshots from this. As is visible in the screenshot, media pipe initially

struggled to find the hands, and misclassified their position, resulting in some errors with the motion tracking lines.

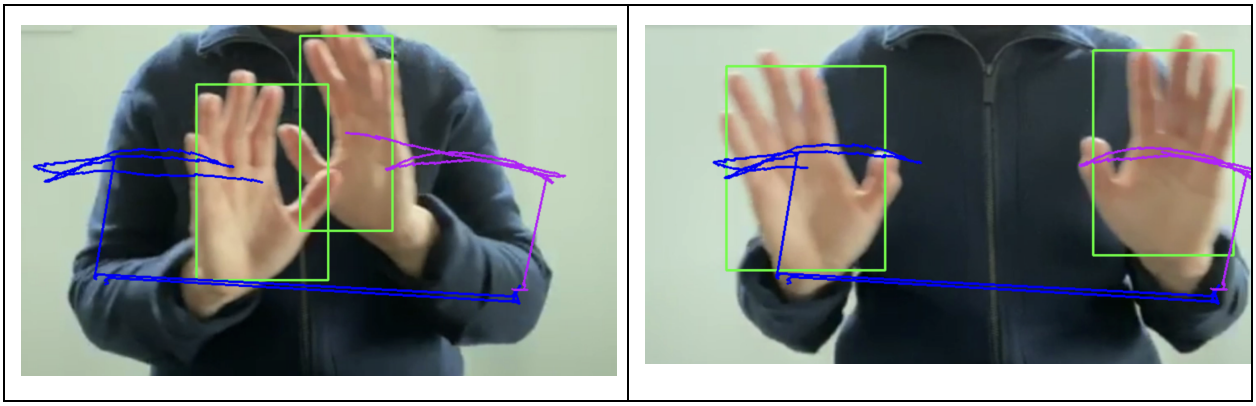

Figure 1