

B657 Final Project: Human Motion Tracking and Recognition

Due: Sunday April 27th.

In this assignment, you will get a chance to try applying what you have learned thus far to a slightly larger scale problem. You are to build a tracking system that can keep track of moving objects and hands. Three datasets (10 frames/second) are available from slashtmp:

<https://www.slashtmp.iu.edu/public/download.php?FILE=astuehli/46070ZeGEy4>

<https://www.slashtmp.iu.edu/public/download.php?FILE=astuehli/70300YU4Gxs>

<https://www.slashtmp.iu.edu/public/download.php?FILE=astuehli/93275fWuzwa>

The goal:

The goal of this assignment is to give you some experience at developing a vision system, and in particular to make the system work. You will need to find solutions by yourself based on what you've learned in this class. As this is a more extensive project, I'd like to see a more formal discussion of your results.

- Tracking the locations of objects in the view and outputting a data file in the following format:
[x1 y1 x2 y2 x3 y3]
While (x,y) is the center of an object and (0,0) means not in the view.
Hint: the challenge is that each object may consist of multiple blobs (separated by other objects and hands).
- Tracking the locations of hands, labeling left/right and person 1/2, outputting a data file in the following format:
[p1_left_x p1_left_y p1_right_x p1_right_y p2_left_x p2_left_y p2_right_x p2_right_y]
- Tracking which objects are in hands and outputting a binary text file in the following format:
[obj1_p1 obj2_p1 obj3_p1 obj1_p2 obj1_p2 obj3_p2]
Hint: you can infer this based on both the spatial distance between hands and objects, and on temporal information (e.g. whether the two are moving together, etc.).
- Categorizing hand status into five categories (1-doing nothing, 2-moving an object, 3-moving without objects, 4- manipulating objects, 0-not in the view). the output data file should be with the following format:
[p1_left p1_right p2_left p2_right]
- Measuring the average processing time for each task above. You can use `cputime()` in Matlab.

The requirement:

- You can work together with one of your classmates.
- You should report individual efforts in the project (who implements which parts, etc.)
- You will need to write a formal report to describe the performance of your program, analyze the results and discuss possible improvement.
- You are free to use any ideas from the papers we studied in class.
- You are free to explore any techniques and algorithms.

You should submit your code and a report of your results. You will need to put your turn-in package on slashtmp and send a link to chenyu@indiana.edu.