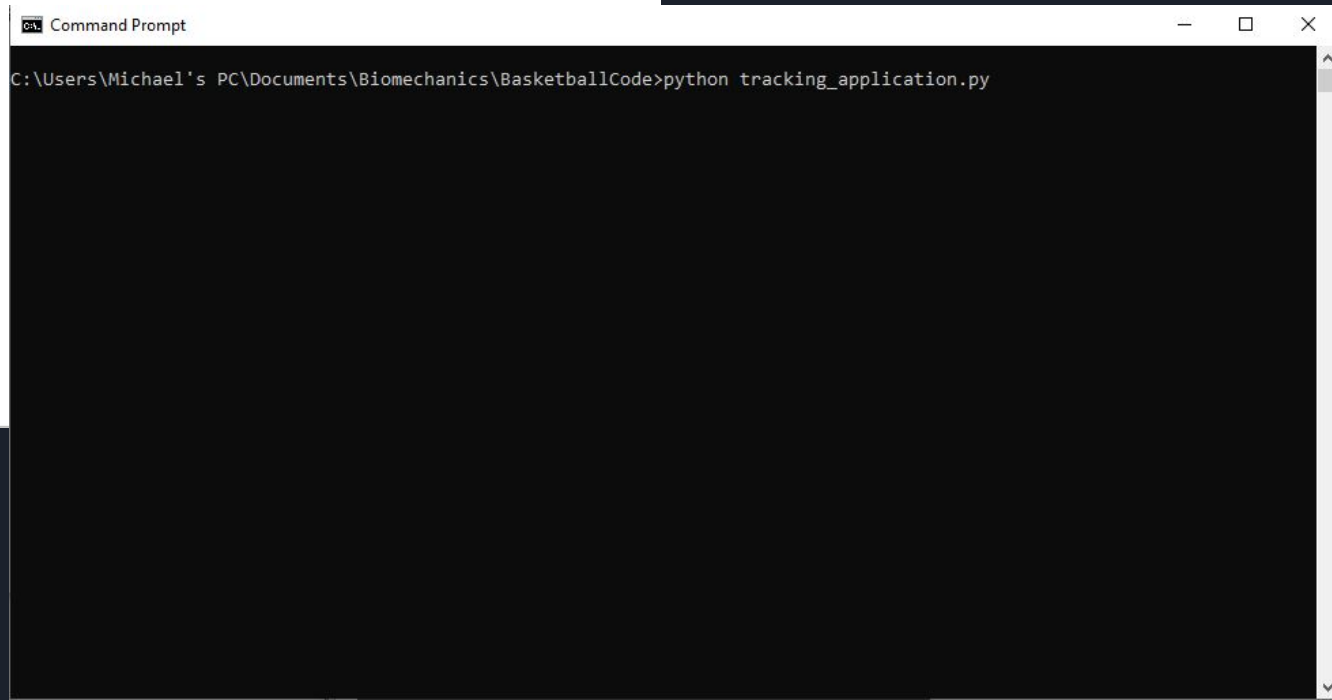
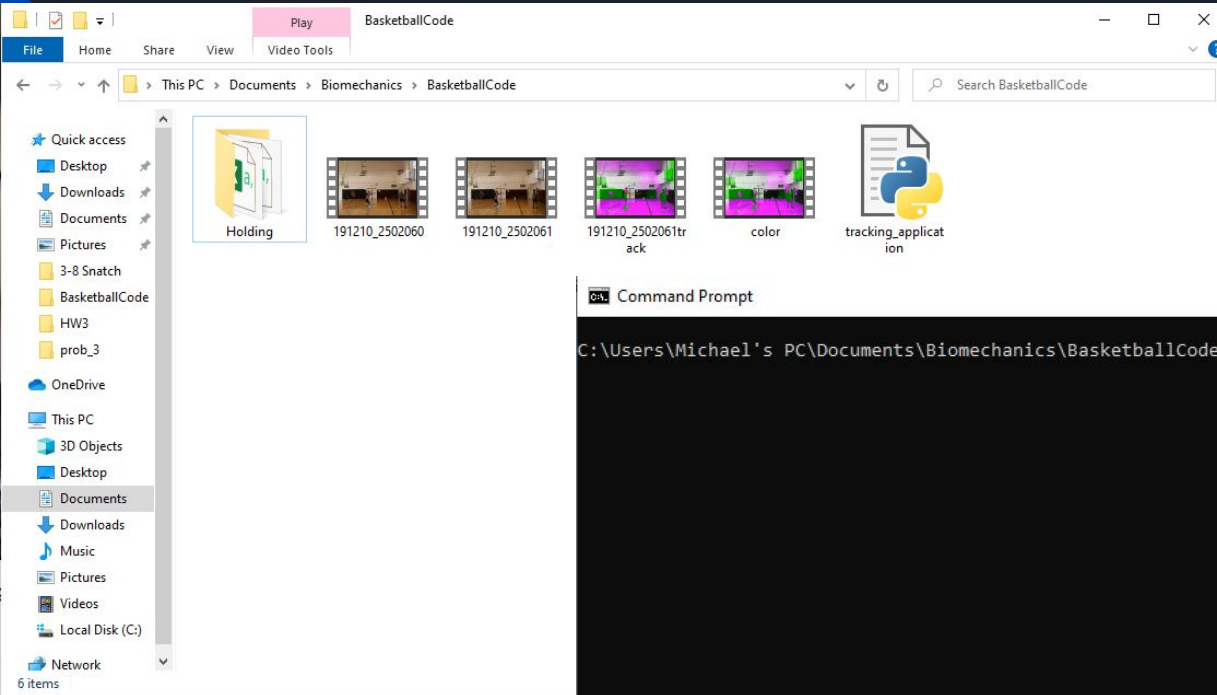


A decorative graphic on the left side of the slide consisting of two overlapping parallelograms. The front one is blue and the back one is a light green. They are positioned diagonally, with the blue one partially covering the green one.

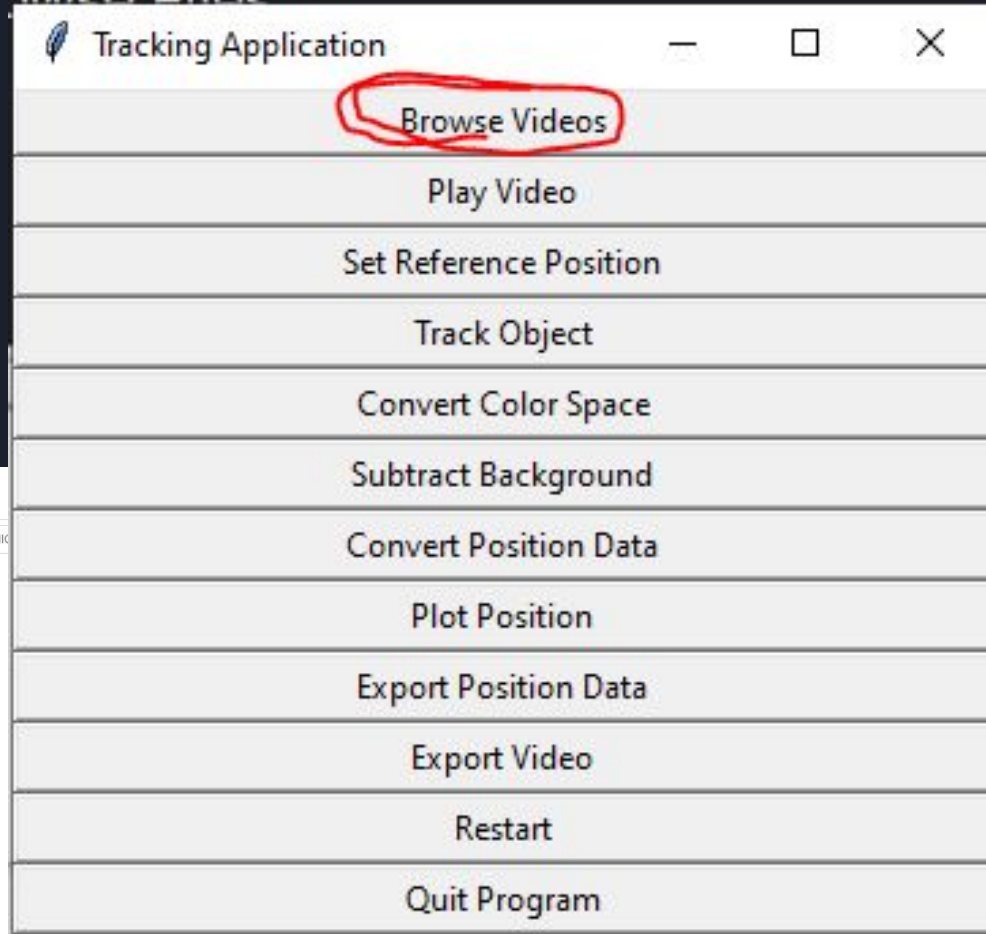
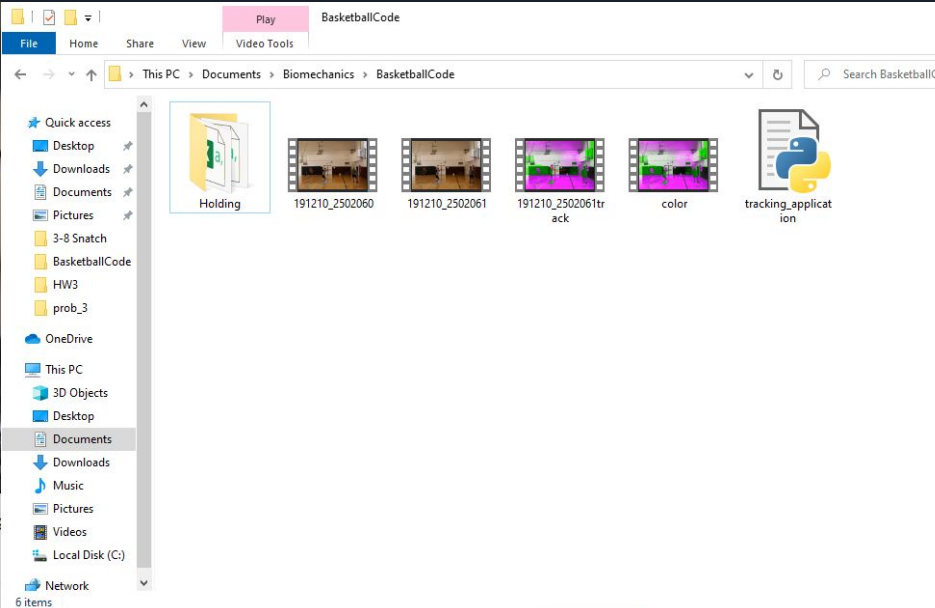
Tracking Application Tutorial

Michael Pozzi

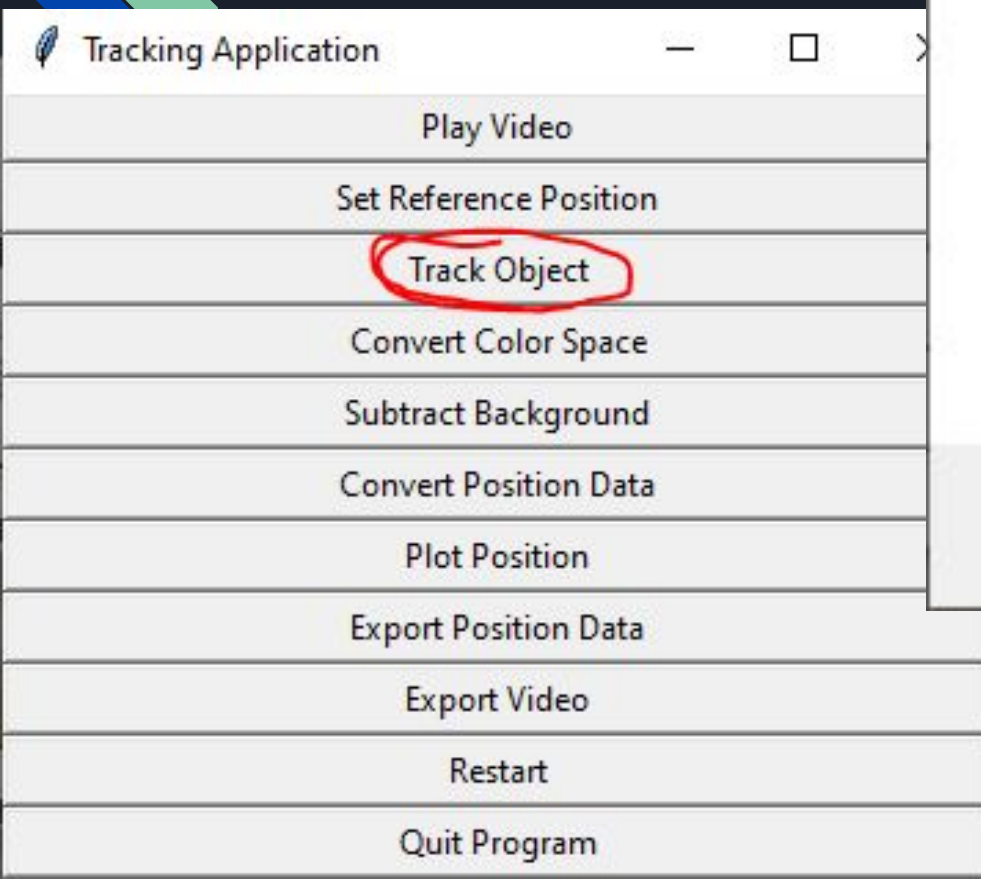
Run the Program in the Desired Directory



Browse Files



Track Object



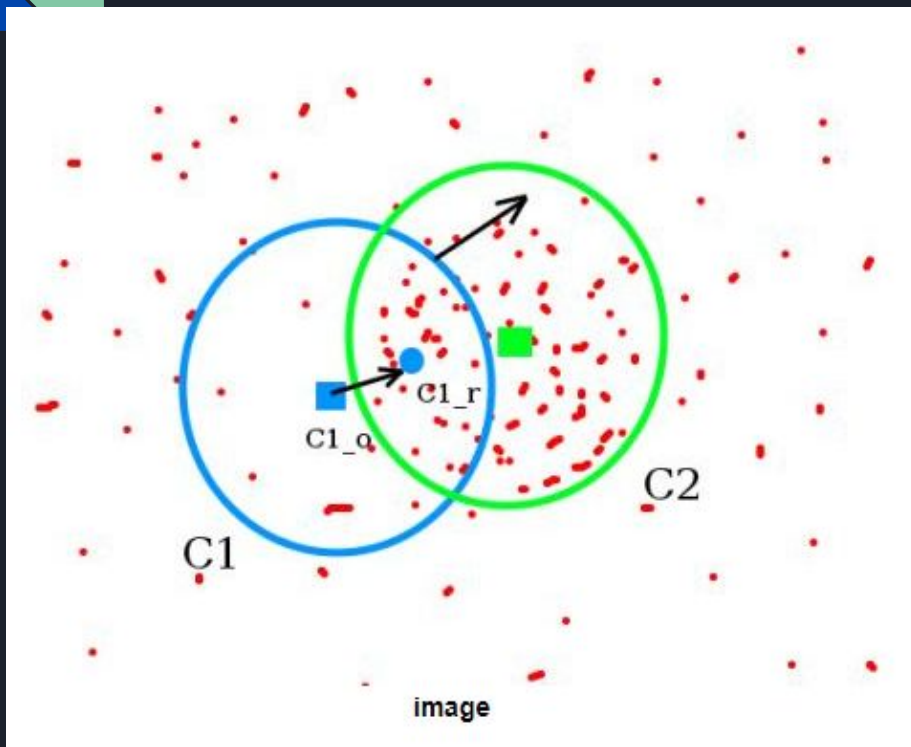
Instructions



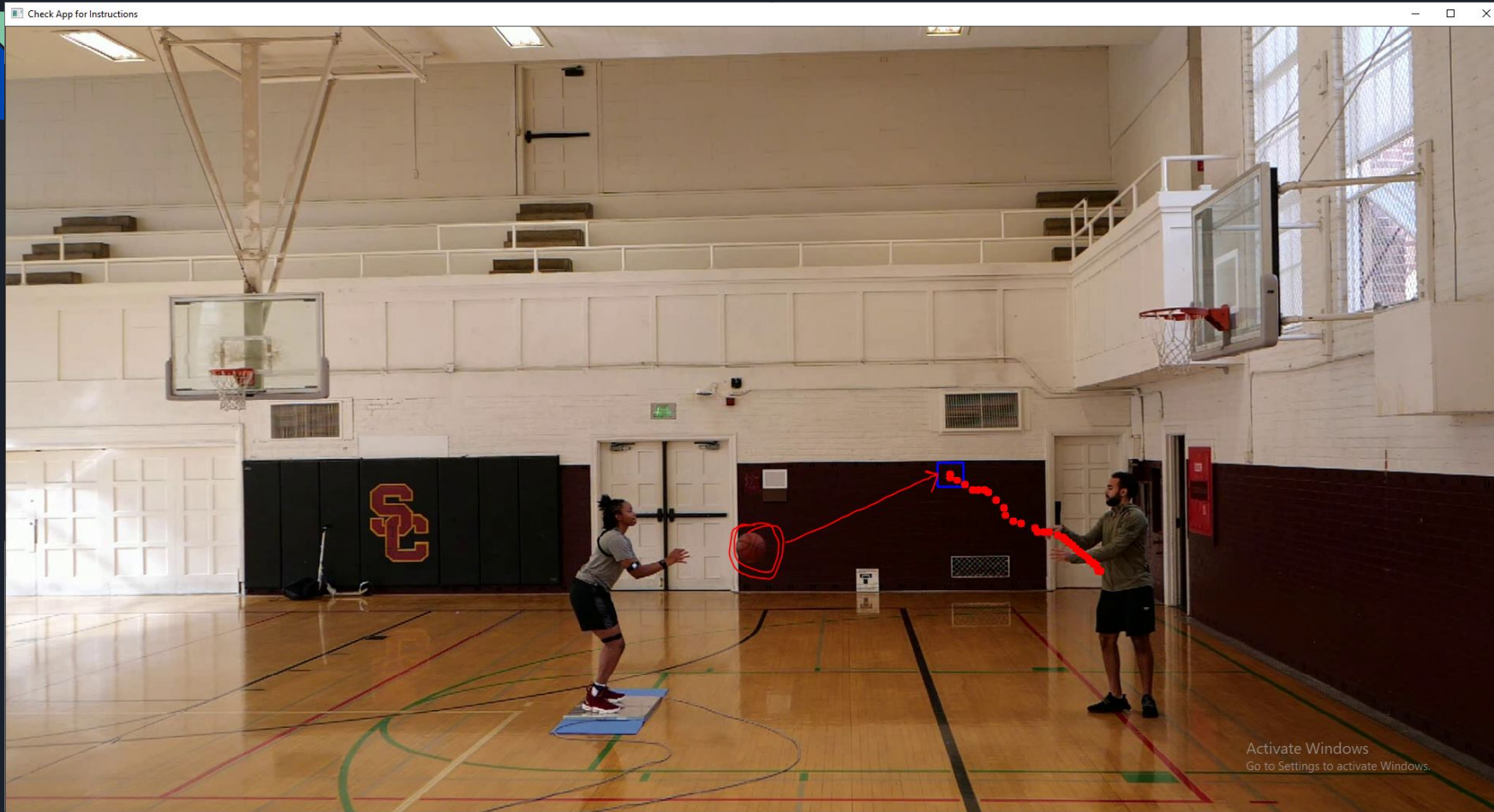
Press F to play
Press J to pause
Left click for upper right crop
Right click for lower right crop
Press T to track
Press J to stop track
Press ENTER to exit

OK

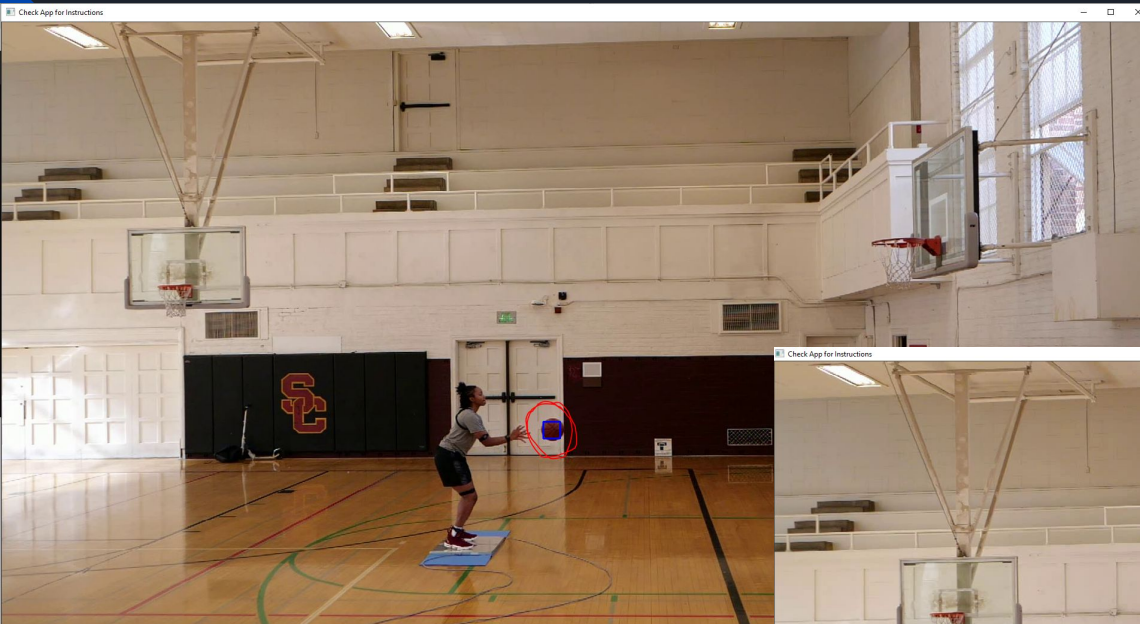
Tracking Through Meanshift



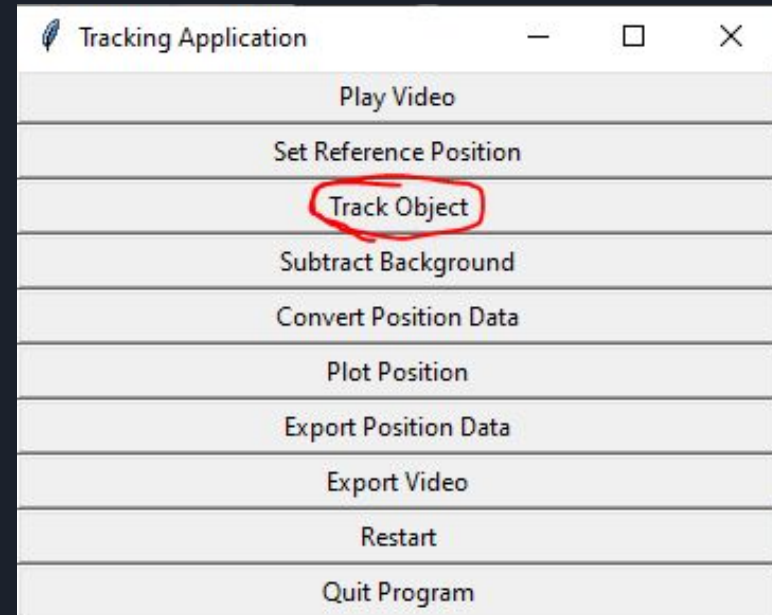
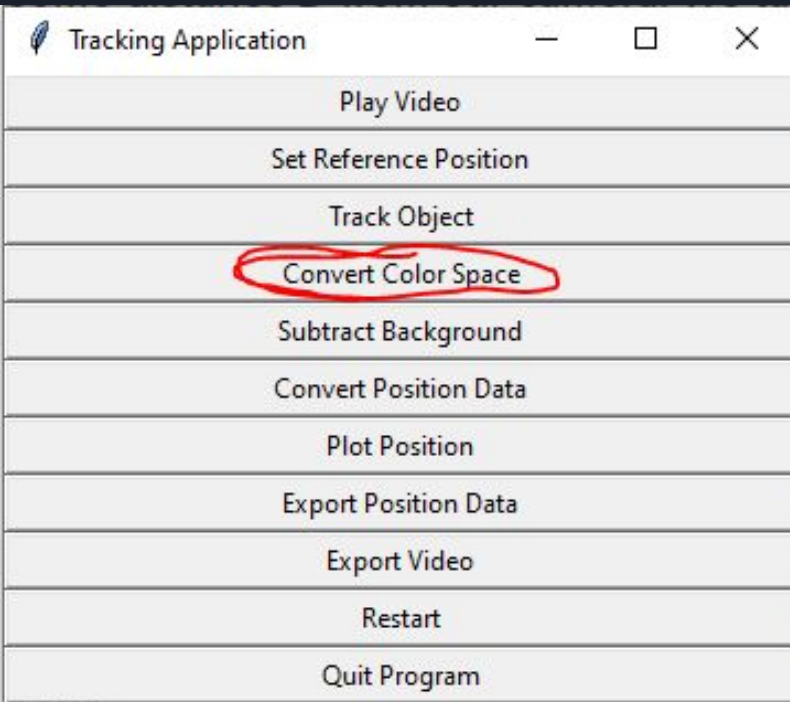
Error

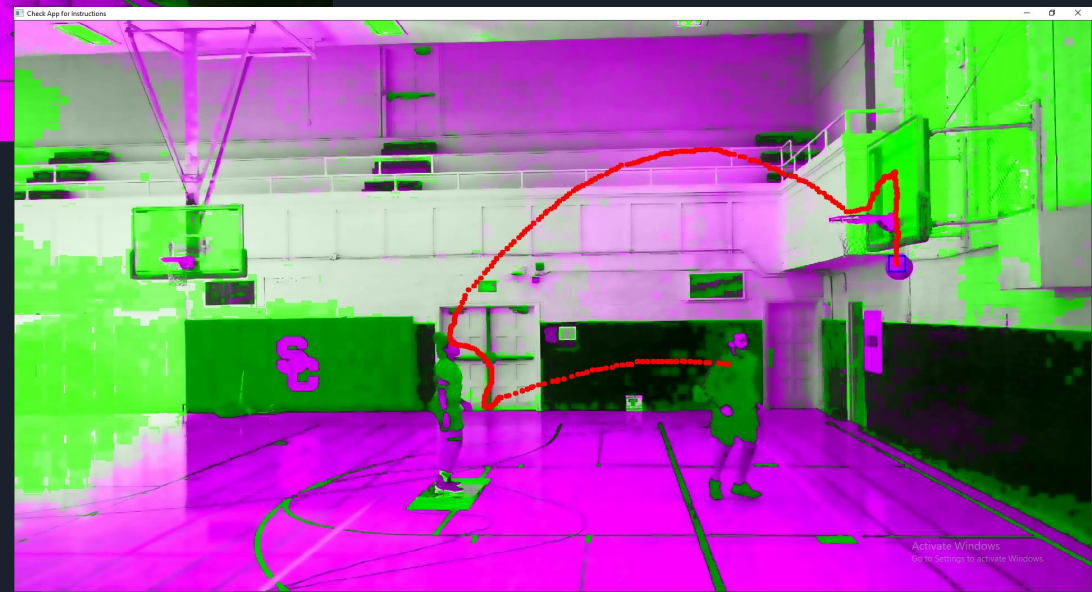
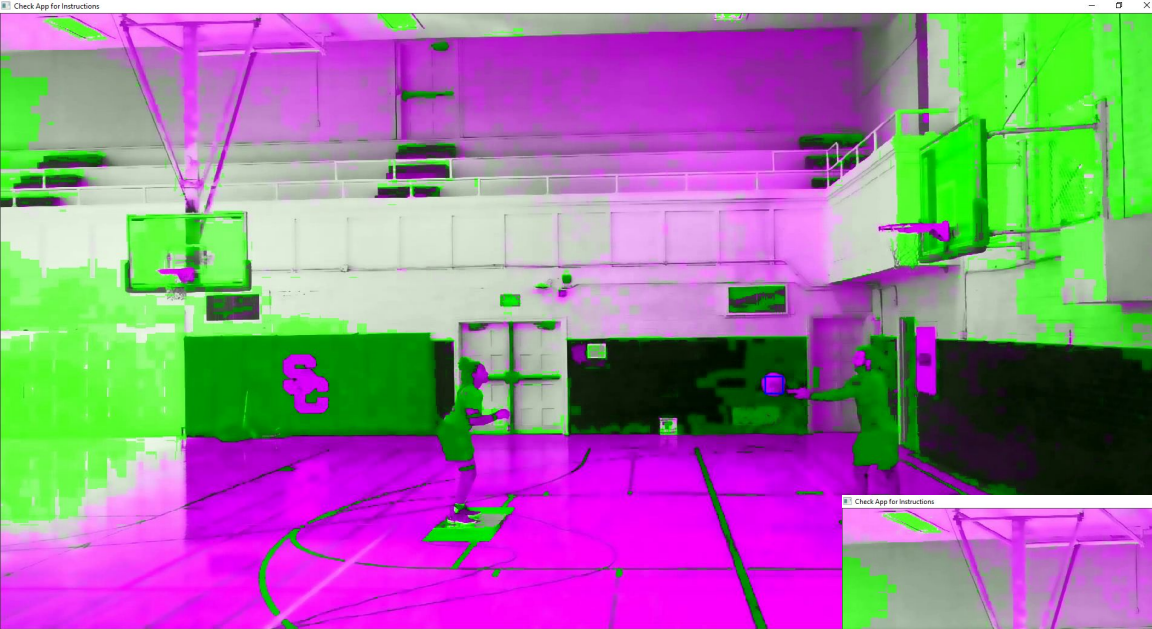


Fix 1

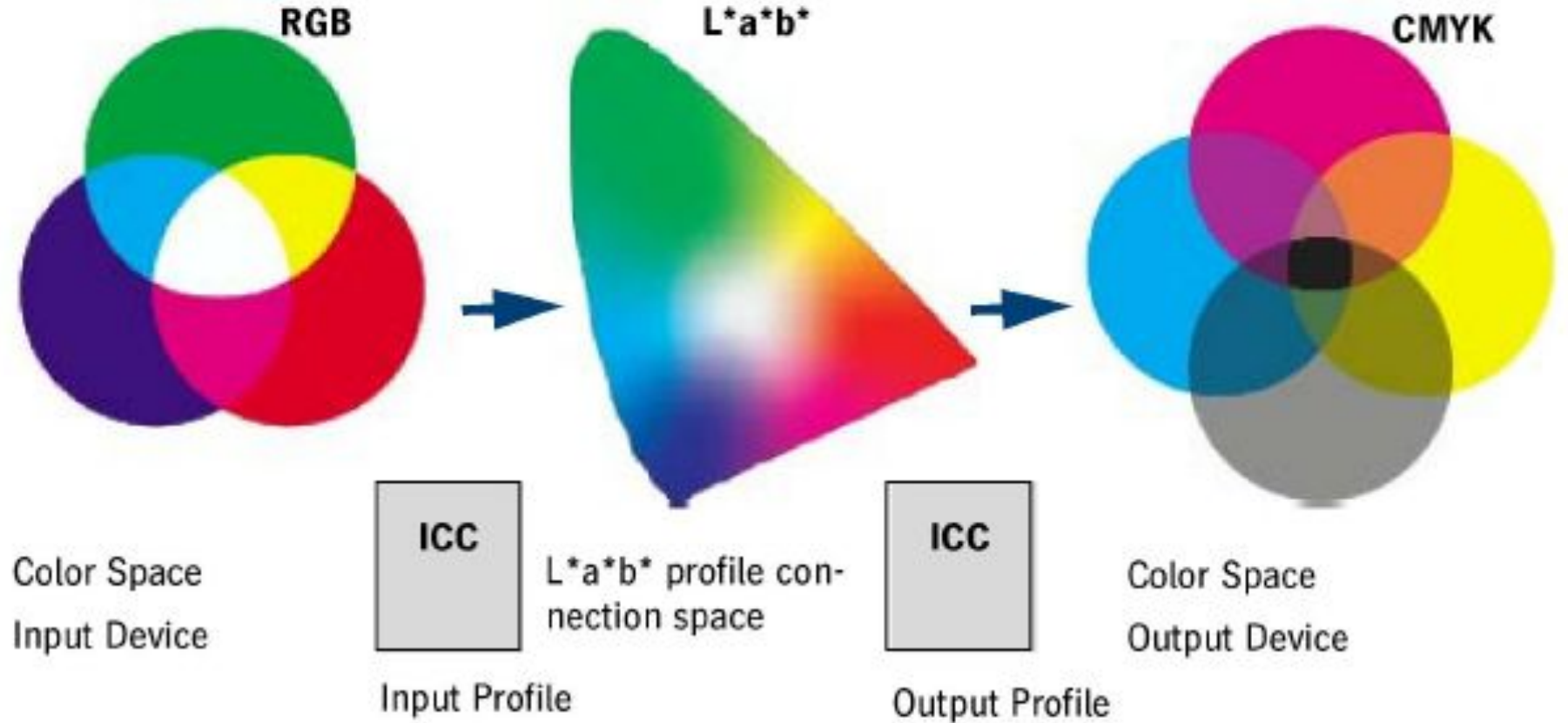


Fix 2 - Histogram Equalization and Color Space Conversion

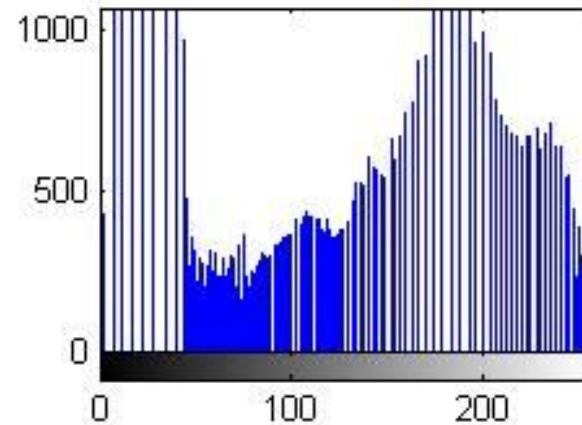
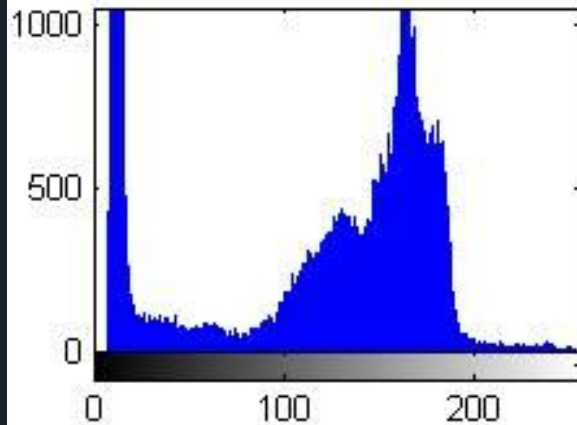




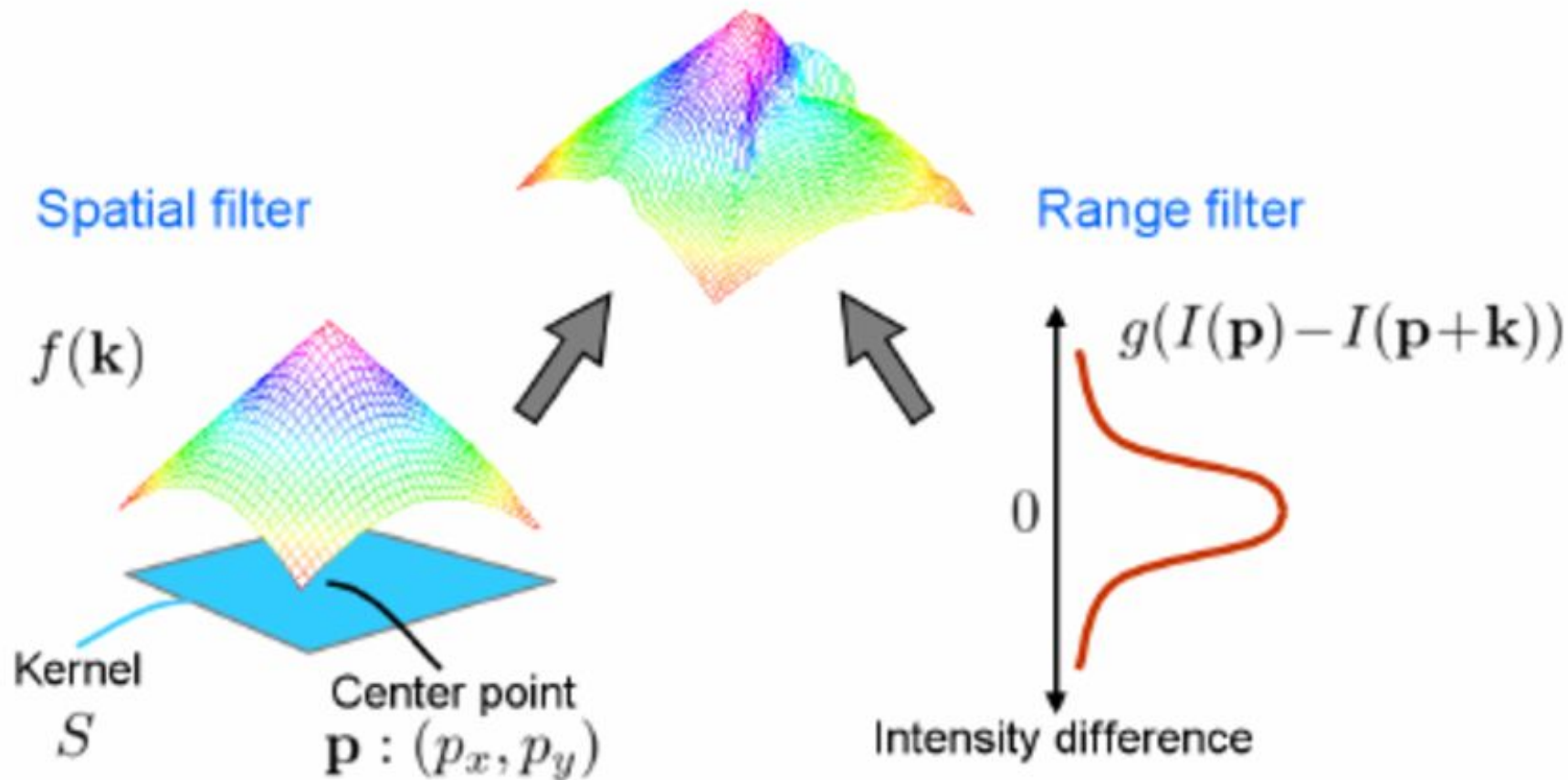
Color Space Conversion



Histogram Equalization



Bilateral Filter



Changing Color Space Values

```
#-----  
#Rearrange order and type of y, cr, and cb to get different results  
#Possible values to rearrange:  
#   y, y_hist  
#   cr, cr_hist  
#   cb, cb_hist  
channels = (y_hist,y_hist,y_hist)  
color = cv2.merge(channels)  
#-----
```



Some Good Color Space Values



y_hist, cr, cb

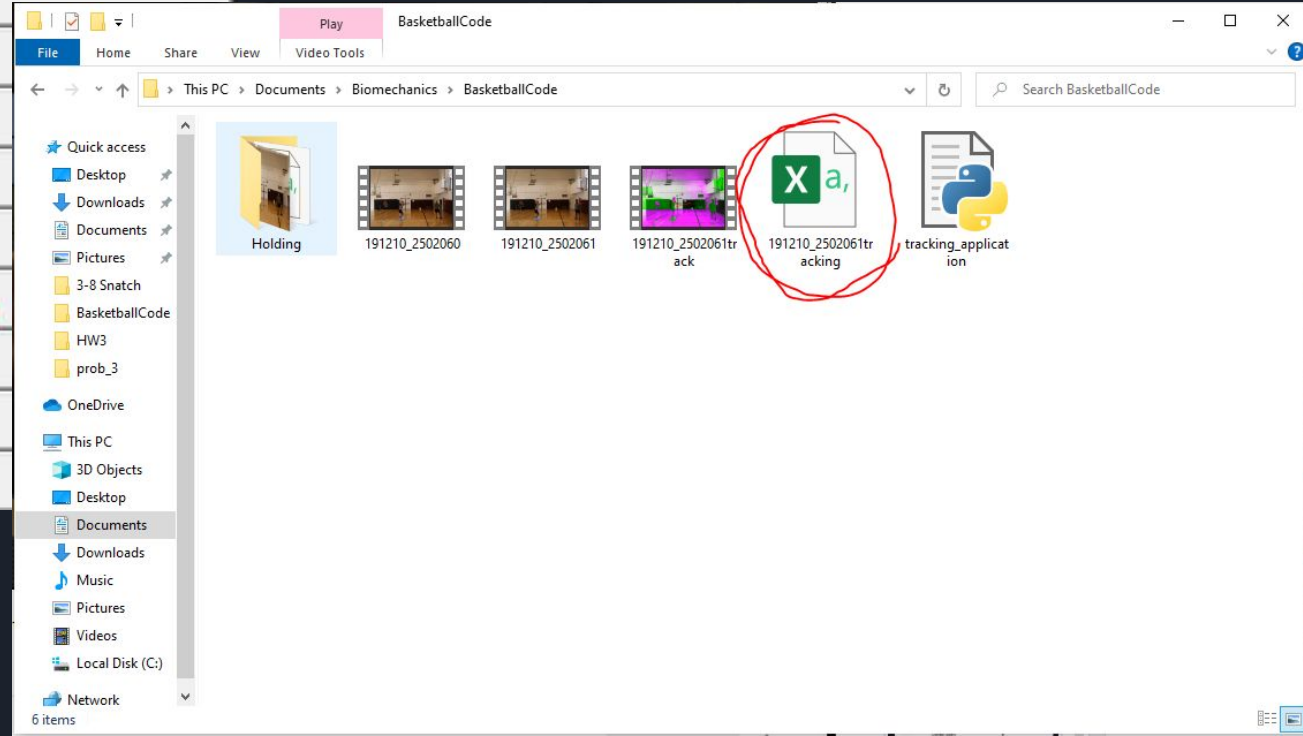
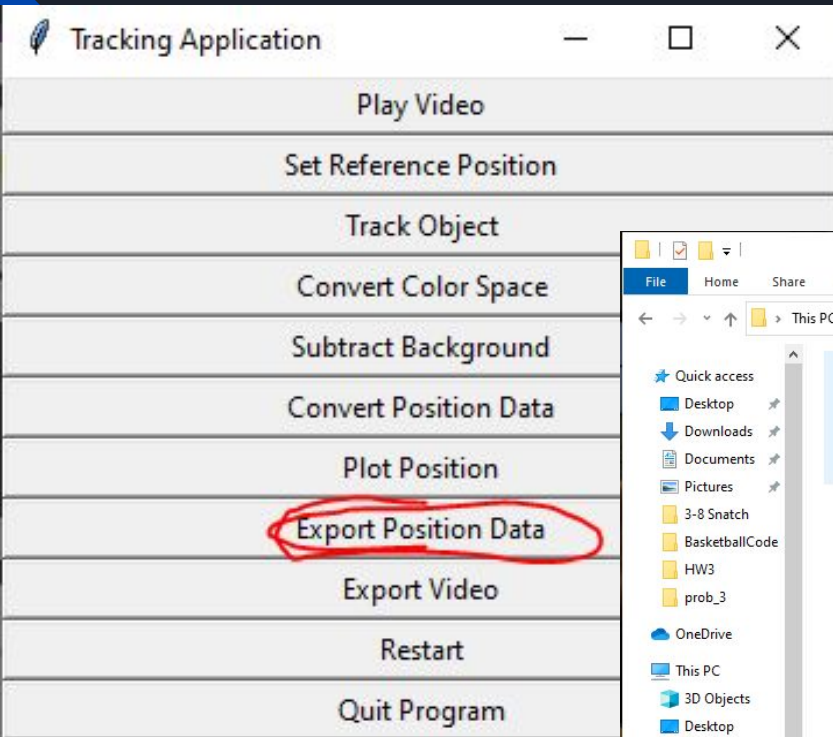


y_hist,
cr_hist,cr_hist

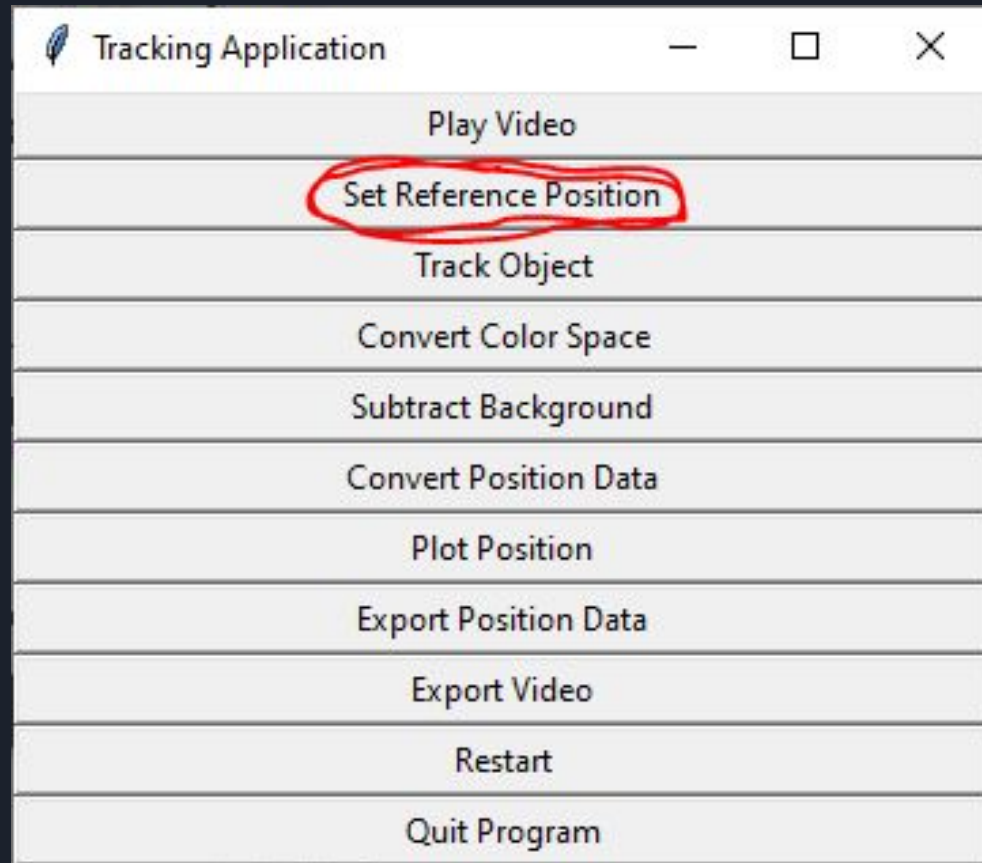


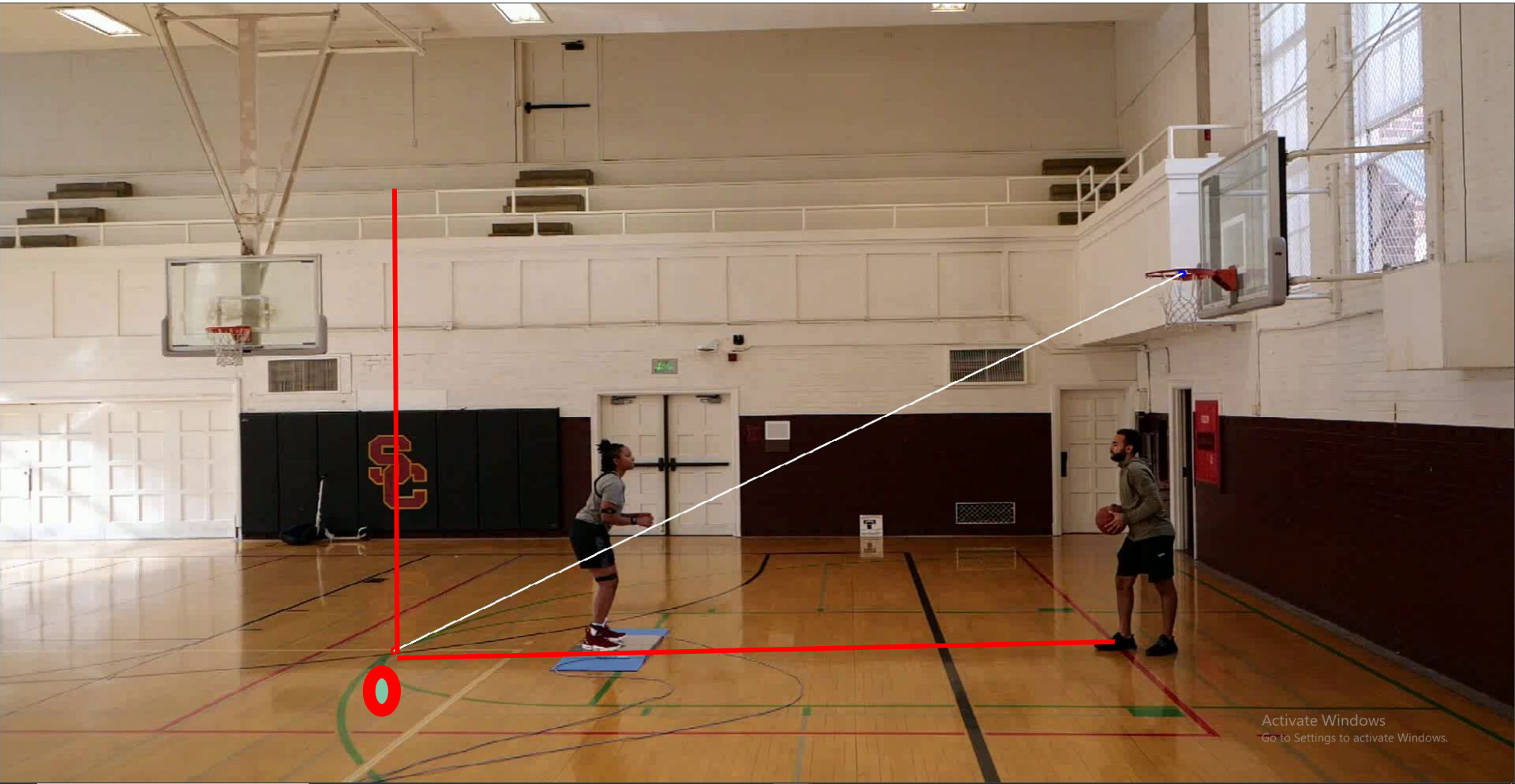
y_hist, cr_hist,
cb

Get Position Data in Pixels

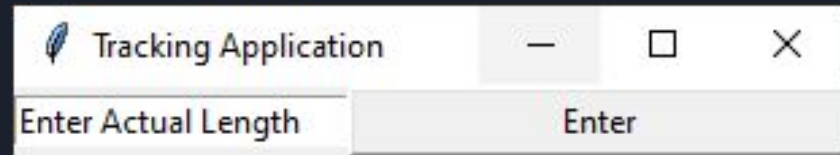
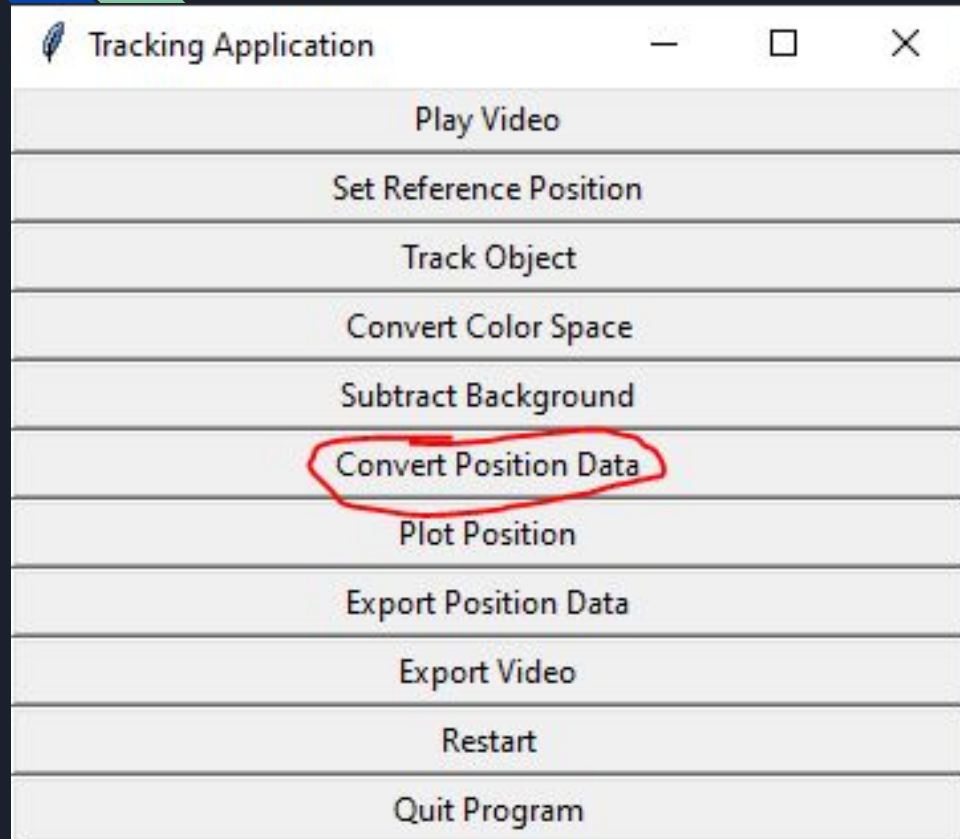


Set Reference





Convert Position Data



Check Plot

Tracking Application

Play Video

Set Reference Position

Track Object

Convert Color Space

Subtract Background

Convert Position Data

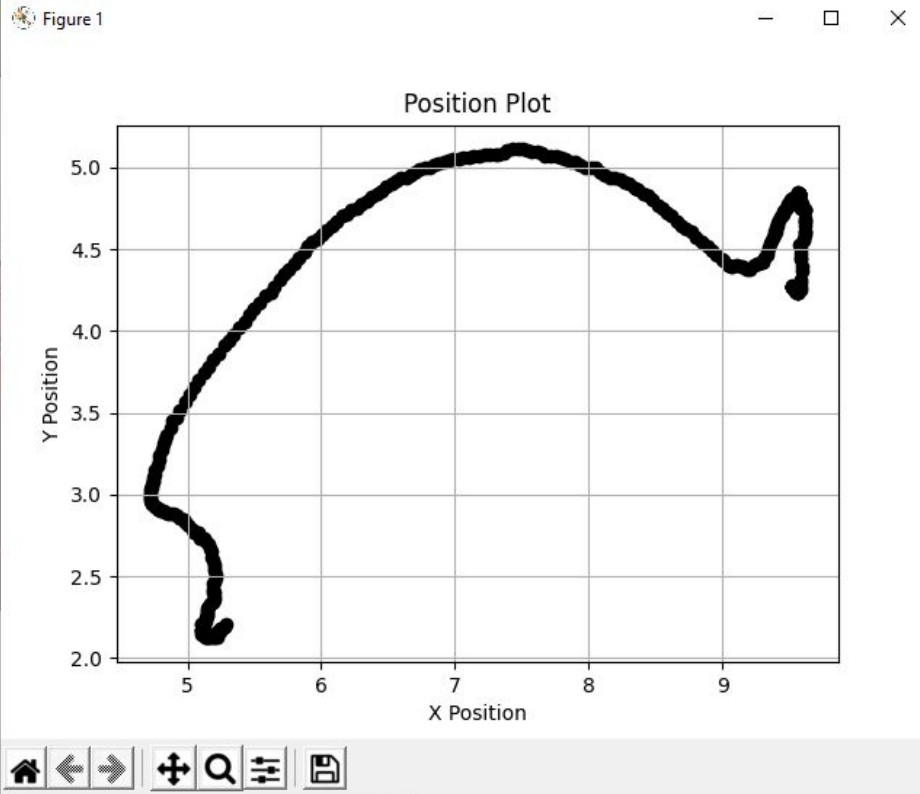
Plot Position

Export Position Data

Export Video

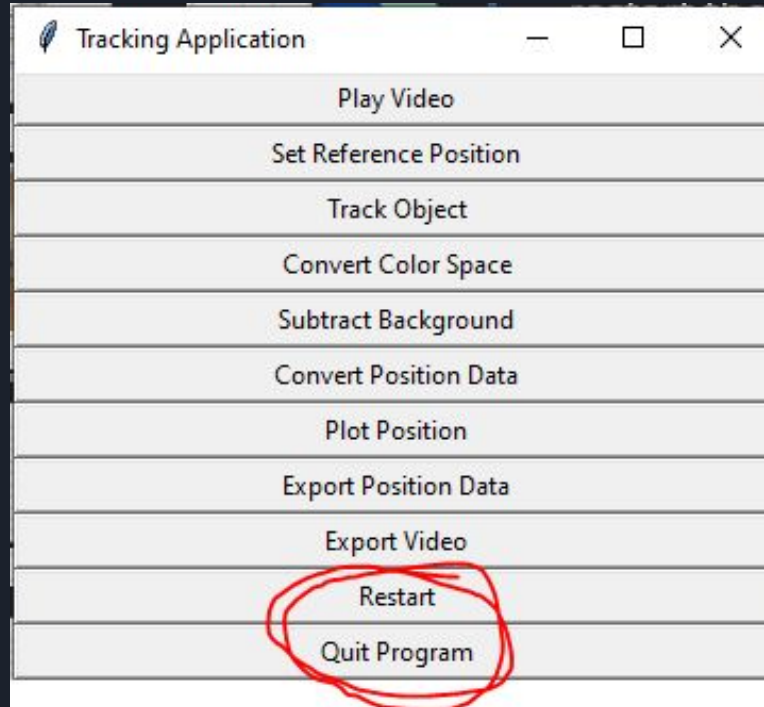
Restart

Quit Program



Restart/Exit

- If you ever make a mistake, go ahead and restart the program by pressing Restart or Quit and Re-Run





Further Development

- Subtract background: Looking to attempt to use background subtraction along with color conversion to get a better track from release, but is still a work in progress
- Exploring different color spaces and finding which of them work better than others
- Applying the tracking application to other testing videos
- Finding a way to perform real time detection using a connected camera, perhaps on Nvidia Jetson or Raspberry Pi