TO RECONSTRUCT 3D REACH TRAJECTORIES FROM DLC .CSV FILES

**Preliminaries**

1. make sure there are calibration files for that day that have been processed (or at least within the previous few days)
   1. On Leventhal computer, these files are currently (11/4/2019) in “LL EXHD #2/calibration\_images/”. They are also backed up in Box (Leventhal-lab🡪skilled\_reaching\_calibration) and in sharedX (“Neuro-Leventhal/analysis/skilled reaching/calibration\_images”). Within these root directories, look in the appropriate year/month folder, then “yyyymm\_calibration\_files”
   2. Load the appropriate .mat file (“SR\_boxCalibration\_yyyymmdd.mat”) and make sure there is a “boxCal\_fromSession” structure for the current rat on the current date.
   3. If not, see CALIBRATION AND RECALIBRATION INSTRUCTIONS
2. Make sure .csv and metadata files from DLC are in the appropriate folders
   1. Directory structure should be “RXXXX/RXXXX\_yyyymmddq/ RXXXX\_yyyymmddq\_direct” (or “left” or “right”) (q = “a,b,c,…”).
   2. There should also be “metadata” .mat files from when the videos were originally cropped for DLC. These files contain the cropping regions, video frame rate, etc. needed for 3D reconstruction. If they are not there, may need to run script\_extract\_vidROI\_DL (comment out “cropVideo(vidName,destVidName,frameTimeLimits,triggerTime,ROI);” to avoid actually cropping the videos and just make the metadata files)

**Reconstruct the trajectories**

1. Run script\_reconstruct3Dtrajectories. This creates a .mat file (RXXX\_yyyymmdd\_HH-MM-SS\_ZZZ\_3dtrajectory\_new.mat) for each video with the 3D reconstructions. ZZZ is the video number
2. Run script\_repair\_mislabeled\_direct\_paw. This looks for frames with big mismatches between the mirror and direct view paw dorsum locations. It assumes the mirror view is correct and “invalidates” the direct view paw dorsum so that it can be estimated from neighboring points
3. Run script\_interp\_trajectories. This interpolates all the body part trajectories and references them to the initial pellet location, and creates a file “RXXXX\_yyyymmdd\_interp\_trajectories” in each DLC output session folder.
4. Run script\_analyze\_interp\_trajectories. This creates a “RXXXX\_yyyymmdd \_processed\_reaches.mat” file in each DLC output session folder.