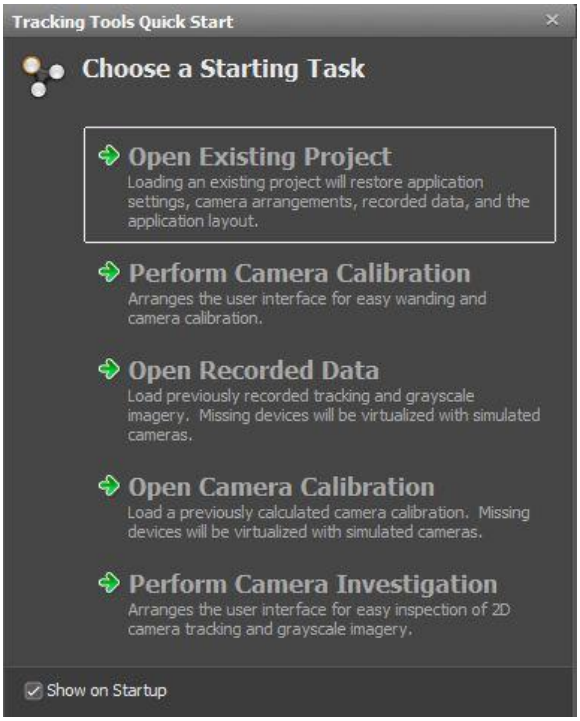
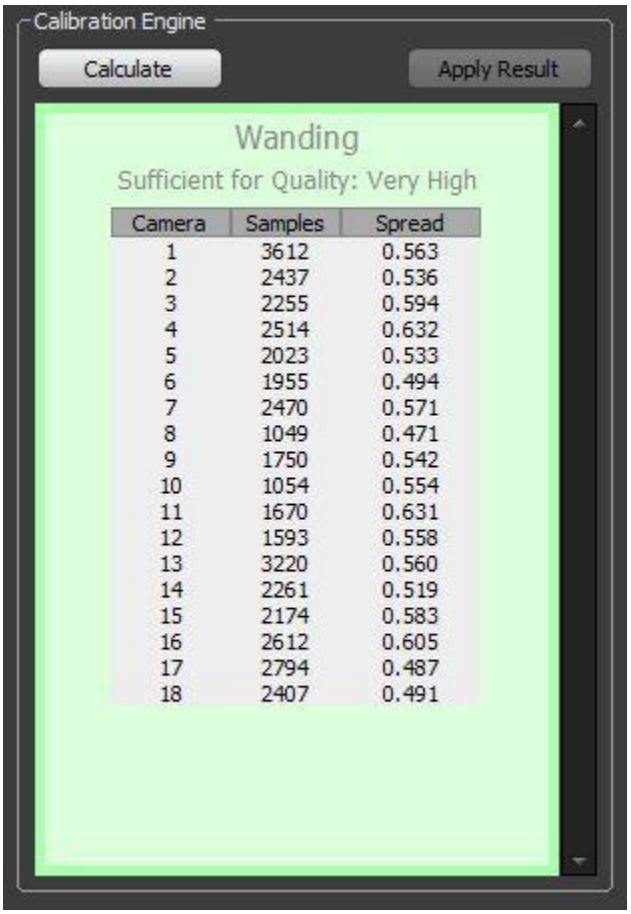
GE423 – How to use OptiTrack

1. Open Optitrack by clicking the ***Tracking Tools*** icon on the desktop.
   a. 

2. Click ***Open Existing Project***. Load most recent ***GE423_201x-mm-dd hh.mm.ttp***. This should be located at ***C:\Users\MECHTR30\My Documents\OptiTrack_Data***



3. **If cameras don't need calibration, go to step 4**. If the cameras require calibration:
   a. **Reopen** ***Tracking Tools***.
   b. Select ***Perform Camera Calibration***
   c. Make sure there are no tracking balls in sight of the cameras.
   d. Click ***Block Visible*** in the Camera Calibration Pane.
   e. Click ***Start Wanding*** and wand the camera volume. A minimum of about 1000 samples for each camera should be good (check the next two figures)



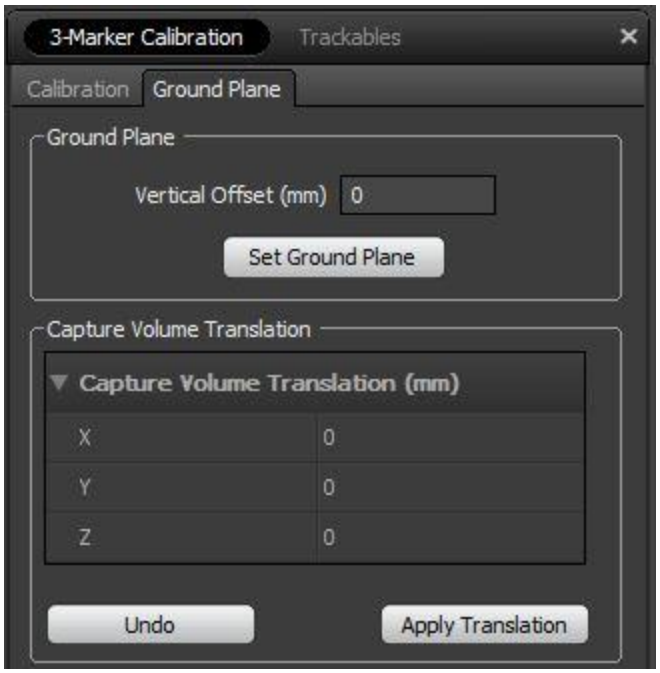
f. Click ***Calculate*** under ***Calibration Engine***.
g. Let the first iteration of the calibration engine run. When most (if not all) cameras say ***Exceptional*** or ***Excellent*** (next figure) click ***Apply Result***.

Cam	Samp	Quality	Focal	StdD	MeanEr
Ave		Exceptional		0.02	0.121
Wand		Exceptional		0.10	0.379
1	26	Exceptional	4.436	0.05	0.092
2	15	Exceptional	4.423	0.06	0.115
3	20	Exceptional	4.432	0.06	0.115
4	18	Exceptional	4.451	0.06	0.111
5	18	Exceptional	4.447	0.10	0.146
6	17	Exceptional	4.455	0.07	0.110
7	19	Excellent	4.454	0.11	0.150
8	13	Excellent	4.444	0.10	0.170
9	17	Exceptional	4.444	0.09	0.109
10	13	Exceptional	4.452	0.06	0.099
11	16	Exceptional	4.472	0.06	0.135
12	12	Exceptional	4.446	0.07	0.114
13	25	Exceptional	4.459	0.07	0.093
14	18	Excellent	4.478	0.10	0.163
15	25	Exceptional	4.460	0.07	0.112
16	26	Excellent	4.445	0.11	0.160
17	22	Exceptional	4.429	0.05	0.078
18	19	Exceptional	4.446	0.05	0.104

h. In the popup, click ***Apply and Refine***. This is the second iteration of the calibration engine. Again, when most cameras say ***Exceptional*** or ***Excellent*** click ***Apply Result***. Typically, waiting longer is better. In the popup, click ***Apply***.

i. Save the calibration using the default name (e.g. ***WandingTimeline 2013-03-11 11.45am.tim***) to the ***Calibrations*** directory. ***C:\Users\MECHTR30\My Documents\OptiTrack_Data\Calibrations***

j. Place the L-shaped ground plane tool on the floor where the origin is marked by a black circle. The tracking ball of the elbow of the ground plane tool should be directly above this circle with the shorter leg of the L pointing directly **EAST** (the side of the room with the door). Click ***Set Ground Plane*** (figure next page).

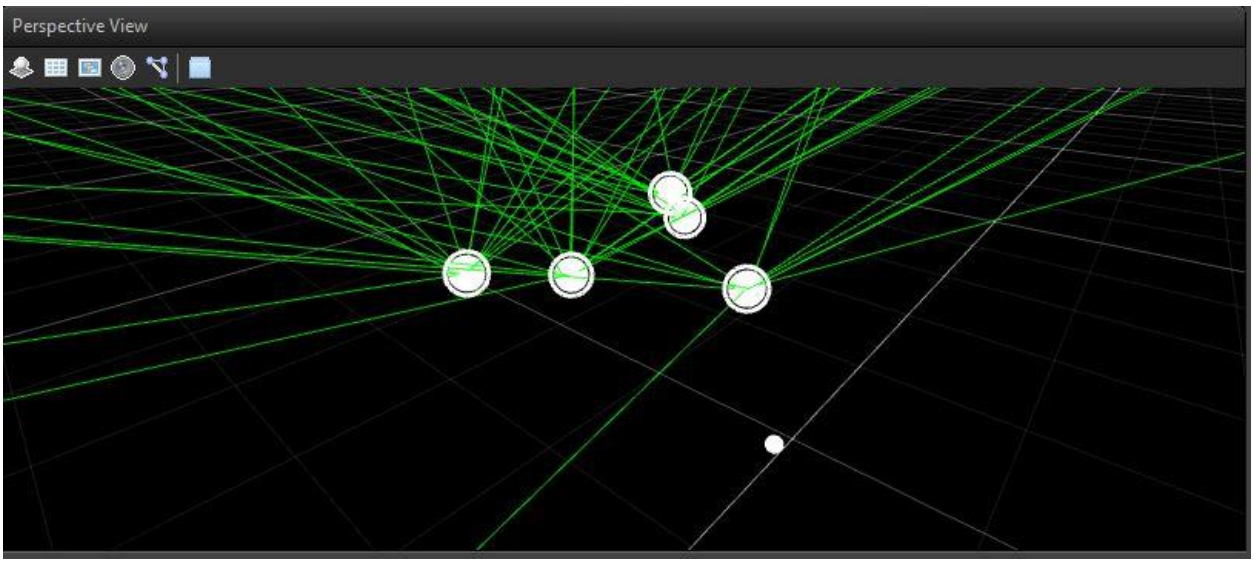


k. Save the file in the default location (***C:\Users\MECHTR30\My Documents\OptiTrack_Data\Calibrations***)

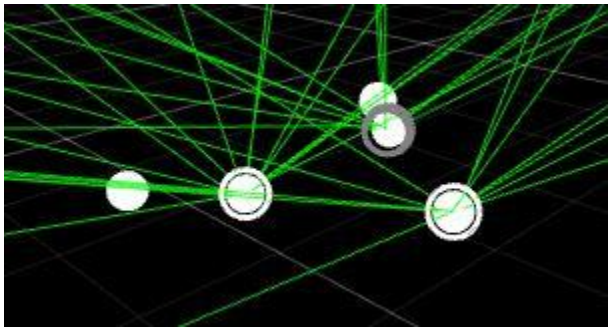
4. **If you don't need to create a *Trackable*, go to step 11.** Otherwise, if the ***Trackable*** for you robot(s) has not already been created, place the robot(s) you need into the center of the camera volume.

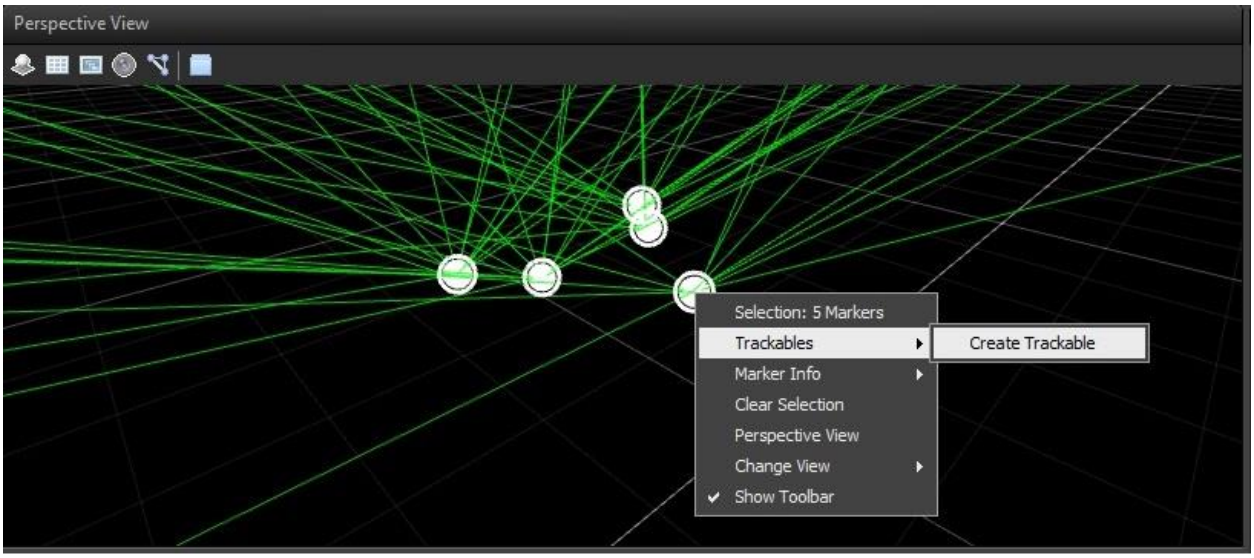
5. Make sure each robot is facing due **EAST,** the side of the room with the door (use the tiles to line up the tires)

6. For each robot, in the ***Perspective View*** drag the mouse to create a box to select the tracking balls for that robot. After being selected, the tracking balls shown appear as below.

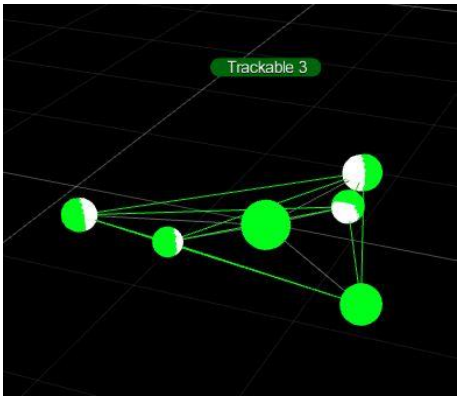


7. If any of the white circles surrounding the tracking balls change to gray circles before you can create the ***Trackable***, **repeat set 6.** Otherwise, right click and select ***Create Trackable***.



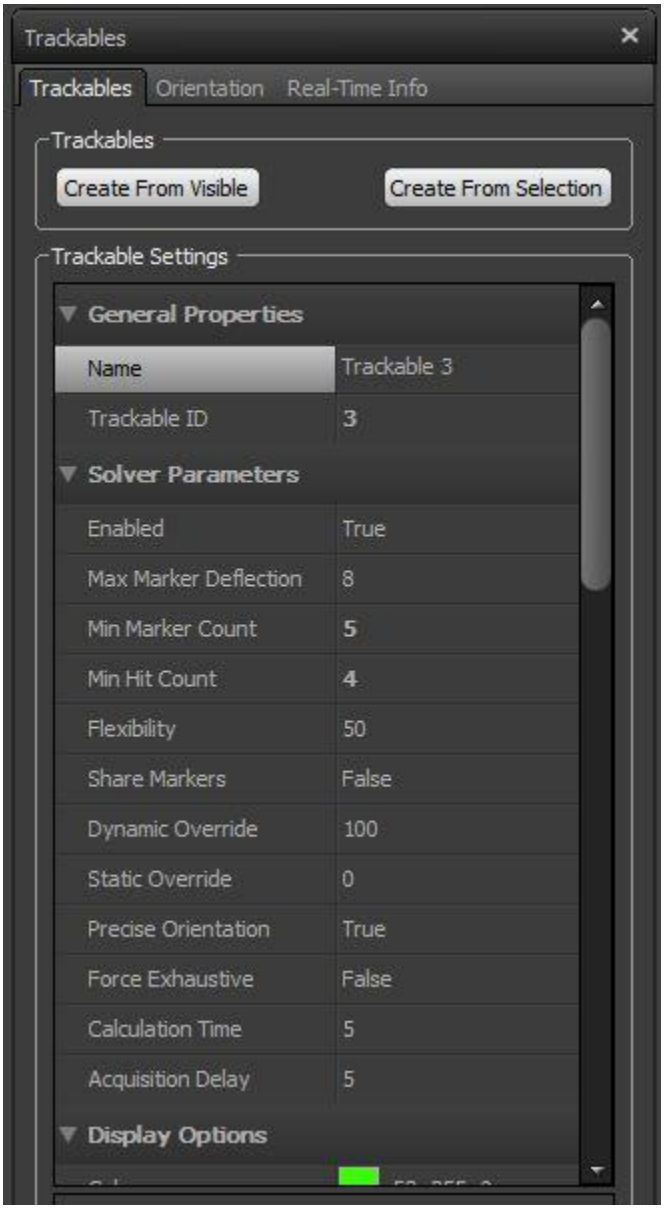


8. If your Trackable was created correctly, it should appear similar to below.

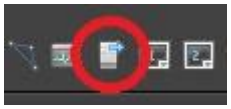


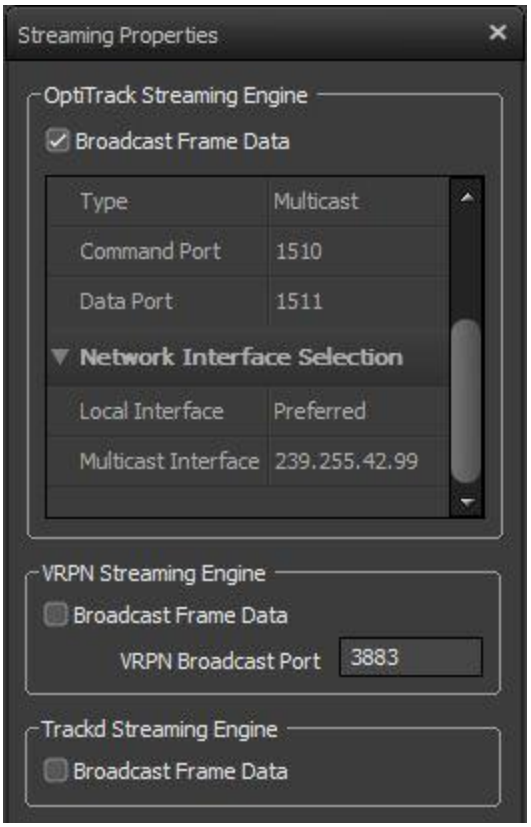
9. Correctly adjust the ***Trackable*** settings (see the next figure):
   a. Make sure each robot has the correct ***Trackable ID***, e.g. the robot with 192.168.1.**73** for its IP should have a ***Trackable ID*** of **3**.
   b. Change the ***Min Market Count*** to **5**.

c. Change the ***Min Hit Count*** to **4**.



10. After you add a ***Trackable***(s), make sure to **SAVE** the project. Save the project as ***GE423_201x-mm-dd hh.mm.ttp***. (e.g. ***GE423_2013-03-11 11.58am.ttp***). Save this project in the ***OptiTrack_Data*** directory (***C:\Users\MECHTR30\My Documents\OptiTrack_Data***).

11. Open the ***Streaming Properties*** pane.  Make sure ***Local Interface*** is 192.168.0.99 or ***Preferred***. Check ***Broadcast Frame Data*** (see next figure).



12. Run the ***SampleClient.bat*** batch file on the Desktop. This batch file will not run if you forgot to start broadcasting in ***Tracking Tools***.

13. Run the ***GE423PythonScript.bat*** batch file on the Desktop. This batch file starts a python script that sends the correct data to each robot being tracked by the camera system.