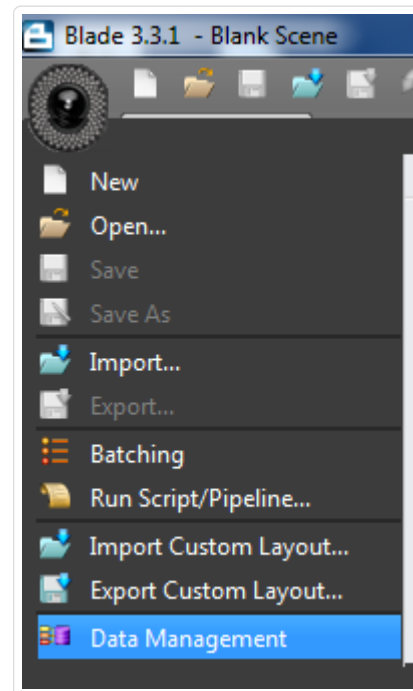


Vicon Blade Manual

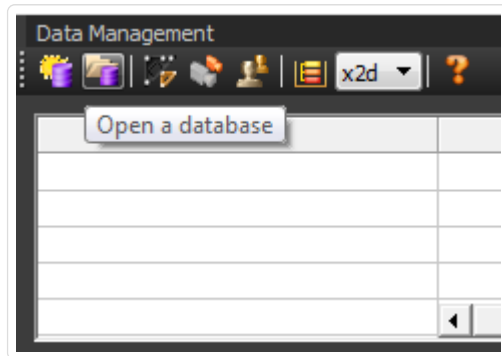
Motion Capture Manual using Vicon Blade 3.3.1

Data Management

1. Click on the Vicon Camera icon and select Data Management from the menu.

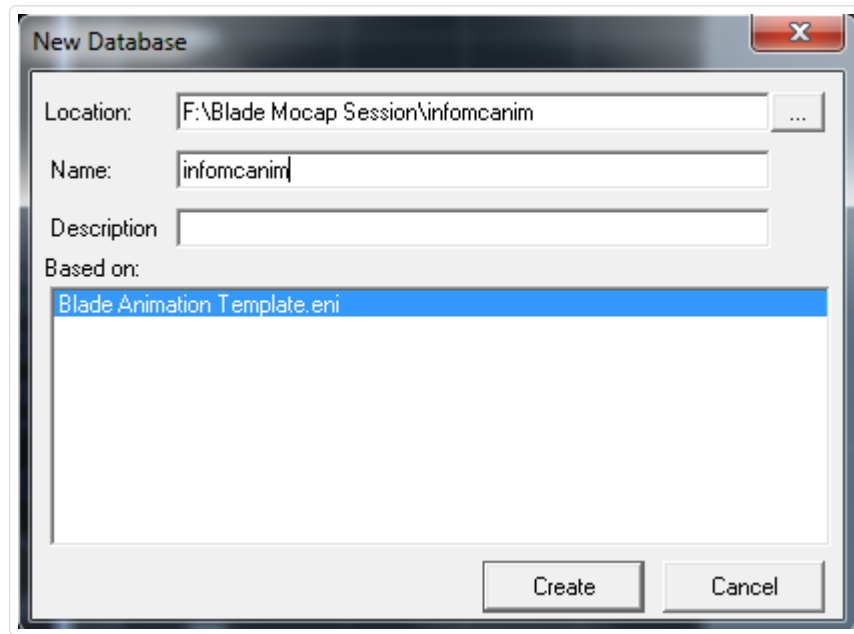


2. Click new database (purple barrel over the sun icon). It brings up a dialog box.



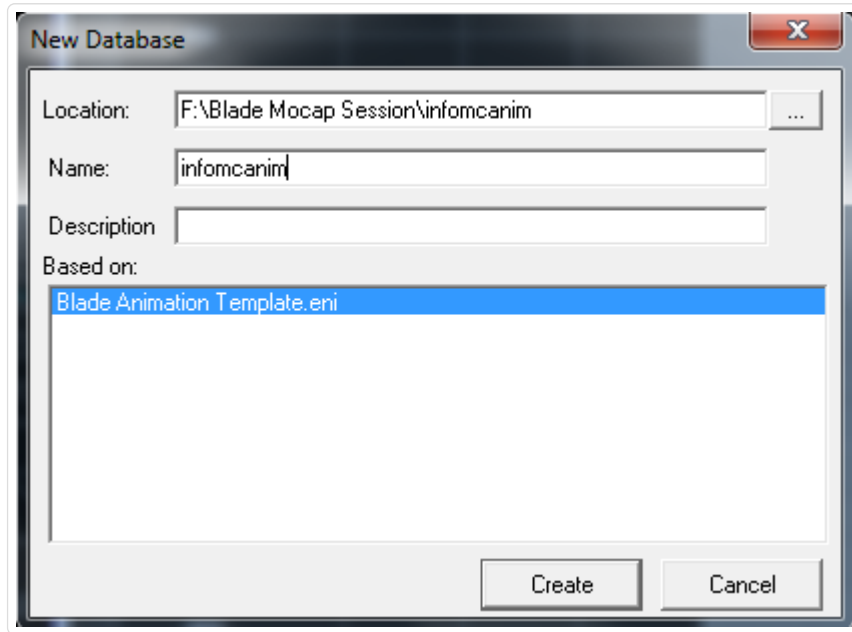
3. To create a new database:

- Create a folder on the hard drive of the PC where you wish to create your database and store the motions.
- Set the location, name and template and click create

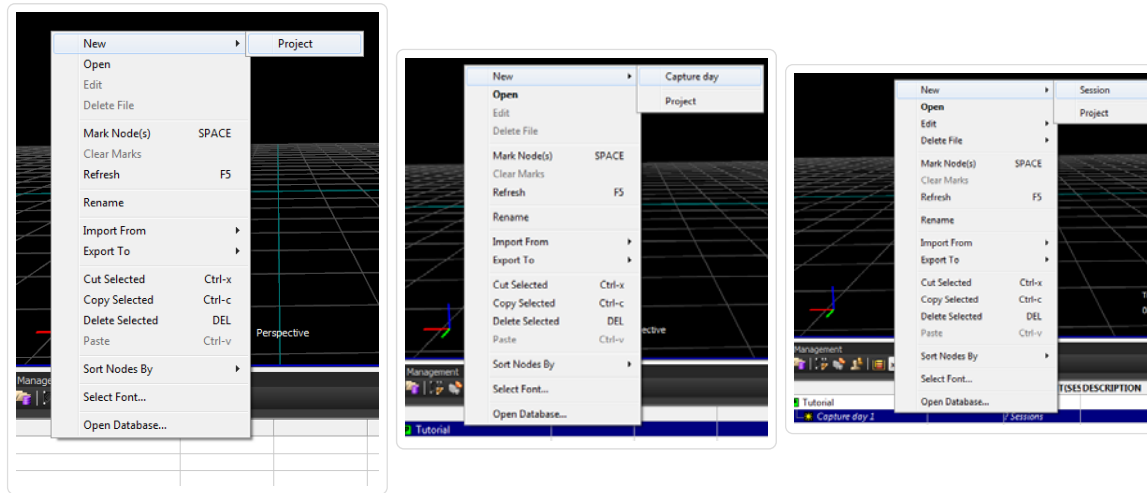


4. To open an old database:

- Click open a database to open your old database.
- Select your database and then click Open

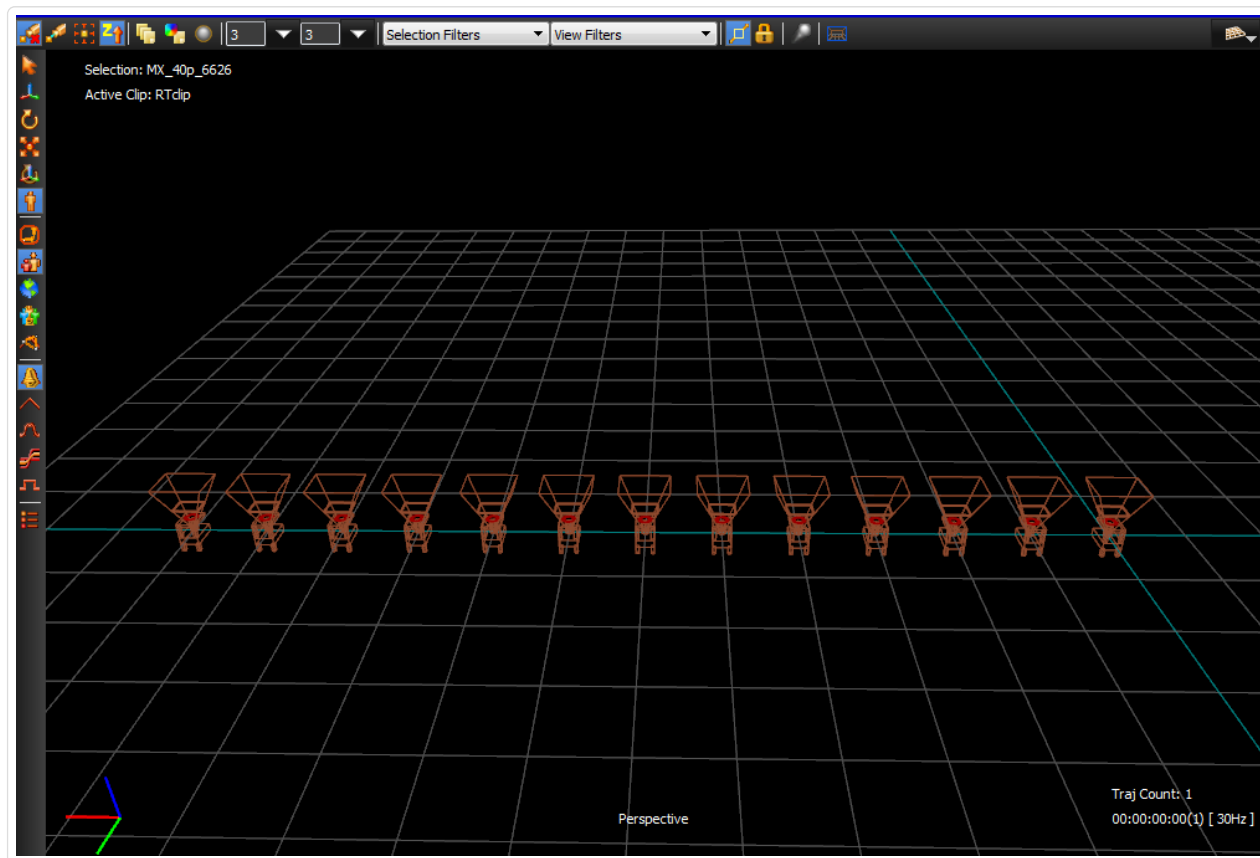


5. Right click anywhere in the database by selecting new at the top and create project / capture day / session.



Camera Calibration

1. This is the uncalibrated camera. In order to use the system, you need to calibrate the camera or load existing calibration file.

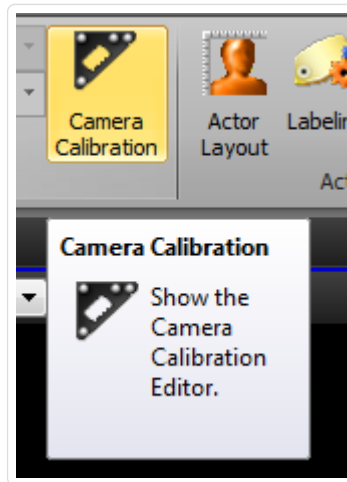


2. Switch on the motion capture cameras and connect to them

- At the top left of the Blade Interface - make sure you hit Connect - you will see the cameras respond by lighting up bright red LEDs, with a blue and a green light. The blue light indicates that cameras are connected. Once we finish the wand wave the green lights will stop blinking and be on solid.
- The Vicon Camera icon (below) will turn red when connected.
- Make sure you are connected to the cameras.



3. Click Camera Calibration under the Studio Activities tab

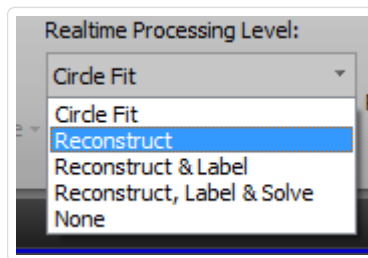


4. Set your workspace to be Camera Layout. This is under the Studio Activities tab.



5. Set the drop down menu below the Connect icon to **Circle Fit** for the real-time engine.

- NB: It is important to note that this is set to **Circle Fit** for the camera calibration, but it will need to be set to **Reconstruct** or **Solve** in Capture mode - otherwise you will not see any markers in the 3D workspace.
- You should now see each camera in perspective view, and the view from each individual camera. If you cannot see markers in a particular camera's view, make sure that the strobe, threshold and gain are of similar values to the other cameras.

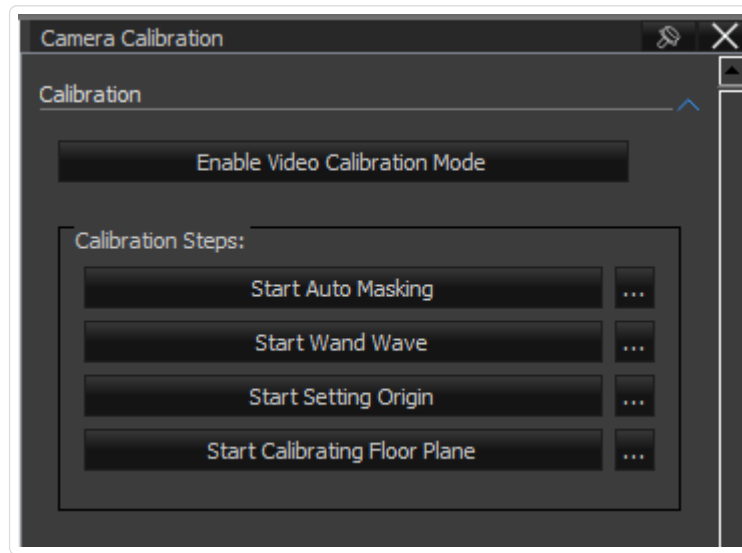


6. Calibration

- Run Auto Masking for a couple of seconds, and fix your floor if you found the problematic cameras.
- Click the three dot on the left of Start Wand Wave, and select the **Combined Wand and L-frame (5 Markers)** under Wand Option. Then click **Start Wand Wave**.
- When a camera has recorded enough frames with the wand, the led will go green. When each camera's led is green, the calibration process will automatically start.
- Place the L-Frame into the center of the room and make sure that the levels are even. Run the

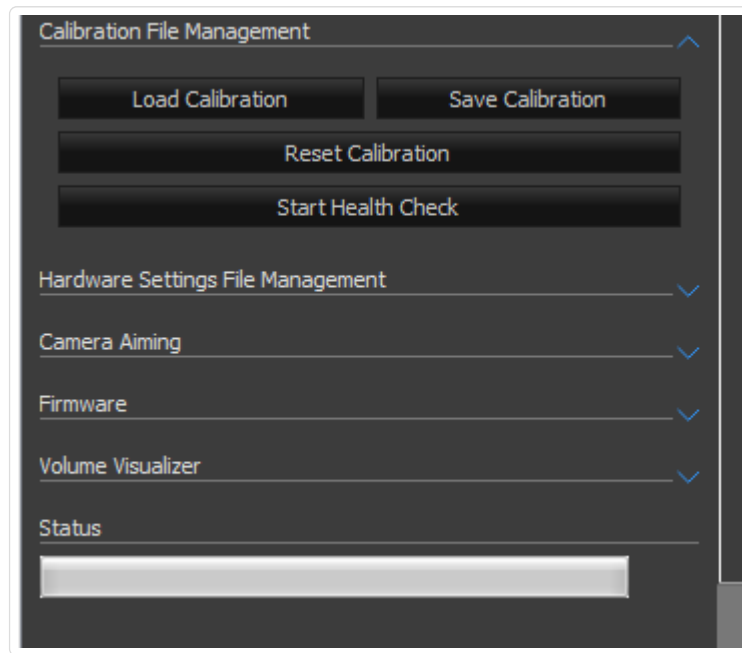
Set Origin operation for a few seconds.

- Remove the L-frame wand from the floor, and scatter 5 markers around the floor and click **Start Calibrating Floor Plane**, and then click Stop
- You can then Save Calibration if you wish.

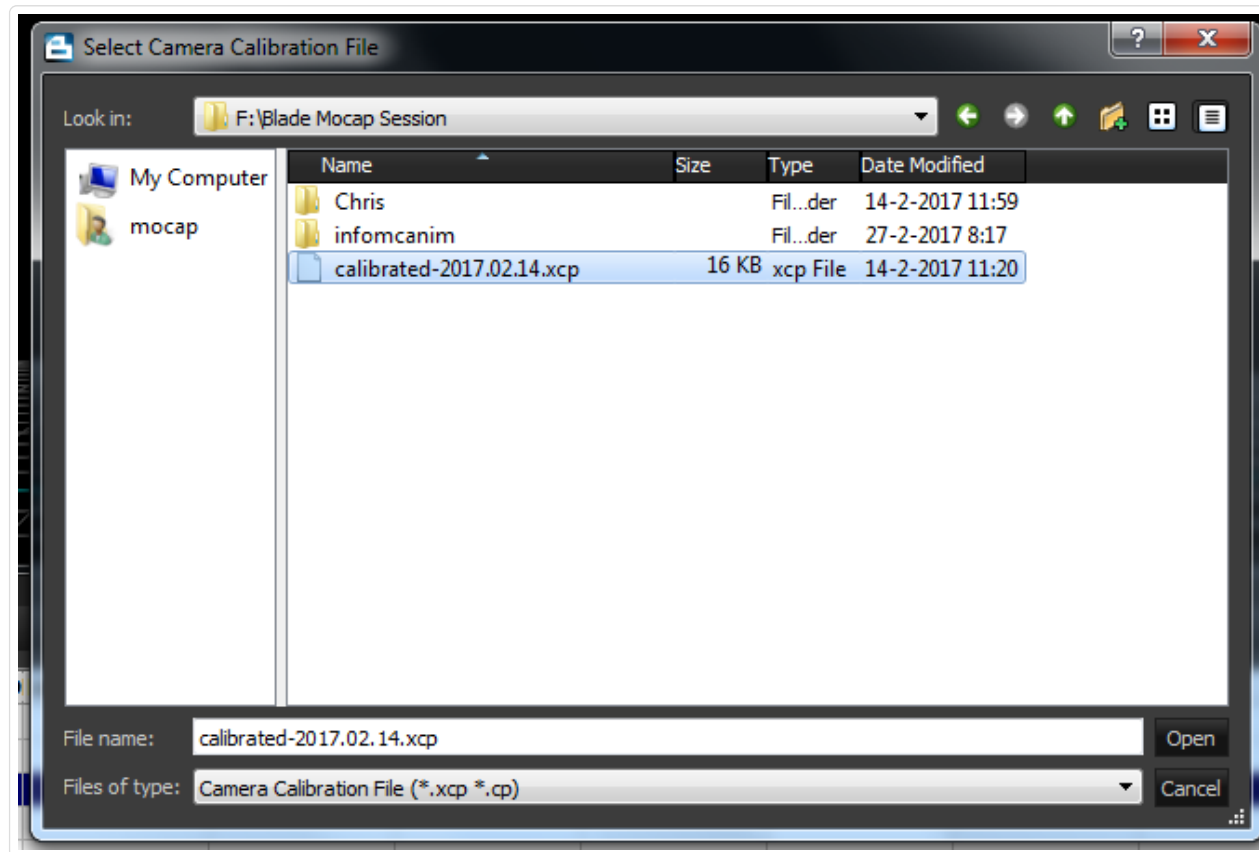


7. Load existing calibration file:

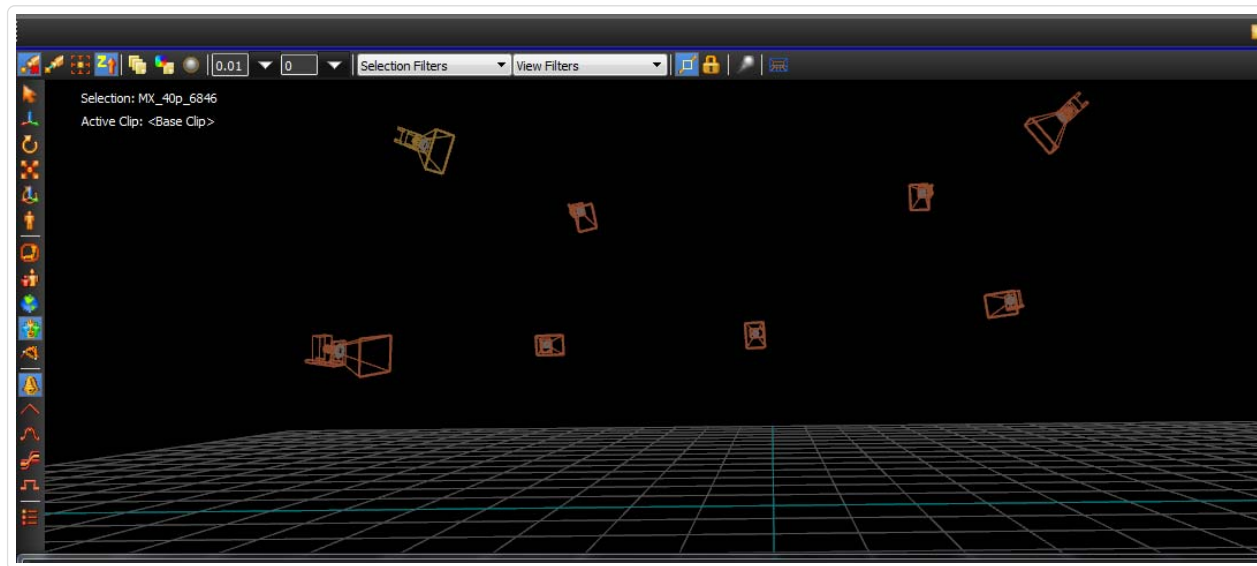
- You can also load the existing calibration file.
- Click Load Calibration under Camera Calibration panel.



8. Select your calibration file (with extension *.xcp), then click open.



9. If your cameras are calibrated, Your perspective view will show each camera at respective position.

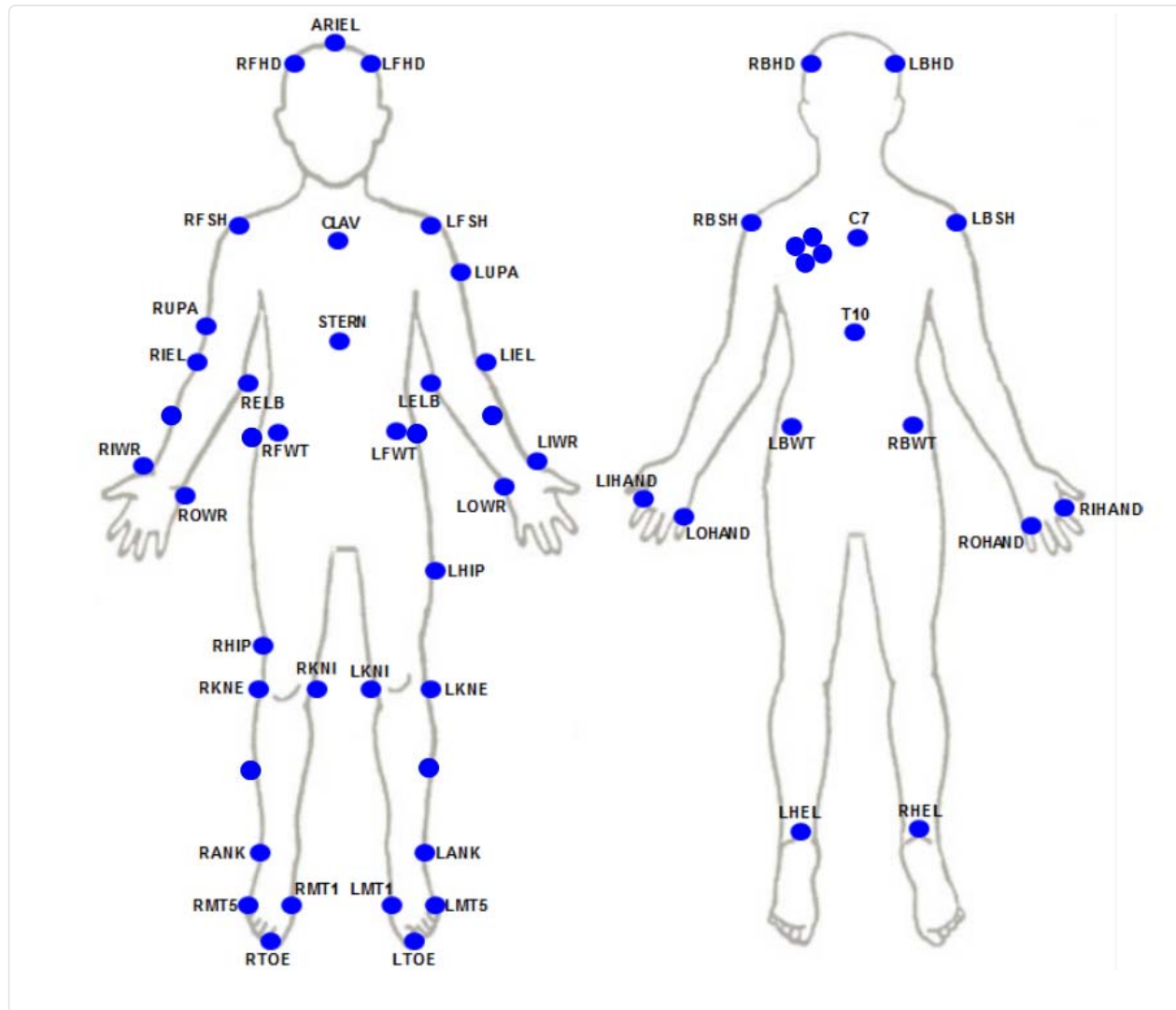


Range of Motion (ROM)

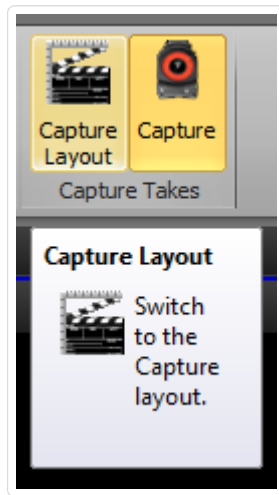
We now need to capture the actors full Range Of Motion (ROM) so that Vicon can fit our template skeleton to the actor:

1. Ensure the 57 markers are placed correctly on the actor:
 - 5 on head (2 front, 2 back, 1 top)
 - 2 on chest
 - 2 on back
 - 4 on shoulders (2 each, front/back)
 - 16 on arms (4 each hand, 2 each elbow, 1 each upper/lower) On the hands, make the flat top two and two on the sides of the wrists. On the elbow close to the bone
 - 6 on hips (3 each side, one front/back/side - pelvic bone)
 - 2 on upper legs - one each leg (non-symmetric, quite different)
 - 4 on knees (2 each side, offset slightly so not knocked off) these are close to the knee caps.

- 2 on lower legs - one each leg
- 10 on feet (5 each, 3 toes, 1 ankle, 1 behind) On the toes, make one in the front center of the foot, one on the Achilles heel, one just above the ankle bone
- 4 on back as identification markers (rotate slightly for each actor)

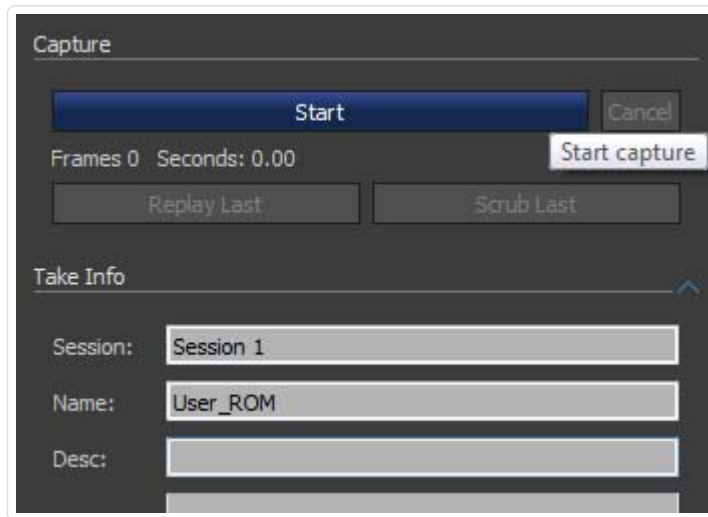


2. Go to Capture Layout under Studio Activities or click Capture Button to show Capture Pane

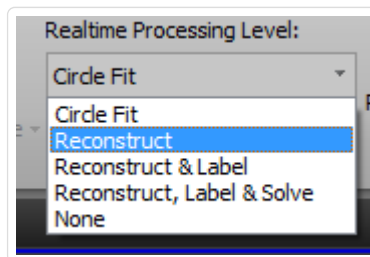


3. Start capturing ROM

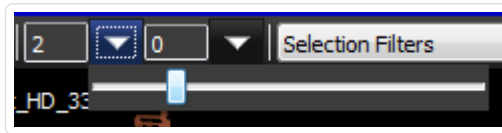
- In the Capture pane at the RHS of workspace, give an appropriate name for your ROM, e.g., ActorName_ROM
- Click the Start and Stop buttons to capture the motions
- Ensuring that your actor starts each take in a T-pose will make the processing much easier



4. Set the drop down menu below the real-time processing level to **Reconstruct, Label & Solve** - otherwise you will not see any markers in the 3D workspace.



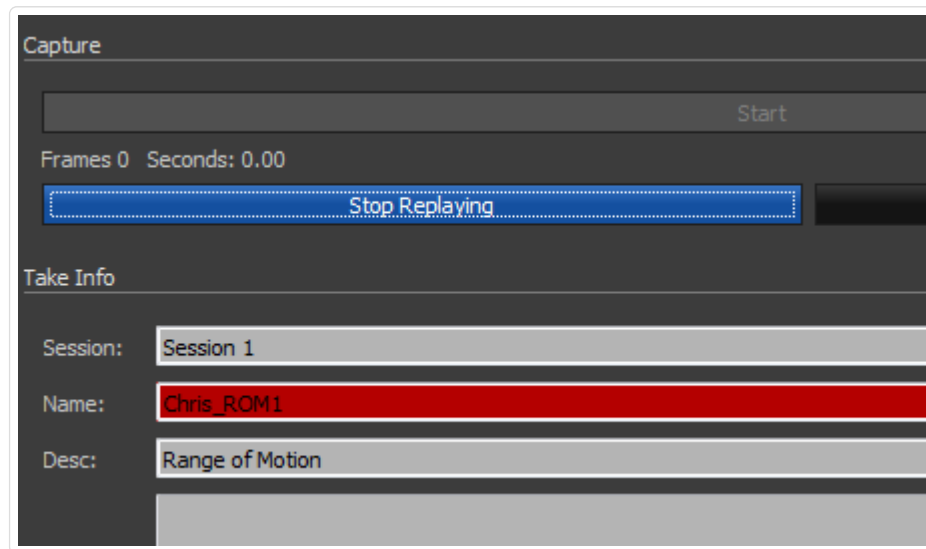
5. Click the triangle button and slide the bar inside perspective window to increase the size of marker



6. Ensure that the full range of each joint is recorded, so perform the following motions, and if you are capturing extreme motions include them too in the ROM:
- Stand in T-Pose, ensuring that arms are as straight as possible, legs slightly apart
 - Head - look left and right, up and down, and roll head around
 - Arms (simultaneously) - move wrists up and down and rotate, bend elbows fully, rotate arms around shoulders as wide a circle as possible
 - Pelvis - rotate hips as much as possible
 - Legs (one at a time) - wiggle toes up and down, rotate ankle, bend and straighten knee, rotate leg around hip joint
 - Move forward two step, and backward two step
 - Back to the T-Pose
7. Click Replay Last to view your captured data



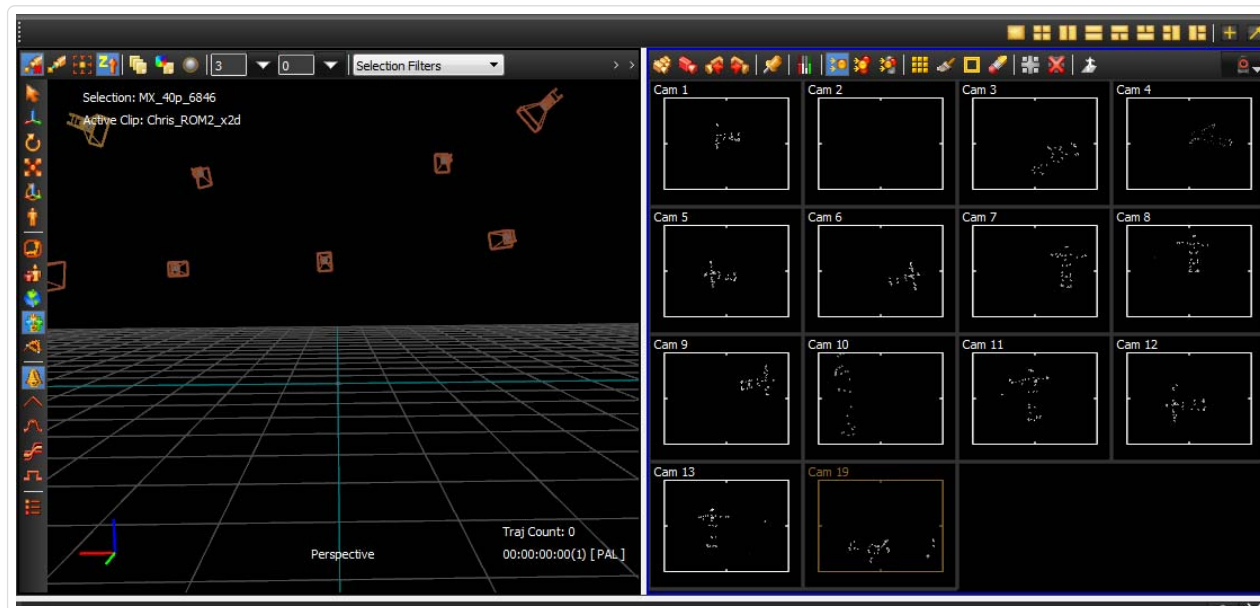
8. Click Stop Replaying to stop view your captured data



9. After every session (Stop Button is pressed), there will be a new row data inside data management panel. This data is automatically saved.

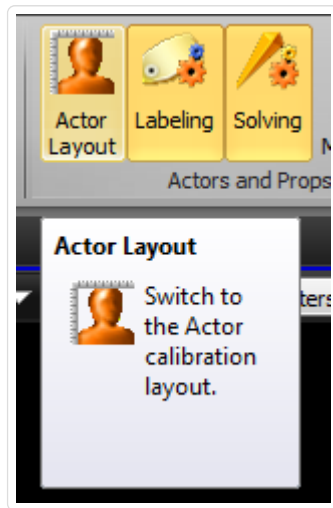
	DATE	CHILDCOUNT(TRI	LASTCALIBRATIO	LASTMASKFILE	LASTTHRESHOLD	DESCRIPTION	NOTES		
Tutorial									
Capture day 1		1 Session							
Session 1	14-2-2017	2 Takes	Chris_ROM2.xcp		Chris_ROM2.xcp				
Chris_ROM1	⊗	Unclassified		Chris_ROM1.xcp		Chris_ROM1.xcp	00:58	5780	
Chris_ROM2	⊗	Unclassified		Chris_ROM2.xcp		Chris_ROM2.xcp	01:00	5977	

10. Double click the blue circle with a cross icon to select and open the captured data.

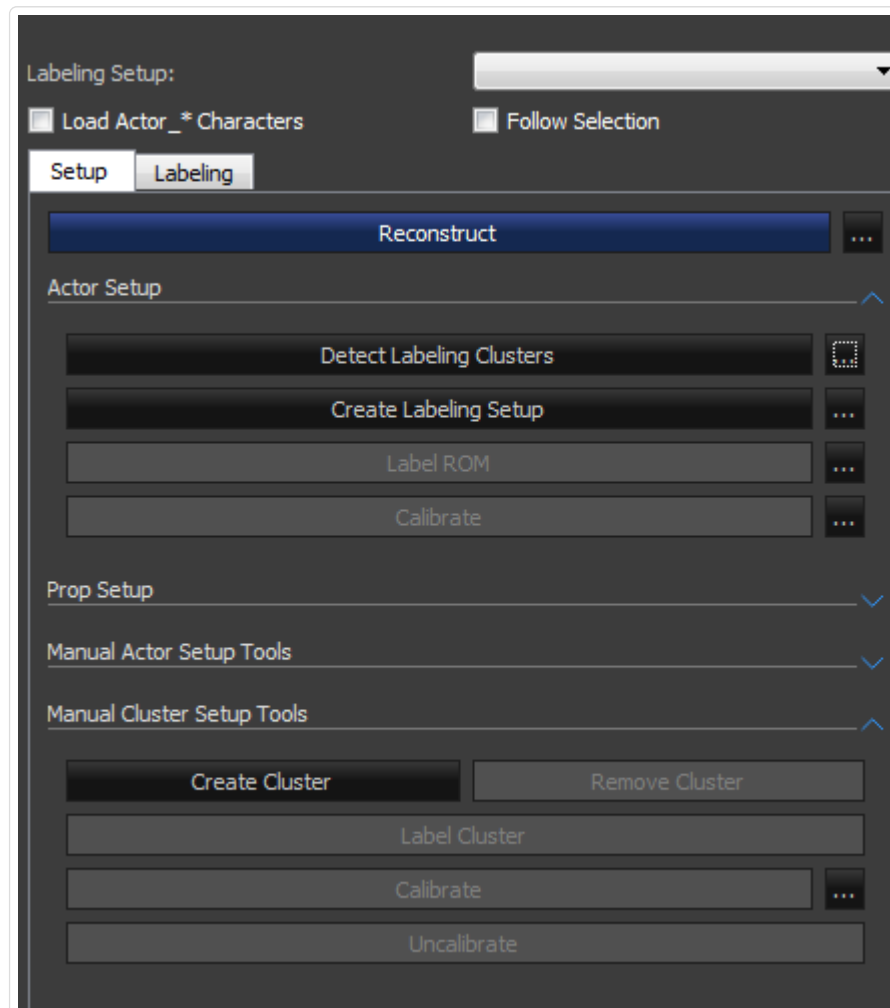


Actor Set-up

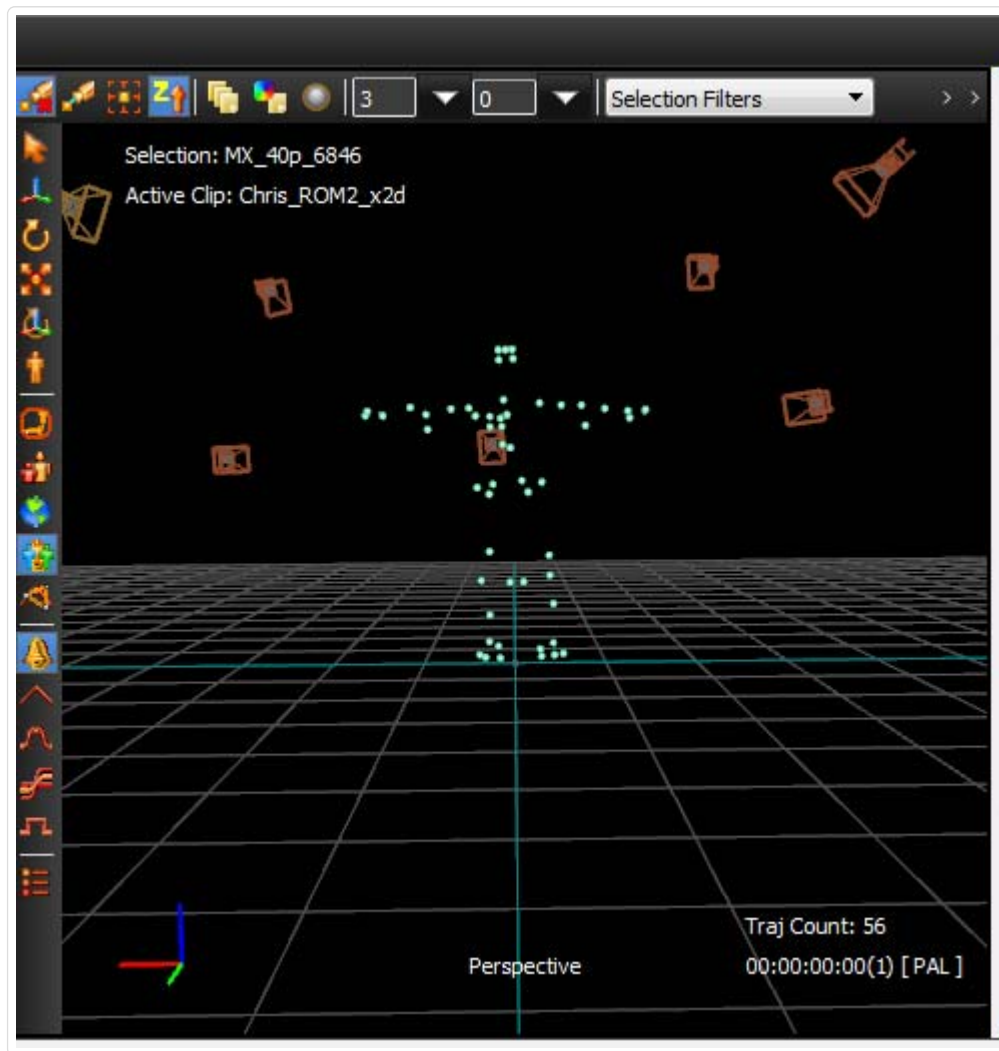
1. Select Actor Layout Button to view labeling panel and Solving Panel
 - Or you can just directly click the Labeling button to view the Labeling Panel
 - Or you can just directly click the Solving button to view the Solving Panel



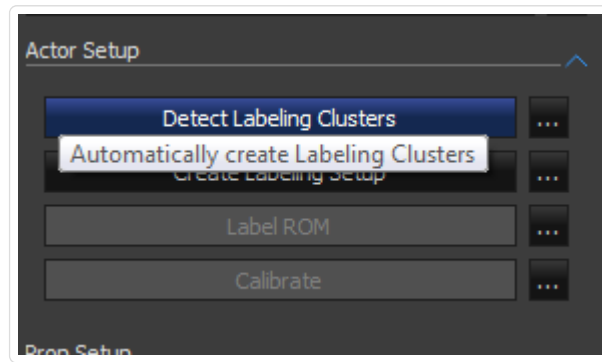
2. Click the Reconstruct button Labeling Panel to view the unlabeled markers in the 3D workspace



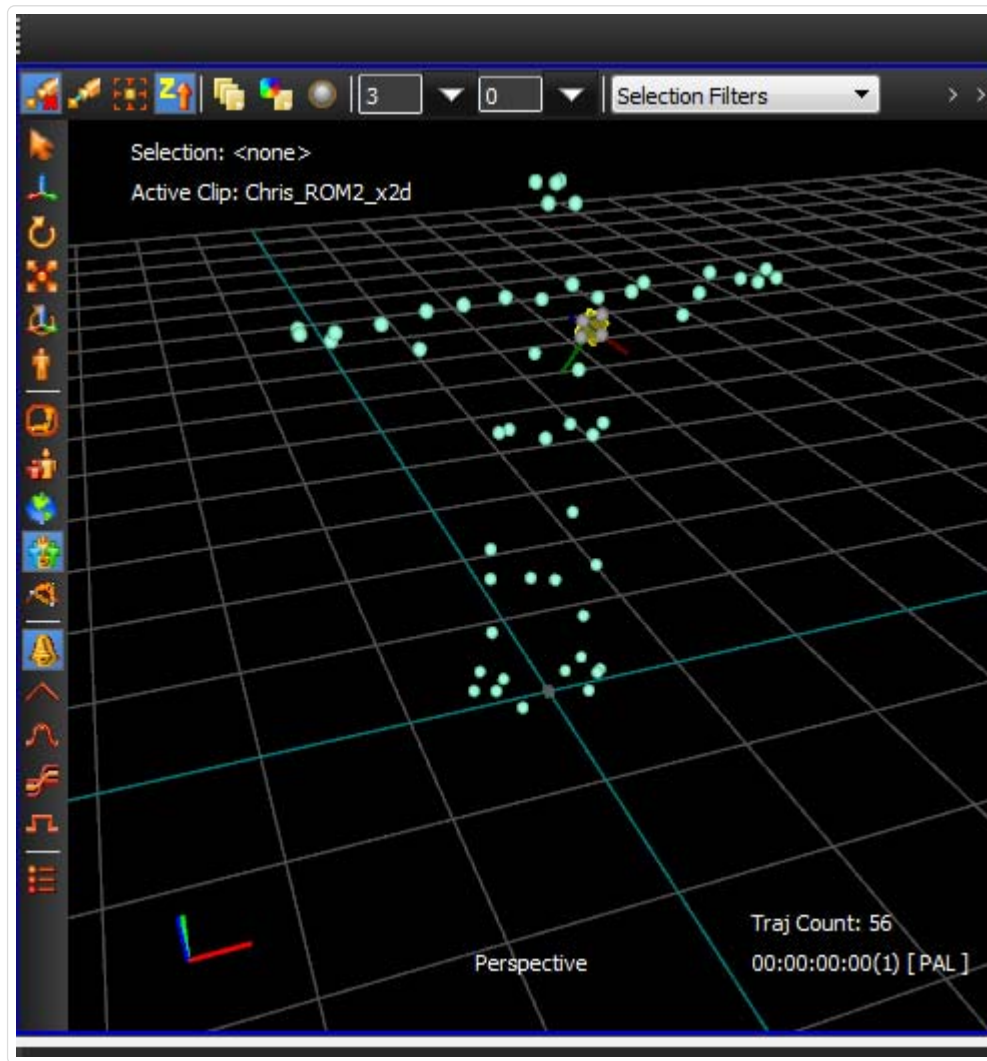
Your viewer will show you the detected markers



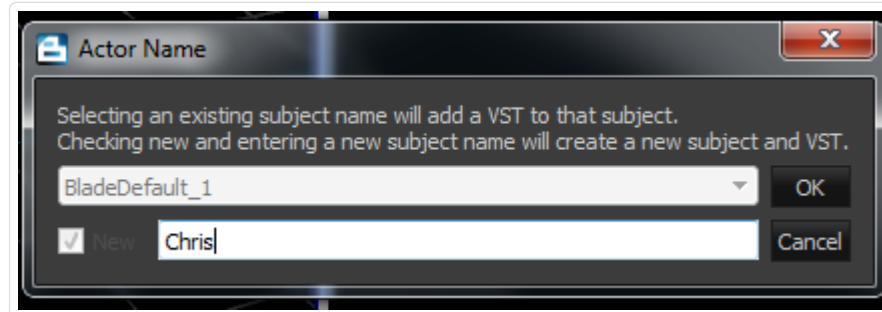
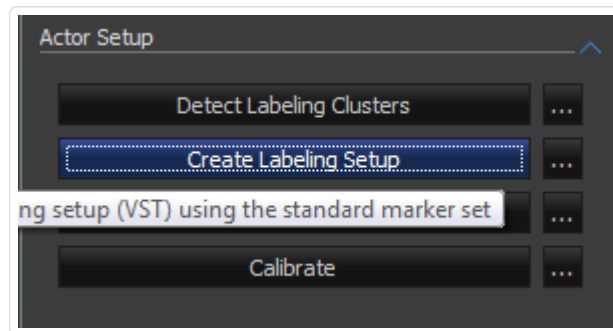
3. Click Detect Labeling Cluster to detect cluster for each character. This feature is useful if you have more than one characters every session.



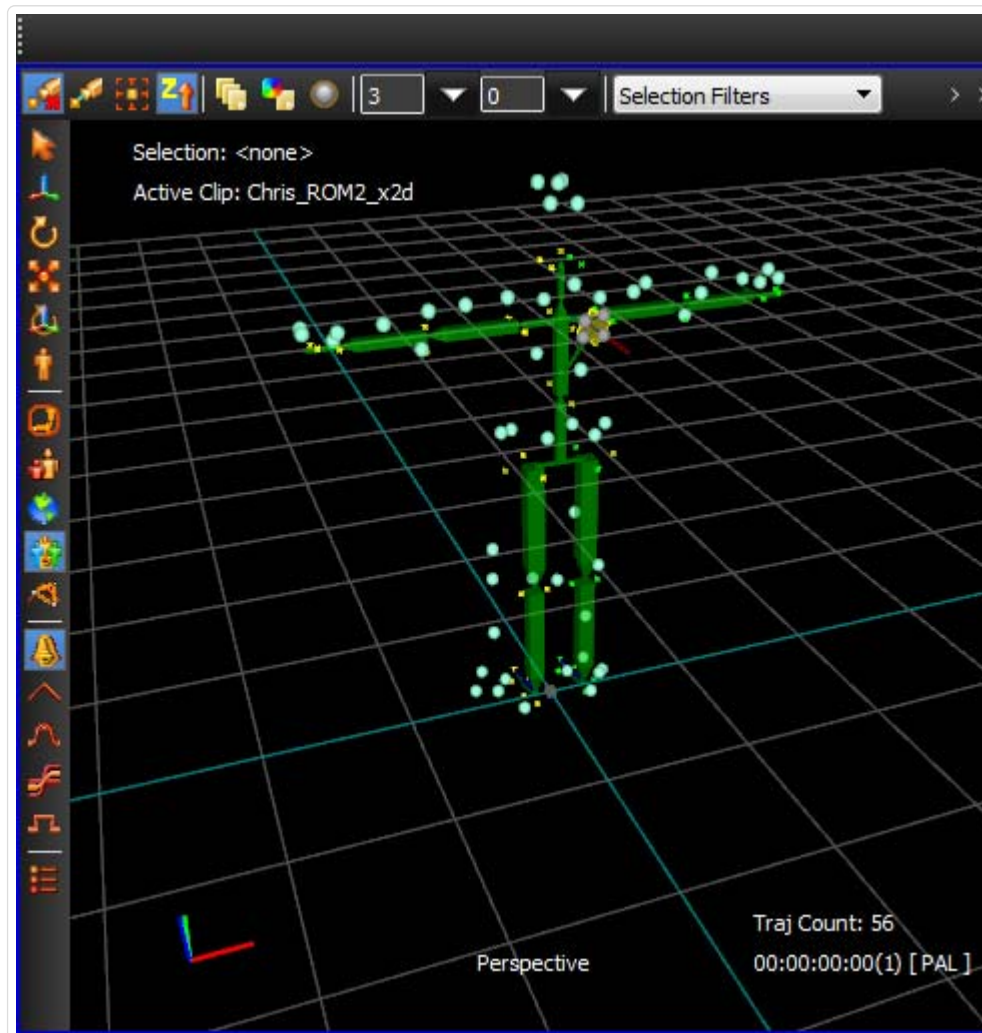
If successful, you will see a plane with axis XYZ



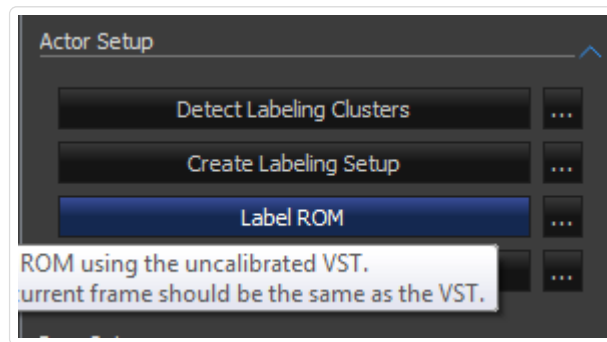
4. Please make sure that your finger option in Labeling Setup is set to **None**. Click Create Labeling Setup and give a name for your actor.



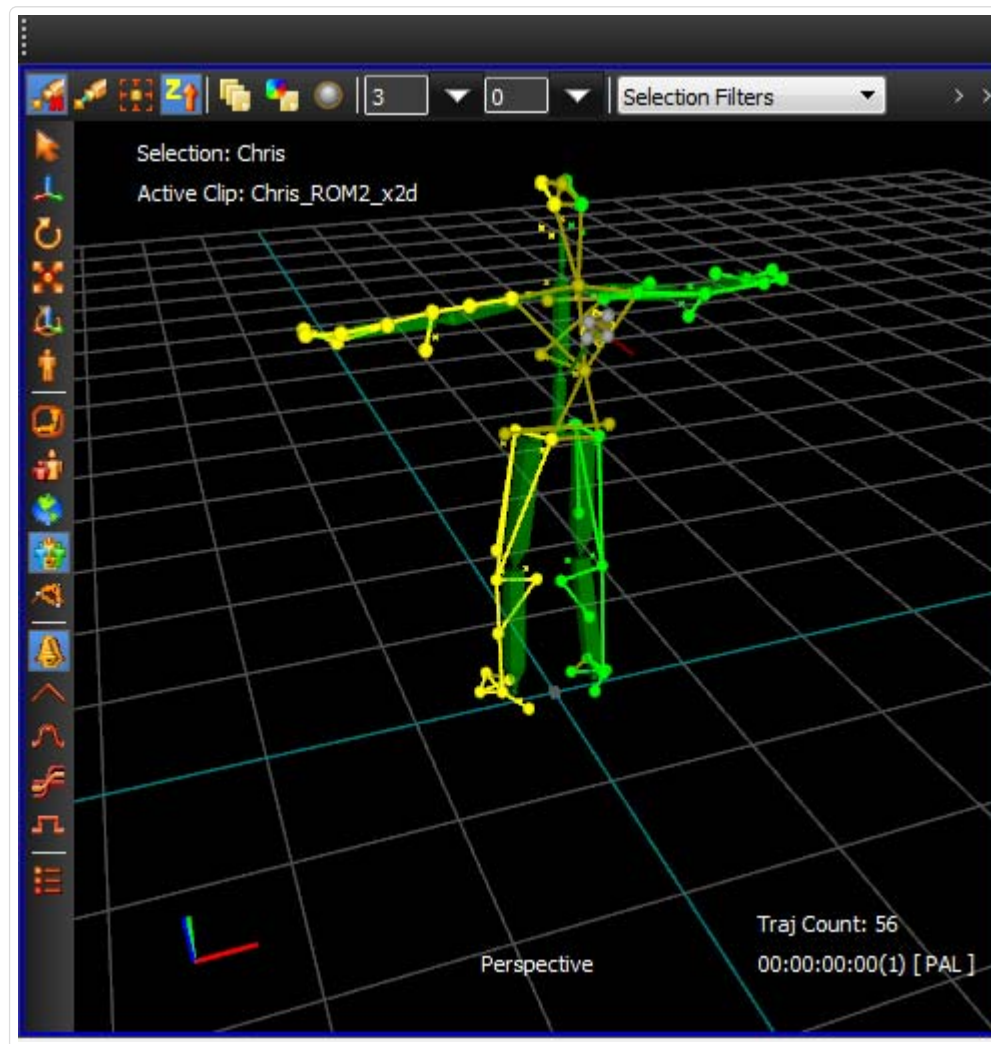
You will see a green skeleton around the marker



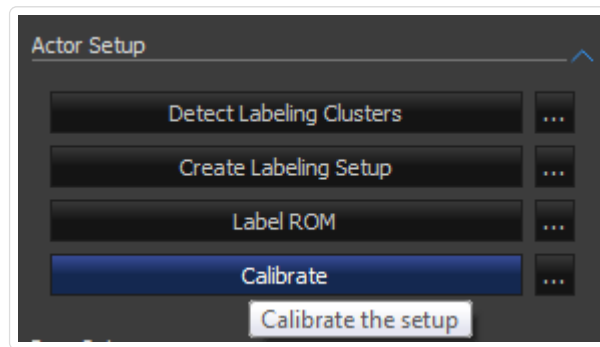
5. Click Label ROM



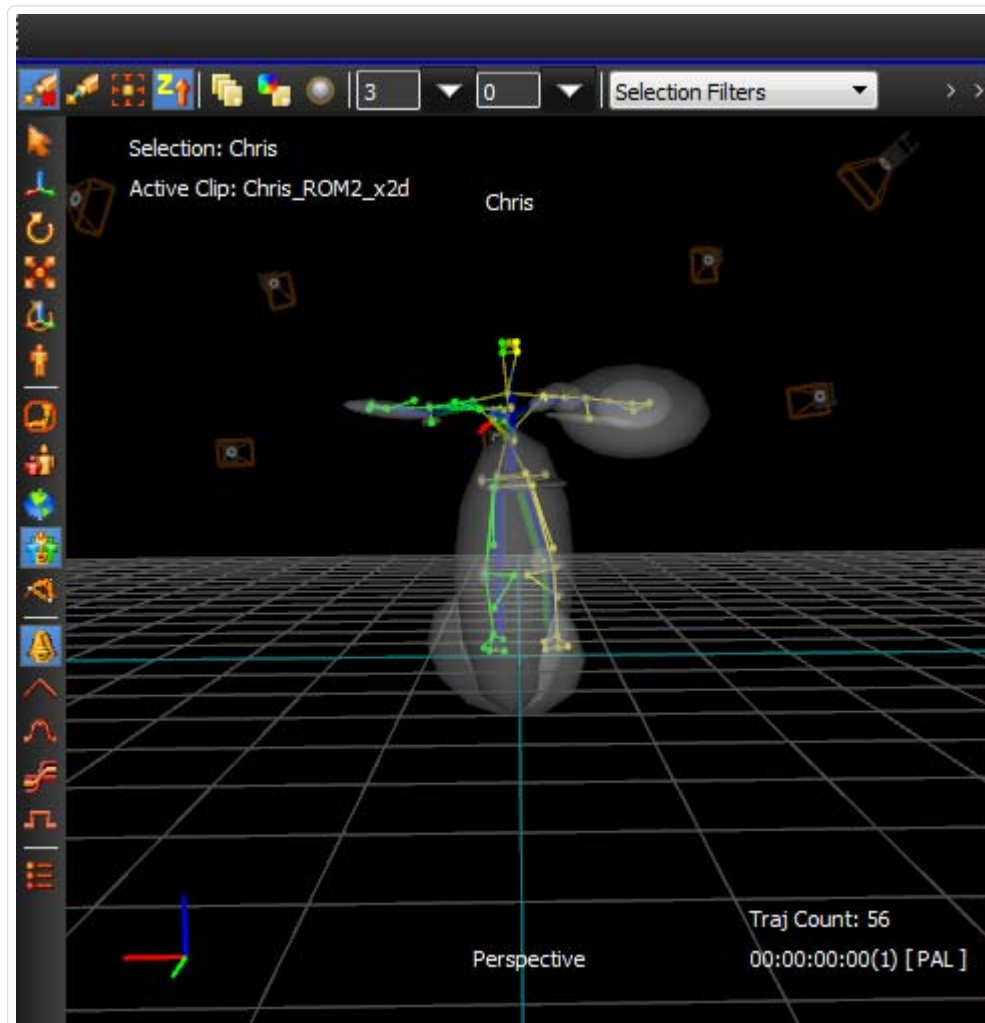
You will see a line between your marker.



6. Click Calibrate to calibrate all markers.



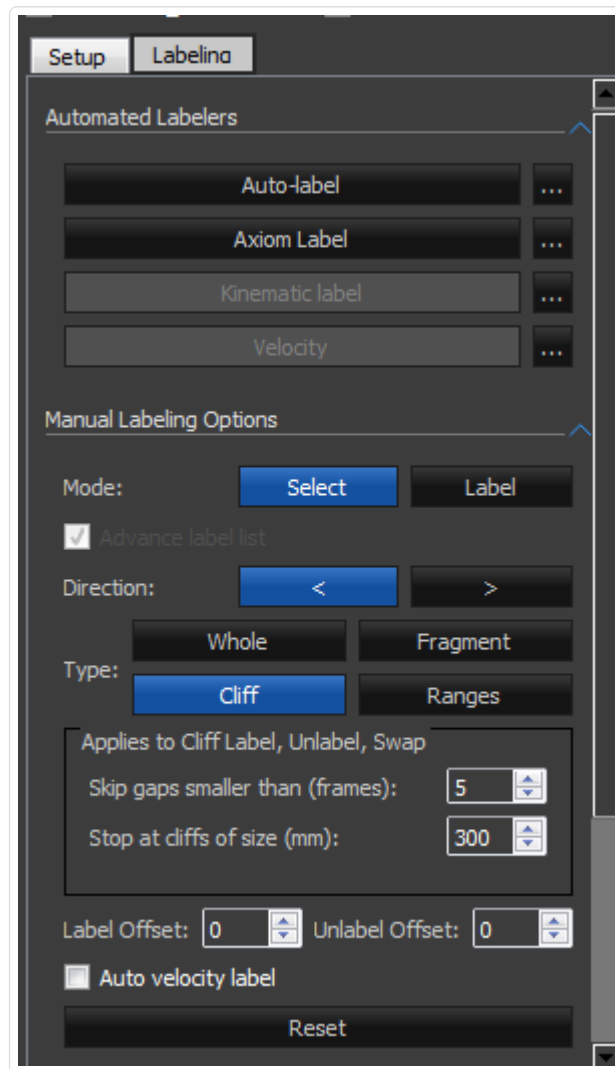
7. **If you get this kind of result, we advise you to check your markers again, and take another range of motion.** But if you insist to use this data, then we can fix it manually (which is take a lot of time) with labeling. Please jump to the step number 9 if you already got a good result.



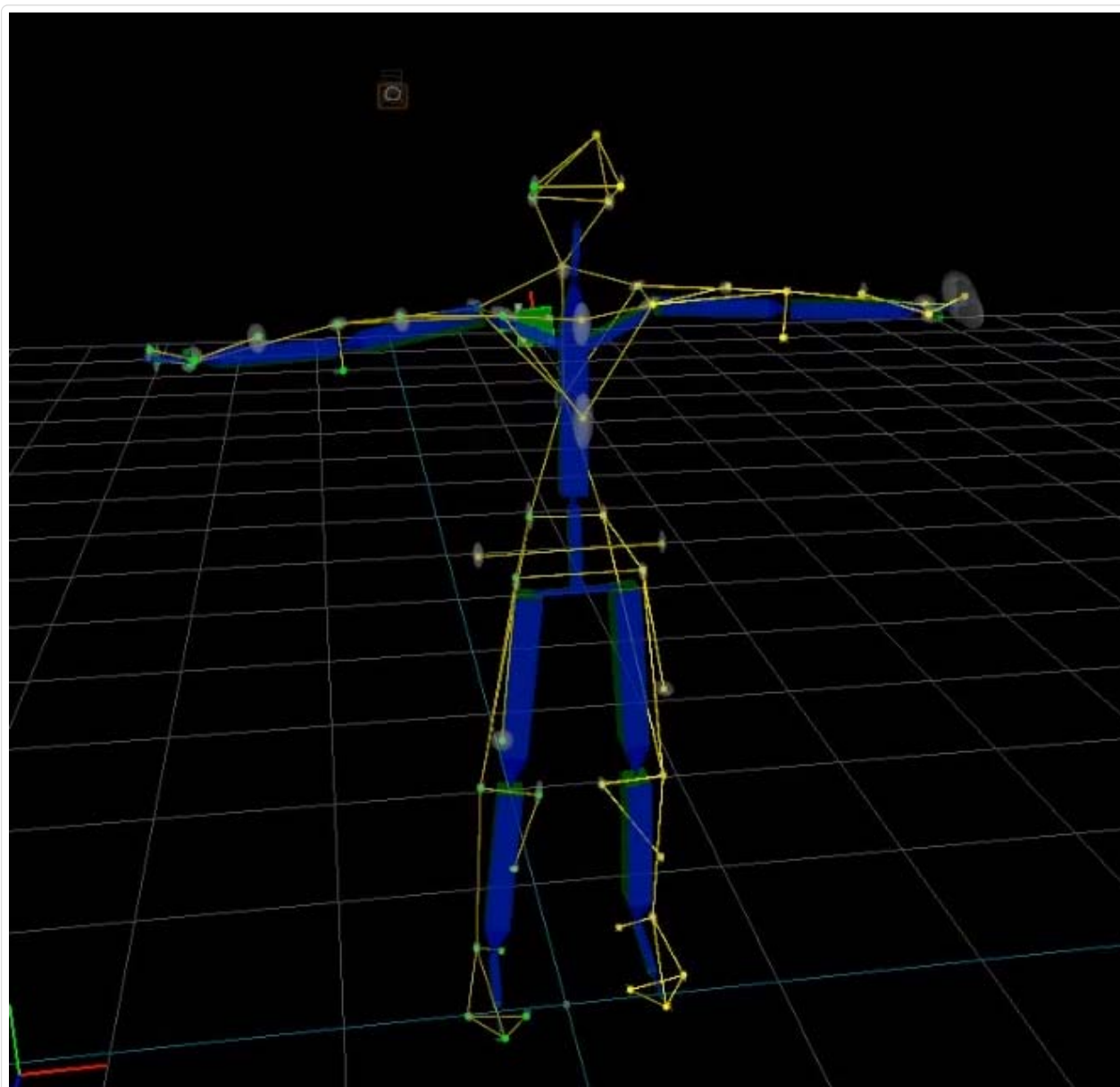
8. Manual Labeling

- If you need to manually label the markers in Blade, do so by selecting the Labeling editor under the Editors tab
- You have a choice of either labeling or selecting the markers in your 3D workspace (mode)

- Hover over a marker to reveal the label on it
- If you are labeling a T-pose before running Auto Label, make sure you pick Both directions (in Labeling tab)
- If you are processing a take and scrolling through, make sure to pick the direction you are scrolling, either forward or backwards. This stops you over-writing manual labels you've already created
- To label a marker ALT+click on it when in Label mode
- When labeling, missing markers or unlabeled markers will not cause as much problems as they can be rectified by filling gaps later on, but incorrectly labeled markers will cause bad artifacts in your final animations - focus on these!



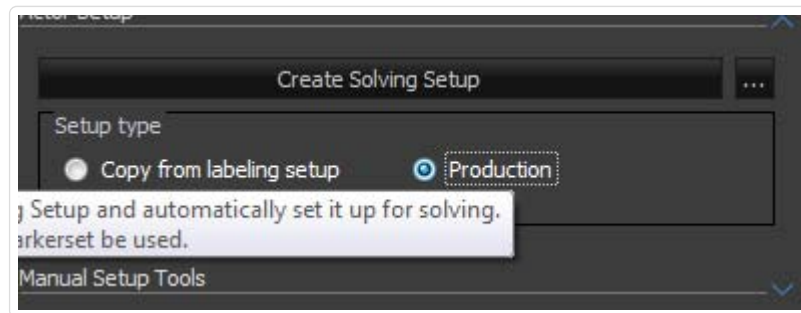
9. If you get this result, then you can proceed to the next step.



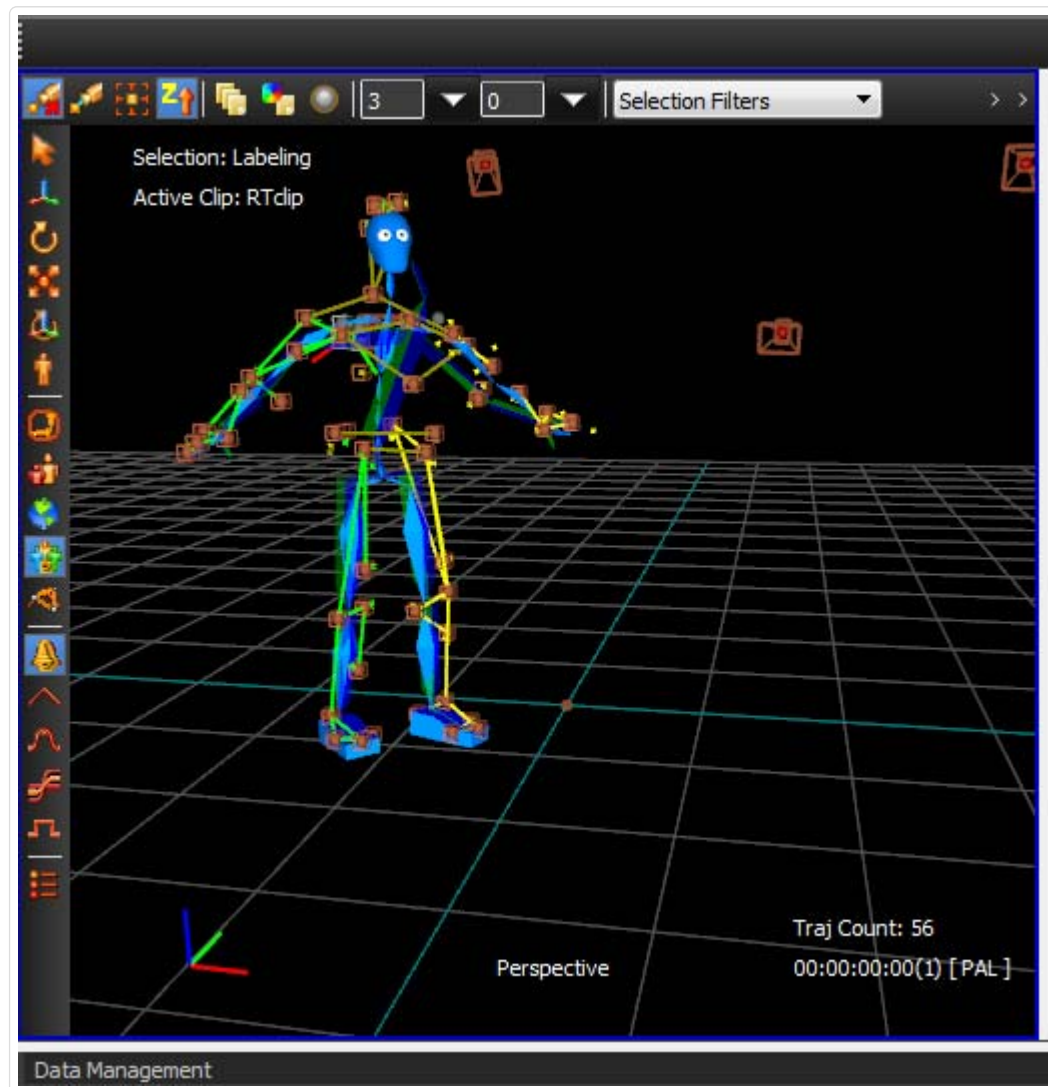
10. Save your result by click the Camera button (on the left corner), and click save. Overwrite everything, then your action will be recorded inside data management panel (B Icon). If you want to load your calibrated actor, just double click the B Icon.

	DATE	CHILD	COUNT(TRI)	LAST CALIBRATION	LAST MASK FILE	LAST THRESHOLD	DESCRIPTION	NOTES		
Tutorial										
Capture day 1			1	Session						
Session 1	14-2-2017		2	Takes	Chris_ROM2.xcp		Chris_ROM2.xcp			
Chris_ROM1				Unclassified	Chris_ROM1.xcp		Chris_ROM1.xcp		00:58	5780
Chris_ROM2				Unclassified	Chris_ROM2.xcp		Chris_ROM2.xcp		01:00	5977

11. Once you are happy with the marker labeling and gaps, you can fit the skeleton to the motion. This is done by selecting the Create Solving Setup operation. Your character will now be fitted to the labeled markers and will move with the motion as you scroll through the take

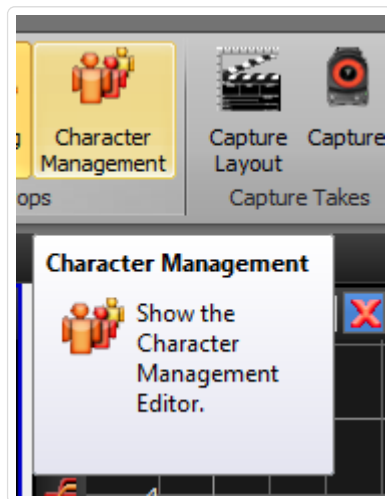


Your viewer will show a new skeleton

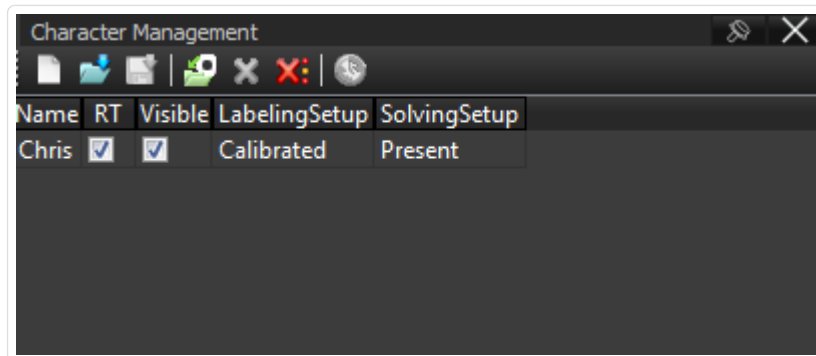


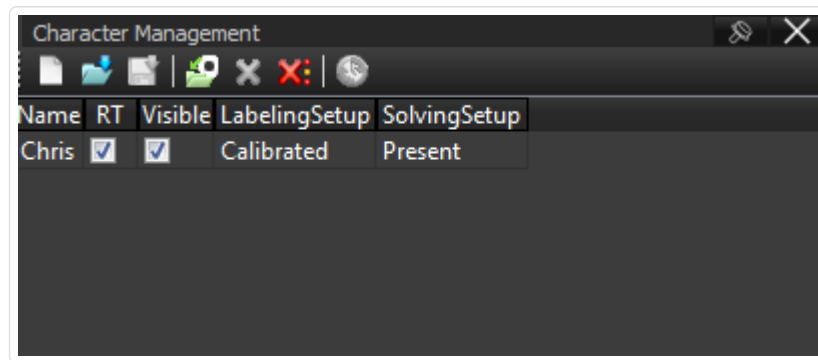
12. Character Management:

- You can also select Character Management Pane to manage all your characters



- Inside Character Management panel, there are information whether you are calibrated or not.



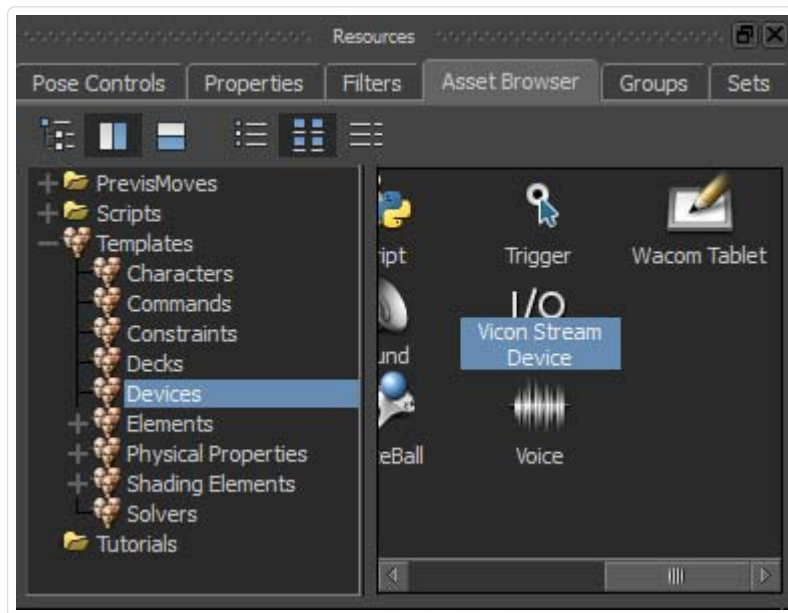


- You can also click Import and Export data to Import and Export skeleton file (.vss and .vsk)
- If you want to import the data, be sure to select both file.
- Export this motion to whatever format you wish. Blade has a bvh exporter, but it exports a largely scaled up motion. Exporting to fbx is a better option as this can be imported directly to a character in Maya and exported from there to bvh if necessary.
- To do this, choose the Import/Export pipeline and run your selected export operation

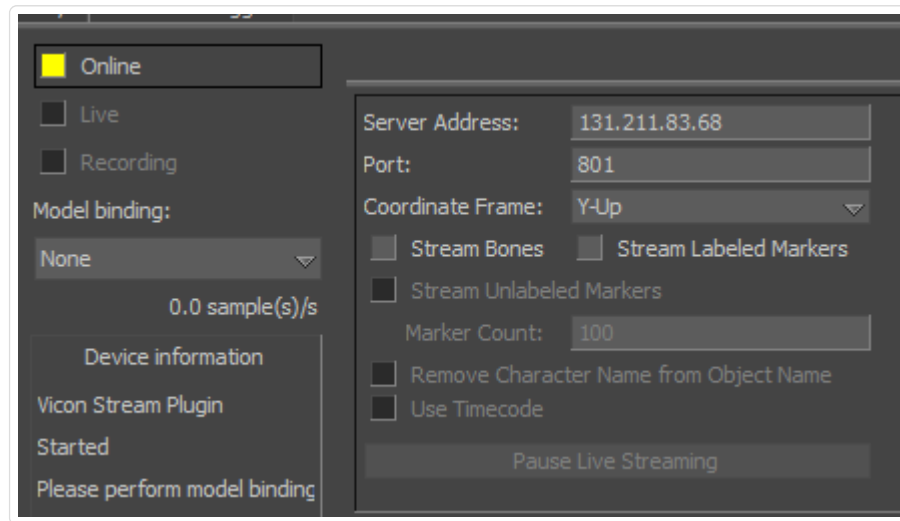
Motion Builder

This manual use Motion Builder 2016

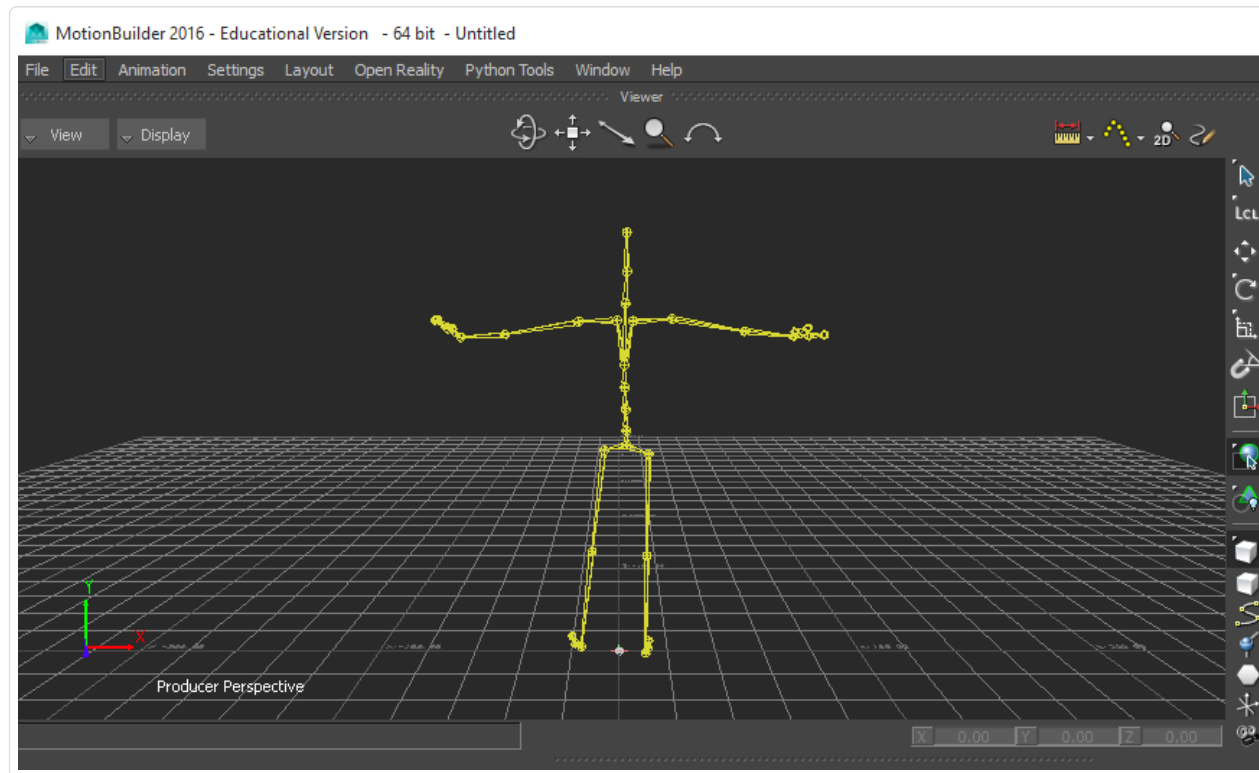
1. Under Resources Panel, Asset Browser Tab, click Templates/Devices then select Vicon Stream Device. Drag and drop it to the viewer panel



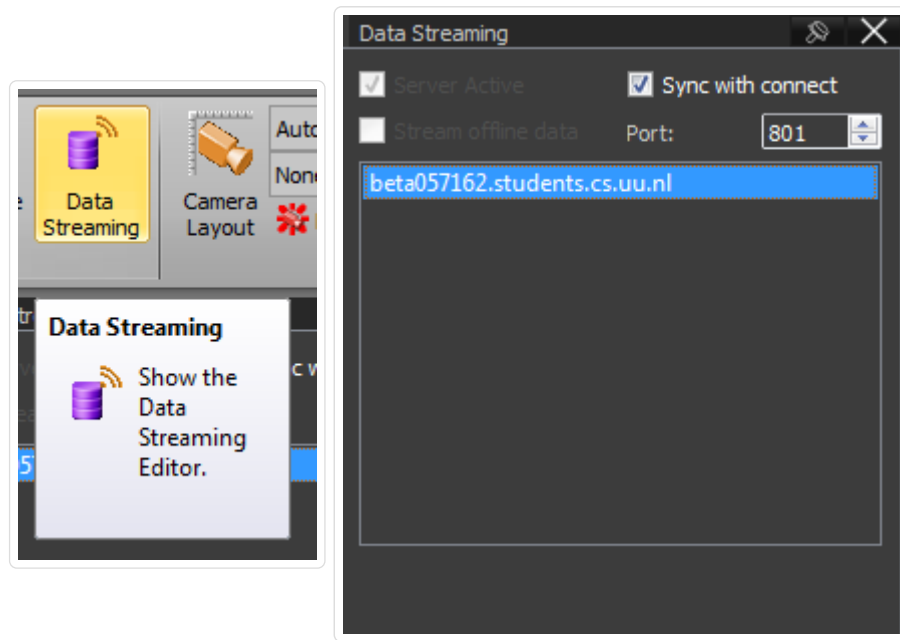
2. Inside Navigator tab, select I/O Devices, then Vicon Stream Devices



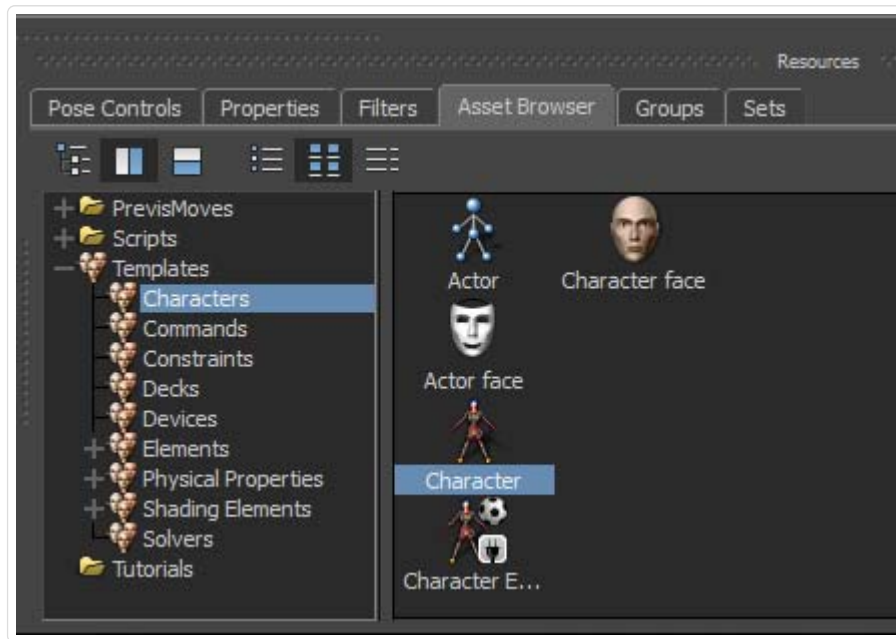
- Be sure the set the Server IP Address and port of Vicon Server
- Change the Coordinate Frame to Z-Up
- Turn On Stream Bones
- Turn On Stream Labeled Markers (optional)
- Click Online label (the color will change to yellow)
- Select combobox below the Model Binding, and select Create...
- Click Live label (the online color will change to green)
- You will see the skeleton inside Motion Builder Viewer Panel
- Once you are satisfied with the connection, click Pause Live Streaming while the skeleton is on T-Pose facing to the front (Z-axis positive)



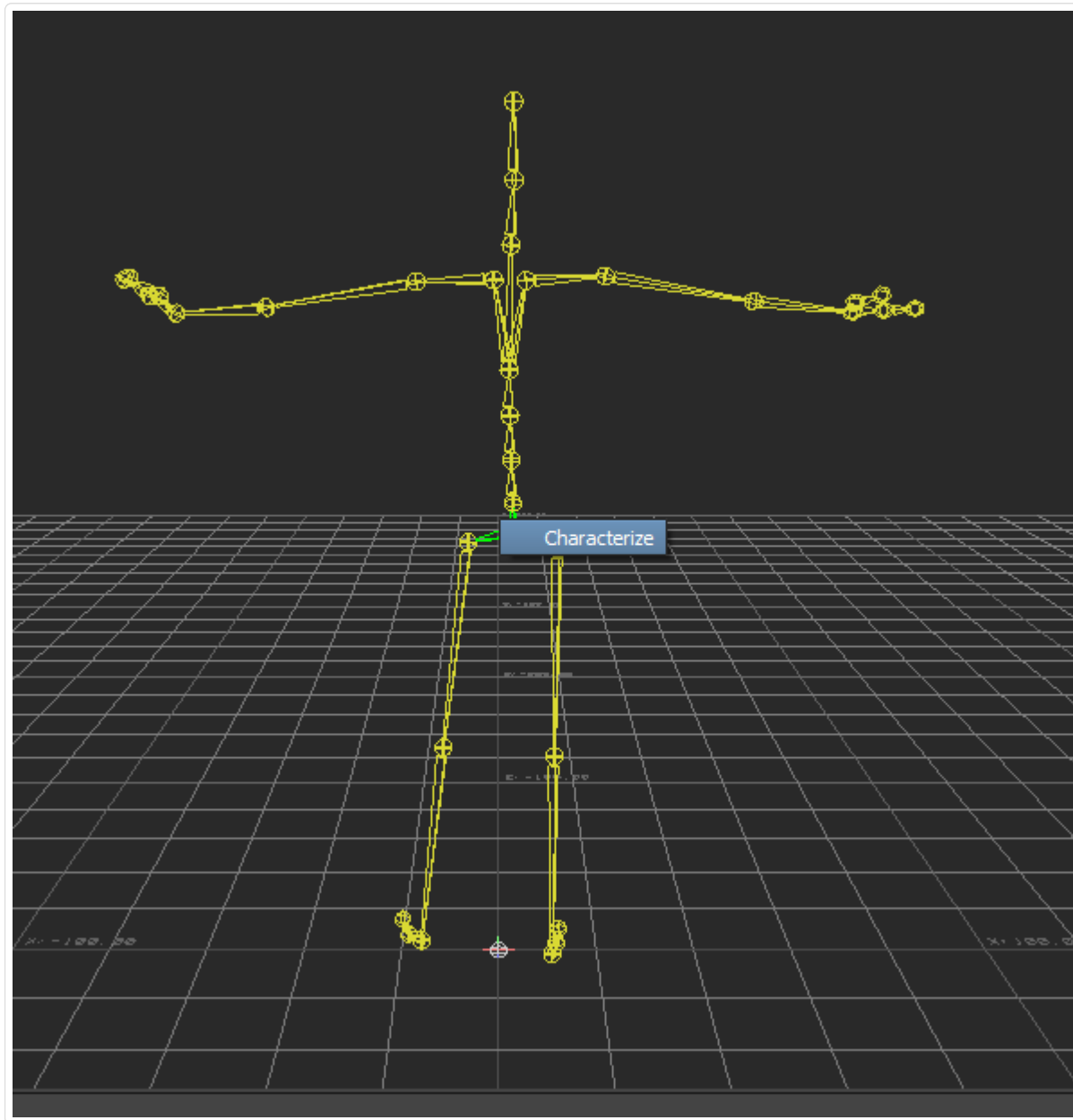
3. You can check the connection inside Vicon Blade, under Data Streaming panel



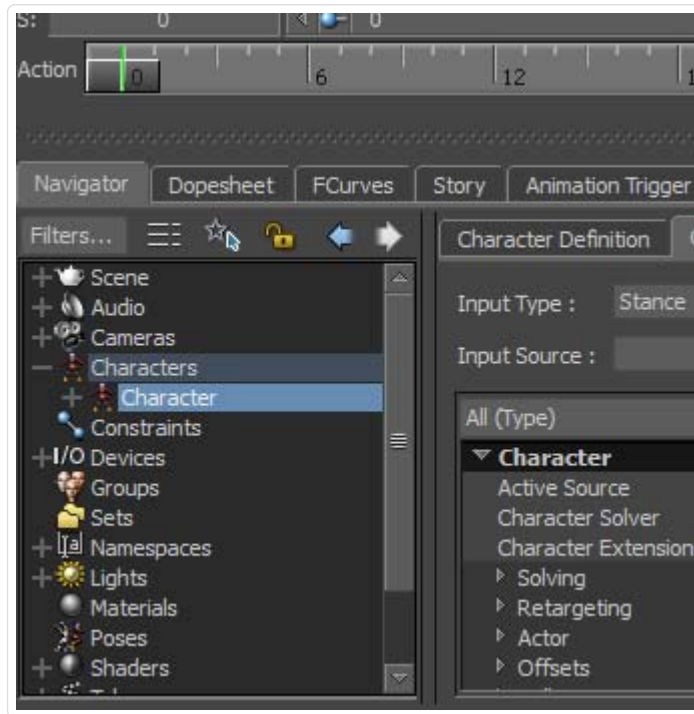
4. Under Resources Panel, Asset Browser Tab, click Templates/Characters then select Character.



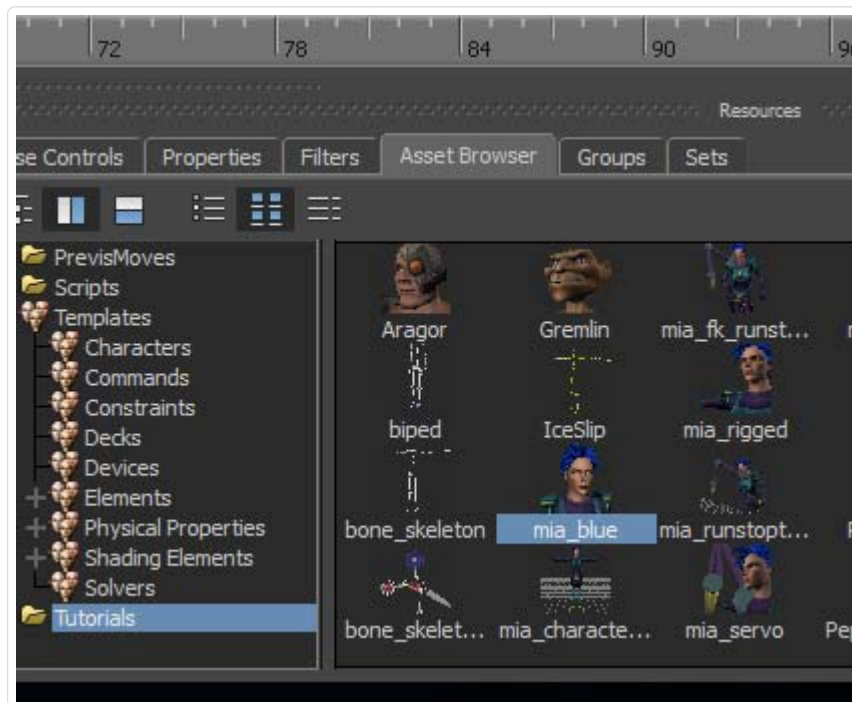
5. Drag and drop it to the hip of skeleton inside viewer panel



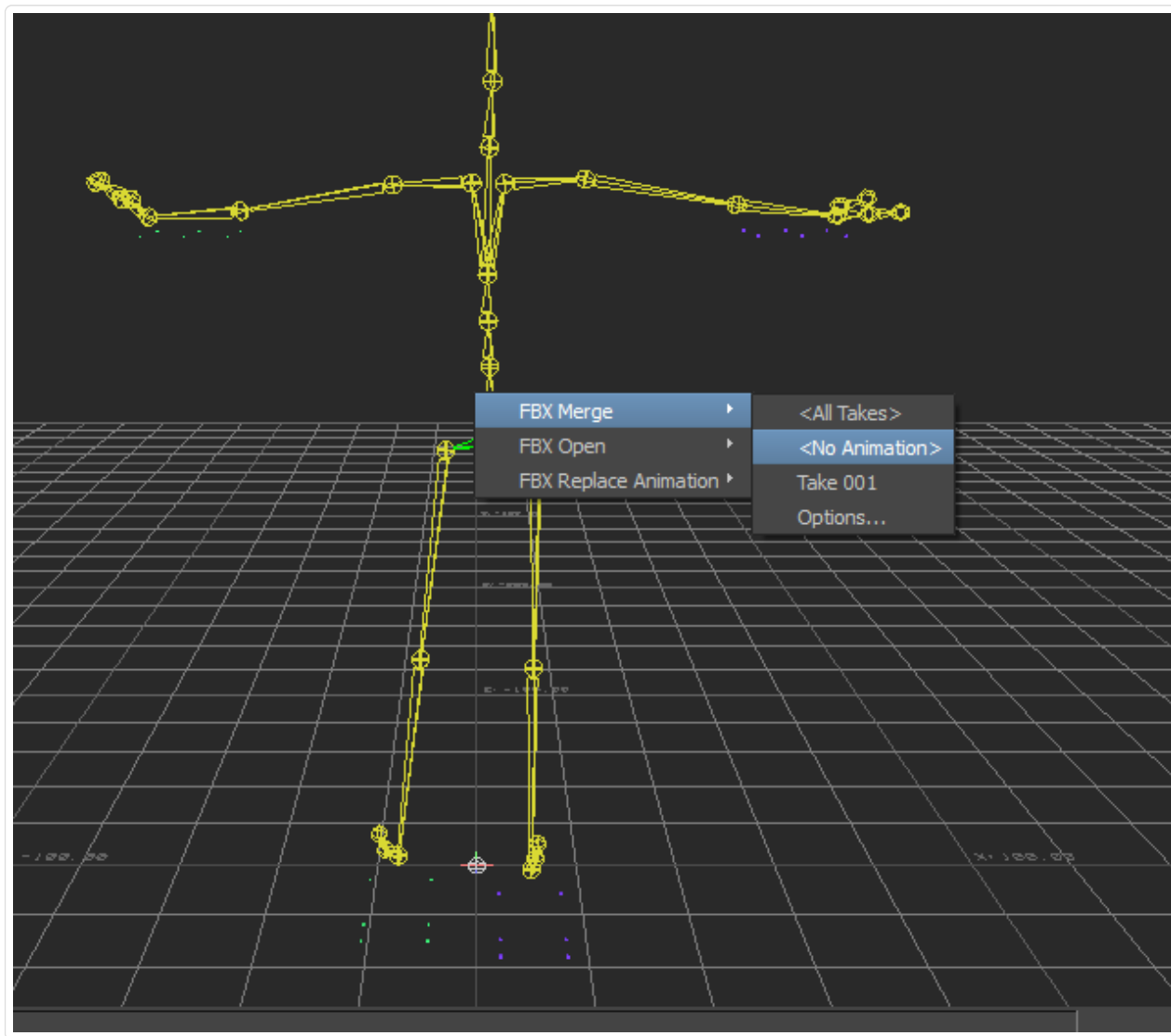
- If there is dialog "Character must be in stance pose facing positive Z-axis", then select Biped
- Under Navigator Tab, you can rename the name of this skeleton.



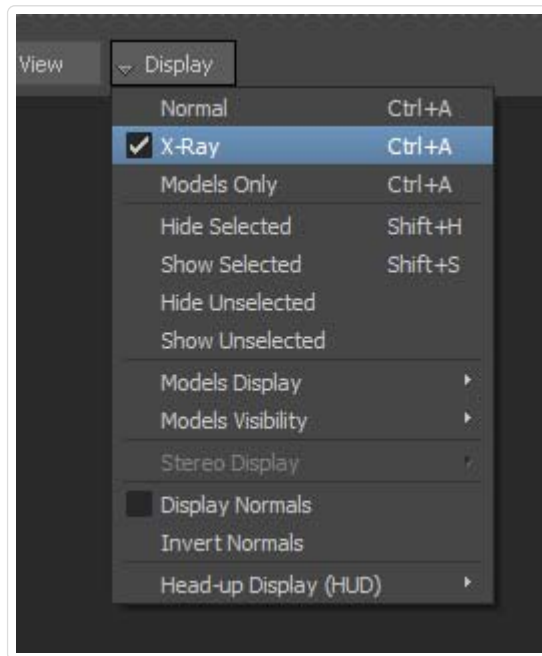
6. Under Resources Panel, Asset Browser Tab, click Tutorials then select mia_blue.



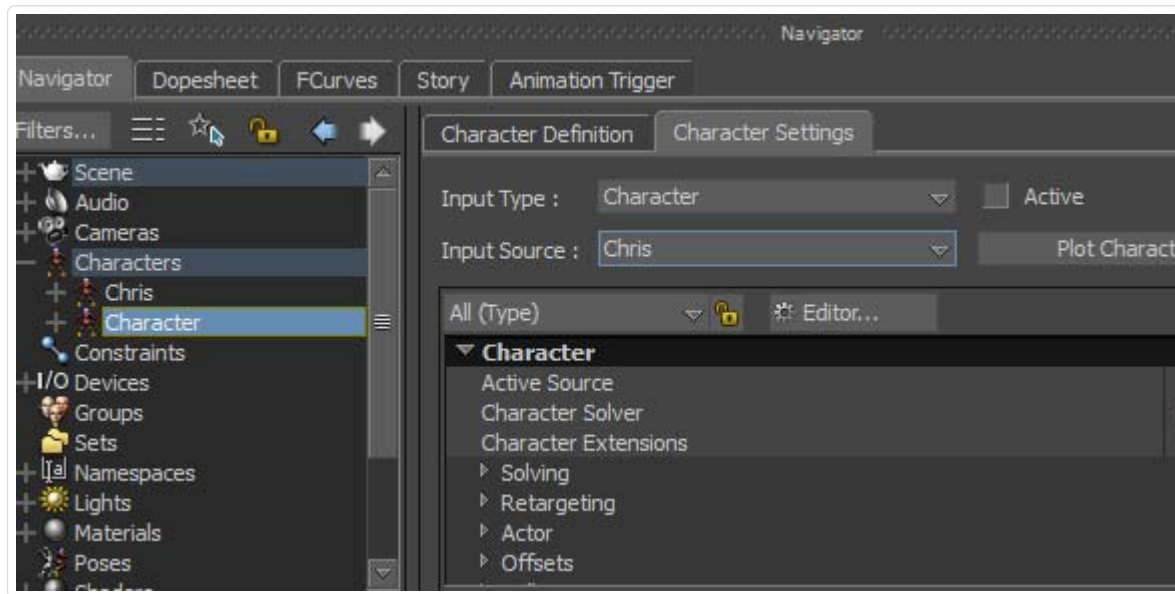
7. Drag and drop it to viewer panel, then select FBX-Merge -



8. Click drop down Display, and tick X-Ray to view Mia Skeleton

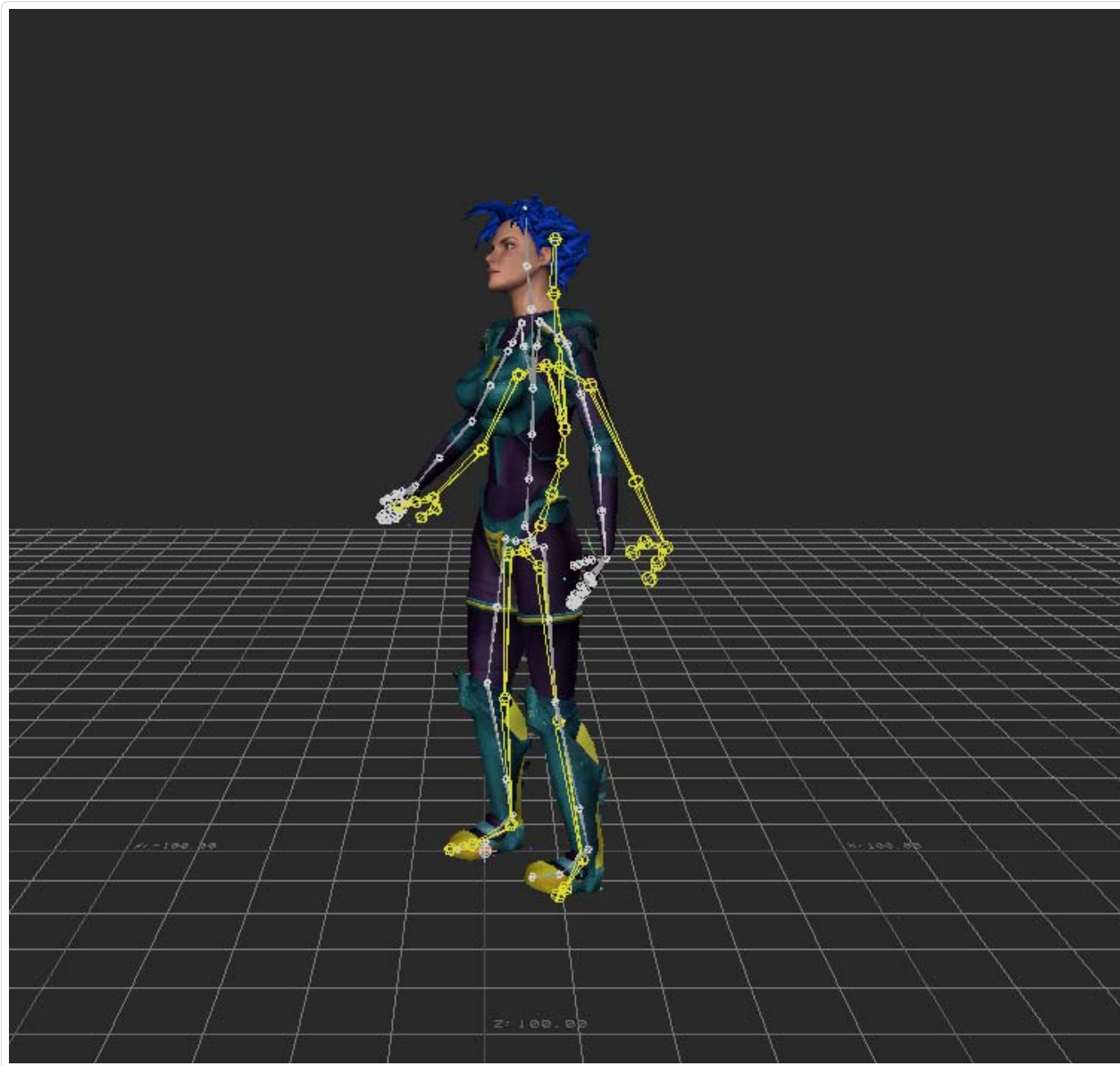


9. Under navigator panel, Select mia_blue Character then change the Input Type to Character and Input Source to your skeleton name

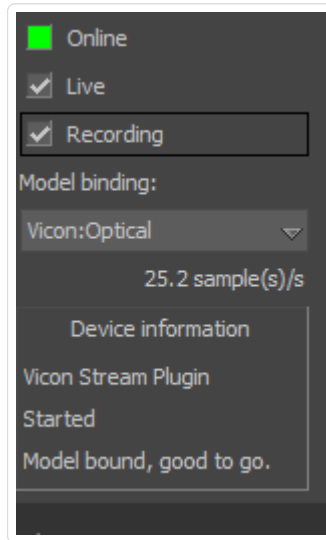


10. Then click Resume Live Streaming inside Vicon I/O devices.

11. After this step, you can move mia_blue character directly.



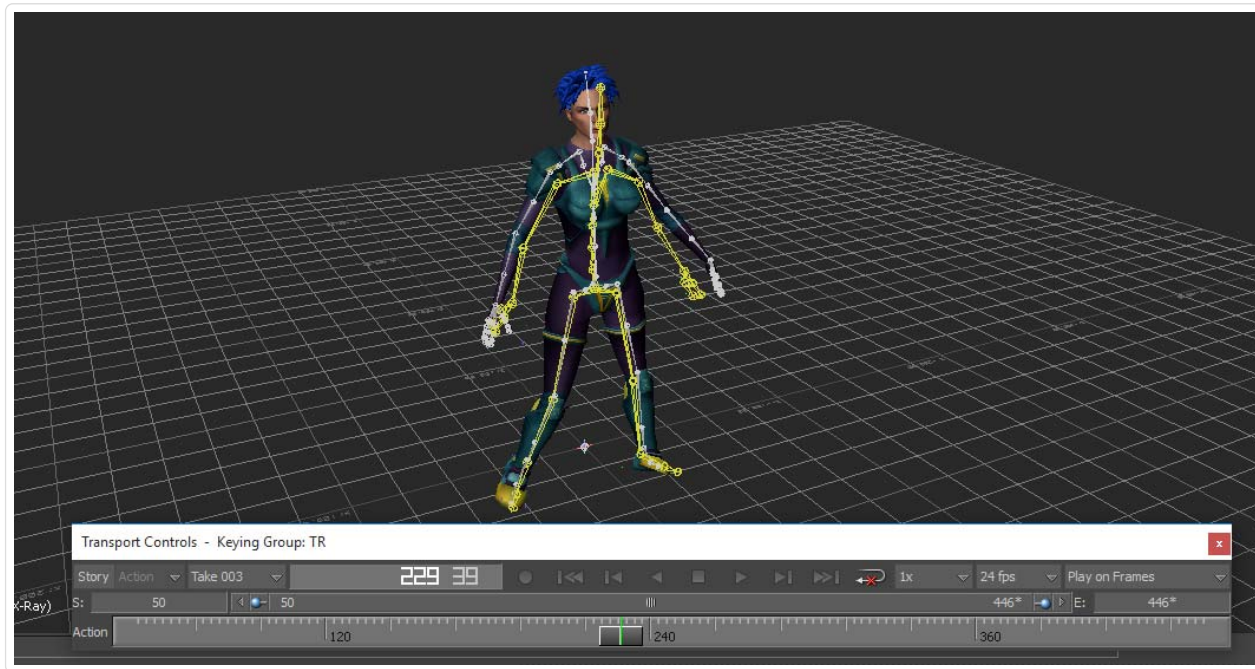
12. In order to record the data, you need to tick the Recording label under Vicon I/O device inside navigator tab.



13. Inside Transport Control Panel, click circle icon (this will turn to red), then click play (triangle icon) whenever you are ready to record the data. Don't forget to change the name of your animation (ex: Take_001)



14. Whenever you are done, click play again, then click circle icon. You can replay the captured data, but be sure to turn off the Recording, Live and Online label of Vicon I/O devices



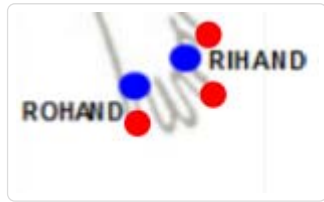
Additional Information

Finger Capture

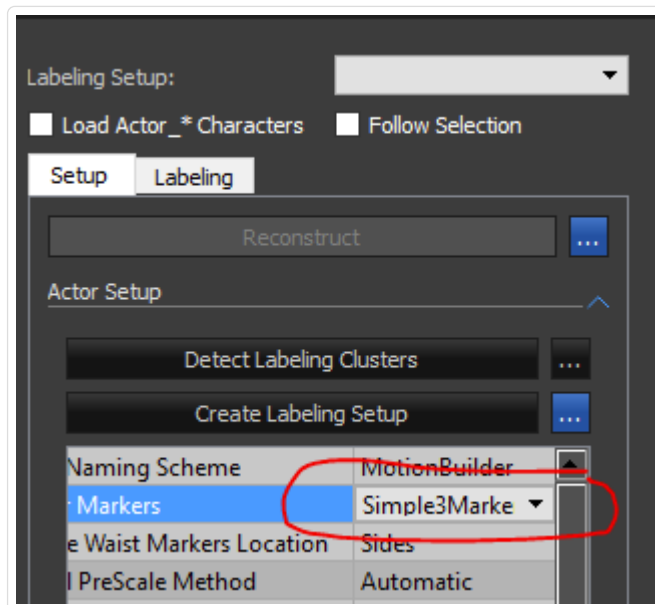
To capture the finger movement is quite easy, but the result is very rough and need more effort to clean it up.

1. Add another 3 additional markers at each of your hand.

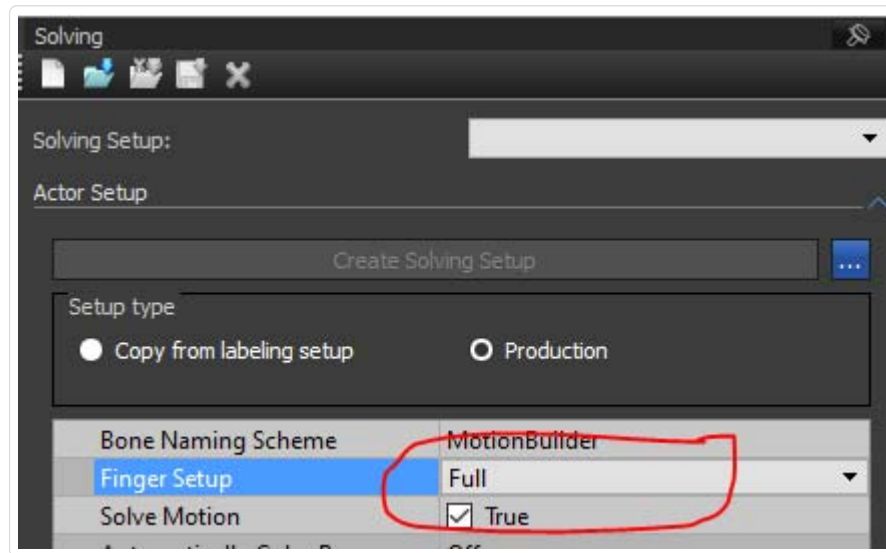
- 1 marker for thumb finger
- 1 marker for index finger
- 1 marker for little finger



2. In the actor setup, step number 4 (Create Labeling Setup), open the options then select the Finger Markers option to **Simple3Markers**.



3. In the actor setup, step number 11 (Create Solving Setup), open the options, then select the Finger Setup option to **Full** or **3 Markers**.



Documentation built with MkDocs (<http://www.mkdocs.org/>).