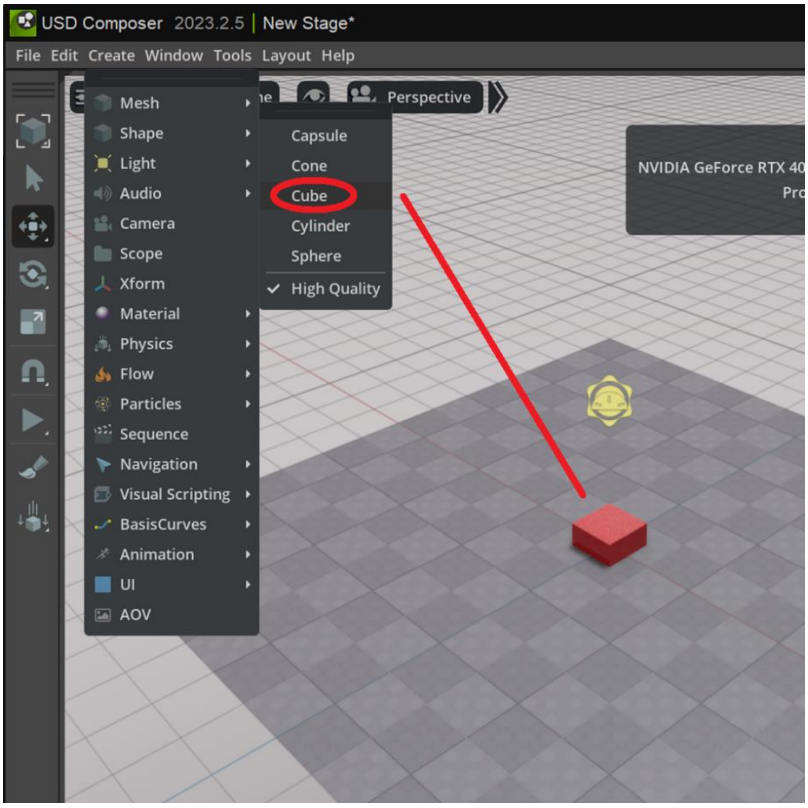
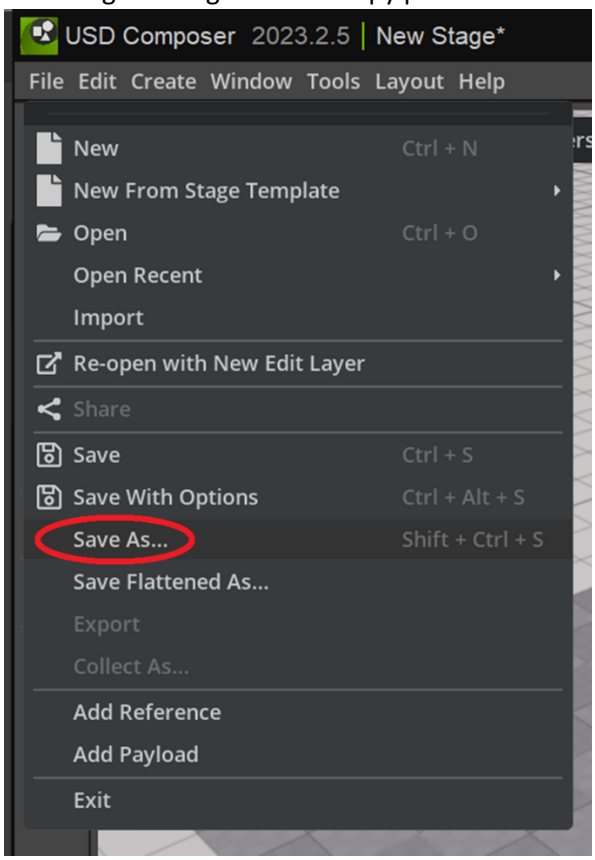
Record animated USD Stage from FlexSim 3D Model

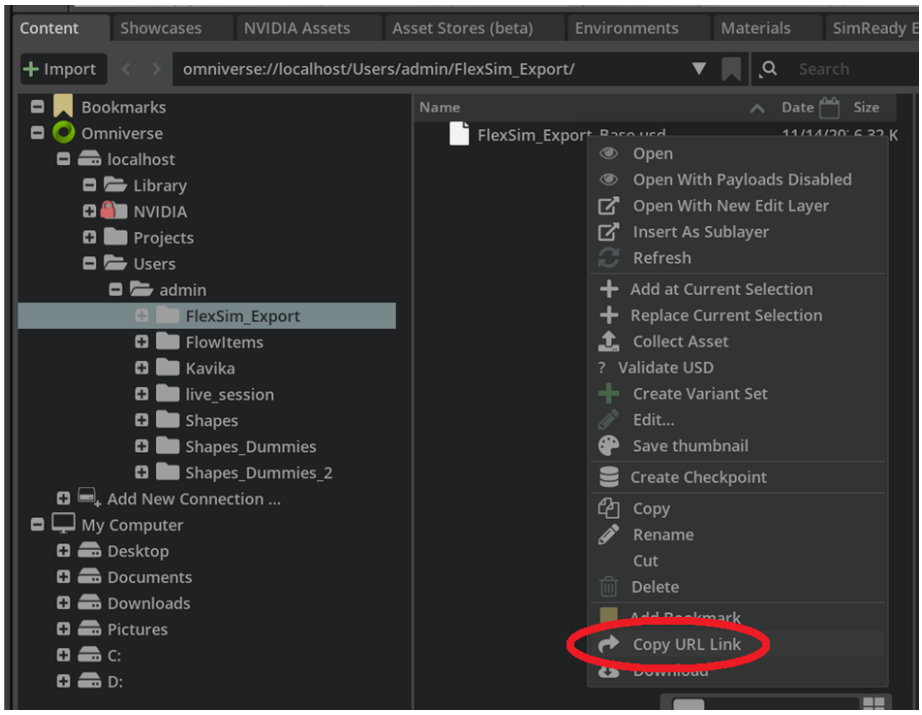
At the current release state 2024.2.2 FlexSim does not provide a tool to export an animated USD stage of a model. There is a way around though by recording the FlexSim model connected to an NVidia Omniverse live session using one of the tools in NVidia's USD Composer, the Animation Stage Recorder. This is a step-by-step tutorial to guide you through the process. It is assumed, when you are interested in this you already know how to connect FlexSim to a live session in NVidia Omniverse.

1. Start USD Composer and create simple stage (you can start with the FlexSim stage as well, but adding this step makes it simple to obtain the path to the stage)



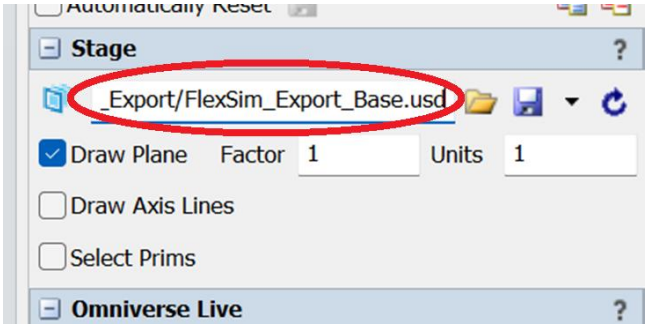
2. Save Stage and right click to copy path to saved stage



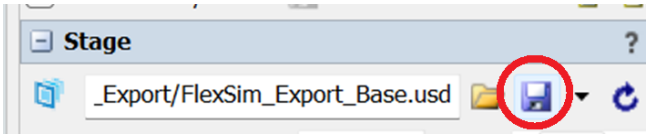


3. Start FlexSim, load or build model

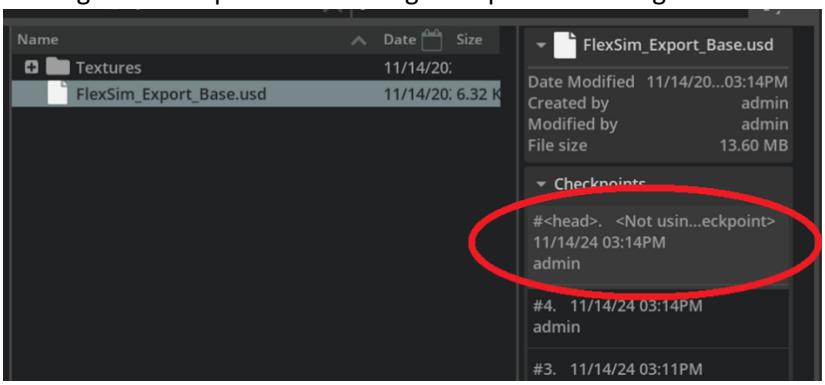
4. Connect USD Stage object in FlexSim to saved USD stage by pasting copied path into property and click into blank background



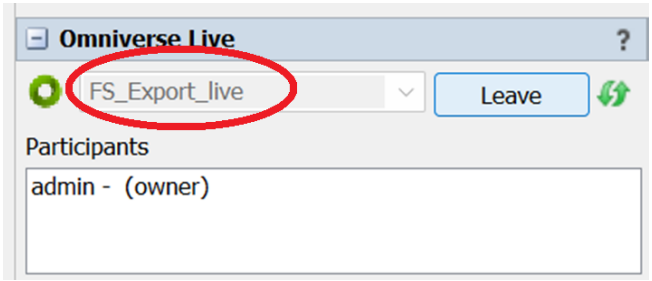
5. Save USD Stage from FlexSim USD Stage object to update saved file



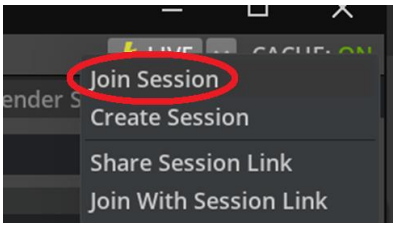
6. If USD Composer does not prompt to fetch update, manually force update by either double clicking last checkpoint for the stage or open a new stage and load the saved one

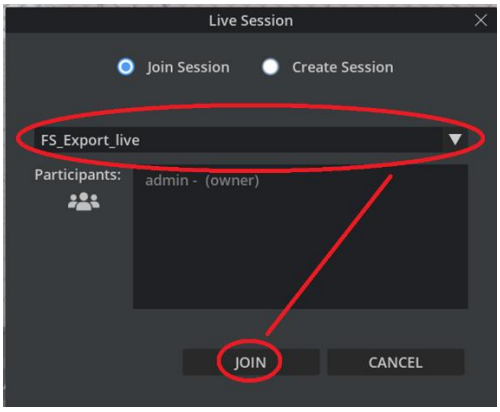


7. Enter a live session name in FlexSim's USD Stage object property and start live session



8. Connect to live session in USD Composer

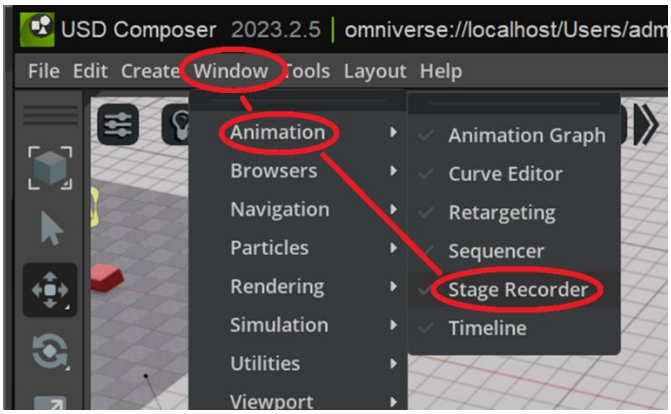




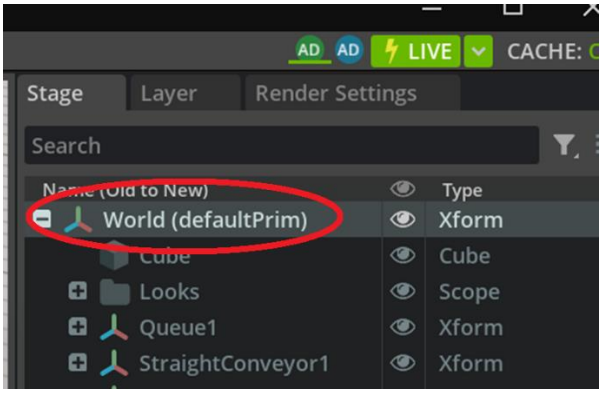
9. Running the model in FlexSim synchronizes the USD Composer view

10. Run the model in FlexSim up to the point where you want to start recording the animation

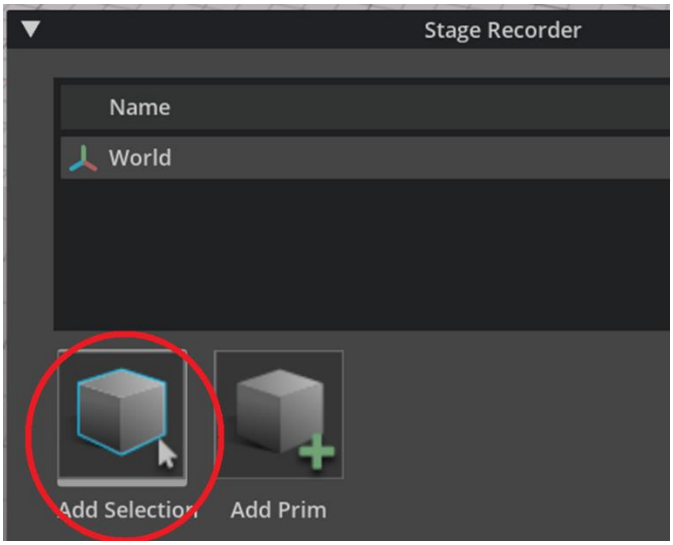
11. Open the Stage Animation Recorder in USD Composer



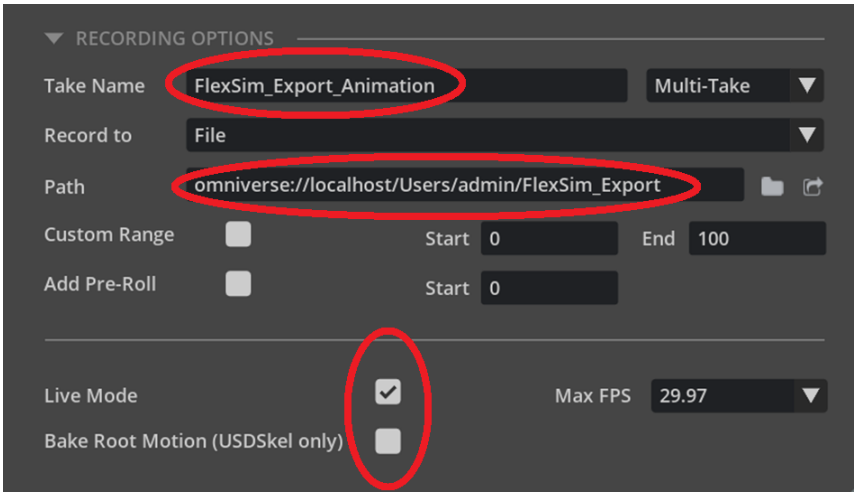
12. Select the prim you want to record the animation from in the Stage tab. This is in general the one holding the animated objects in the model.



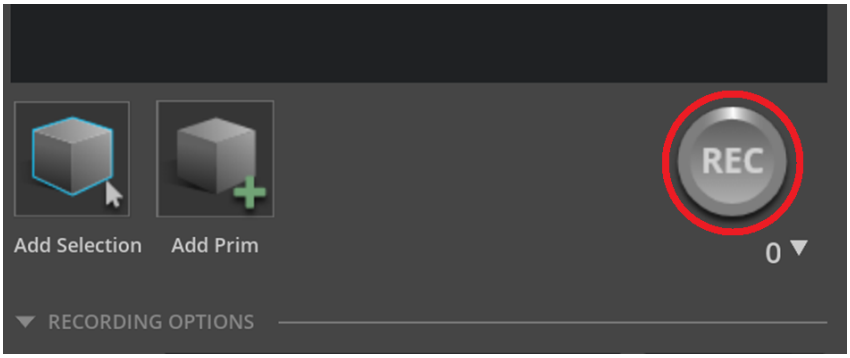
13. Add Selection to the Stage Recorder



14. Select the track name and export location and make the changes to record the animation from a live session

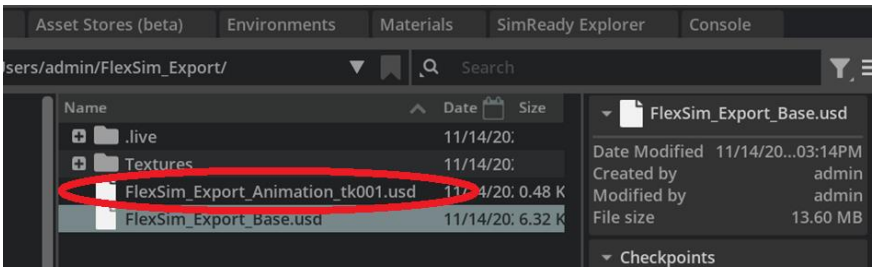


15. Run the model in FlexSim and start to record in USD Composer

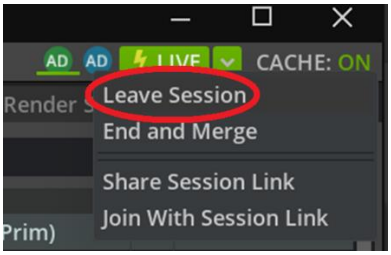


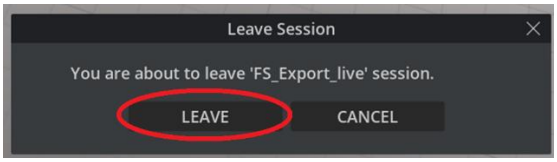
16. Press Record again to stop the recording

17. The result is a recording of the animation ONLY



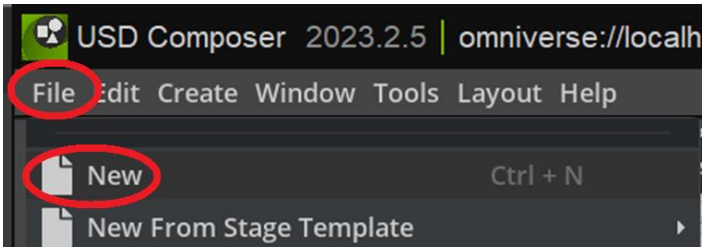
18. Disconnect USD Composer from the live session and confirm



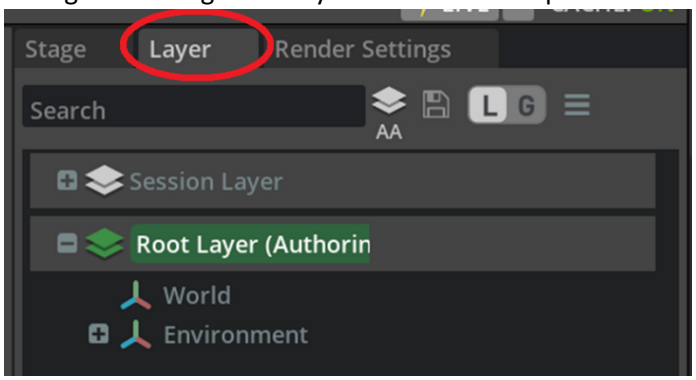


19. In the next steps we will combine the two stages, the base stage containing the objects and the recorded stage containing the animation into one stage.

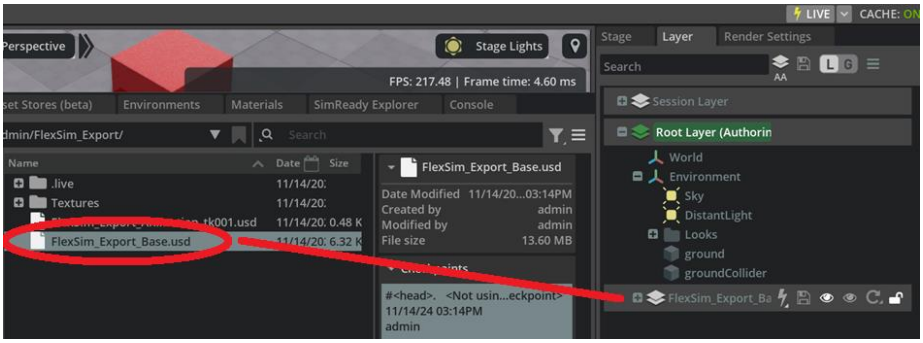
20. Create a new blank stage in USD Composer WITHOUT saving the old one



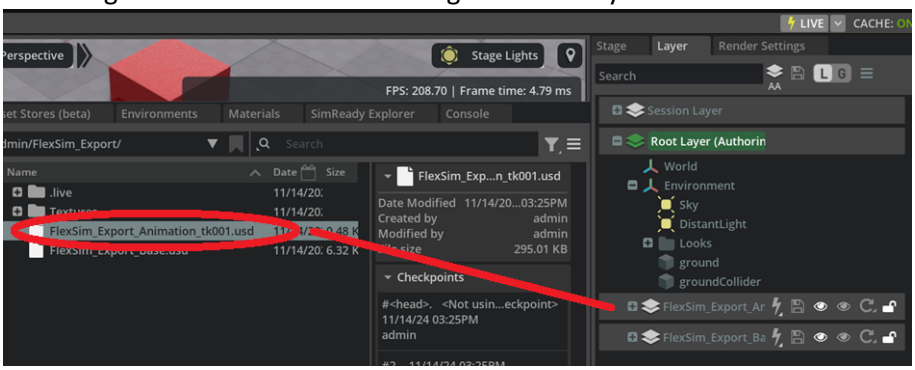
21. Change from Stage into Layer tab in USD Composer's tree view



22. Drag the original object containing stage from the content browser into the Layer tab

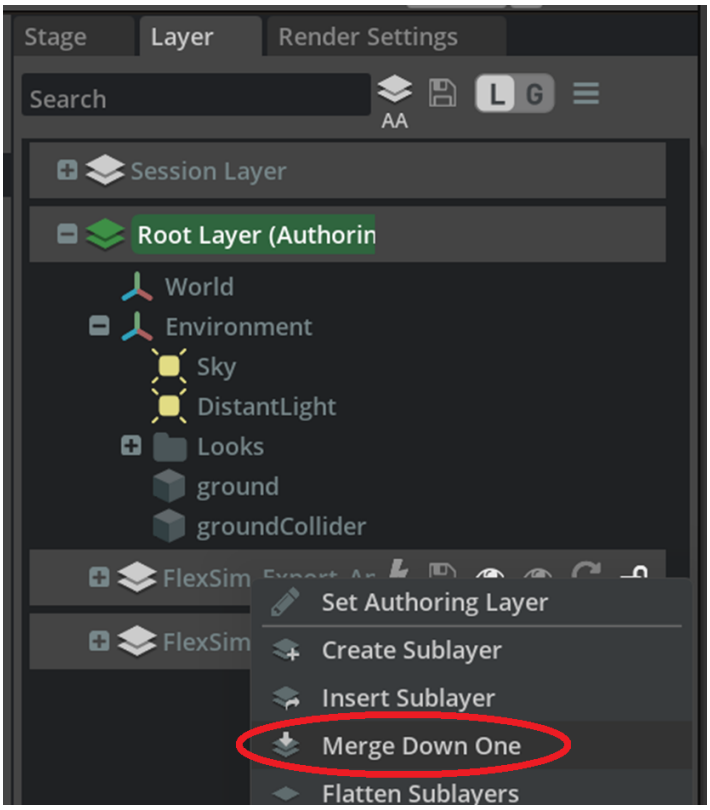


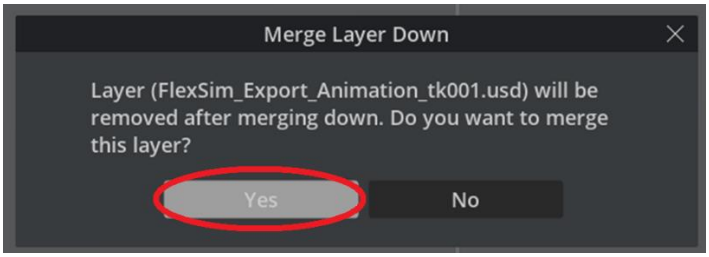
23. Now drag the recorded animation stage into the Layer tab as well



Notice that the newly dragged animation stage is put above the original object stage. The order matters, don't do it the other way round.

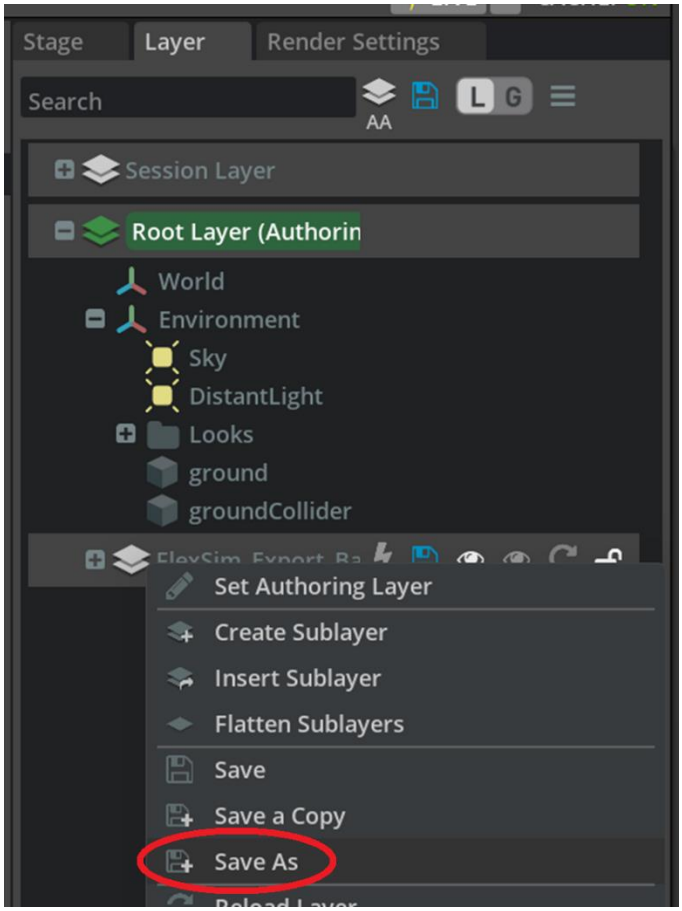
24. Right click into the animation stage and select Merge Down One to merge the animation stage into the original object stage and confirm. That adds the animation information directly into that stage to the corresponding objects



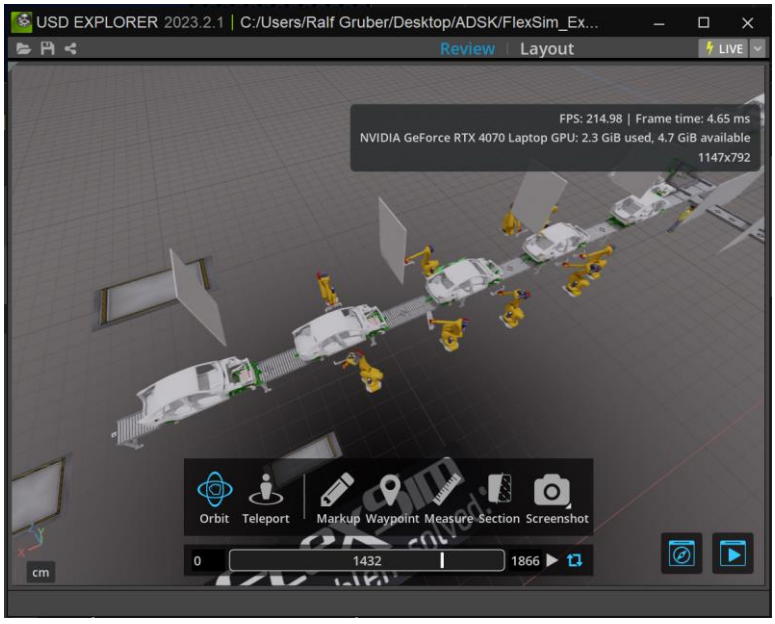


You might want to open the timeline GUI at “Windows/Animation/Time Line” and check, if the recording went well before saving it off.

25. Right click into the remaining original stage layer and select “Save As”



26. The saved USD stage contains the full animated stage without references to external files now and can be used in any USD compatible tool, e.g. USD Explorer



Congratulations, you made it!! This might not be the best or most simple way to get here, but this worked for me.