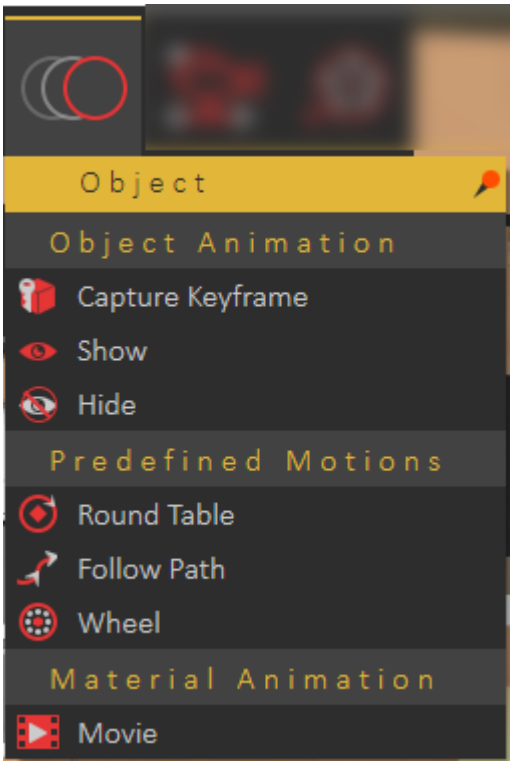
Animation Workbench

The animation workbench in SimLab Composer offers multiple tools that facilitate animating objects and cameras in the 3D scene. They provide a way to create videos and movies as well as walkthroughs.

- Object Menu
- Camera Menu
- Video Menu
- Animation Timeline
- Sequence Timeline
- Animation Auto Ease Options

Object Menu

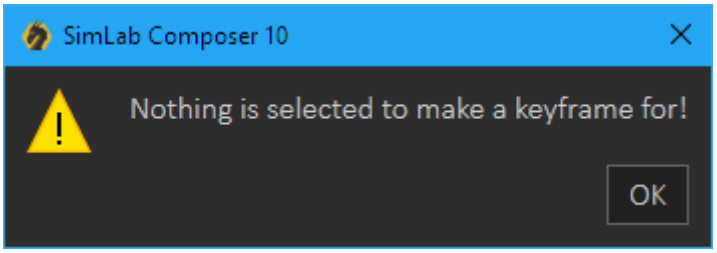
Functions in this menu assist the user in creating common object animation quickly and efficiently.



Object Animation Group

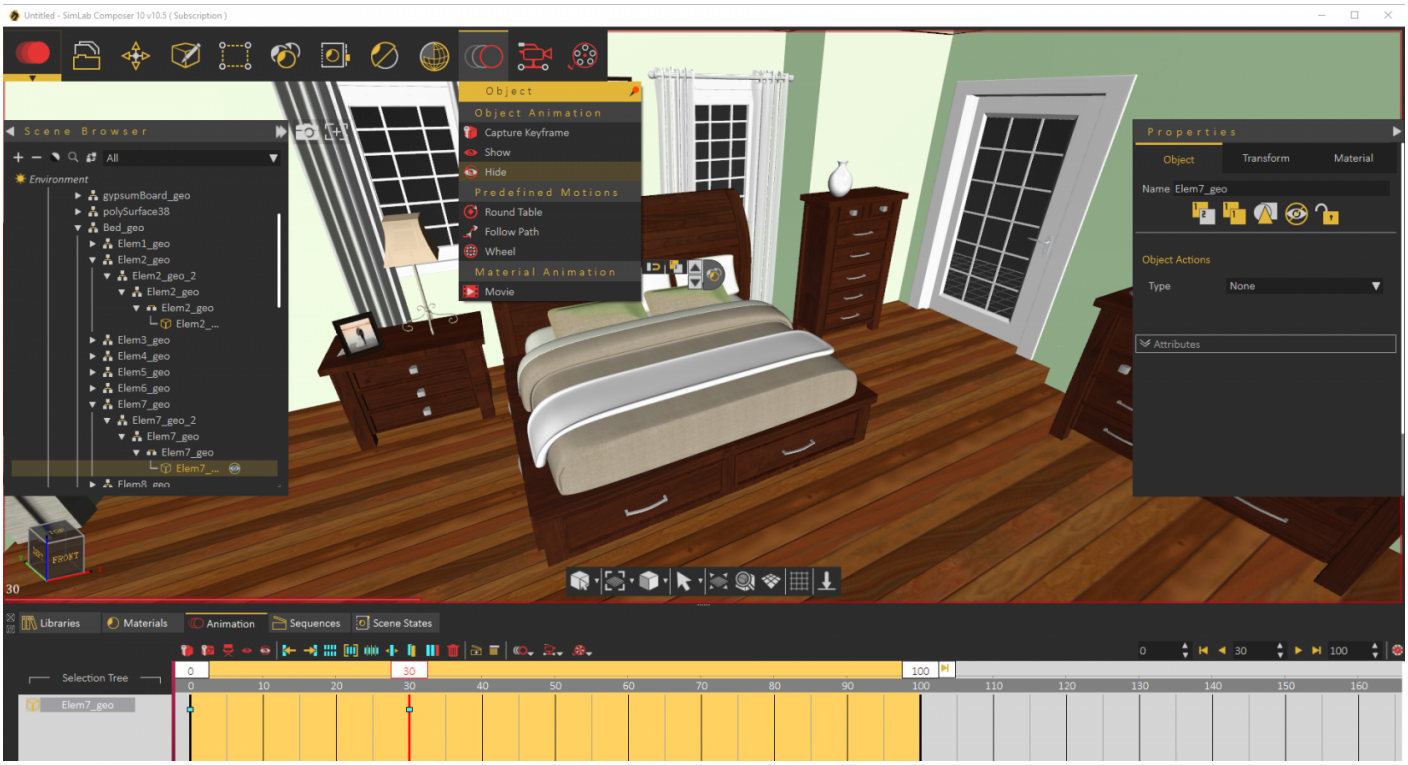
Capture Keyframe

Creates a keyframe at the location in the timeline, for the selected object. If no object is selected a message will appear indicating the need to select one.



Show/Hide Object Animation

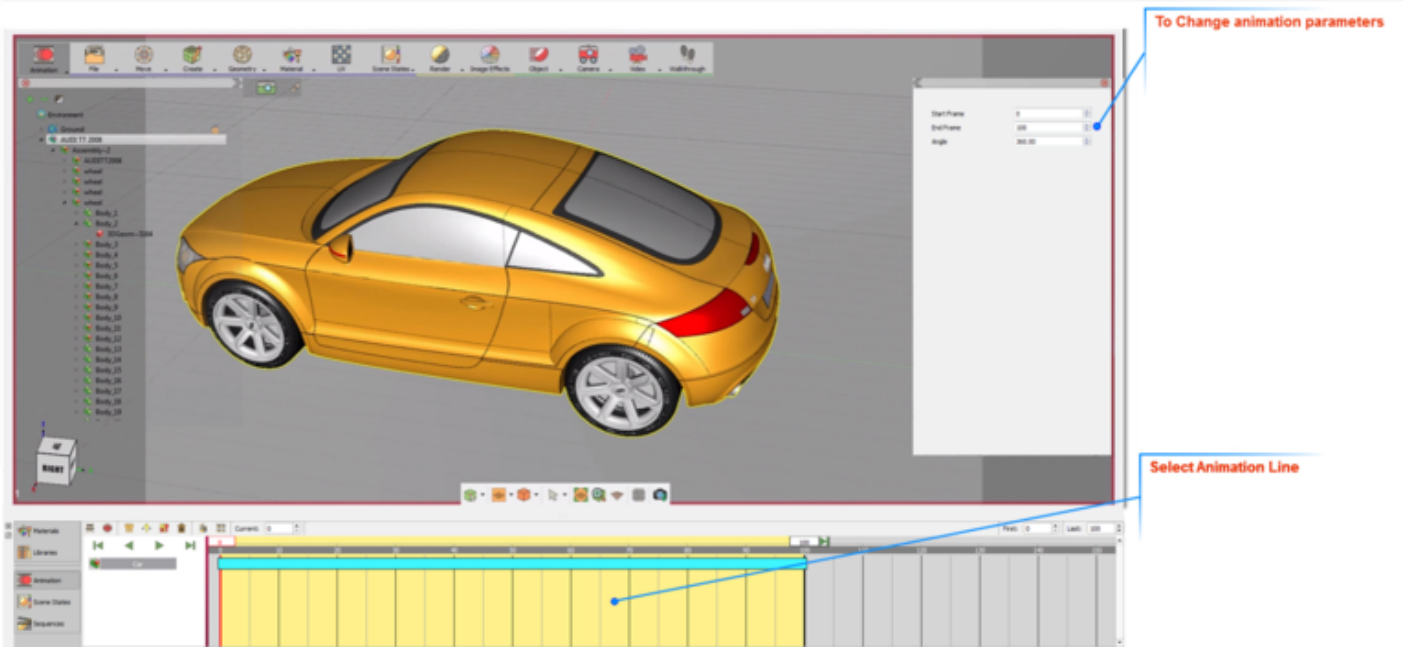
Selecting a 3D object at any frame other than zero and clicking Hide from the Object Animation group, will add a keyframe at that location and the object will be hidden there. Another keyframe will be added at frame zero, with the object shown. Using these two functions hide/show animations can be created easily.



Predefined Motions Group

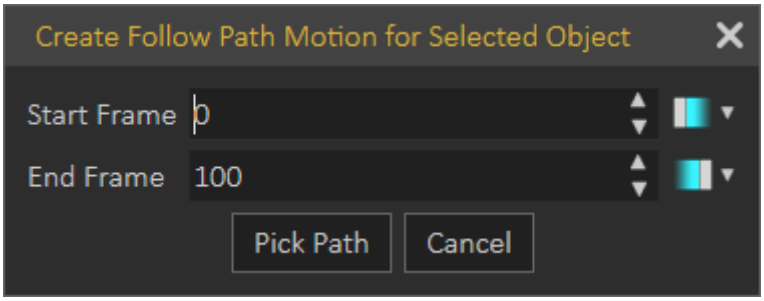
Round Table

Round Table Object animation rotates the selected object by default, 360 degrees around the global z-axis. The animation starts at frame 0 and ends at the last specified frame. Selecting the green animation line of the object in the Time Line, will display the animation parameters in the Properties Panel of the application interface, as shown in the image below. The user can select to change the Start/End frames, as well as the angle of rotation.



Follow Path

Path animation can be used to make an object follow a predefined path. This object can be a 3D object, a camera, or a light in the scene.

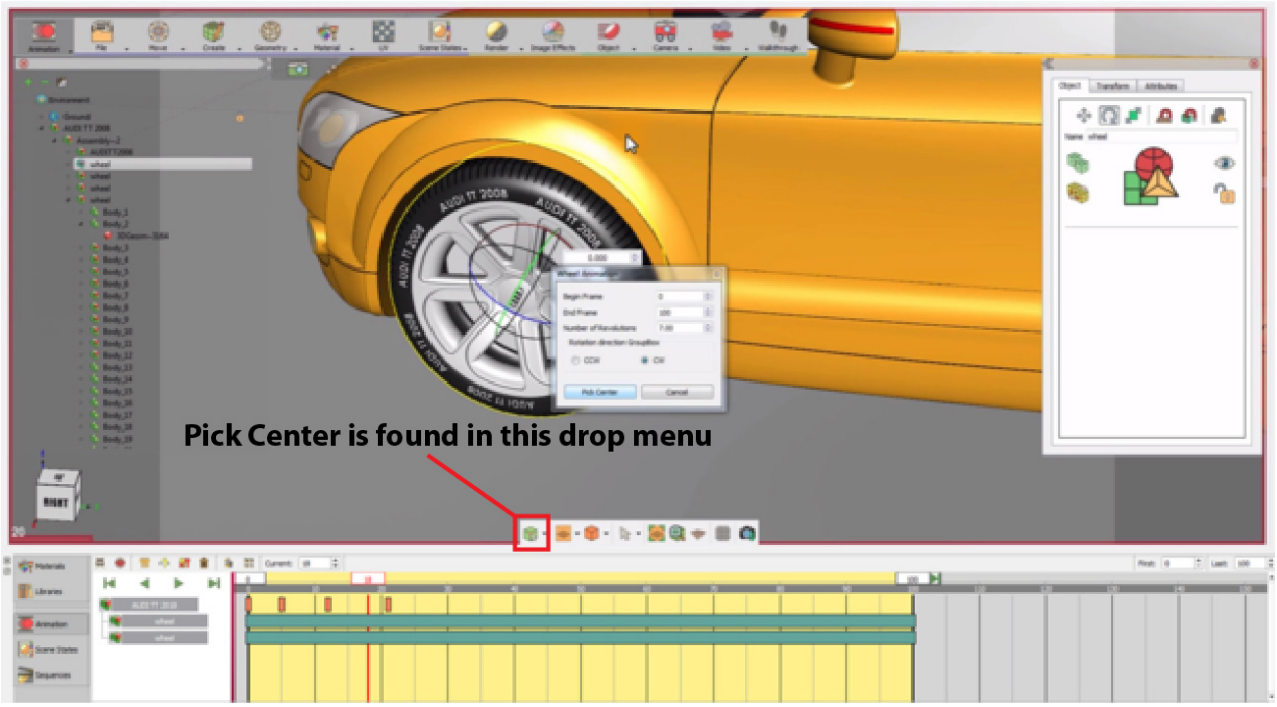


Wheel

Wheel Animation is useful for rotating object(s) around a selected axis. To create wheel animation the user needs to select the object(s) to be rotated, then click this function button. In the image shown below, one of the tires was selected. To be able to precisely select the wheel’s center, change the pick mode to Pick Center of Curvature. This will generate edges for the whole scene and will select the center of the selected curvature precisely. The wheel animation dialog will appear where the user can set the animation parameters.

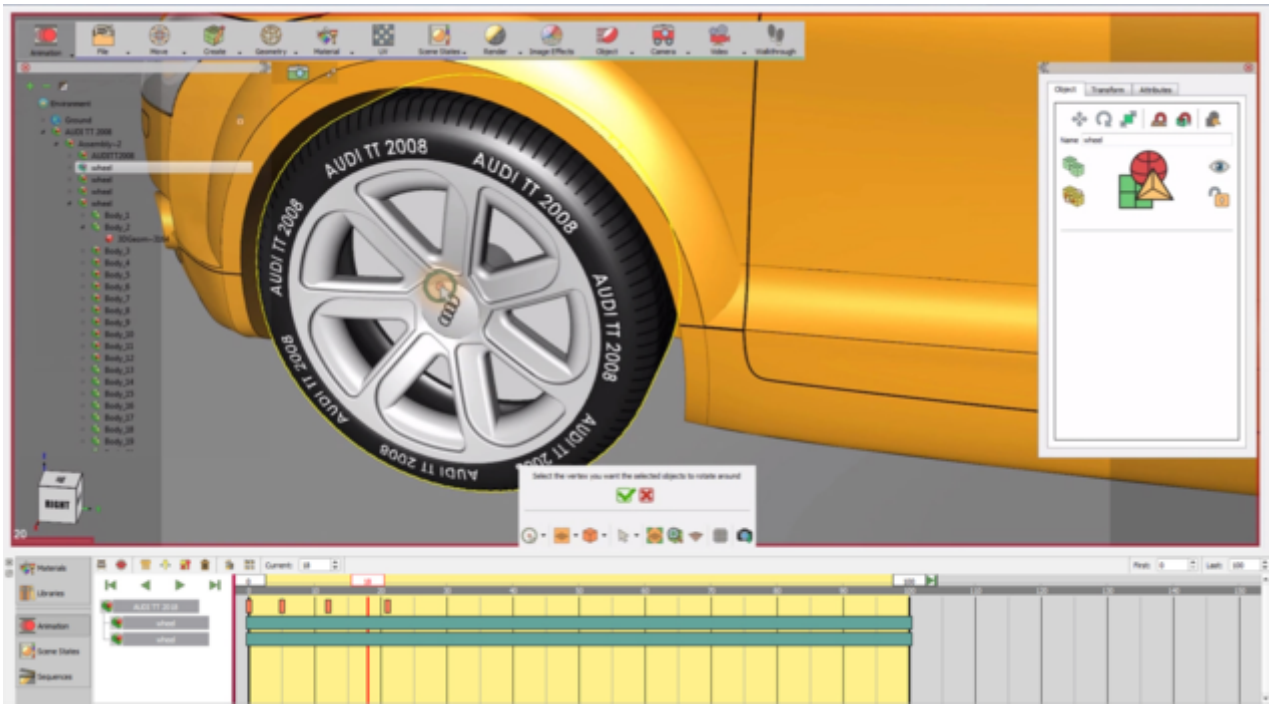
Select the start frame for the animation, the end frame, and the number of revolutions. The number of revolutions is the number of full rotations to be done by the selected object(s). The user can also select the rotation direction to be Clockwise or Counter Clockwise, the direction is determined using the right-hand rule around the rotation axis,

which always points out of the geometry.



Click Pick Center, and select the circle of the tire. The normal of the circle’s center will be highlighted, click the approve icon to end the process. As can be seen in the image, an animation line for the Tier has been added to the timeline.

Selecting this green line will display wheel animation parameters, in the Properties Panel of the SimLab Composer interface. The user can change the Start and End frames for the animation, as well as the angle of rotation. In the Wheel Animation dialog shown above, the Number of Revolutions was set to 10. This will result in 10 * 360 = 3,600 angles of rotation.

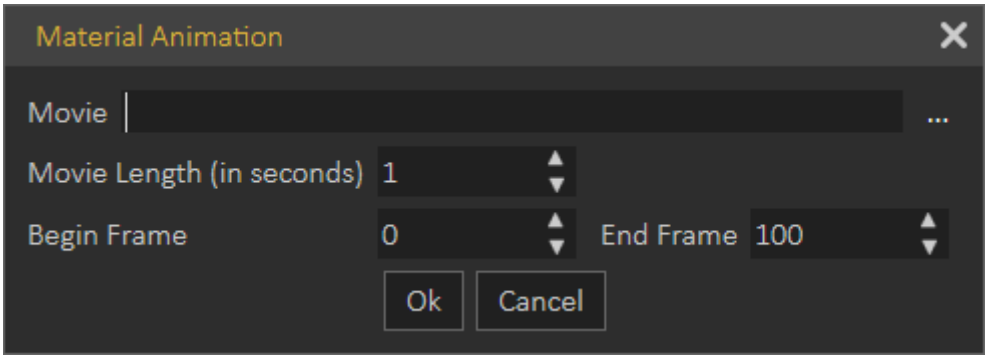


> Following the same steps, the user can create wheel animations for the other three tires.

Material Animation Group

Movie Textures are animated textures that are created from a video file, they can be applied to objects while being in the Animation workbench.

To add an animated texture, you have first to select an object and then click above the Movie button. The Material Animation dialog box appears (as shown in the following image) asking the user to specify a movie and to enter inputs as desired.



The Material Animation dialog box consists of the following fields and buttons:

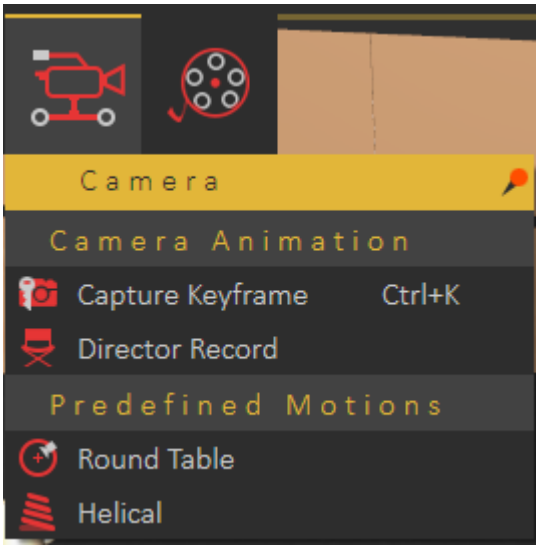
- **Movie:** Browse and select the desired movie from your disk drive.

- **Movie Length:** Enter the length of the movie (in seconds).
- **Begin Frame:** Determine the frame where you would like to start showing the texture in the animation timeline.
- **End Frame:** Determine the frame where you would like to finish showing the texture in the animation timeline.
- **OK:** Confirm and accept settings.
- **Cancel:** To abort the operation.

> Supported file types are MP4, avi, or flv.

Camera Menu

In this Panel, the user can create keyframes camera animations and use predefined camera animation functions.



Camera Animation Group

Capture Keyframe

Captures the current view in the 3D area with an animated camera, and creates a keyframe at the current location on the animation timeLine.

Director Record

Director camera gives the user the ability to create animations that combine views from multiple animated cameras/views in a scene. Clicking the Director Record button will create a new camera named director camera and adds it to the Object Tree. The director camera will start recording the views from the existing camera in the active view.

Predefined Motions Group

Round Table

This function creates a camera animation, for the whole scene, that rotates 360 degrees around the global Z axis. By default, this animation starts at frame 0 and ends at the last

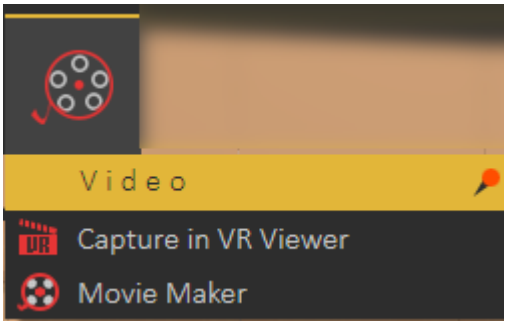
frame of the animation.

Helical

Creates an animation that rotates the camera 360 degrees around the global Z axis, with translation from the current elevation of the camera to the ground (Z = 0), suitable for showing high buildings.

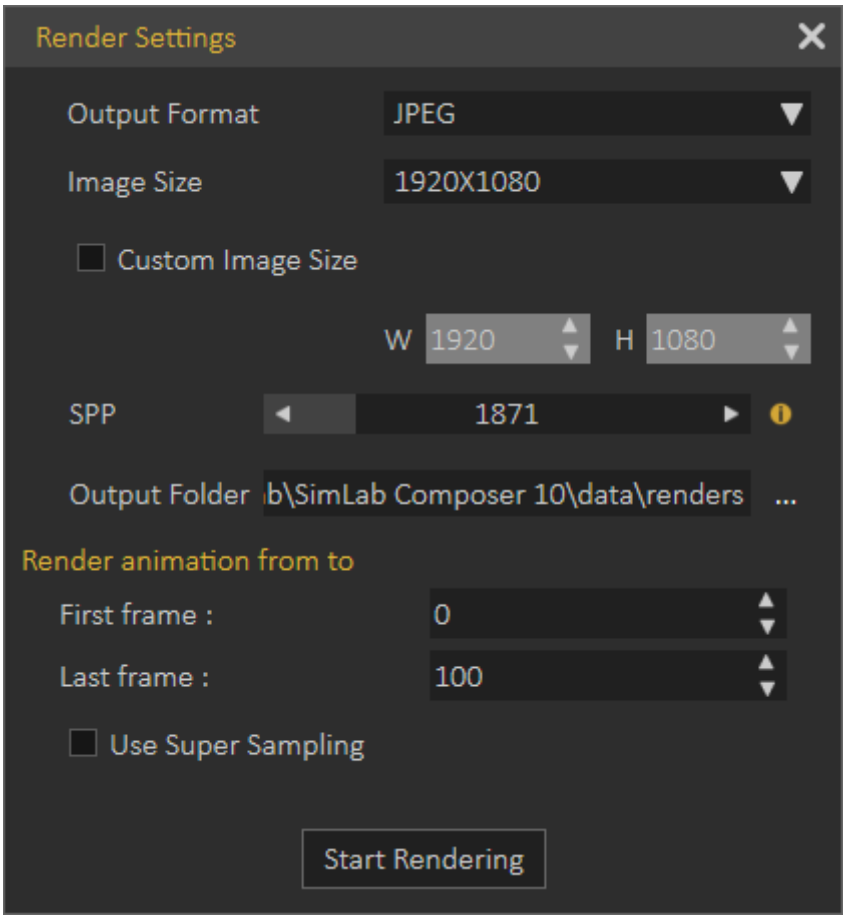
Video Menu

The video menu enables the user to capture animation from scene view in VR Viewer, and save the resulting rendered images.



Capture in VR Viewer

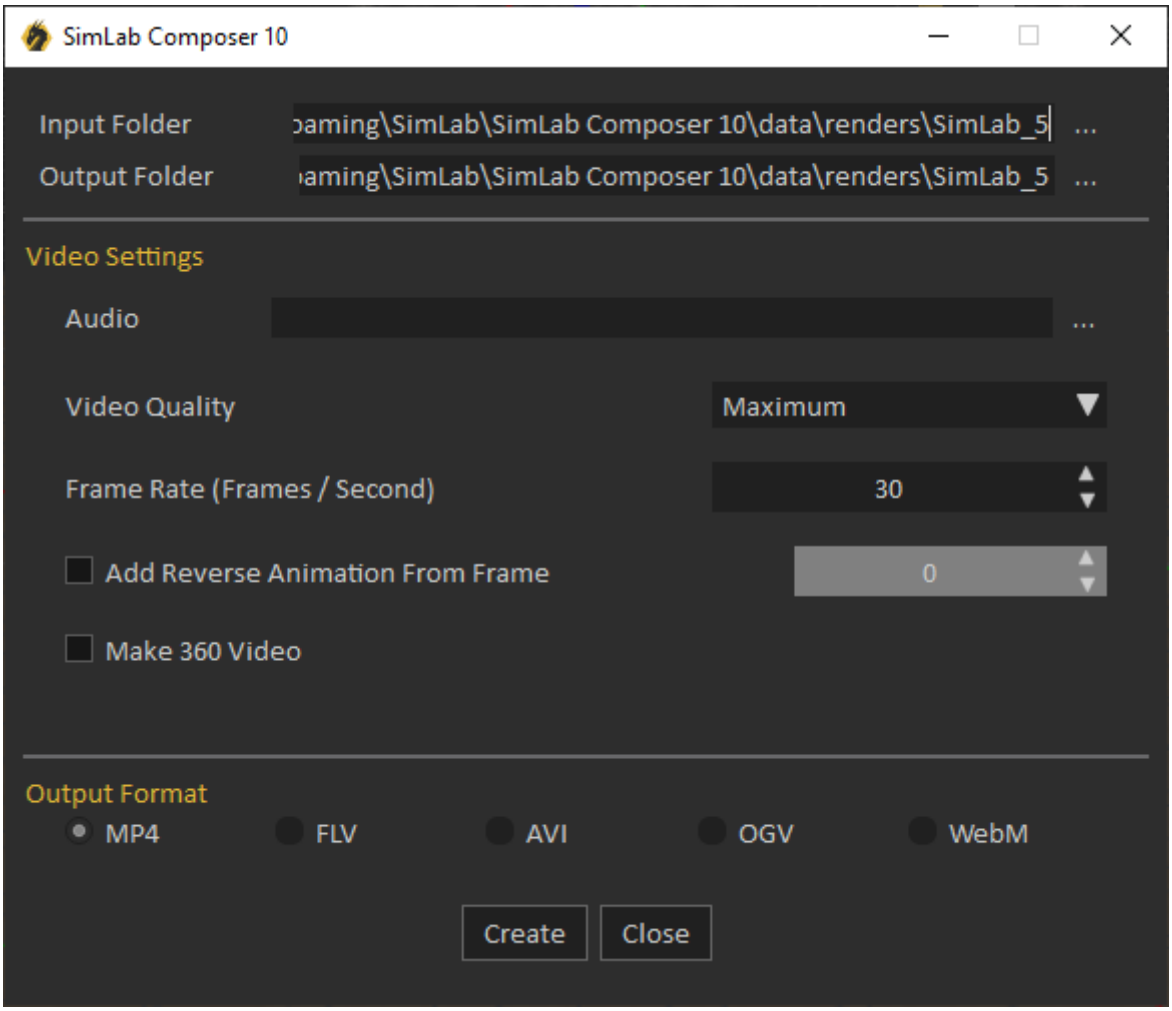
Enables users to render animation quickly in the VR Viewer, to share it with others, as rendered images and videos. Render Settings dialog will open, where the user can select the frames to include in the generated video/images. Upon clicking Start SimLab VR Viewer will open, and the rendered images will be generated and saved to the folder specified in the Output Settings under the Render menu.



> If the Super Sampling option is checked, the generated images will be rendered in a bigger size in the viewer, and then compressed. This option will reduce pixelation and will give clearer images.

Movie Maker

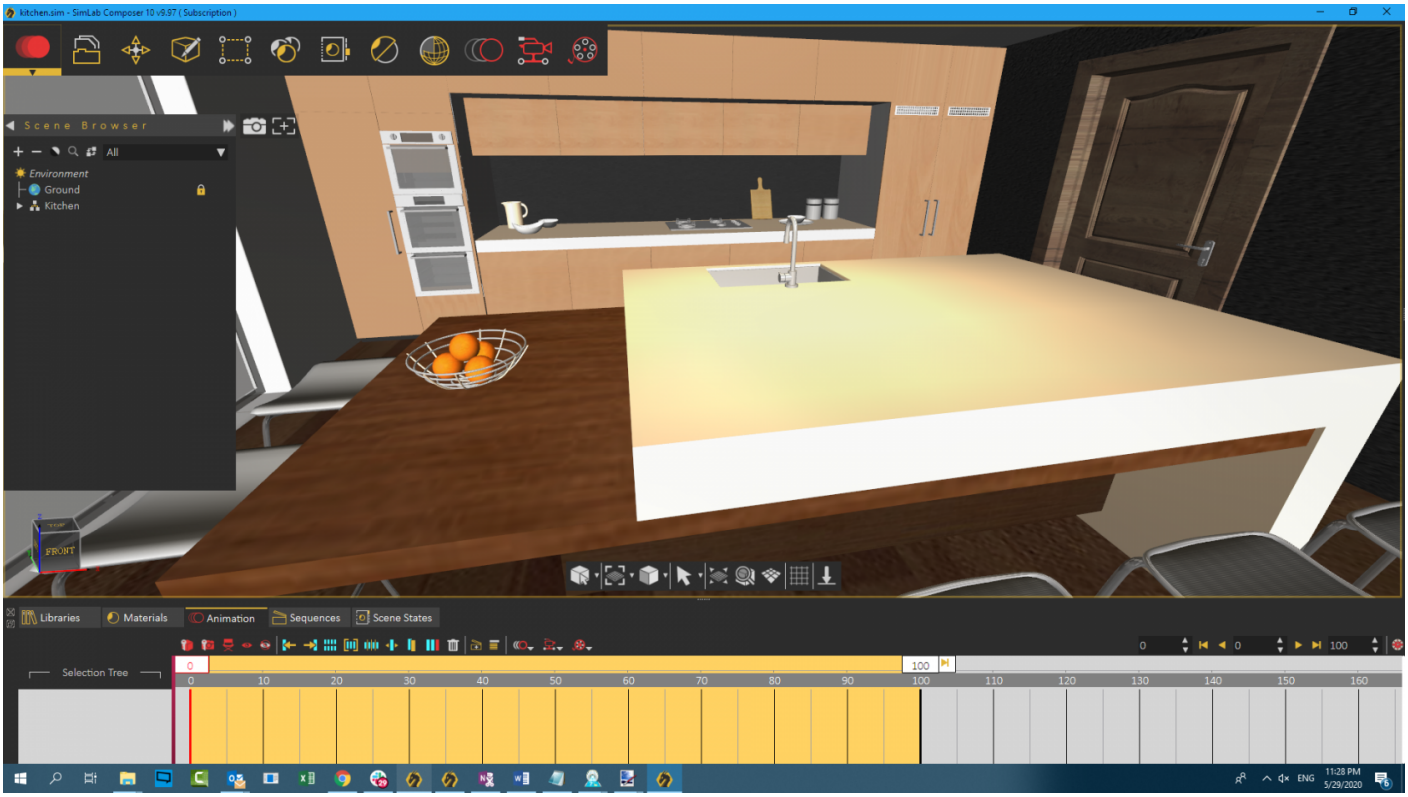
This function enables users to create videos of several output formats from sequential rendered images (rendered animation). SimLab Movie Maker dialog will open, where the user can select the frames to include in the generated video, add audio files to the generated movies, and select output formats and their folder location.


SimLab Composer 10
Input Folder
aming\SimLab\SimLab Composer 10\data\renders\SimLab_5
...
Output Folder
aming\SimLab\SimLab Composer 10\data\renders\SimLab_5
...
Video Settings
Audio
...
Video Quality
Maximum
Frame Rate (Frames / Second)
30
Add Reverse Animation From Frame
0
Make 360 Video
Output Format
MP4
FLV
AVI
OGV
WebM
Create
Close

Animation Timeline

The timeline is a dynamic diagram that holds editable keys denoting any animation created in the scene. SimLab Composer can produce an image sequence of the animation and is able to convert the sequence to a video file that can be easily viewed externally.

Check this animation video tutorial



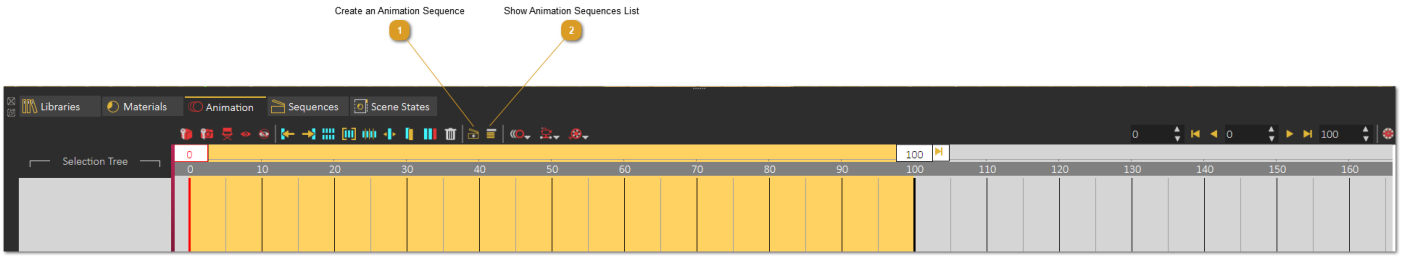
With SimLab Composer, **Skeleton joints controller animations** can also be created for 3D models with rigs. A rig is a digital skeleton that is used to animate 3D models imported in fbx, gltf, and usdz formats. Check this Skeleton joints tutorial

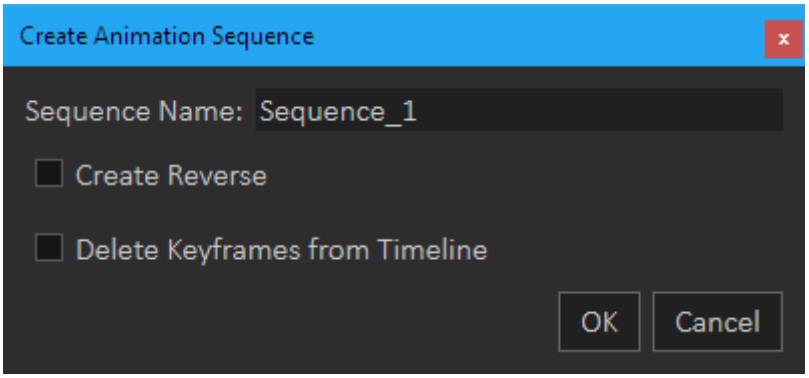
Sequence Timeline

Create an Animation Sequence

Users can create interactive animation sequences that can be implemented in VR experience in Simlab Viewer. Go to the animation workbench to reveal the timeline where animation keyframes and sequences can be created and managed.

Select the animation keyframes created in the scene and click Create an Animation Sequence icon, to open the dialog shown below. Enter the name of the new sequence, the user has the option to create a reverse of the created sequence, and to delete keyframes from the timeline after the sequence creation.





Show Animation Sequences List

The user can view the created sequences by switching to the Sequences tab in the bottom panel, or by clicking Show Animation Sequence List in the Sequence Timeline. Once clicked the dialog below will appear.

- Show as animation: If you delete the keyframe from the timeline, by clicking on this button you can return the keyframe again on the timeline.
- Delete: Erase the selected sequence from the list.

- Manage Groups: Gives the user options to create, delete and rename Sequence groups.



Capture morphing animation

SimLab Composer allows the user to control what morphing parameters to save in the keyframe. This enables mixing multiple animations, and is shown in the following video:

https://www.youtube.com/embed/MOwqp_eEDL0

> Video tutorials to create animation sequences for VR are below:

https://www.youtube.com/embed/k-Yzn_PVSIA

https://www.youtube.com/embed/dox5W06f370

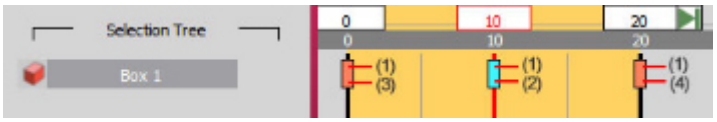
Animation Auto Ease Options

An auto ease option specifies the speed curve of an animation. SimLab Composer comes with various predefined motions, a motion is the type of generated animation that is used for creating predefined animations such as a round table, follow path wheel motions for the selected object, and round table and helical motions for cameras.

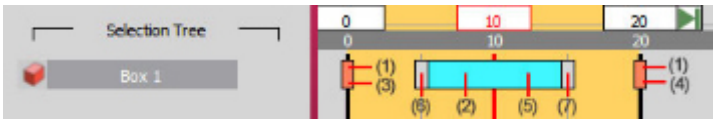
Regular keyframes

SimLab Composer has three types of ease that automatically adjusts the influence into and out of a keyframe to smooth out sudden changes in translation, rotation, and scale. these options are auto ease-out, out ease-in, and auto ease. With these options, users can ease the speed of an object when coming into or out of a keyframe or both, where (auto ease out) is used to ease speed coming out of a selected keyframe, (auto ease in) is used to a speed coming into a selected keyframe, and (ease) is used to a speed coming both into and out of a selected keyframe.

With animation ease options, you can easily achieve smoother and more realistic motion for geometries and cameras in your 3D scenes.



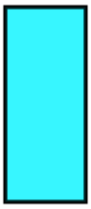
1. Regular Keyframe
2. Selected keyframe (appears in blue)
3. Previous keyframe
4. Next keyframe



1. Regular keyframe
2. Predefined keyframe
3. Previous keyframe

4. Next keyframe
5. Selected Keyframe (appears in blue)
6. Start frame
7. End frame

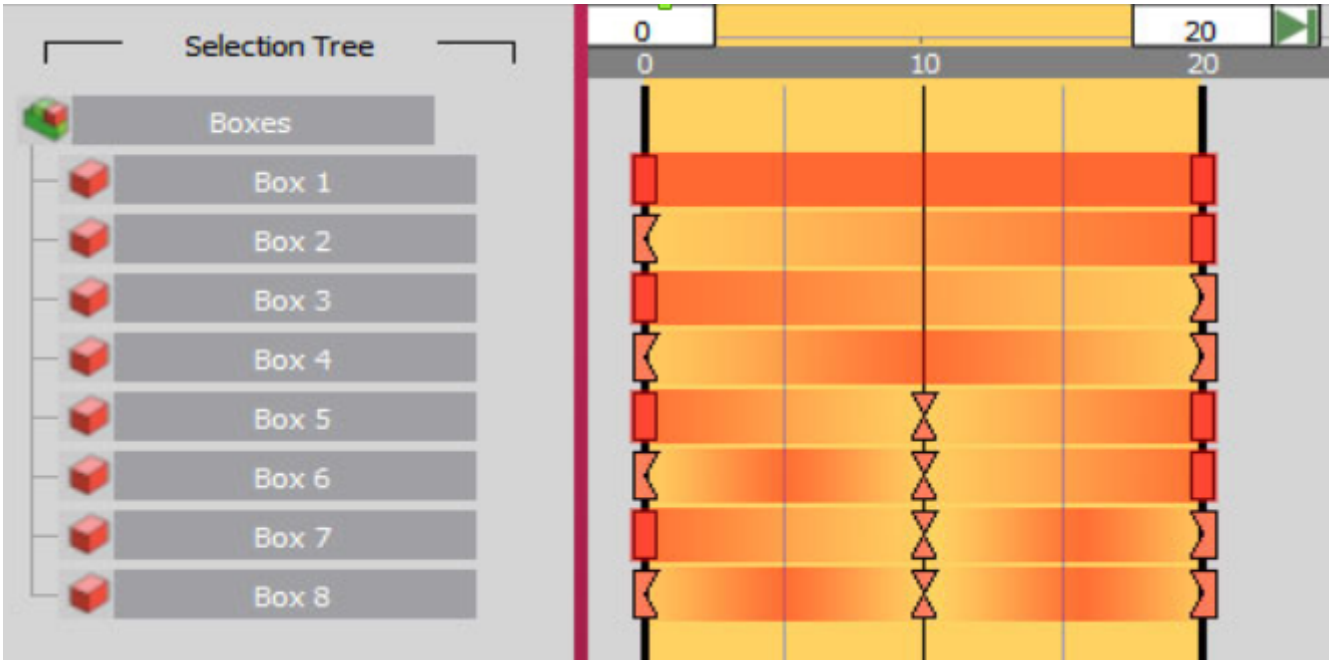
Possible Symbols for Regular Keyframes with and without Ease Effect

Icons	Description
	**No Ease** • Regular animation keyframe without any ease type applied. • Maintains constant speed at the keyframe itself from the direction of the previous keyframe. • Maintains constant speed from the keyframe itself to the direction of the next keyframe.
	**Ease-out** • Regular animation keyframe with ease out applied. • Acceleration. • Maintain constant speed at the keyframe itself from the direction of the previous keyframe. • Accelerate (speed up or increase speed) from the keyframe itself to the direction of the next keyframe.
	**Ease-in** • Deceleration. • Regular animation keyframe. • Decelerate (slowdown or decrease speed) at the keyframe itself to the direction of the previous keyframe. • Maintain constant speed from the keyframe itself to the direction of the next keyframe.



Ease

- Deceleration then acceleration.
- Regular animation keyframe.
- Decelerate (slowdown or decrease speed) at the keyframe itself to the direction of the previous keyframe.
- Accelerate (speed up or increase speed) from the keyframe itself to the direction of the next keyframe.



In the image above, the darker the red gradient color, the faster the object is.

The first keyframe of Box 2 has a speed of 0 with an influence of 100% on its right side. Auto Ease Out automatically adjusts the influence out of a keyframe. The object gradually accelerates as it leaves the first keyframe until it reaches the last keyframe, where it reaches its maximum speed. Keep in mind that Auto Ease Out requires an existing next keyframe in order to take effect.

The first keyframe of Box 3 has a speed of 0 with an influence of 100% on its left side. Auto Ease In automatically adjusts the influence into a keyframe. The object starts at its maximum speed and slows down as it approaches the last keyframe. Keep in mind that Auto Ease In requires an existing previous keyframe in order to take effect.

Both of first and last keyframes of Box 4 have a speed of 0 with an influence of 50% on the right side of the first frame and the left side of the last frame. This automatically adjusts the speed of change, which accelerates as animation retreats from the first keyframe until it reaches a maximum speed at frame number 10 and from there

decelerates as animation advances toward the last keyframe.

The middle keyframe of Box 5 has a speed of 0 with an influence of 50% on both sides. The object slows down as it approaches the middle keyframe and gradually accelerates as it leaves. Keep in mind that Auto Ease requires existing previous and next keyframes in order to take effect on both sides of the selected keyframe.

Predefined Motions

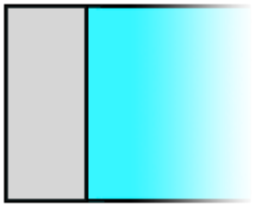
SimLab Composer comes with various predefined motions. A Motion is a type of Composer-generated animation that is used for creating predefined animations such as Round Table, Follow Path, Wheel motions for the selected object, and Round table and helical motions for cameras. In the case of predefined motions, start and end frames have a speed of 0 with a default influence of 25% on sides that falls within an animation sequence itself. The symbol of predefined motion provides a simple visual representation that indicates the relative speed at each particular frame within it.

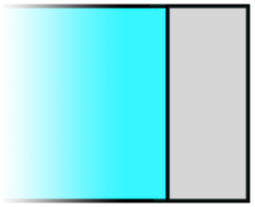
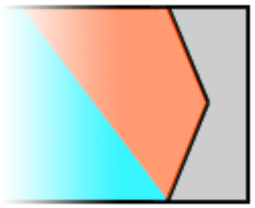
Possible Parts of Predefined Symbols with One of Ease Effects

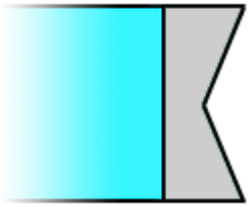
The symbol of predefined motion on the animation timeline consists of:

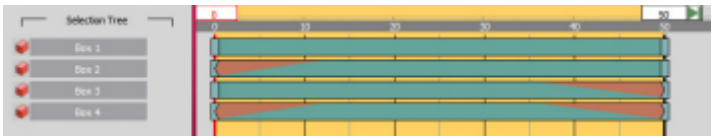
1. The animation sequence itself.
2. Start frame, which acts as a regular keyframe.
3. End frame, which also acts as another regular keyframe.

Possible Symbols for Predefined Keyframes with and without Ease Effect

Icons	Description
	**No Ease** • Start frame of a predefined animation keyframe. • Maintain constant speed at the first frame of the motion itself from the direction of the previous keyframe. • Maintain constant speed from the first frame of the motion itself to the direction of the end frame of the motion itself.

	**No Ease** • Predefined animation keyframe. • End frame of a predefined animation keyframe. • Maintain constant speed at the end frame of the motion itself from the direction of the first frame of the motion itself. • Maintain constant speed from the end frame of the motion itself to the direction of the next keyframe.
	**Ease Out Acceleration** • Start frame of a predefined animation keyframe. • Maintain constant speed at the first frame of the motion itself from the direction of the previous keyframe. • Accelerate (speed up or increase speed) from the first frame of the motion itself to the direction of the end frame of the motion itself.
	**Ease in Deceleration** • End frame of a predefined animation keyframe. • Decelerate (slowdown or decrease speed) at the end frame of the motion itself from the direction of the first frame of the motion itself. • Maintain constant speed from the end frame of the motion itself to the direction of the next keyframe.
	**Ease in Deceleration** • Start frame of a predefined animation keyframe. • Decelerate (slowdown or decrease speed) at the first frame of the motion itself from the direction of the previous keyframe. • Maintain constant speed from the first frame of the motion itself to the direction of the end frame of the motion itself.

	**Ease Out Acceleration** • End frame of a predefined animation keyframe. • Maintain constant speed at the end frame of the motion itself from the direction of the first frame of the motion itself. • Accelerate (speed up or increase speed) from the end frame of the motion itself to the direction of the next keyframe.
	**Ease Deceleration then Acceleration** • Start frame of a predefined animation keyframe. • Decelerate (slowdown or decrease speed) at the start frame of the motion itself from the direction of the previous keyframe. • Accelerate (speed up or increase speed) from the start frame of the motion itself to the direction of the end frame of the motion itself.
	**Ease Deceleration then Acceleration** • End frame of a predefined animation keyframe. • Decelerate (slowdown or decrease speed) at the end frame of the motion itself from the direction of the start frame of the motion itself. • Accelerate (speed up or increase speed) from the end frame of the motion itself to the direction of the next keyframe.



Box 1 has a predefined motion with no ease effects. Box 2 has a predefined motion with ease-out only. Box 3 has a predefined motion with ease-in only. Box 4 has a predefined motion with ease-out and ease-in effects.

> In the tutorial video below, we will show you how to use an animation auto ease types:

https://www.youtube.com/embed/mWRz64Cqa1w