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## Creating Animation for Cinema 4D in Life Forms Studio 3

Introducing a new way to animate characters for Cinema 4D.

Character Animation is one of the most rewarding albeit challenging type of animation you can undertake as a 3D artist. Now, there is a new way for Cinema 4D users to animate. You'll want to read this document if you are looking for ways to:

- Create more motion intensive projects.
- Do more with mocap data.

This tutorial describes how we set up the project "Aura-Alive!". Aura was created with a model created 3DS Max. Using bones, we use mocap data to animate Aura and render her in Cinema 4D.

You will need **Life Forms Studio 3.0** and **Cinema 4D**, and **new LightWave plug-ins** from Credo Interactive Inc.

## How does it work?

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Life Forms shares two file formats in common with Cinema 4D: the Lightwave scene file (.lws) and Biovision motion capture file format (.bvh).

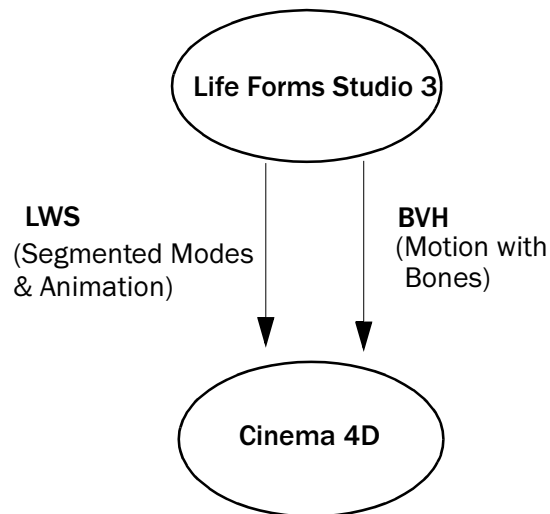
### Lightwave Scene file

Life Forms can export geometry and motion as LWS file. Since Cinema 4D reads this file format, you can bring any segmented model and motion that you animated in Life Forms into Cinema 4D in one easy step.

### BioVision motion capture file

Cinema 4D imports BioVision files via its BioVision import plug-in. This plug-in comes with the XL version of Cinema 4D, and it also comes with Life Forms 3. This file format allows you to bring motion data and a BVH skeleton figure into Cinema 4D. Then, you “fit” the bone skeleton to a mesh model. For more information please refer to the Readme file that accompanies the Cinema 4D BioVision plug-ins.

The diagram below shows 2 ways to move data between Life Forms and Cinema 4D..



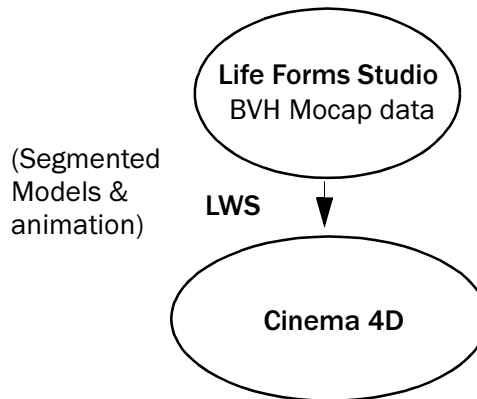
**\* See Project Limitations**

## **Getting Cinema 4D models into Life Forms**

At the present time, Life Forms is working on a way to import geometry from Cinema 4D into Life Forms. We are in the final phase of developing and testing a VRML 2 import that will allow you to import models from Cinema 4D. Please contact us if you would like to beta test this plug-in.

### Objective

This tutorial shows you how to bring a Life Forms animation into Cinema 4D for rendering. Note for this tutorial, we will use segmented models. You can also export bones to deform mesh models in Cinema 4D. The illustration below summarizes how data moves between Cinema 4D and Life Forms in this tutorial. For other ways of using Life Forms see **Other Techniques**.



### Important. Please note the following:

- 1 If you have Life Forms Classic 3.0 or Life Forms 2.1 you will need to upgrade to the Studio version to use Life Forms with LightWave.
- 2 You will need latest Lightwave plug-in. Please contact us at [info@credo-interactive.com](mailto:info@credo-interactive.com).
- 3 You will need Cinema 4D's BioVision import plug-in. This plug-in comes with Cinema 4D XL and is also included in Life Forms Studio 3 CD in the Third Party /Cinema 4D folder.

### Conventions and Files used

This tutorial uses both Cinema 4D and Life Forms Studio 3. To make it clear which application to use at each step, the application is given on the left.

#### Step 1

Life Forms

#### Animate Aura

Aura is a custom model that we created for Life Forms. You will find several Life Forms ready custom models in the PowerMoves

## Step 2

Life Forms

library that you can use. In Life Forms, we mapped BioVision motion capture data to her. This involves mapping her joints limb by limb to the bones of the BioVision skeleton.

### Export as a LightWave Scene file

Cinema 4D imports LightWave scene files (LWS). Hence, we will export Aura and her motion data to Cinema 4D in the LWS file format.

To export the animation choose File menu > Export. In the Export dialog box, click the LightWave icon in the Export List window. Select the export options as follows:

- **Deselect** Bones only.
- **Select** Geometry.
- Do **not** click Keyframes only.

**Note** If the LightWave icon cannot be found, this means that you do not have the LightWave plug-in or you are not using the Studio version of Life Forms. Install the plug-in by dragging it into the Plug-in folder in the Life Forms 3 folder and restart Life Forms.

## Step 3

Cinema 4D

### Import the Scene file

In Cinema 4D, open the LightWave scene file (.LWS). You will see Aura. Then click play to see the animation.

## Step 4

Cinema 4D

### Import Scene elements

Cinema 4D allows you to add scene elements such as lights, cameras, props from another C4D file. You may choose to do this now.

## Step 6

Cinema 4D

### Rendering

Here is where you take over with your expertise in C4D.

## Other Techniques

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### Animating with Bones & Meshes

In Life Forms any motion created either by:

- Keyframing,
- Procedurally using the Walk Generator, or
- Editing mocap data from the PowerMoves Libraries

can be exported as a BioVision file (.BVH). When Cinema 4D imports a BVH file, it represents the motion data as a set of bones. You will need to attach the bones to a mesh model. For more information on how to “fit” the bones to a mesh please see the Readme file that comes with the Cinema 4D BioVision import plug-in. A sound understanding of how to set up bones to get a good effect for complex skeletons.

## File Formats Supported

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### LightWave Scene file (.LWS)

Life Forms can export animation you created - either by using mocap data, procedurally using the Walk Generator or by keyframing to LightWave. You have several options:

- **Merge the motion data to a scene file** — If you have a scene file that contains objects that were animated in Life Forms, you can merge the animation of those objects to this scene file.
- **Export Motion with Bones Only** — Exports a new scene file. Allows you to export bones with animation. The benefit of this is that you can attach the bones to a mesh in LightWave 3D. Note, this option is intended for use when exporting to LightWave 3D. It may not work for exporting Bones to Cinema 4D.
- **Export Motion with Geometry** — Exports a scene file, creating new object files (.lwo) in the content directory for all models in Life Forms. Cinema 4D users can select this option to effectively bring a Life Forms animation into Cinema 4D for rendering.

### BioVision Motion Capture file (.BVH)

The BVH (BioVision Hierarchical Motion Data) file format is a commonly used motion capture file format. It is a text file format that stores motion data as rotations around a local axis rather than a fixed global axis. BVH files stores descriptive information such as joint names, hierarchy information (relationship between joints), and the position of the joint’s pivot points relative to its parent joint (joint offset). This means that BVH will only apply correctly to mesh models that can be animated effectively by a skeleton with the same hierarchy and pivot points.

## Project Constraints

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- 1 Cannot bring Cinema 4D Models into Life Forms.  
This means that you must use the models that come with Life Forms Studio 3 or use another Modeler such as 3D Studio Max to create models for Life Forms. Credo is currently working on several solutions for importing geometry from Cinema 4D. The VRML 2 import plug-in is now ready for testing. Please contact Credo Interactive for more information.
- 2 Motion data in Cinema 4D may have “discontinuities”.  
Movement may have sharp irregularities caused by how Cinema 4D interpolates motion data. This problem applies imported motion data not only motion data from Life Forms, for example BioVision mocap data. It can be minimized by keyframing all frames at 30 f/s. The discontinuities that are not removed in this must be fixed by tweaking the motion data in Cinema 4D.

## General Concepts

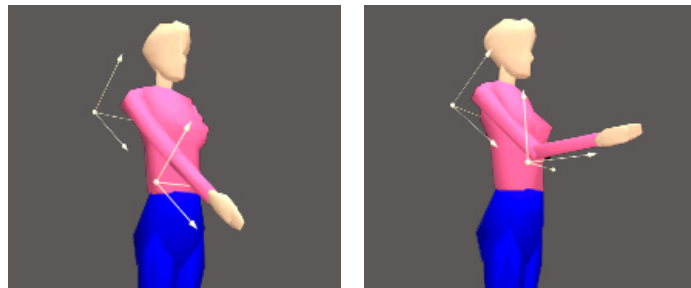
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### Setting up Segmented Models for animation

For Life Forms to animate a segmented or articulated model, it must have correct pivot points and its joints must be linked in a hierarchy. In the Modeler, objects can be parented to others to set up a hierarchy. You can also set the pivot point for each object. You should rotate the joints in layout mode to check that the pivot points are appropriate for the model.

### Why Hierarchy is Important

The axis of each joint is relative to the position of the joint. Another way of expressing this concept is that each joint has its own **local axis**. The axes of a joint changes with the position of its parent joint (e.g. the upper arm is the parent of the lower arm).



Some motion data file formats store **relative** instead of absolute rotation angles, for example BioVision BVH format. Relative rotation angles are the angles of rotation given relative to the parent joint's local axes. When motion data is recorded in this way, the model that the data will be applied to must have the same hierarchy as the data in the motion file.

## Why Pivot Points are Important

To understand how pivot points affect the motion applied to the model, you have to understand how motion data is described. The position of a joint is described as the angle of rotation around the joint's pivot point. When motion data is applied it rotates the joint around the pivot point defined in ElectricImage. Thus, when the pivot points of the model are wrong, the motion data will rotate the joint incorrectly. It may cause the joints to over or under rotate, or it may cause joints to break off from adjacent joints.

*Important*

This document is still being worked on. This document will be updated as more complete information is available. Your contributions and feedback are welcomed. Please send them to [info@credo-interactive.com](mailto:info@credo-interactive.com).



Life Forms