Exp/Log Interp User's Guide

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1   Introduction

This paper describes the basic user interface for Exp/Log Interp. The program allows a user to visually compare various types of keyframe interpolation.

2   User Interface

2.1   Main Menu

File I/O:

Read Scene: The user can read in a scene file. Default is the table scene.
Write Interpolate: Writes out information about the current set of keyframes.
Read Interpolate: Reads in a set of saved keyframes.

View: Some toggles for controlling how the meshes are viewed. Most of these are not particularly necessary in this context.

2.2   Camera Controls

Reset Camera: Resets the camera to a default view.

IBar: Toggles the IBar widget on and off. The IBar can be used to control the camera parameters.

IBar Help: Toggles the IBar labels on and off. The labels show which colored arm of the IBar can be used to control each camera parameter.

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2.3   Keyframe Controls

 # Keyframes: The user can specify how many keyframes the animation sequence will contain.

Clear Keyframes: Deletes any currently specified keyframes, and sets #Keyframes = 2.

Generate Keyframes Randomly: This button will generate a random sequence of keyframes of length #Keyframes. These sequences are generated by assuming that the objects in the scene are centered around the origin (as is the case in our default scene with the table). We generate random values for all the camera parameters except for translation. (We make sure to generate a wide enough range of values to fully test our system.) Then, we translate backwards along the camera's look vector, making sure we go far enough that we don't end up inside the table. This ensures that the camera is always facing reasonably towards the objects in the scene.

This technique for generating random sequences of keyframes should work for scenes other than our default, provided that a) the objects in the scene are centered around the origin, and b) the objects are not vastly larger than those in our scene.

Keyframe Slider: Allows the user to view all of the current keyframes by moving the slider back and forth.

2.4   Interpolation Controls

 # Frames: The user can specify how many frames the animation sequence will contain.

Interpolation Type Radio Buttons: The user specifies whether to display linear interpolation, spline-based smooth approximation, or smooth exact interpolation using subdivision.

Play Traditional: When this button is pressed, the current keyframes are interpolated using the traditional method, and the entire animation is displayed. Note that we only show linear interpolation here.

Play Exp/Log: When this button is pressed, the current keyframes are interpolated using our method, and the animation is displayed. The type of interpolation is selected based on the radio buttons, described above.

Frame Slider: Allows the user to view the frames in the most recently calculated animation by moving the slider back and forth.

3   Summary

Some key things to note about using this program:

First, there are three ways for the user to specify the keyframes to be used in the animation.

1. Specify the keyframes by hand, using the following steps:

    (a) Type in the number of keyframes desired.

    (b) Move the keyframe slider to zero.

    (c) Use the IBar to move the camera to the desired location for keyframe zero.

    (d) The keyframe will be saved into the sequence automatically, so simply use the keyframe slider and the IBar to specify all keyframes in this manner.

2. Read in a previously made sequence of keyframes by going to the menu and clicking **File → Read interpolate**. We provide several of these files, including the files that were used to make the examples shown in the paper. Additionally, the user can write out one of these files by clicking **File → Write interpolate**.

3. Type in the number of keyframes desired, and click **Generate keyframes randomly** to generate a sequence of keyframes.

Second, the user can view a total of four types of interpolation.

1. Traditional method: linear interpolation of camera parameters

2. Exp/Log method: linear interpolation

3. Exp/Log method: spline-based smooth approximation

4. Exp/Log method: smooth exact interpolation using subdivision