

MotionRecorder, version 1.0 Documentation
by David Hirschfield
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The MotionRecorder is a full-featured recording and playback system that allows you to record any Alice animation sequence, save the recording to a file, reload it and play it back. It also allows recordings to be modified and extended.

The multi-track nature of the recordings allows complex animations to be built up by recording individual actions and then layering them to create more advanced animations. This makes it possible, for example, to record the facial motion of a character, followed by their head motions and then their body motions, to create a complete animation sequence.

I. Starting the MotionRecorder

To begin using the motion recorder, first make sure the following files are in your world directory:

MotionRecorder.py (version 1.1.4 or higher)
Spline.py (version 1.4.4)
FastSpline.pyd
WidgetUtilities.py (version 1.1.0)

All of these files are required for the MotionRecorder system to run properly.

Add the following code to your world script to load the MotionRecorder code and instantiate a MotionRecorder object:

```
import MotionRecorder
from MotionRecorder import *

recorder = cMotionRecorder()
```

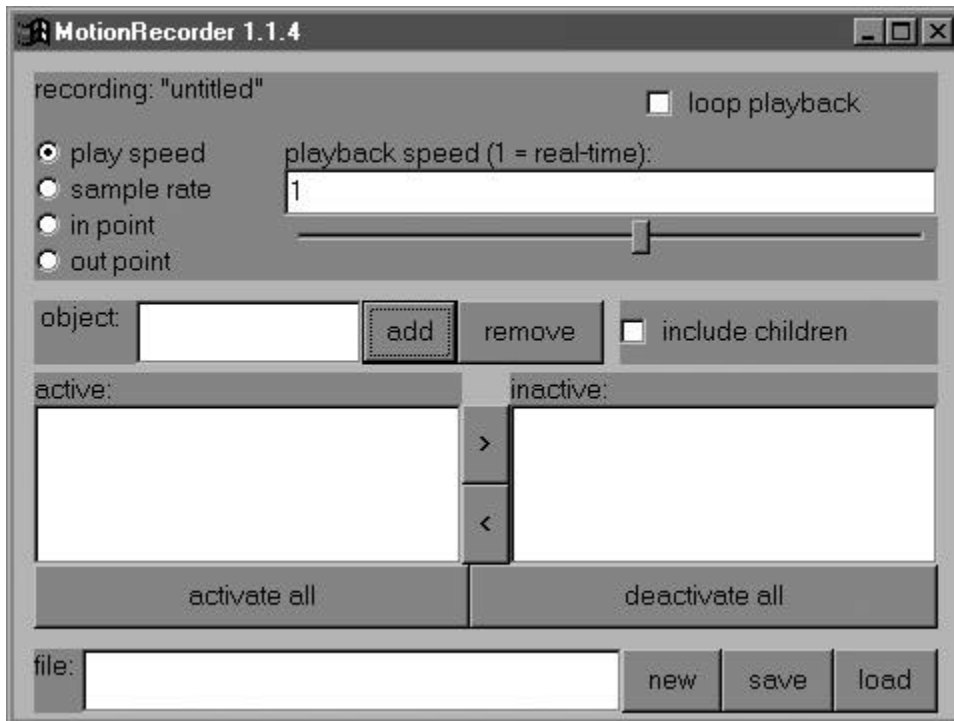
Now run your world. The motion recorder interface should appear after a few moments. You are now ready to begin using the MotionRecorder system.

II. The Interface

When the MotionRecorder system loads, you are presented with these two windows:



The Control panel



The Edit panel

The Control panel allows you to control the playback of the recording you are working on. The Edit panel allows you to

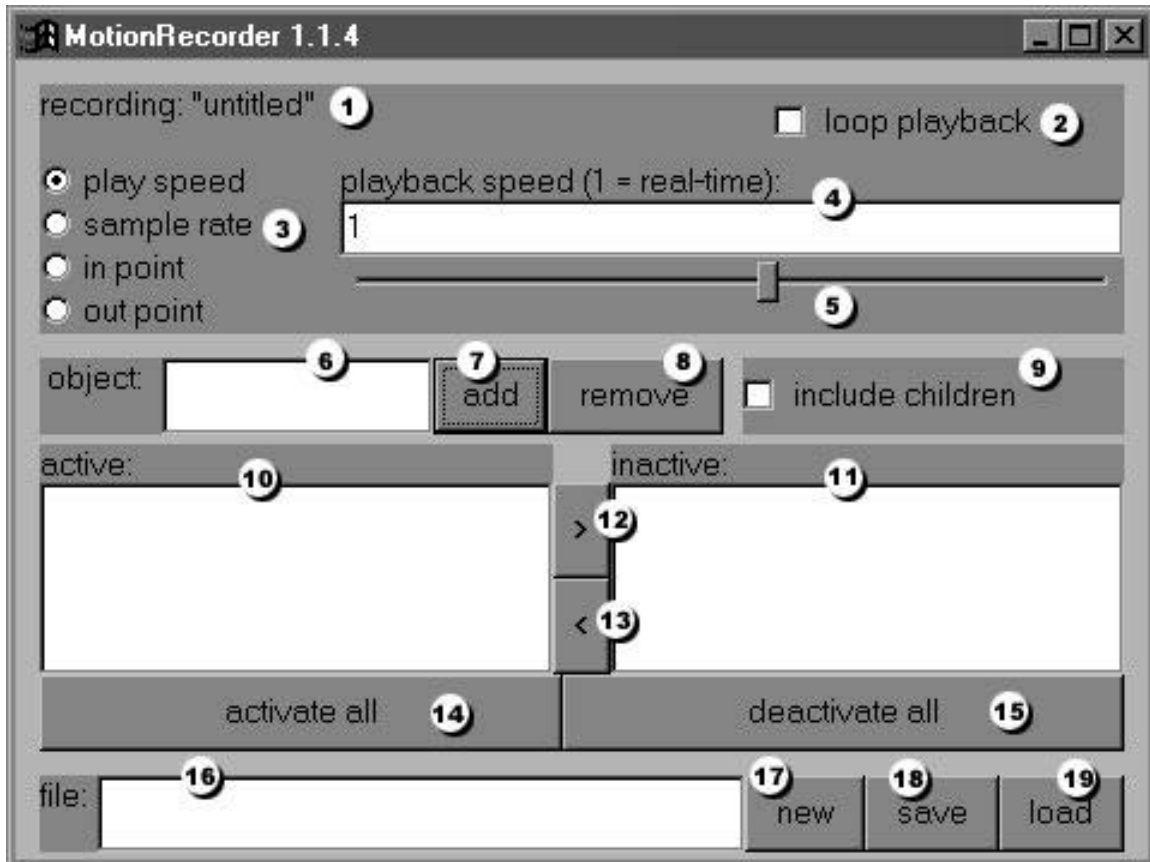
change options for the current recording, and to save and load recordings.

The functions of the Control panel are as follows:



1. **Record:** Begin recording to the currently active tracks
2. **Stop:** Stop recording or playing the currently active tracks
3. **Play:** Play the currently active tracks
4. **Go To In Point:** Go to the in point of the recording
5. **Step Backward:** Step backward one sample at a time
6. **Step Forward:** Step forward one sample at a time
7. **Go To Out Point:** Go to the out point of the recording
8. **Time Jog:** Rapidly move to any point in the recording
9. **Time Display:** Displays the current location in the recording (hh:mm:ss.ss) and can be used to go to an exact time

The functions of the Edit panel are as follows:



1. **Name:** The name of the current recording
2. **Loop:** If checked, the recording will loop continuously while playing
3. **Options:** Which option to edit
4. **Option Value:** The value of the selected option
5. **Option Slider:** To set the value of the selected option (you can also type into the value box)
6. **Object Name:** The current track/object
7. **Add Object/Track:** Add the specified object as a new track
8. **Remove Object/Track:** Remove the specified object
9. **Include Children:** When checked, the children of the specified object will be added and removed along with the parent
10. **Active Tracks:** List of the active tracks in the recording
11. **Inactive Tracks:** List of the inactive tracks in the recording
12. **Deactivate Track:** Deactivates the selected track

13. **Activate Track:** Activates the selected track
14. **Activate All:** Activates all tracks
15. **Deactivate All:** Deactivates all tracks
16. **File Name:** Specifies the name of the recording file
17. **New:** Creates a new recording with the specified name
18. **Save:** Saves the current recording to a file with the specified name
19. **Load:** Loads the recording stored in the file with the specified name

III. Tracks

The MotionRecorder system is based on the concept of "tracks" of recorded data. Similar to real-world multi-track audio recordings, the MotionRecorder records the movements of objects in Alice to multiple tracks, allowing different recordings to be layered on top of each other.

For our purposes, the name of the Alice object being recorded to a track is the same as the name of the track itself.

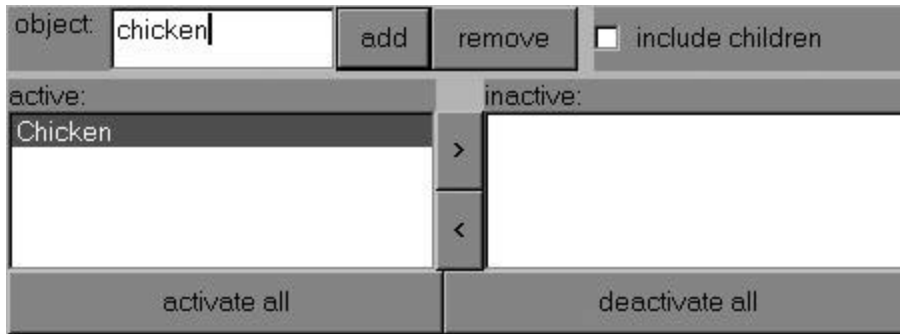
IV. Making A Recording

To make a simple recording, you add an object as a track press record, move the object, and then press stop.

For this example, let's assume you have a simple Alice world with a Chicken object in it.

To start with, let's add the Chicken to the MotionRecorder list of active tracks:

1. Type "Chicken" into the Object Name box



2. Click the Add button. The Chicken track should appear in the list of active tracks

3. Click the Record button and move the chicken around either with the mouse or with Alice commands

4. Click the Stop button when you are done recording

5. Click the Play button to watch your recording play back.

At this point you have made a simple recording of the chicken moving about. The next sections describe in detail how to modify and extend recordings.

V. Activating and Deactivating Tracks

As long as a track is listed in the active tracks list, it will play when you click the Play button.

To deactivate a track, click on it in the Active Tracks list and click the Deactivate Track button.

Similarly, to activate an inactive track, click on it in the Inactive Tracks list, and then click the Activate Track button.

The Deactivate All and Activate All buttons will move all tracks either to the Inactive Tracks list, or the Active Tracks list.

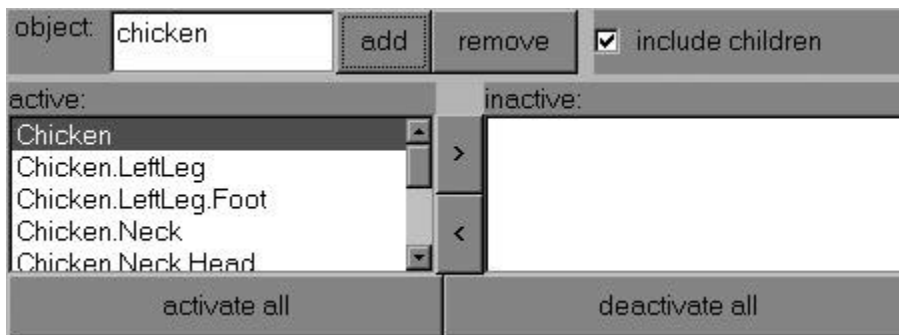
To play only specific tracks of a recording make sure only the tracks that you wish to have playing are listed in the Active Tracks list.

VI. Adding and Deleting Tracks

Adding new tracks is as simple as typing the name of the object to be added into the Object Name box, and then clicking the Add Track button.

Similarly, to remove a track just click on the track in either the Active or Inactive track lists and then click the Remove Track button.

The Include Children checkbox allows you to more efficiently add and remove groups of tracks. If you wish to add, for example, the Chicken object and all of its children, simply check the Include Children box and then add the chicken object:



All of the children of the chicken object will be added along with the chicken object itself. This also works for removing, activating and deactivating tracks.

VII. Recording Layered Tracks

To layer recordings on top of each other is as simple as adding and activating the tracks you wish to record and then recording them as before.

For example, to record the chicken's neck and head in a separate layer from the previously recorded chicken body motions, you would deactivate the entire chicken (including all its children), and then activate just the neck and head:



Then you can record just the neck and head motions.

If you begin to record a track from some point other than the start of the original recording (i.e. recording facial motion that occurs two seconds after the head starts moving), the new tracks will be padded to begin at the proper time.

All recording is destructive, so recording new animations over previously recorded tracks will overwrite the animation already on those tracks. However, extending previously recorded tracks (recording new animation after the end of the original recording) will not change the previously recorded animation.

Because recording is destructive, be sure to deactivate the tracks that you have already recorded before recording the new tracks.

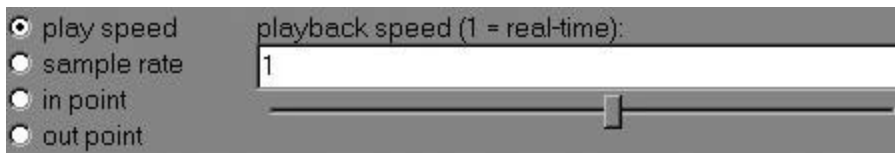
Deactivated tracks will automatically play while recording new tracks, so you can match the new motion to the previously recorded motions.

VIII. Recording Options

There are many different options when recording tracks, which are all accessible from the Edit panel.

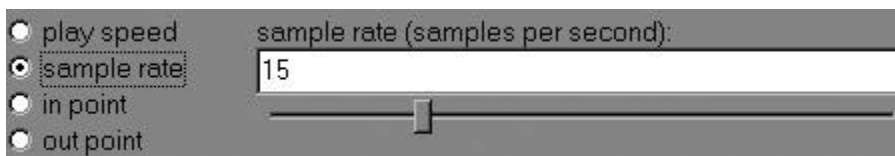
To edit a specific option, choose it from the Options choices in the Edit panel.

The **Play Speed** option allows you to set how fast the recording plays back:



A value of 1 means the recording will play back at the same speed it was recorded, values greater than one make the recording play back that many times faster than it was recorded, values less than one will make the recording play backwards.

The **Sample Rate** option allows you to specify how often the MotionRecorder records the orientation of the active object tracks:



The minimum value for this option is 1, which means the MotionRecorder will record the orientations of all active track objects once every second. There is no maximum value for this option, but very high sample rates may surpass the speed at which the MotionRecorder can sample, and therefore some samples will be skipped.

Different tracks can be recorded using different sample rates. This means that you should think ahead of time about

which tracks require more "detail" in the recording than others, and record similar tracks together.

NOTE: It is tempting to make the sample rate very high, but be warned, high sample rates will make your recordings very large and therefore will make them load very slowly. Also, since the MotionRecorder smoothly interpolates from one sample to the next, it is not necessary to sample at a high rate in order to get smooth playback. 15 samples per second is probably the highest sample rate you will ever want to use, and sample rates around 5 samples per second will be perfect for most recordings.

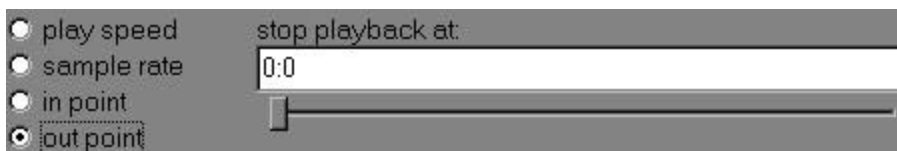
The **In Point** option allows you to set the point at which the recording begins to play:



The default value is the very beginning of the recording (time 0:0:00.00), but you can have the recording start playing at any point.

When you set the In Point, it does not destroy the data in the recording that precedes that point. This means that you can set the In Point to an earlier time even after you have saved and reloaded the recording.

The **Out Point** option lets you set the point at which the recording stops playing:



The default value for the Out Point is the end of the recording.

When you set the Out Point, it does not destroy the data in the recording which follows that point. This means that you can set the Out Point to a later time even after you have saved and reloaded the recording.

IX. Saving A Recording

To save a recording, simply type the name of the recording into the File Name box and then press the Save button. A saving dialogue box will appear and your recording will be saved. Recordings are saved automatically to your world directory.

If a problem occurs while saving, an error dialogue will appear.

NOTE: Saving a recording using the same name as a previously saved recording will overwrite the previously saved recording.

X. Loading A Recording

To load a saved recording, type the name of the recording to load into the File Name box and press the Load button.

A loading dialogue box will appear, and in a moment the name of the recording you are editing will change to the loaded recording, and all the tracks you recorded will appear in the track list.

NOTE: Loading a recording will destroy any currently recorded information that has not been saved.

XI. Using Animation Objects

Included in the MotionRecorder package is a separate object called `cMRAnimation`. These objects are simple playback objects that can be used to load and play recorded animation sequences as standard Alice animations.

To create an animation object, add the following code to your world script:

```
anim = cMRAnimation("test")
```

In this example, "test" is the name of an animation file in the world directory.

`anim` is now an Alice animation that can be placed in a `DoInOrder()` or `DoTogether()` structure, or simply played via the `anim.start()` method.

The methods specific to an animation object are:

```
setSpeed(speed)
```

Set the speed of playback (`speed` is a floating point value, 1 = real-time)

```
goTo(time)
```

Go to a specific point in the animation (`time` is in seconds from the start)

```
getParentObject()
```

Get the parent object to which the animation is attached. Use this object to move and rotate the animating objects during playback. Moving and rotating the actual objects being animated will give unpredictable results.

XII. Hints and Tips

1. Use low sample rates

MotionRecorder animations are interpolated from frame to frame, so the playback will be smooth no matter how low the sample rate. Higher sample rates are only useful when there are very abrupt changes in the position or rotation of an object. Also, using low sample rates will mean smaller recording sizes and, therefore, faster load times.

2. Include leader and footer time

Include a few seconds of lead time and a few seconds of end time in which nothing moves so that you can easily transition from one recording to another. You can adjust the in and out points to make the animation run just the way you want.

3. Press return after editing an option

Changes to options in the Edit panel do not take effect till the enter key is pressed.

4. Record individual objects

It is better to record animations for single objects (i.e. the Chicken OR a car), than to record animations of multiple objects together in one recording (i.e. the Chicken AND a car). This is because, when playing back the animations, you will probably want to move the individual objects independently and not as a group.

XIII. Bugs and Missing Features

1. No smoothing of transitions from one animation to the next.

2. cMRAnimation objects can't loop.

3. Reparenting of objects when playing animations is messy.

4. Play always starts playing at the in point, and not from the current time.

5. No checks for already existing files when saving.

6. Can't insert new data into an existing animation, only appending or overwriting is supported.

~Fin~