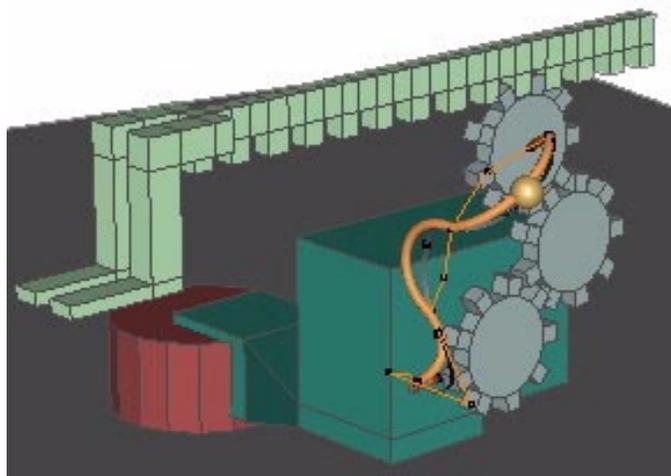![mirai logo]

USING THE CALL SCRIPT OPERATION

This tutorial will teach you how to use the Call Script operation.

ESTIMATED TIME REQUIRED

10 Minutes

LEARNING GOALS

In this tutorial, you'll learn about:

• The Call Script Operation

• The Time Mode parameter

UNDERSTANDING THE CALL SCRIPT OPERATION

The Call Script operation lets you call one script from another. If you are coordinating a large number of complex sub-animations in your script, you may find it useful to animate them in individual scripts, then create a main script which calls those other scripts. Creating animations in this manner allows you to break the animation up into manageable chunks that can be easily debugged. In addition, if you want to re-use or modify the timing of what you just animated, you can create another script and use a Call Script operation to activate the subscript at a selected frame.

USING THE CALL SCRIPT OPERATION

The following tutorial uses the scene "tinker_toys." It contains two separate scripts that animate a mechanical arm. By inspecting each script and changing a few settings, you will gain a greater understanding of the Call Script operation.

● TO USE THE CALL SCRIPT OPERATION:

1 Start Animation in Mirai.

2 In the scene tinker_toys, make the script "sub motion" the current script in the Timeline.
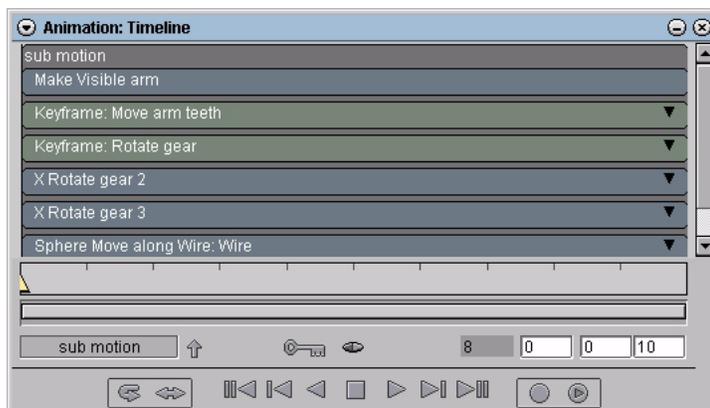
The sub motion script controls the movement of the different components of the arm. It contains the following operations:
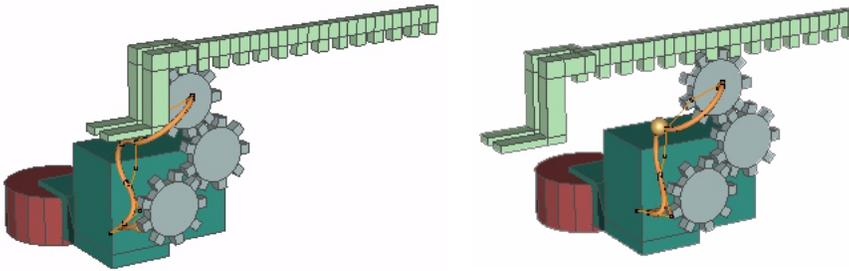
• Make Visible arm operation makes the arm visible

• Keyframe: Move arm teeth moves the arm teeth

• Keyframe: Rotate gear rotates the topmost gear

• X Rotate gear 2 rotates the middle gear

- X Rotate gear 3 rotates the bottom gear

- Sphere Move along wire: Wire moves the sphere along the wire as the gears turn

- Keyframe: Shape with Wire controls the shape of the wire as the sphere moves along it

When the script is executed, each of these operations is executed from top to bottom for each frame.

3 In the Animation Viewer, [L] on Options Menu>Render Domain>OpenGL.

4 Make the objects in the scene visible in the Animation Viewer and turn on their shading.

5 Animate the script. As the gears rotate, the arm teeth move across the topmost gear and the sphere travels along the wire.

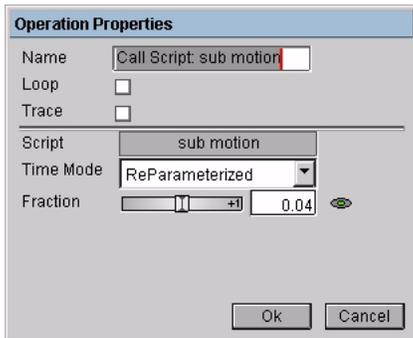NOTE: *You may need to adjust the camera to view the animation.*

6 Make the "scene motion" script the current script in the Timeline.
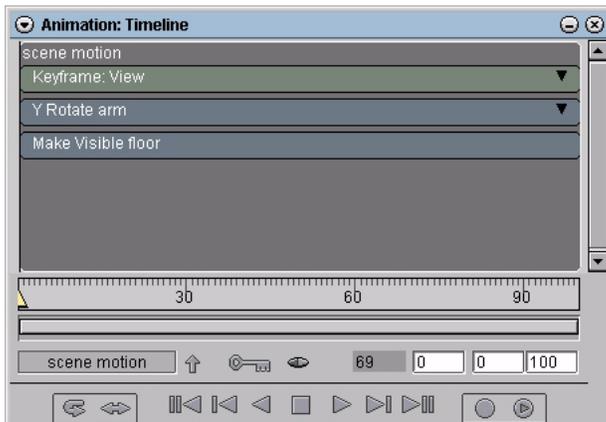
The scene motion script contains the following operations:

- Keyframe: View sets the camera view for the animation

- Y Rotate arm rotates the arm around the Y axis

- Make Visible floor makes the floor underneath the arm visible

7 [R] on the Timeline, then [L] on Add Operation>Programming>Call Script to add a Call Script operation to the script. The Call Script properties appear.

Operation Properties

|	
Name	Call Script: sub motion
Loop	☐
Trace	☐
Script	sub motion
Time Mode	ReParameterized ▼
Fraction	🔲▯ +1 0.04 👁

Ok   Cancel

You can set the following Call Script properties:

- Script is the script that is being called.

- Time Mode controls the timing of the execution of the script that is being called. You can select any of the following:

  - Direct animates the same numbered frame in the called and calling scripts. For example, when frame 10 is animated in the calling script, frame 10 of the called script is animated.

Script
calling_script
called_script

30   60   90
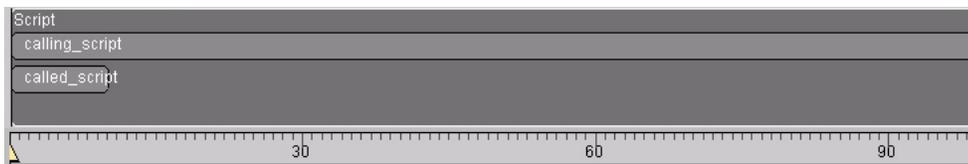
  - Offset adds a frame offset before animating the same numbered frame in the called and calling scripts. The number of frames the called script is offset is equal to the frame offset of the calling channel. For example, if the calling channel starts at frame 5, there will be a 5 frame offset.

Script
calling_script
called_script

30   60   90
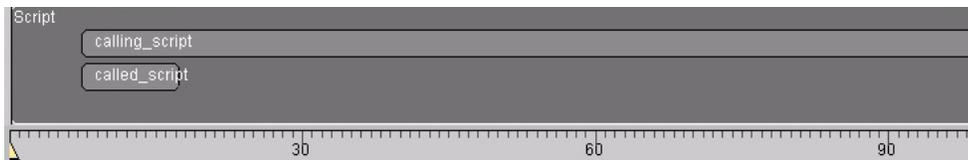
  - Stretched animates a frame at the same fraction of time as the calling channel. So, if the current frame is situated halfway through the calling script, the called script will also be animated at its halfway point.

Script
calling_script
called_script

30   60   90

  - ReParameterized also animates a frame at the same fraction of time as the calling channel. However, unlike Stretched, the Fraction data channel determines the fractional position in

the called script. So, if the time curve is set to .50, the called script will also be animated at its halfway point in time.
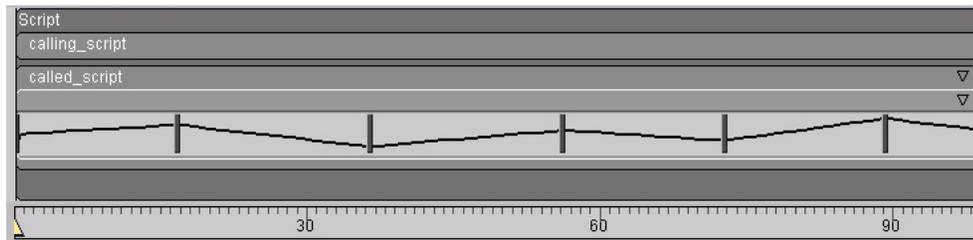
• Fraction is a dynamic value that controls which portion of the script is executed. It is only available if ReParameterized is the Time Mode. You can manipulate this value to specify the point of the called script that is to be animated. For example, if Fraction is set to .50, then the frame at the midpoint of the called script is executed.

8 Specify the sub motion script for the Script parameter.

9 Set Time Mode to ReParameterized. This will cause the sub motion script to be executed over the length of the scene motion script. This means that it will execute over the course of 100 frames, instead of the 10 frames it contains.

10 [L] on Ok. The Call Script channel is created.

11 Move the Frame Marker to frame 0.

12 In the Mixer, [L] on the Call Script operation to reveal its parameters, then set the Fraction value to 0.

13 Move the Frame Marker to frame 100.

14 In the Mixer, set the Fraction value to 1. Now the sub motion script will be executed sequentially from beginning to end.

NOTE: *If you set Fraction to a constant value, then only the frame at that fractional position in the called script will be executed.*

15 Reorder the script so that the Call Script operation is between the Keyframe: View and Y Rotate arm channels. This causes the Call Script operation to be executed after the camera view is established for that frame and before the arm is rotated.

16 Deactivate all of the channels in the script except the Call Script: sub motion operation, then animate the script. The sub motion script executes as it did before, however, since Time Mode is set to ReParameterized, this time it takes 100 frames to execute instead of 10.

17 Activate each of the channels in the script, then animate the script again.
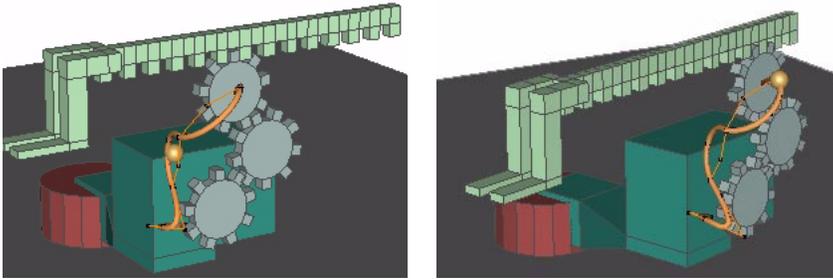

At each frame:

- The camera view for that frame is set.

- Part of the sub motion script is executed. Since we set Time Mode to reparameterized, the portion of the sub motion script that is executed is controlled by the Fraction data channel. For example, at frame 0, the value of the Call Script curve is 0, so frame 0 of the sub motion script is executed. At frame 50, the value of the Call Script curve is .50, so the frame 50% of the way through the script, frame 5, is executed.

- The arm is rotated around the central cylinder to the position specified in the angle parameter.

- The floor is made visible.

Initially, the motion in the script appears to be identical to the motion in the sub motion script. However, at frame 37, the arm begins to rotate around the central cylinder.

18 Open the Y Rotate operation channel to look at its curve, then animate the script again. As you can see, the curve's value corresponds to the rotational motion of the arm.

19 [M] on the cue at frame 60.
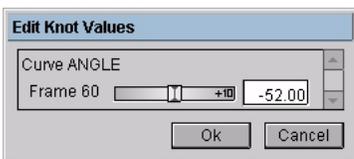
20 Change the cue's value. As you do, the scene is interactively updated to reflect the cue's current value.

21 [L] on Ok when the arm is in the desired position.

22 Animate the script. The new rotation value for the Y Rotate Arm operation is used when you animate the scene motion script.