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Techniques, Tips, and Procedures (TTP) for Simulating Virtual Stage Characters Manipulating Objects

By

**Romel Gallamoza
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Introduction:

This document describes how to simulate Virtual Stage (VS) characters manipulating objects. At the time of this writing, the current version of VS is VS3.011. There is no capability for a character to grab and use objects. There is no collision detection at all. There is a way around this problem. With the basic techniques described, other techniques can be built upon. The object manipulation possibilities are endless.

Prerequisites:

VS3.011

3d Modeling tools such as Anim8or

Knowledge of building your own model using the VS specs.

Animation experience (Action Repertoire Function) with VS.

Fraps (optional)

Holding and Manipulating Objects:

Currently, VS does not allow for characters to touch and grab object. The 3d models do not detect collision and every part of the body can go through anything with the virtual environment: The walls, props, other characters, and even itself.

Avoiding contact with walls, props, and other objects is an easy way to make your characters not move through things. What if you want your characters to pick up objects and use them? This feature is not available in VS at the time of this writing. There are ways to get around these problems.

First I will describe an easy way for characters already holding or using an object. The first thing you should do is make multiple copies of your base character, depending on the number of different objects the character will hold. Make a version of your base character and attach the object to its body part. Once this is done, you'll need to rename the character's body part or mesh again.

For example, I attached a model of an open book to one character. I joined the book to the right hand. Per VS character specification, the model's right hand and joint is labeled "rtwrist". After you join the book to "rtwrist", the "rtwrist" label is gone, replaced by another label named such as "mesh123", created by the 3d modeling software. That means you must rename the new mesh "rtwrist" again. You can do this with any body part but we'll continue with the book example.

Once you have the new character with object attached, add the character into the VS actor's agency. If the base character is already there, you can save time by just making a copy of the character (if you haven't done so already) and replace the base character with the same 3d model but with an object attached. Another way to replace the character with object is to change the file link from VS.

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Once you have included the new model in the actor's agency, you can design the animation of the character manipulating the object with the action feature.

Using the book example, the character is already holding the book in his hands. This book is already open. You can design the animation to show the model putting the book up to face or whatever height you wish. Let's say the model is holding the book to his chest. You can show him balancing the book with one hand or let him use the other hand to show him holding the book with two hands. If the model uses one hand, you can make it use the other hand to pretend he's turning pages.



Picking Up Objects

For creating the illusion of picking up objects, have a scene set up where the character approaches the object. As soon as the character touches the object, stop the scene and create a continuation scene.

Follow the directions above for manipulating the object. Once the animation of the character holding or using the object is done, go back to the scene where the character is touching the object. Remove the separate object in this scene. Test the combined scenes using the video capture software, Fraps.

Problems/Challenges:

Initial Position.

When VS characters are created according to spec, they are standing up and they are imported in that position.

When the objects are added to the 3d model, the object attached* must be positioned so that when the model begins to animate, the object is in the correct position.

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Using the book example above, the initial standing pose is a character with an open book prop attached to the right hand. I positioned the open book on the palm (of "rtwrist" model part) of the character. I centered the back of the book to the palm as well. Notice that the book goes through the body of the model. (It is fortunate that there is no collision detection at this time).

When the model is animated in VS described above, the model will move from its initial standing position and hold the book to its intended position(s).

*Note: The objects do not need to be attached. In Anim8or, I can allow the objects to be separate. This leads to even more options in object manipulation, which will be explored in the future.

Two or more Characters.

Another challenge is having two or more characters manipulating the same characters. One way around this is to let one character manipulate the object in VS while the second "pretend" to touch or use the same object.

For example, having a scene where two characters are carrying the same object. Using the method above, animate one character to carry the object by himself. Later, add the second character and animate it pretending to hold the same object. The trick here is synchronizing the animation steps (time, position of model pose, and location of model) with the model actually holding the object and the other model not attached to the object. There is a lot of trial and error involved here but it can be done.

Other Techniques:

Another method is to superimpose an animated character video clip over another animated clip. For this technique, a video editor such as Ulead's Video Studio or Roxio's VideoWave with special effects software is required. The blue screen/green screen special effects methods like the ones used in many film and video applications are implemented. Another name for this technique is chromakeying. (Later, I discovered that Wax 2.0e was more superior. The software is free).

For example, do a video capture of a character "pretending" to open a door with a blue or green screen background. Later film a video sequence from live action or a virtual environment like Bryce or Vue and animate a door opening. (Incorporating a model in Bryce or Vue is even more challenging). With the video editor like Video Studio or Wax, you can move the overlay of the character so that his position can match the video sequence of the door opening (i.e. have the hand over the doorknob).