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# Paula Avatar Display

Rosalee Wolfe  
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## Purpose

The Avatar Display is the user interface to the Display Engine, (DE), a lightweight, efficient real-time 3D renderer created by John McDonald. Our avatar's name is Paula, named after DePaul University. The Avatar Display is a component of the Sign Creation suite of tools by the American Sign Language Project. It supports the visualization of sign language in the Expression Builder, the Sign Transcriber, and the Sentence Generator. You access the Avatar Display by launching one of these programs.

## Accessing the Avatar Display

For this example, we'll activate the Expression Builder to access the Avatar Display. Click on the Expression Builder icon (Figure 1). You will first see the splash screen, (Figure 2).

## Three windows

Once you click "OK", you will see a set of three windows appear that will be similar to those in Figure 3. The top right window displaying Paula is the *avatar display*. The top left window will vary, depending on what component of the Sign Creation suite you are using. Since we're using the Expression Builder, you are seeing the *face dialog*. The lower text output window reports program status and errors to developer staff.

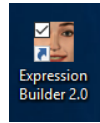


Figure 1: Expression Builder icon



Figure 2: Splash screen

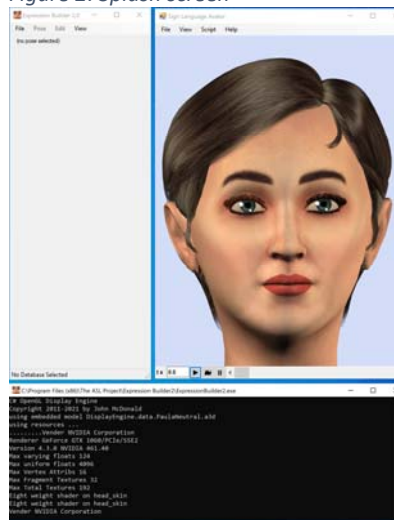


Figure 3: The three windows of the Expression Builder

## Navigation

You can use the mouse inside the avatar display window to change the camera position and zoom.

- A right-click and drag will rotate the camera about the avatar (Arc rotate).
- A shift-left click and drag zooms in and out (Field of View).
- A control-left click and drag will pan the camera (Pan).

You may want to pan (control-left click) and zoom (shift-left click) to see details of Paula's face on the screen.

## Viewing Animations

At the bottom of the avatar display are the media transport controls. The Start button contains an arrow and is the one currently highlighted in Figure 4. This will play an animation at normal video speeds. To play an animation at half speed, click the button containing the snail. To stop the animation, click on the Pause button, which contains two short vertical lines.

You can move to a specific frame by clicking on the slider and dragging it to the preferred time. You can also type in the desired time (in seconds) into the white text box immediately to the right of "t = ". If you prefer to use frame numbers, click on the "t = " text and it will change to "f = ". Now the numbers you enter in the text box will be interpreted as frame numbers



Figure 4: The avatar display

## Menus

The main menu entries of the Avatar Display are “File”, “View”, “Script” and “Help”. They appear at the top of the Avatar Display window, as seen in Figure 4.

To save a single image, use the File > Save Image command. This will present you with a conventional Save File dialog. Type in the filename you want. The images are saved in BMP format.

To save the entire animation as an .avi file, use the menu item File > Record full animation. You will see a conventional Save File dialog. Type in the filename you want.

Once you have specified the filename, you will see a dialog where you select the compressor (codec) for the video (Figure 6, left image). Without compression, video files become overwhelmingly huge. We like the “Cinepak Codec by Radius” because it works well in the QuickTime player. In the right image of Figure 6, you can see that there are quite a few selections. The list will vary, depending on what codecs have been installed on your computer.

After you select the codec and click OK, you’ll wait a bit while the animation renders out. The nice thing about the codec selection step is that you only have to do it once per session.

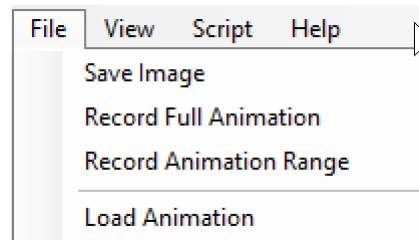


Figure 5: File Menu

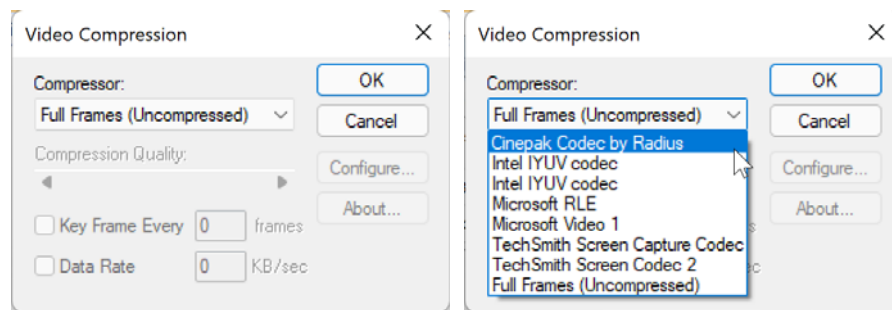


Figure 6: Selecting the video codec

The View menu, (Figure 7), gives you quick ways to control the camera. The “Look at Object”, which will display a dialog where you can type the name of an object to serve as the camera’s target. Useful names of useful object include

- JawBone
- LeftWristBone
- RightWristBone

Note: It *must* be a bone name – naming a mesh will place the camera target at Paula’s feet.

The “Set window size” entry will allow you to change the width and height of the Avatar Display. The size of the window will change in response.

The “set clip planes” command can be useful when it seems that parts of Paula disappear into the background.

Quick tutorial on clipping planes: We want to ignore things that are too close to the camera or are too far away from the camera. To do this, we set near and far planes which slice the scene into visible and invisible regions. See Figure 9 for a bird’s eye view. In the left diagram, the Near and Far clip planes are shown as heavy black lines. The diagram on the right shows which parts of the scene will be visible through the camera. Note that an object can be cut in half. If you zoom in too far, you can cut off Paula’s face and see inside her head. In this case, set the near clip plane to something smaller than its current setting.

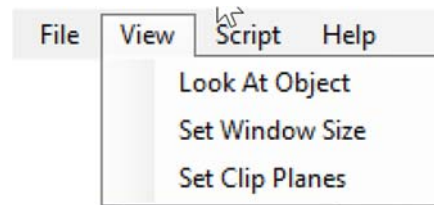


Figure 7: View Menu

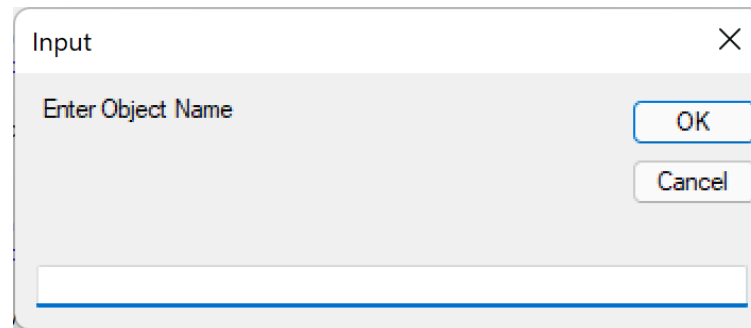


Figure 8: Look At Object dialog

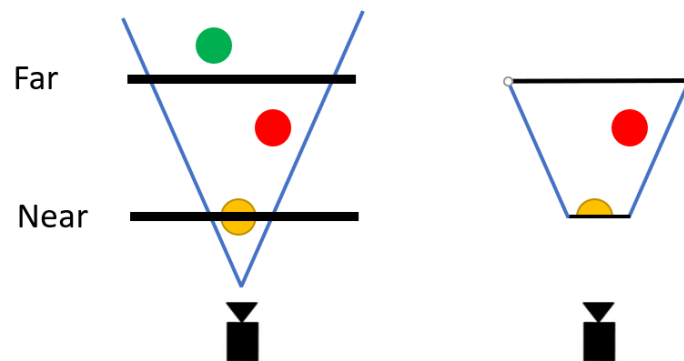


Figure 9: Near and far clipping planes

The Script menu (Figure 10) features a menu item “Open Python Window” that opens a Python window which allows you to type commands directly to Paula. The DE commands to animate Paula directly are available through an Iron Python 2.7 syntax. The ease of use for development purposes rivals that of scripting systems available in commercial packages such as Maya and 3ds max.

For more information how to use this powerful prototyping tool, click on “Online DE Python manual.”

The Help menu (Figure 11) contains an “About” item, which lists credits, and an “Online user manual” item, which links to this document.

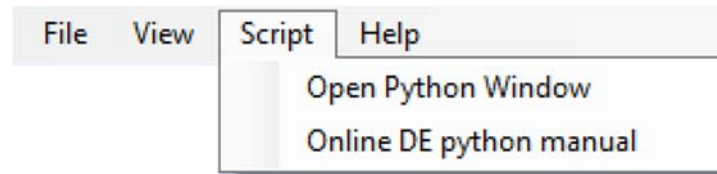


Figure 10: Scripting menu

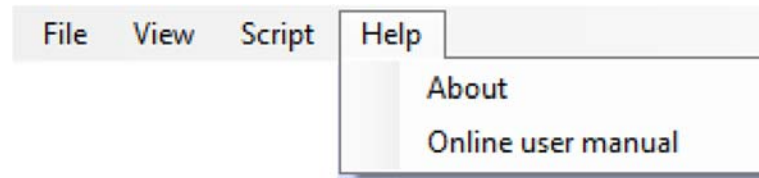


Figure 11: Help menu

## Known Issues and Workarounds

1. To exit the program, click the “Close Window” button on the Expression Builder, *not* the avatar display. If you close the avatar display first, you will likely encounter an error when closing the Expression Builder.
2. When overwriting an animation (.avi) file, be sure that you do not have the file open in a video player, or that you have it selected in file explorer. There is a very good chance that Expression Builder will crash because the file has been locked, preventing it from being overwritten.

## Feedback

Feedback on the Expression Builder is welcome and warmly encouraged! Feel free to contact me at [rjwolfe@gmail.com](mailto:rjwolfe@gmail.com) as you work with the Paula avatar and have ideas on how to improve it.

Enjoy.

Απολαμβάνω!

Genieß.

Profitez-en.

Godere.

Genieten.