ARTIST GUIDE

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

TRADEMARK & COPYRIGHT NOTICE

CONTENTS

DAZ|STUDIO
ARTIST GUIDE

CONTENTS

CONTENTS

CONTENTS

CONTENTS

Introduction

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Chapter 1: Welcome!

Hello and thank you for your interest in DAZ|Studio, the new 3D design tool by DAZ Productions (DAZ). DAZ|Studio puts the power of a complete photo and motion picture studio at your fingertips, unleashing your creativity and innovation. New to the 3D scene? No problem. DAZ|Studio makes creating high-quality images fast, easy, and enjoyable! This chapter introduces you to DAZ|Studio and showcases just a few of the many hundreds of pieces of content available for DAZ|Studio- A whole universe of 3D content and stunning art awaits!

What is DAZ|Studio?

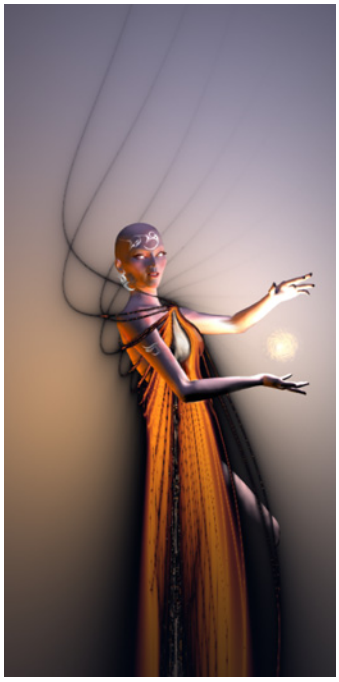
Think of DAZ|Studio as a complete virtual photo studio where you can create still images or animations. Lights, cameras, makeup, wardrobe, props, and more are at your fingertips. You create scenes by placing virtual actors (called *figures* or *characters*), props, and other elements in the studio. Adjust your lighting, position your cameras, and you've got a complete image. It's that easy. Want to change an actor or prop's appearance? It's easy. DAZ|Studio's **Surfaces** tab allows you to change any object's color, opacity, roughness, and many other attributes. You can even change your figures' skin with a few mouse clicks!

Real-world photo or film projects pose many challenges that begin with finding places to shoot and don't end until you have all of the images or footage you need and then some. Scheduling is a tricky and costly affair that can go wrong for any number of reasons including rush hour traffic. This requires extensive planning.

The challenges multiply once the crew is assembled, the actors are on set, and work begins. Want to adjust the lighting? You need to stop filming while technicians do their work. Want that pine table to look more like mahogany? Either get a new table or spend hours refinishing the existing one- with no guarantee of its final appearance. Want to adjust your angle? Production stops again while equipment is moved and calibrated. Want your actor to move left instead of right? Reshoot the entire scene. Want special effects such as stunts or pyrotechnics? Sure- once you've complied with complex and costly safety regulations. Photography and filmmaking are complex, costly, and potentially dangerous affairs, which places them out of reach of many individuals and companies.

But what if you could:

- Schedule studio time whenever you wanted?
- Have actors who are always ready when you are?
- Move cameras, lights, actors, and props on a whim?
- Control and change the appearance of every item in the scene instantly?
- Achieve excellent results in hours or even minutes instead of days, weeks, or months?



DAZ|Studio makes all of this and more possible, easy, cost-effective, and fun! Are you ready to unleash your inner artist?

What can DAZ|Studio do for me?

DAZ|Studio gives novice and experienced artists the power to create imagery that expresses their creativity while saving time, effort, and money.

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

INTRODUCTION

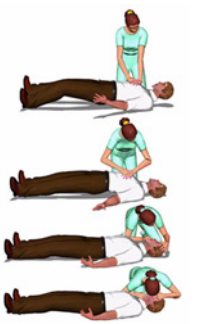
CREATE

DAZ|Studio unleashes creativity in artists, photographers, filmmakers, animators, illustrators, and more. Hobbyists and professionals alike can create impressive images for just about any purpose. With DAZ|Studio, you concentrate on your art, not on extensive setup. Here are just a few of the things you can do with DAZ|Studio:

- Add any number of figures into your scene.
- Pose and animate figures down to the smallest detail.
- Dress up your figures by adding custom hair and clothing. Further, many hair and clothing items have additional built-in customization. Need a costume for virtually any period or profession? Chances are it already exists. And your choices are expanding daily!
- Place furniture, backgrounds, and other objects in your scene. The variety is almost limitless, from household items and appliances to hand tools, trees, etc. These props add context, realism, and interest to your scenes.
- Place and adjust lights. You can customize brightness, area of illumination, location, direction, color, and gels to achieve the exact effect you're looking for.
- Place and adjust multiple cameras and see your scene from up to four points of view at once. You can select from a variety of viewport layouts and choose from a complete assortment of orthographic and perspective cameras. This gives you great flexibility and control as you build and adjust your scene.
- Change the appearance of any character, prop, or other item in your scene. Need to make that red shirt blue? Turn wood into stone? Change your character's ethnicity and/or physical proportions? DAZ|Studio makes it easy and fun to create just the look you're going for! Best of all, you can change any item while leaving the rest of your scene unchanged. Save your work as you go and you can leverage one project for many purposes. You don't have to be a programmer or engineer to achieve stellar results!

EXPRESS

DAZ|Studio's powerful creativity features empower you to focus on creating scenes and expressing your creativity. The only limit to what you can produce using DAZ|Studio is your imagination. Here are a few examples of ways you can use DAZ|Studio:



- Hobbyists can create images in any genre from medieval to contemporary and beyond.
- Book designers can create compelling cover images that capture the book's essence and help sell more copies.
- Application developers can use stills or animations inside software from games to business applications.

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- Product designers can test size, proportions, and ergonomics without having to create a prototype.
- Law enforcement specialists can recreate crime scenes and reenact events for forensic and civil or criminal trial purposes.
- Public safety personnel, the military, and adventurers can simulate potentially dangerous procedures for training purposes without putting anyone at risk.
- Architects can include people to illustrate how the spaces they design interact with their occupants.
- Filmmakers can create compelling storyboards during pre-production.
- Create almost any imaginable world complete with environments. From outer space to underwater, your imagination is the limit.

- Photographers and filmmakers can create professional results usable for any imaginable purpose from advertising to entertainment and fine art.

DAZ|Studio gives you the power to express your personal or professional creativity!

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Chapter 2: About DAZ|Studio

This chapter describes DAZ|Studio in more detail and introduces you to some of the DAZ products designed to work with this program.

Key Features

DAZ|Studio includes these powerful features:

- PC and MAC Support: DAZ|Studio runs on Windows 98SE/2000/Me/XP, and MAC OSX 10.2 and above.
- Fully Optimized: DAZ|Studio supports Open-GL acceleration in 3D views, which gives you high-quality real-time lighting, textures, transparency, anti-aliasing, and depth-of-field. Smart memory optimization saves system resources and boosts performance. The built-in asset manager allows you to handle large amounts of content effortlessly. By taking advantage of the latest technologies, DAZ|Studio gives you amazing power, speed, and ease of use. Spend time creating, not waiting for your computer to catch up!
- Multiple 3D Views: Select one of several included viewport layouts that let you see your scene from up to four angles at once. Change any view to suit your needs at any time using intuitive camera controls. Try that in any real-world studio!

- Native File Format: The new .DAZ file format allows both flexibility and digital rights management to protect content creators' copyrights.
- Import Popular File Formats: DAZ|Studio can import both .OBJ objects and all Poser 4 file formats (scene- .PZ3,character- .CR2, prop- .PP2, camera-.CM2, light- .LT2, hand- .hair- HR2, face- .FC2, hand- HD2, pose- .PZ2, and their compressed .**Z counterparts).
- Powerful Rendering Engine: DAZ|Studio uses the RenderMan®-compliant 3Delight renderer (www.3delight.com). See your scenes rendered with amazing realism normally found in expensive software packages!
- Customizable Interface: Move, resize, dock, hide, or show DAZ|Studio's interface panes and tabs to create your own custom interface. DAZ|Studio works on your terms!

- Direct Select: Select any object or material by clicking it directly inside a viewport.
- Scene Tab: View your scene hierarchy and select and edit bones or objects and apply clothing and other properties using this tab.
- Parameter Tab: Pose figures and manipulate cameras, props, and scenes as easily as turning the dials in this tab.
- Surfaces Tab: Edit any material in your scene, including color, highlight, opacity, reflection, and texture using this tab.
- 3D Manipulation: Pose figures using intuitive on-screen controls. Set movement limits to define custom ranges of motion.
- Multiple Undo/Redo: Move back- or forward- several steps if you made a mistake or want to make some changes. Go ahead, experiment! You can always decide to do something different.

Included Documentation

DAZ|Studio includes a full suite of documentation to make learning and using the program easy and enjoyable.

ARTIST GUIDE

DAZ's goal is to ensure that all of our documentation is complete, accurate, and friendly. We welcome all constructive feedback and suggestions for future improvements. Please email docs@daz3d.com.

Conventions

This Artist Guide describes both the Windows and Macintosh versions of DAZ|Studio. It includes several formatting conventions that present information clearly and make learning and working with DAZ|Studio easier.

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Lists or procedures that need not be performed in a specific order have bullets next to each item, as shown here:

- Item 1
- Item 2

If a procedure must be followed in a specific order, it will have numbers next to each step, as shown here:

1. Perform this step first
2. Perform this step second

If you need to press a specific key on your keyboard, you will see the key label in CAPITAL letters surrounded by square brackets. For example, [CTRL]. If you need to press two more keys simultaneously, the notation will appear as [KEY1]+[KEY2]. For example [CTRL]+[V].

Screen prompts, menu and window names, fields, buttons, boxes, etc. appear in **bold** type. The syntax used to demonstrate accessing a palette or sub-menu is **Menu>Submenu**. For example **Edit>Preferences** means that you should open the **Edit** pull-down menu and then select **Preferences** to open the **Preferences** dialog box.

Important terms appear in *italics*. Program and script code appears in standard Courier font. For example:

```
cd\letters\business\legal [ENTER]
```

TIP
Tips contain helpful advice and other information that makes using DAZ|Studio easier and more enjoyable.

CAUTION
CAUTIONS WARN OF POSSIBLE PROBLEMS SUCH AS DATA LOSS.

README

At the end of the DAZ|Studio installation process, the Readme file will automatically appear. This file includes late-breaking developments and other information that was too recent to be included in the Artist Guide or Install Notes. Please take a few moments to read this information carefully as it may affect how you use DAZ|Studio.

System Requirements

In order to install and run DAZ|Studio, you must have either a Windows PC or Macintosh that meets or exceeds the minimum requirements listed below. Please note that these are just the minimum requirements. Computers that exceed the following specifications will be able to process scenes faster and/or store more content. For processing speed, RAM is the largest contributing factor followed by your graphics card, then your processor speed. To store more raw content and/or finished scenes, add hard drive space.

The above recommendations are valid for both Windows PCs and Macintoshes.

WINDOWS

To run DAZ|Studio on a Windows PCs, your computer must meet the following minimum requirements:

- Pentium III processor running at 450 MHz
- Windows 98SE or above
- 64 MB RAM (if running Windows 98 or ME)
- 128 MB RAM (if running Windows 2000 or XP)
- 20 MB hard drive space (for DAZ|Studio installation only). Content requires additional space. DAZ therefore recommends that you reserve at least 100MB for the software and some basic content.
- OpenGL-compatible graphics card
- 32-bit color
- An Internet connection is required to register Studio and activate it to a usable (save-enabled) state. This connection need not be on the computer on which you will be running the software.

MACINTOSH

To run DAZ|Studio on a Macintosh, your computer must meet the following minimum requirements:

- G4 processor running at 400 MHz
- OSX 10.2 or above
- 128 MB RAM

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- 20 MB hard drive space (for DAZ|Studio installation only). Content requires additional space. DAZ therefore recommends that you reserve at least 100MB for the software and some basic content.
- OpenGL-compatible graphics card
- 32-bit color
- An Internet connection is required to register Studio and activate it to a usable (save-enabled) state. This connection need not be on the computer on which you will be running the software.

Other DAZ Products

As you begin using DAZ|Studio for custom projects, you'll need to obtain characters, props, and other content beyond the starter content supplied with the program.

DAZ figures are a wonderful addition to any existing 3D library. The Millennium Figures are completely set up and ready to work in DAZ|Studio. They give artists realism and versatility that is unmatched by any other commercially available 3D models. DAZ releases updates and other additions for each figure on a regular basis, giving you an ever-expanding array of options.

Beyond figures, DAZ both produces many other items and partners with leading modelers and artists to bring you a huge variety of content that you can use in DAZ|Studio. This content includes clothing, morph targets, maps, poses, hairstyles, props, light sets, camera settings, and more.

"In my experience, I have never seen 3D models that compare to our Millennium Figures in quality and versatility," says Chris Creek, Vice President and Art Director of DAZ Productions. Chad Smith, Product Development Manager adds, "We still have a few tricks up our sleeve. These figures are still very young products and have a lot more potential and versatility that will be implemented. Much of our focus is in finding ways to push the limits of realism in virtual worlds."

Please seeSection 7: "Other DAZ Products" on page 158 for more information about some of the content DAZ offers. Also, be sure to visit DAZ regularly at www.daz3d.com to see the latest additions to our ever-expanding library of excellent 3D content!

Need Help?

This manual addresses as many questions about DAZ|Studio as possible. Should you need it, there are several ways to get additional help.

CONTACTING TECHNICAL SUPPORT

Need support? Please contact DAZ as follows:

- Toll Free Phone: (800) 267-1570
- Local Phone: (801) 495-1777. Our technical support hours are 9:00 a.m. to 5:00 p.m. Mountain Standard Time.
- Fax: (801) 495-1787
- Email: tech@daz3d.com
- Mail: 1350 E. Draper PKWY, Draper, UT 84020

OTHER DAZ RESOURCES

- Web site: http://www.daz3d.com
- Support database: http://www.daz3d.com/support
- Community Forum: forum.daz3d.com
- Tutorials: acrana.daz3d.com

Chapter 3: Installing DAZ|Studio

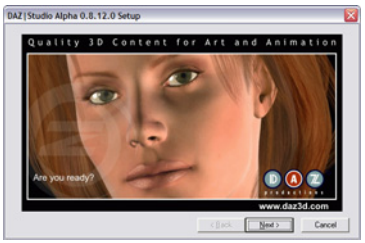
This chapter describes the installation process for DAZ|Studio on both Windows and Macintosh computers. Before installing DAZ|Studio, you must read, understand, and agree to the End User License Agreement (EULA) and learn how DAZ|Studio protects artists' copyrights. The EULA appears during DAZ|Studio installation. For your convenience, we have included a print version. Please see Appendix 1: "End User License Agreement (EULA)" on page 154 to read the EULA prior to installing DAZ|Studio on your system.

Installation

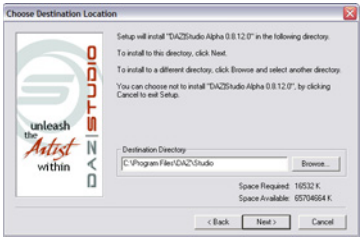
This section describes installing DAZ|Studio on PC (Windows) and Macintosh (OSX) computers.

Windows

To install DAZ|Studio on a Windows PC:



1. Double-click the **DAZStudio Setup** icon to start DAZ|Studio Setup.
2. If you have another installation of DAZ|Studio on your computer, the installer will prompt you to uninstall your previous installation. We recommend that you select **Yes** to avoid potential conflicts. This operation only uninstalls content installed by the previous DAZ|Studio installation. Content (such as figures, etc.) installed by independent installers are not removed.
3. The **Welcome** dialog appears. Click **Next** to proceed.
4. The **Software License Agreement** dialog appears. You must read, understand, and agree to abide by the terms of the DAZ|Studio End User License Agreement (EULA). Indicate your acceptance by clicking **Yes**. If you would like a hard copy of the EULA for your records, you may click the **Print** button. For your convenience, the EULA appears in this manual at Appendix 1: "End User License Agreement (EULA)" on page 154.
5. The **Choose Destination Location** dialog appears with the default installation folder selected. Click **Next** to install DAZ|Studio to the default folder. To select a custom location, you may either type in your desired location in the **Destination Directory** field or click the Browse button to navigate to your desired installation folder. After selecting your desired folder, click **Next** to proceed.



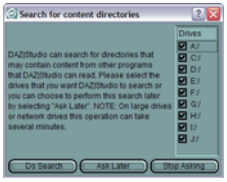
6 The **Select Program Folder** dialog appears. This is where DAZ|Studio will appear in the Windows **Start** menu. Enter your desired location in the **Program Folder** or select an existing folder, then click **Next**. To accept the default folder, click **Next** without making any changes.

7 DAZ|Studio searches your local and networked hard drives for both native DAZ|Studio content and compatible content libraries from third-party applications. If you have previously installed DAZ|Studio on your computer, the **Previous Settings Found** dialog appears. If you have not made changes to your content folder locations, you may select **Use the previous content search results** to save time. Selecting **Perform a content search on next launch** instructs DAZ|Studio to conduct a new search for content. After selecting your desired option, click **Next**.

8 The DAZ|Studio installer now copies the program files to the installation folder and updates the Windows registry.

9 The **Important Notes** dialog appears. It contains information too recent to be included in the Artist Guide. Please take a few moments to read this important information, then click **Next** to proceed.

10 The **Finished** dialog box appears. This dialog confirms the successful installation. Clicking **Close** ends the installation and launches the Readme file. The Readme contains up-to-the-minute information too recent for either the Artist Guide or Install Notes. It appears in a separate window.



11 If this is your first time installing DAZ|Studio (or if you opted to perform a new search in Step 7, above), you will be prompted to search for supported third-party content directories when you launch DAZ|Studio for the first time. To perform the search, select the drive(s) you wish you search, then click **Do Search**. To perform the search the next time you start DAZ|Studio, select **Ask Later**. To never perform the search, click **Stop Asking**.

12 DAZ|Studio is Tellware. Be sure to tell at least two friends about DAZ|Studio and where to get it (www.daz3d.com)!

This concludes the DAZ|Studio installation process for Windows.

MACINTOSH

To install DAZ|Studio on a Macintosh:

1 Double click the **DAZ|Studio Setup** icon to start DAZ|Studio Setup.

2 The **Welcome** dialog appears. Click **Next** to proceed.

3 The **Software License Agreement** dialog appears. You must read, understand, and agree to abide by the terms of the DAZ|Studio End User License Agreement (EULA). To proceed, you must scroll to the bottom of the agreement to enable the **Accept** button. Indicate your acceptance by clicking **Accept**. If you would like a hard copy of the EULA for your records, you may click the **Print** button. For your convenience, the EULA appears in this manual at Appendix 1: “End User License Agreement (EULA)” on page 154.

4 The **DAZ|Studio Setup** dialog appears with the default installation location selected. Click **Install** to install DAZ|Studio to the default location. To select a custom location, you may click the **Install Location** button to navigate to your desired location. After selecting your desired location, click **Install** to proceed.

5 The DAZ|Studio installer now copies the program files to the selected installation folder.

6 A message appears asking if you would like to add DAZ|Studio to the OSX dock. Select **Yes** to add DAZ|Studio to the OSX dock or **No** to skip this step.

7 A message appears indicating installation was successful. Select **Quit** to end the installation.

8 The Readme file will be launched in your system default web browser after installation. The Readme contains up-to-the-minute information too recent for either the Artist Guide or Install Notes.

Registering the Software

The registration process is as follows:

<TBD>

Getting Updates

DAZ|Studio will continue evolving and improving, and periodic updates will be released. To check for program updates, watch for news and updates at the DAZ forums (http://forum.daz3d.com).

Tutorials

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Chapter 4: The Basics

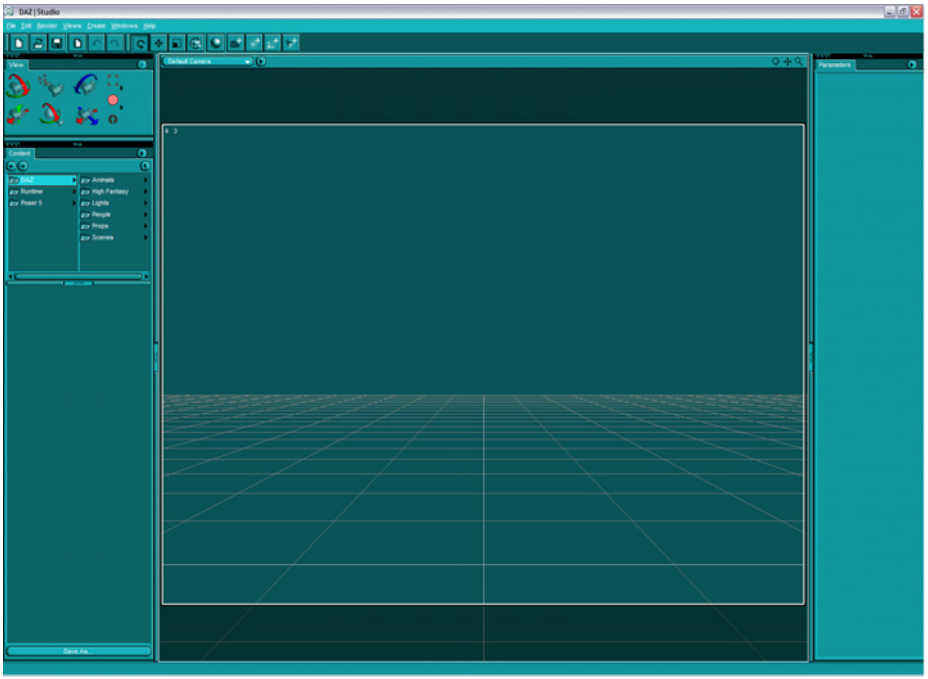
This tutorial will show you how to launch DAZ|Studio and then how to add a figure to your scene as Step One. In Step Two, we'll add lights and get your virtual model to pose for you. In the third step, you will learn how to alter your figure to resemble almost anyone imaginable. Finally, we'll experiment with the cameras. For now, let's focus on familiarizing you with DAZ|Studio. We'll begin by showing you how easy it is to get great results and leave achieving specific results for later tutorials. New to 3D? Please take a few minutes to read Section 6: "About 3D" on page 129. If you've used 2D graphics programs, you'll soon see how adding the third dimension can simplify your creative process. Never used graphics software? We'll show you how fast and easy it is! Already experienced with other 3D programs? DAZ|Studio both resembles and differs from what you may be accustomed to and includes powerful features that will get you great results.

Step One: Add A Figure

Let's begin by launching DAZ|Studio:

- On Windows, click **Start>Programs>DAZ Programs>DAZ Studio>DAZ Studio**.
- On MAC OSX, double-click the **DAZ|Studio** icon in the OSX dock.

DAZ|Studio appears as shown below:



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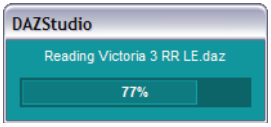
As we mentioned in the last section, DAZ|Studio is like a virtual photo studio. The *viewport* appears in the center and is where you view and manipulate your scene's *content*. This is the equivalent of looking through a camera lens into a room that has no preset length, width, or height- a sort of parallel universe. Content denotes everything in your scene such as figures, props, lights, etc. A default scene loads when DAZ|Studio launches. This scene is empty because you have not yet added content to your scene.

The **Content** tab is where you access all of the content available for use in your scenes. Think of it as a virtual storeroom. We'll talk about how to use the **Content** tab in detail in Chapter 12: "The Content Tab" on page 69. For now, though, you should see two columns at the top of this pane. The left column has a folder icon labeled **DAZ**. Click this folder to select it.

TIP
If you searched for additional content (for example, if you have Curious Labs' Poser), you may see additional icons in the left column of the **Content** tab.

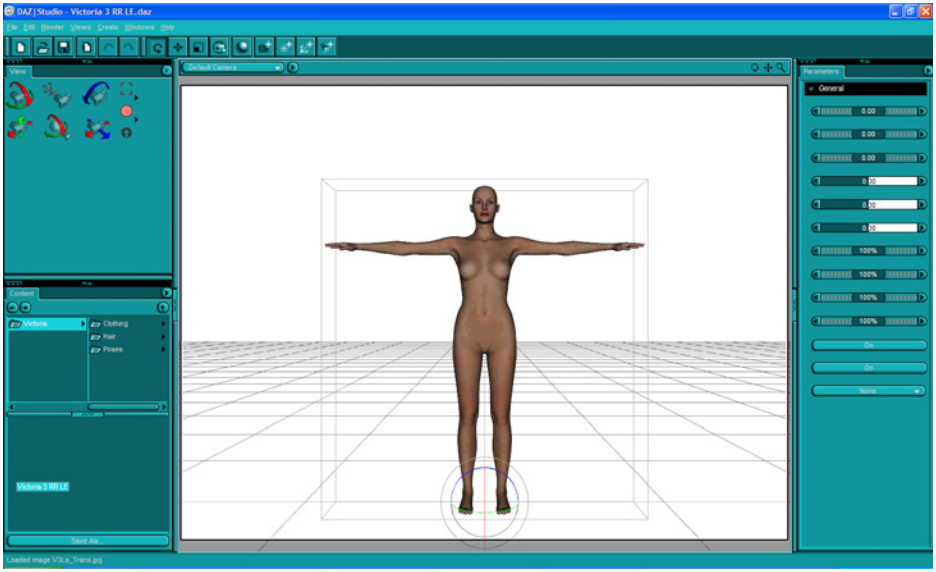
The right column contains a list of icons representing the available content categories within the folder selected on the left (such as **Animals**, **High Fantasy**, etc.). Let's begin this tutorial by clicking the **People** folder.

TIP
You can also use the **File** menu (**File>Open** and **File>Import**) to access and use content.



The folder list described above moves to the left column and a new folder named **Victoria** appears in the right column. This is because the left **Content** tab column displays the folder level above your current level while the right-hand column displays your current folder level. This feature speeds navigation by giving you access to two folder levels at once. For now, click the **Victoria** folder. An entry labeled **Victoria 3 RR LE** appears at the bottom of the **Content** tab, which displays the content items available in the currently selected folder. Double-click this entry to load the Victoria figure included with DAZ|Studio. A series of progress bars appears as the application loads the figure and supporting files.

Victoria appears in the viewport as soon as she finishes loading, as shown here:



Step Two: Fun with Lights

As you can see in the previous image, the figure you just loaded appears lit. DAZ|Studio does this for your convenience when loading content if you have not added any other lights to your scene. This default light remains on while you are working with your scene to ensure that you can see everything. If you do not add at least one light before *rendering* (snapping a photo of) your scene, DAZ|Studio will complete the render using the default light. If you add one or more lights to your scene before clicking **Render**, DAZ|Studio will disable the default light and render the scene using your added light(s). The **Render** button is located above the viewport.

Let there be light! Add lights to your scene by clicking one of the **Create Light** buttons shown to the right or by using the **Create** menu. You can insert as many lights as you want and can control each light individually. We'll talk about that in a few moments.

Each **Create Light** button or **Create Light** menu option allows you to create a different type of light in order to get the effect you're looking for. DAZ|Studio supports three types of light. From left to right, these are:

- Point: Light emanates from a single point in all directions and decreases in intensity the further it gets from the source. This the equivalent of a bare light bulb that you can put anywhere in your scene. Want to create a living room scene with end-table lamps? Place a point light in each lamp. Want a zombie with glowing eyeballs? Place a couple of point lights inside its eye sockets.

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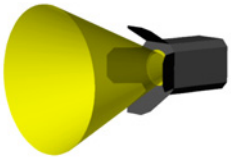
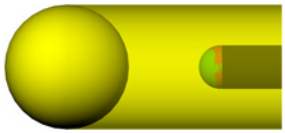
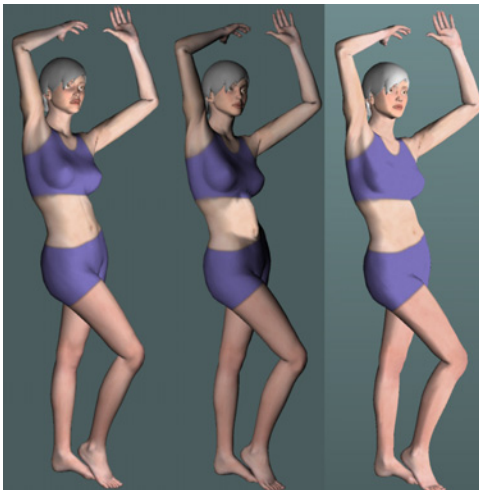
- Spot: Light emanates in a cone from a fixed location, just like from a spotlight in a stage ceiling. They will create a bright spot of light on the surface they strike, hence the term "spot". You can position spot lights anywhere in your scene and aim them in any direction. Need to light a particular portion of your scene for emphasis or other effect? Use a spotlight!



- Distant: These lights exist outside your scene and cast parallel light rays into your scene. They are great for outdoor scenes since they mimic sunlight. Distant lights illuminate one side of an object uniformly. You can adjust their position in the "sky" surrounding your scene to mimic the sun's position. And you can have as many as you like.



We'll discuss lights in lots more detail in "Lights" on page 96. In the meantime, the image on the right shows how each type of light affects your scene. From left to right, the light types shown are point, spot, and distant. In all examples, the lights are located in the same spot to give you a true side-by-side comparison.



Try inserting a light into your scene by clicking your desired **Add Light** button. A dialog box appears asking you to name the new light. Enter a descriptive name of your choosing, and click **OK**. Your new light appears in the scene. Notice how the figure's lighting changes. This is because DAZ|Studio is using the new light to calculate the scene's lighting.

TIP

The default light stays on until you add one or more lights to your scene. This ensures that you can always see your entire scene from every angle. When rendering, DAZ|Studio turns off the default light and relies exclusively on the light(s) you have added to the scene. If you have not added any lights, your scene will render using the default light only.

Now let's play around with this light and watch what happens. Begin by selecting your light in the **Scene** tab. Just look for the name you entered when you created the light and click it. Next, we'll use the **Parameters** tab to adjust the light's properties and watch the results. We'll discuss light parameters in more detail in "Lights" on page 96. Meanwhile, here is a brief explanation of what the light parameters do:

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- Translation: The **Translation** parameters allow you specify your light's location. You can move lights left to right (X), up and down (Y), and front to back (Z). For distant lights, this parameter only changes the location of the icon representing the light but does not affect how it lights the scene since distant lights emit parallel rays no matter where you place them.
- Scale: You may be able to change the light's size in one or more axes, depending on the light type.
- Rotation: You can aim the light by rotating it about one or more axes, depending on the light type. This parameter does not apply to point lights, since rotating a light bulb does not affect its output.
- Intensity: This allows you to dim or brighten the light.
- Color: Clicking the **Color** parameter opens a standard Color Picker, allowing you to specify the desired color for your light.
- Shadow: You can control shadow softness (hardness of shadow edges) and bias (sample-shifting to prevent object self-shadowing).

TIP

Section 6: "About 3D" on page 129 describes basic 3D terms and concepts. If you're not already familiar with working in 3D, please read this chapter.

Step Three: The Hair

Well, our scene is lit and we can finally see the figure. You'll notice that she's bald. Most figures come without hair. This allows you to add custom hair from the many choices available at the DAZ online store or via the Platinum Club (http://www.daz3d.com) and gives you much greater flexibility. No actor or actress can change hairstyles as fast as these figures can!

Hair is figure-specific, meaning that a given hair object is designed to work with a specific figure. DAZ|Studio includes one sample hair object for Victoria. We'll use this sample to explain the basics of adding hair to your figure:

1 Select the **Content** tab.

- If you are in the **Victoria** folder, click the **Hair** folder in the right column. Next, double-click the **Updo** image in the lower portion of the **Content** tab.

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2 The selected hair appears on the figure's head, as shown here.

3 The next step is to *parent* the hair to Victoria's head so that it will remain in position as she moves. To do this, open the **Scene** tab by selecting **Windows>Scene**. The **Scene** tab (shown here in the bottom half of the image) shows your scene's *hierarchy* (see "The Pecking Order" on page 142) as a tree. You can select any object in your scene by clicking its entry in the tree display and can expand/collapse branches by clicking the **+** and **-** icons, respectively. The **Scene** tab appears in a floating pane.

4 Notice that the Victoria figure appears in the **Scene** tab as **bIMilWom_v3Lo**. Select her head by either clicking it in the viewport or by expanding the **bIMilWom_v3Lo** branch in the **Scene** tab and following the hierarchy from **Hip** to **Abdomen**, **Chest**, and **Head**.

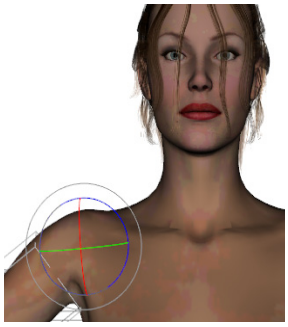
5 Click the **Hair** entry in the **Scene** tab and drag it down until it is over the **Head** entry. The **Hair** entry will move down underneath the **Head**, indicating that is now a child object to Victoria's head and will therefore retain its position and distance relative to her head.

TIP

As mentioned above, each hair object is created for a specific figure. This ensures that the hair appears in the correct location and fits the figure's head. With practice, you can use a hairstyle with any figure. This method requires a few adjustments for optimal results and is not recommended for novices.

Step Four: Posing

So far, we've added a figure to our scene, added one or more lights, and given our figure a head of hair. Now let's *pose* (position) the figure. Each figure has a default pose, which is usually a neutral standing position with the arms straight out to the side. Each figure's creator builds the model in a default pose. Victoria's default pose is favored by most figure creators because it makes design and modeling far easier. OK, now let's do something about that pose. You can change your figure's position in three ways:



- Direct 3D Manipulation: Within the viewport, click the body part you wish to move. Doing this brings up between one and three colored **Direct Manipulation** tools at the joint for the selected bone that connects it to its *parent*. Please see "The Pecking Order" on page 142 for information about *hierarchies* and parent/child relationships.

  To move the selected body part, click and drag any of the **Direct Manipulation** tools (see "Direct Manipulation" on page 85 for more information about the **Direct Manipulation** tools). The number of tools you'll see

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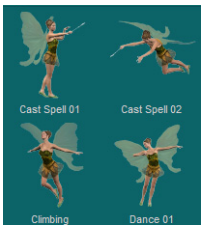
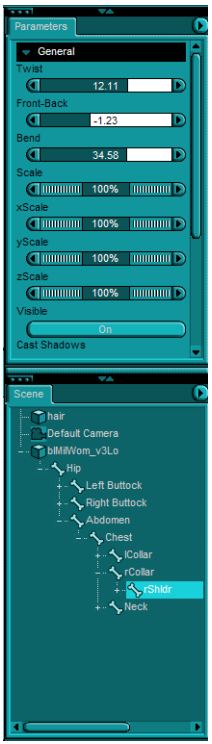
depends on which part you're trying to move and the figure's *degrees of freedom*. This posing method is both the most common and takes full advantage of DAZ|Studio's multiple viewport capability (see "Orthogonal and Perspective Views" on page 132 for more information about *perspective* and *orthogonal* views, and "Views Menu" on page 54 for information on selecting and using multiple viewports.

- Preset Poses: What if you could get your figure into the perfect pose at the push of a button? That's impossible for a live model but is easy for DAZ|Studio figures. Many artists create custom pose sets for Michael, Victoria, and the other DAZ figures. Each pose set contains one or more pre-built poses. Creating a dance scene? You can purchase dance poses and save lots of time. There are many pose sets available with more being released all the time. Please refer to "The Scene Tab" on page 79 for more information on using pre-built poses. Also, please see Appendix 2: "Other DAZ Products" on page 158 for information on where to purchase pre-built poses for your scenes. We'll use the **Climbing** pose in these tutorials.



- Scene/Parameter Tabs: The **Scene** tab (shown here in the bottom half of the image) shows your scene's *hierarchy* (see "The Pecking Order" on page 142) as a tree. You can select any object in your scene by clicking its entry in the tree display. For example, to select Victoria's left forearm, you could either click it in any viewport or click it in the **Scene** tab. You can then use the **Parameters** tab (shown here in the top half of the image) to move the selected limb. Please refer to Chapter 14: "The Scene Tab" on page 79 for more information about the **Scene** tab and Chapter 13: "The Parameters Tab" on page 73 for more information about the **Parameters** tab.



TIP

The **Scene** tab is hidden by default. To view it, select **Windows>Scene** to open the **Scene** tab in a floating window. To dock the **Scene** tab next to the **Parameters** tab, click the grab handle in the top left corner of the floating pane and drag it on top of the **Parameters** palette.

After selecting the body part, you can move it using the available **Parameter** sliders for the selected part. To pose using the **Parameters** tab, select the parameter you wish to modify. There are several ways to modify parameters:

- Sliders: You can click and drag the dark portion of your desired slider to make direct changes. You can also click anywhere on the slider to instantly change the value based on the cursor location.

- Arrows: You can click the arrows at either end of any slider to make finer changes.
- Direct Entry: Each slider displays a numeric value that corresponds to the parameter's current setting. Right-clicking ([CTRL]+click on Macintosh) the numeric value allows you to input your desired value.

Many artists use preset poses and/or direct manipulation methods to get their figures into their general positions followed by the **Parameter** sliders to fine-tune the results.

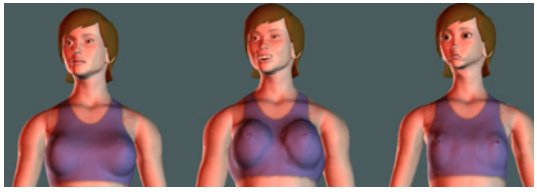
Step Five: Morph Targets

A *morph target* is a deformation that can be applied to a figure, part of a figure, or a prop. Morph targets vary by specific figure, body part, or prop. In general, a morph target affects an object's shape without affecting its position. For example, you could add a morph target that gives your figure the appearance of bulging muscles- or a bulging beer belly!

From a technical standpoint, a morph target is itself a separate mesh object. For example, if you are creating a smile morph, you take the desired figure's face into a 3D modeling application and alter it to get the appearance you want. You then save this separate mesh object as a morph target. Then, in DAZ|Studio, you can apply the morph target to your figure. DAZ|Studio *interpolates* between the base mesh and the morph target to arrive at the correct results. For example, if you set your smile morph to 50%, DAZ|Studio will apply half of the difference between the base face and the morphed face. You can apply a limitless amount of morph targets to any object, and DAZ|Studio will interpolate them all.

DAZ's Michael 3.0 and Victoria 3.0 figures each have hundreds of morph targets that allow you to create almost any appearance you can imagine. Please refer to "Parameters vs. Morph Targets" on page 73 for more information about morph targets. Morph targets appear on the **Parameters** tab (described in Chapter 13: "The Parameters Tab" on page 73). Even the reduced resolution versions of Michael and Victoria included with DAZ|Studio have enough morph targets to allow significant customization. For example, there are dozens of morph targets available for customizing the head.

Here are a few examples of morph targets. Notice how different each image looks. All of this was accomplished using the same figure. The only changes made were adjusting morph targets.



Try adjusting one of these morph targets in the same manner we just described for posing using the **Parameter** sliders. Try them one at a time, at first. A value of 100% means that the selected morph target is fully "on", while a value of 0% signifies fully "off". Negative values give the opposite effect. For example, setting a smile morph to -100% will create a pretty mean scowl. Values beyond +/-100% will exaggerate the morph. You can set morphs to any number you like, provided the value falls within the predefined limits. The examples

shown above employ some exaggerated settings to give you an idea of what morphs can do. The best results, however, usually occur with subtle settings.

You can use morphs singly or in any combination you like. For example, you could set the **Smile** morph to 50% and the **Blink** morph to 100% to give your figure a slight smile with closed eyes.

Go ahead, play around with the posing. Michael, Victoria, and the other figures will never flinch, lose their balance, get hurt- or talk back.

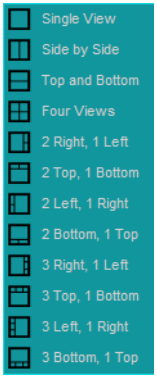
Step Six: Cameras

Finally, let's check out the cameras a bit more. If you haven't already done so, select one of the multiple viewport layouts using the **Views** menu. One of these views will be a perspective view, meaning that the view behaves just like real life where objects appear to get smaller with distance. Please see "Orthogonal and Perspective Views" on page 132 for more information about *perspective* versus *orthogonal* views. You can spot the perspective views pretty easily because they usually look like they are seeing the scene on an angle instead of directly. The left part of the following image shows a perspective view; the one on the right is orthogonal.

DAZ|Studio allows you to view your scene from up to four cameras at once. Try that in any real-world photo studio! To change the viewport layout, click **Views** in the menu bar, then select your desired layout. For this tutorial, please select **Four Views** (the fourth option from the top).

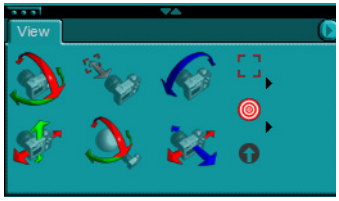
Now we can move the figure in all three dimensions (side to side, up and down, and front to back) at once. See Section 6: "About 3D" on page 129 for more information about 3D space.

While you can view your scene from multiple cameras at once, you can only work within one viewport at a time. To select which viewport to work in, click the bar on top of your desired viewport. In the above example, to switch to the **Front** camera, click the bar to the right of the label above the **Front** camera.

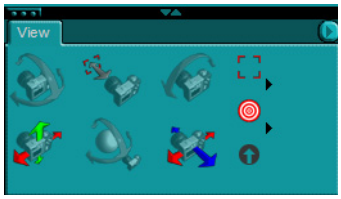


Cameras and viewport layouts are independent, meaning that you can select a desired viewport layout and then assign any camera to any viewport. To change the camera in a viewport, click the **Select Camera** button and select your desired camera using the drop-down menu. By default, DAZ|Studio has seven views: **Perspective**, **Left**, **Right**, **Up**, **Down**, **Front**, and **Back**.

Now that you have your viewports set up and have assigned a view to each viewport, let's play with the views/cameras a little. The **View** tab allows you to control views/cameras.



If you have the **Perspective** view/camera selected, the **View** tab appears as shown at right. Click and drag any of the six controls on the left side of the tab and notice how your view/camera moves. You can move the view/camera side to side, up and down, near and far, and can also rotate the view/camera in all three *axes*. Please refer to Section 6: "About 3D" on page 129 for more information about axes, and to Chapter 11: "View Tab (Cameras)" on page 65 for more information about the **View** tab.



Now select one of the orthogonal views/cameras (**Left**, **Right**, **Top**, **Bottom**, **Front**, or **Back**) in any viewport. Notice how some of the controls in the **View** tab gray out? This is because orthogonal views/cameras can only view the scene straight on. You can move orthogonal views/cameras but cannot rotate them.

Now let's add a camera. Click the **New Camera** button in the **Quick Access** toolbar (or use the **Create** menu) and enter a name or the new camera in the **Camera Name** dialog box that appears. Your new camera will appear in the **Scene** tab and in the **Select Camera** drop-down menu above each viewport. When selected, you can alter your camera's parameters in the **Parameters** tab (see "The Parameters Tab" on page 73). Try selecting your new camera and checking and clearing the **Perspective** checkbox in the **Parameters** tab. Experiment with the other available parameters.

In Conclusion

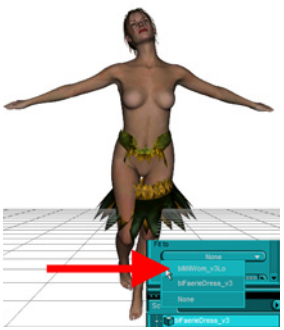
In this tutorial, we covered loading a figure, adding lights and hair, posing and modifying the figure, using multiple viewports, and moving the cameras. These are the basic functions you'll use to modify scenes. Next, we'll discuss advanced topics, including materials and rendering. Remember that these tutorials are a fast overview of working with DAZ|Studio. For more information on the concepts behind what we just covered, please refer to Section 6: "About 3D" on page 129. And, for detailed information on how to use the tools we described, please refer to Section 3: "Reference" on page 41.

Chapter 5: Using Figure-Based Clothing

Some figures come dressed, while most come nude. The advantage of dressed figures is that you can always be certain that the clothes will fit properly. The drawback is that the clothes are part of the model itself, meaning that you cannot place a different outfit on that figure. This significant limitation is the largest reason for using nude figures, which you can dress using any clothing available for that figure.

Clothing items are props that can *follow* (or *fit*) your figure, meaning that they can both take your figure's shape and position, and follow the figure as it moves. Like figures, fitted clothing items each contain bones that match those of the figure they are designed to conform to. Because of this, clothing items are designed to work with specific figures. It is possible to use any clothing item with any figure, however obtaining optimal results requires making numerous advanced adjustments. Please see "Applying Clothing" on page 87 for more information on working with conforming clothing.

OK, let's experiment with some fitting clothing.



1. Begin by loading Victoria followed by the clothing. If you are using the default **Faerie** content that shipped with DAZ|Studio, you may select any item you like from the **Clothing>Faerie Outfit** folder in the **Content** tab. The images in this tutorial use the **Dress** clothing. Please see "Step One: Add A Figure" on page 24 for a tutorial on loading content into DAZ|Studio and Chapter 12: "The Content Tab" on page 69 for detailed information on using the **Content** tab. The clothing appears near the figure but does not cover her body.
2. Select the **bIFaerieDress_v3** entry in the **Scene** tab.
3. In the **Parameters** tab, locate the **Fit** drop-down menu. Click the menu, then select the **bIMilWom_v3Lo** figure to fit the clothing to Victoria.

The clothing item adjusts to fit your figure. It's that easy!

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Chapter 6: Surfaces

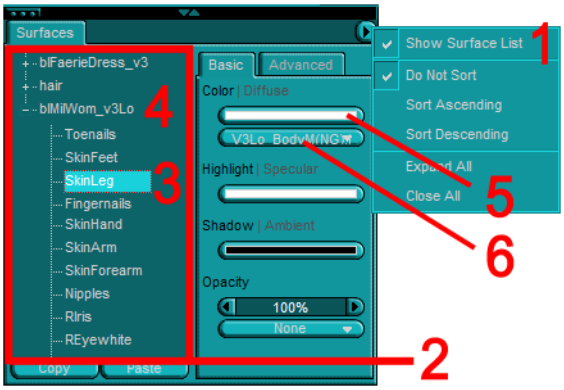
Now let's have some fun with surfaces and the **Surfaces** tab. For a detailed technical explanation of what's happening behind the scenes, please see Chapter 25: "About Materials" on page 144. In the meantime, let's have some fun with surfaces in DAZ|Studio. We'll be using the **Faerie** content that ships with DAZ|Studio. The concepts we'll explore will work equally well with any content you have or will have inside DAZ|Studio.

A Little Terminology

Before we get started, we need to define a few words to help avoid any confusion:

- Object: Figures, props, lights, cameras, etc.
- Surface: A portion of a figure or prop that has been given a unique material ID. See "Multi/Sub-Object Materials" on page 144 for more information. One object can have many surfaces.
- Material: The settings applied to a surface to make it look like a particular material such as wood, plastic, glass, granite, etc.

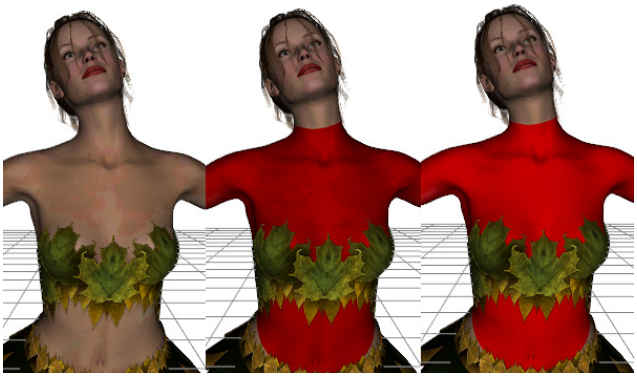
Getting Around



Let's start by learning a little more about the **Surfaces** tab. We'll begin by selecting **Windows>Surfaces** to open the **Surfaces** tab, which appears in a floating pane. Leave it as a floating window or dock it by clicking and dragging the grab handle at the top left corner as described in "Customizing Your DAZ|Studio Experience" on page 44. Then open the **Surface Options** menu by clicking the arrow in the top right corner and check the **Show Surfaces Tree** option (#1 in the image) to open the **Surfaces Tree** (#2 in the image), which displays every surface in every object in your scene. Select **SkinLeg** under **blMilWom_v3Lo** in the **Surfaces Tree** (#3 and #4 in the image, respectively). Notice that nothing appears in the **Surfaces** tab until you select a surface. When you select a surface, its settings appear in the **Basic** and **Advanced** sub-tabs. Try selecting some other surfaces and watch as the information in these tabs changes with each new selection. Once you've seen how this works, come back to the **blMilWom_v3Lo>SkinLegs** surface and we'll move on. Be sure you have the **Basic** sub-tab selected. We'll move on to the **Advanced** tab a little later.

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Diffuse Color



In the previous example, you selected the **SkinLeg** surface. For this example, select the **SkinTorso** surface. With the surface selected, click the **Diffuse Color** button (#5 in the image on the preceding page) to open a standard Color Picker and select any color you like (such as red). Victoria's torso will turn the color you selected. But notice how dull the color looks. This is because the color is being *multiplied* through the *texture map* that has been applied to that surface. As described in "Texture Maps" on page 117 and "What are Maps?" on page 146, a texture map is an image that is designed to wrap around the selected object so you can add details such as moles, hairs, veins, scars, birthmarks, tattoos, etc. with precise control over location, size, etc. Multiplication means that DAZ|Studio combines the underlying color (the red, in this example) with the colors specified by the texture map to get the final color. To see this effect more clearly, click the **Select Map** button (#6 in the image on the preceding page) and select **None**. The image shows the default Victoria and the red color with and without the texture map.

Fun With Maps

To restore the figure's default appearance, reset the color to white using the **Diffuse Color** button, then replace the texture map using the **Select Map** menu, The image you want is **V3Lo_BodyM(NG).jpg**. But while we're at it, try selecting a different image such as **FaerieDressTr02.jpg** and see what happens. This image was designed for the figure's dress and therefore doesn't look right when applied to the figure itself. This is because maps designed for a particular object are keyed to that object's *U/V coordinates*, which are the equivalent of latitude and longitude for an object.

This example shows you that you can use any image you like for any type of map, but the results might be unexpected. For example, you could wrap a picture of a flower around a globe of the Earth and it might look nice but will be meaningless with respect to continents, oceans, cities, etc. Likewise, you could wrap a map of any planet around the globe but could not expect the mountains, borders, etc. to be in the correct locations for the Earth. This same basic concept applies to 3D objects as well. For a much more technical description, please refer to "What are Maps?" on page 146.

Try selecting different images. You can even select **Browse for Image** in the **Select Map** menu and load in any picture you like. When you're finished, restore the default image and color as described above.

Highlights

Let's now see what highlight or *specular* color does. To do this, click the **Specular Color** button and select any color you like (such as red). If you reset the figure to its default appearance as described above, you'll notice that Victoria now has a red sheen on portions of her torso. Specularity defines a surface's highlights such as the bright white spot you might see when sunlight strikes stainless steel. Other materials (such as slightly damp skin) will show a faint sheen, such as the red visible on the chest in the image. Both are examples of specularity.

Once you've finished looking at the effect of specularity, reset the specular color to default (black).

Opacity

Opacity defines how much light passes through a surface. Glass is transparent, while wood is opaque. Many materials (such as stained glass) have limited opacity. For this tutorial, make sure you have the **Perspective** view selected (see "Adding, Selecting, & Deleting Cameras" on page 65) and use the **Orbit** and **Zoom** controls (see "The View Tab" on page 66) to zoom in closer to the man and put the column on his left directly behind him as shown here. After that, right-click the **Opacity** slider and enter `25`, then press [ENTER]. You can now see right through Victoria's body. Render the image to get the best effect by selecting **Render>Render**. We've changed the background color in this image to show off the transparency effect.

So far so good. Now let's see what happens when we start playing with some more advanced functions. Just for fun, select the **Advanced** sub-tab. Add the **UpDoTr.jpg** image to the **Opacity Strength** channel by clicking the small arrow to the right of the slider, then set the opacity to 100% and render the image. This gives you a quick glance at how maps can do far more than just add color. For a more advanced sample of *transparency maps*, see the image in "Opacity Maps" on page 119.

Bump & Displacement

From here on out, we'll be using the **Advanced** sub-tab. Let's see what happens when we apply a bump map (see "Bump (Strength)" on page 149 for a technical description of bump maps). To access the **Select Map** menu, click the small arrow to the right of the **Bump Strength** slider. For this example, we're using the **UpDoTr.jpg** image. We'll also exaggerate the amount of bump to make it readily apparent. To do this, right-click the number in the **Bump Strength** slider, enter 200, then press [ENTER]. Go ahead and render your image. You can render the entire image, or you can render just Victoria's upper body using the **Spot Render** tool (described in "Spot Render" on page 64). The image shows the result of adding bump. Imagine the results if you used a custom bump map to show veins, moles, etc.

Take a close look at the figure. Note that her chest and arms appear rough while the edges of her body appear smooth. This occurs when using bump because this channel only affects a surface's *normals* without affecting the polygons (geometry) underneath. So how do you make the edges reflect the roughness? Let's find out. Begin by setting the bump strength to 0% to disable the bump. Next, repeat this tutorial- except use the **Displacement Strength** slider. Render the image and notice the difference. As you can see, displacement alters the surface's geometry. Please see "What are Maps?" on page 146, "Bump (Strength)" on page 149, and "Displacement (Strength)" on page 149 for more detailed technical information on what's happening behind the scenes.

Reflection

Let's give Victoria a mirror finish. To do this, set the **Reflection Color** to white and the **Reflection Strength** slider to 100%, render the scene, and see what happens. You can use *reflection maps* to specify areas of varying reflectivity. You can use this effect to do various things such as simulating a peeling mirror, rusted metal, etc. Here's an example that uses the Michael 3 figure and the Egyptian scene, available from the DAZ online store. The man's chest has a reflection strength of100% and render with no map. Notice that his chest appears made of curved glass. This is because the chest is curved. Remember, figures and props in DAZ|Studio are fully three-dimensional. You'll also notice more than one reflection, which is caused by both the objects in front of the man and the several lights used in the scene.

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Refraction

Refraction is when light rays bend while passing through objects of different density. One simple example of refraction is standing in water looking down at fish. Thanks to refraction, the fish appear to be in a different location than they actually are. You can see an example of this by doing the following:

1. Remove all maps by setting any maps you may have to **None** as described above in "Applying Maps" on page 127.
2. Set the **Diffuse Strength**, **Glossiness**, **Specular Strength**, **Ambient Strength**, **Opacity Strength**, **Bump Strength**, **Displacement Strength**, and **Reflection Strength** sliders to 0%.
3. Set the **Refraction Color** to white.
4. Set the **Refraction Strength** slider to 100%.
5. Set the **Refraction Index** slider to 1.33.

TIP

This example also uses the Egyptian scene, available from the DAZ online store. To see this effect with the default Faerie scene included with your copy of DAZ|Studio, try selecting **File>New** and loading the **Fairie Forest DAY** scene by selecting **DAZ>Scenes>Faerie Forest>Faerie Forest DAY** in the **Content** tab, then using the settings described above.

Render your scene and check out the results. Why does the whole chest look distorted? Remember that there are multiple lights and that the light is bending twice since it is passing through both the back and front of the body. And don't forget that the body is curved, which adds to the distortion.

Multiple Selection, Cutting, & Pasting

Looking at the **Surfaces Tree** and the **Basic** and **Advanced** sub-tabs, you're probably thinking that applying materials to even a moderately complex scene like the Faerie Forest DAY default will take a long time. Don't worry; DAZ|Studio includes a few features that can greatly speed up the materials process. These include:

- Copying and pasting material settings. Select a surface and click the **Copy** button at the bottom of the **Surfaces Tree**. Then select any other surface and click **Paste**. The materials from the former surface are instantly applied to the new surface.

- Hold down [CTRL] to select multiple surfaces, or [SHIFT] to select a range of surfaces. Any changes you make in both the **Basic** and **Advanced** sub-tabs will be applied to all selected surfaces.

Please refer to Chapter 22: “Basic Surface Properties” on page 117 and Chapter 23: “Advanced Surface Properties” on page 120 for more information about these features. Then go ahead and experiment. DAZ|Studio makes it easy for anyone to quickly and easily create stunning 3D art.

Putting It All Together

With its powerful raytracing render engine and many surface channels, DAZ|Studio lets you create truly breathtaking results like the image shown below, which was created by Catharina Harders-Przezak.

Reference

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Chapter 7: The Interface

This chapter explains the DAZ|Studio interface and shows you how to customize DAZ|Studio for your specific needs. Once you are familiar with how the interface works, subsequent chapters will explain DAZ|Studio functionality in a lot more detail.

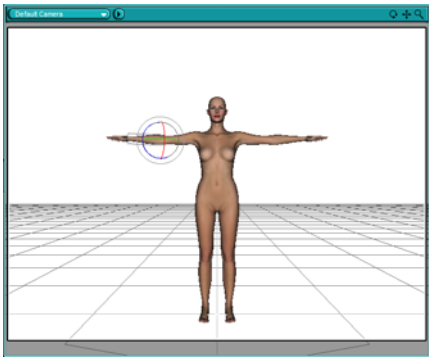
Menu Bar

The menu bar appears at the top left of the DAZ|Studio workspace. Clicking any menu item opens a drop-down menu with additional options. For example, clicking **File** or pressing [ALT]+[F] opens the **File** menu. The menu bar contains the following menus:

- File: Accesses file-related functions. Please refer to "File Menu" on page 46 for more information about this menu
- Edit: Accesses clipboard functions and application preferences. Please refer to "Edit Menu" on page 47 for more information about this menu
- Render: Accesses rendering options. Please refer to "Render Menu" on page 53 for more information about this menu
- Views: Accesses viewport layout options. Please refer to Chapter 9: "Working with Viewports" on page 57 for more information about viewports and viewport layouts.
- Create: Allows you to create cameras and lights. Please refer to "Create Menu" on page 54 for more information about this menu.
- Windows: Toggles tabs on and off. Please refer to "Create Menu" on page 54 for more information about this menu
- Help: Accesses DAZ|Studio help and copyright information. Please refer to "Help Menu" on page 55 for more information about this menu.

3D Viewports

In DAZ|Studio, *viewports* are your window to the virtual universe inside your computer. They emulate the view through a *camera*, In other words, whenever you look at your scene, you are looking at it through a virtual camera. By default, DAZ|Studio loads with one viewport. You may, however, view your scene using up to four viewports at once. In addition, DAZ|Studio gives you control over several viewport properties such as size, location, and selected camera. Please see Chapter 9: "Working with Viewports" on page 57 for more information on working with viewports.

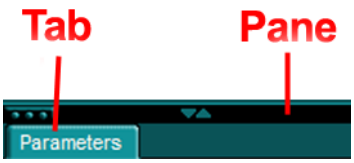


Panes

Aside from the viewports, the main DAZ|Studio interface consists of several *panes* that are used to contain *tabs*. You can show, hide, and resize panes.

Tabs

As previously mentioned, *tabs* reside within panes and contain most of the functions that you'll use while working with DAZ|Studio. The tabs are:



- View: The **View** tab contains the controls that allow you to position and aim the active camera as desired. Please refer to Chapter 11: "View Tab (Cameras)" on page 65 for more information about using cameras.
- Content: The **Content** tab is where your virtual warehouse, where you can access figures, props, textures, poses, clothing, hair, and more for use in your scene. You will be able to access DAZ|Studio-native content and, if present on your hard drive, may also be able to access content libraries for supported legacy applications. Please refer to Chapter 12: "The Content Tab" on page 69 for more information on using content within DAZ|Studio.
- Scene: The **Scene** tab displays a hierarchical view of every item in your scene. This allows you to view the object type and parent/child relationships between objects and components within objects (such as body parts). This can be a huge help when working with complex scenes. Please refer to Chapter 14: "The Scene Tab" on page 79 for more information on using the **Scene** tab.
- Surfaces: The **Surfaces** tab is where you control how each surface in your scene looks including color, bump, etc. Please refer to Section 5: "Surfaces" on page 113 for more information on working with surfaces.

- Parameters: The **Parameters** tab gives you fine control over your scene. Fine-tune poses, locations, scale, and more. This is also where you can access and use morph targets. Please refer to Chapter 13: “The Parameters Tab” on page 73 for more information on using the **Parameters** tab.

Scroll Bars

In some cases, there can be too much information to fit within a tab. Information may overflow horizontally and/or vertically. If this happens, a horizontal and/or vertical scroll bar will appear, as appropriate. Scroll bars allow you to quickly navigate large amounts of information. To use a scroll bar, click and drag it in your desired direction. Release the bar when your desired information comes into view.

Each scroll bar has arrows at either end. Clicking one of these arrows nudges the scroll bar a small amount in the desired direction.

In any tab with a list or tree view, you can use the navigation keys on your keyboard. To do this, first select an item in the tab by clicking it, then use the keys as follows:

- Pressing [PG UP] scrolls up one page.
- Pressing [PG DN] scrolls down one page.
- Pressing [UP ARROW] scrolls up one item in the current list.
- Pressing [DN ARROW] scrolls down one item in the current list.
- Pressing [RIGHT ARROW] expands one level in the current list. If the level is already expanded, it will step down to the next level in the list.
- Pressing [LEFT ARROW] collapses one level in the current list. If the level is already collapsed, it will step up to the previous level in the list.

Customizing Your DAZ|Studio Experience

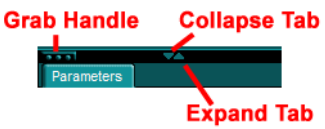
DAZ|Studio gives you a degree of control over the interface, allowing you to customize it to your specific uses and needs.

Custom Layouts

You can customize the interface by moving and resizing panes, moving tabs, and using multiple monitors.

Moving/Sizing/Hiding Panes

To move a pane, click the grab handle at the top of your desired pane and drag it to its new location. You have the following options:



- Dropping a pane inside the main DAZ|Studio screen on either side of the viewports *docks* it (places the pane in the closest possible location to where you dropped it, based on the locations of other panes).

- Dropping a pane on top of the viewports creates a *floating* (detached) window where you dropped it.
- Dropping a pane beyond the edge of the main DAZ|Studio screen creates a floating window at the drop location. This feature works on both single and multiple monitor systems.
- Dragging a floating window back into the main screen re-docks the pane where you dropped it, provided you drop the pane on either side (or above/below) of the viewports.
- Double-clicking the bar at the top of a tab while docked undocks the current tab to a free-floating window that you can place anywhere on any monitor on your system.
- Double-clicking the bar at the top of a free-floating window (undocked tab) re-docks the window as a tab in its previous position and size.

To size a pane, position the cursor at any edge of the pane you wish to resize. The cursor will change to a pair of arrows indicating the direction(s) in which you can resize the pane.

- To adjust a pane's width, place the cursor at either the left or side edge of the pane.
- To adjust a pane's height, place the cursor at either the top or bottom of the pane.
- To adjust height and width simultaneously, place the cursor at any corner of the pane. This only works with floating windows.

To hide a pane, toggle it off using the **Windows** menu. To show hidden panes, use the **Windows** menu, as described in "Create Menu" on page 54.

To collapse a tab, click the down arrow at the top of the desired tab, as shown in the image on the previous page. To expand a tab, click the up arrow at the top of the desired tab, as shown in the image on the previous page.

Moving Tabs

You can move tabs to any pane by clicking the tab and dragging it to your desired pane. After dragging, the pane will show the moved tab and any other tabs in the same pane.

Multiple Monitors

As mentioned above, DAZ|Studio supports multiple monitors. Simply click and drag your desired pane(s) to any available monitor.

RESTORING DEFAULTS

To restore the default DAZ|Studio interface, delete the **StartupScript.ds** file located in the installation directory.

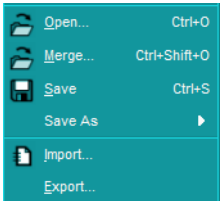
CUTTING/COPYING/PASTING

Right-clicking a text field within DAZ|Studio opens a menu that allows you to cut, copy, and paste text. This is a standard operating system function.

Chapter 8: The Menu Bar

The menu bar allows you to access various DAZ|Studio functions. These functions are either used less often or are redundant and are placed in the menu bar to avoid cluttering the interface. Clicking any menu item opens a drop-down menu with additional options. For example, clicking **File** or pressing [ALT]+[F] opens the **File** menu. The menu bar contains six menus, described below in this chapter.

File Menu



The **File** menu is where you access file-related functions. To access this menu, either click **File** or press [ALT]+[F].

NEW

Selecting **File>New** or pressing [CTRL]+[N] closes your current DAZ|Studio scene file and opens a new blank scene. You are prompted to save any unsaved changes.

CAUTION
IF YOU OPEN A NEW SCENE WITHOUT SAVING YOUR CURRENT SCENE, ALL UNSAVED CHANGES WILL BE LOST.

OPEN

Selecting **File>Open** or pressing [CTRL]+[O] allows you to select a previously saved scene to work on. A standard **Open File** dialog box appears, allowing you to navigate to the folder containing your desired file and select it for opening.

SAVE

Selecting **File>Save** or pressing [CTRL]+[S] saves your current scene. If you have not yet saved this scene, a standard **Save File** dialog appears, allowing you to select both the folder where you want to save your scene and the filename.

SAVE AS

Selecting **File>Save As** or pressing [CTRL]+[SHIFT]+[S] allows you to save your current scene contents to a different filename. This allows you to save multiple versions of the same scene so that you can easily return to a previous version. A standard **Save As** dialog appears, allowing you to select your desired folder and filename.

IMPORT

Selecting **File>Import** allows you to add content saved in different formats. A standard **Browse** dialog appears, allowing you to locate and select your desired content. The currently supported import formats are:

- Curious Labs Poser 4 and previous: PZ3, PZ2, CR2, CM2, LT2, HD2, FC2,HR2. DAZ|Studio also imports the compressed versions of these files (.PZZ, CMZ, etc.).
- OBJ

EXPORT

Selecting **File>Export** allows you to save content to different formats. A standard **Save As** dialog appears, allowing you to select your desired folder and filename. The currently supported export formats are:

- OBJ

PREFERENCES (MACINTOSH ONLY)

On Macintosh systems, selecting **File>Preferences** opens the **Preferences** window, which is described in "Preferences" on page 49.

TIP
On Windows systems, the **Preferences** window appears under the **Edit** menu

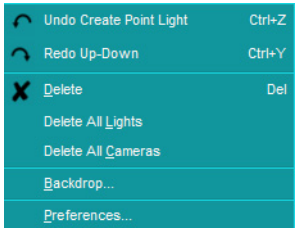
EXIT

Selecting **File>Quit** or pressing [ALT]+[F4] (Windows) or pressing [CTRL]+[Q] (any platform) exits the DAZ|Studio application. You are prompted to save any unsaved changes.

CAUTION
IF YOU EXIT DAZ|STUDIO WITHOUT SAVING YOUR CURRENT SCENE, YOU WILL LOSE ALL UNSAVED CHANGES.

EDIT MENU

The **Edit** menu allows you to perform standard editing functions and to set global DAZ|Studio preferences. To access this menu, either click **Edit** or press [ALT]+[E].



UNDO LAST ACTION

Selecting **Edit>Undo** or pressing [CTRL]+[Z] reverses the last action you took. DAZ|Studio supports multiple undos, meaning that you can delete many prior actions. Undo functionality extends to actions performed during the current session. In other words, if you create a scene, save it, then close it, you will not be able to

undo your previous actions when you reopen the file. Actions are reversed in the order you performed them, meaning that your most recent action is reversed first, and so forth.

REDO LAST ACTION

Selecting **Edit>Redo** or pressing [CTRL]+[Y] reinstates previously deleted actions. DAZ|Studio supports multiple redos, meaning that you can repeat many prior actions. Redo functionality extends to actions performed during the current session. In other words, if you create a scene, save it, then close it, you will not be able to redo your previous actions when you reopen the file. Actions are reinstated in order, meaning that the most recently reversed action is reinstated first, and so forth.

DELETE

Selecting one or more objects, then either selecting **Edit>Delete** or pressing [DEL] deletes the object.

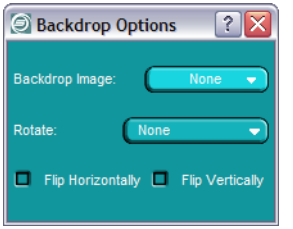
DELETE ALL LIGHTS

If you have added one or more lights to your scene, selecting **Edit>Delete All Lights** will delete all of the lights in your scene. To delete an individual light, select the light you wish to delete and either select **Edit>Delete** or press [DEL].

DELETE ALL CAMERAS

If you have added one or more cameras to your scene, selecting **Edit>Delete All Cameras** will delete all of the cameras in your scene. To delete an individual camera, select the camera you wish to delete in the **Scene** tab (see "Selecting Objects" on page 80), then either select **Edit>Delete** or press [DEL].

BACKDROP



Selecting **Edit>Backdrop** opens the **Backdrop Preferences** window, which allows you to place images as backdrops into your scene. This window has the following options:

- Backdrop Image: The **Backdrop** Image pull-down menu allows you to use any listed pre-loaded image for your scene backdrop. To load an image, select **Browse for image** to open a standard **Browse** dialog allowing you to navigate to your desired image. To use a pre-loaded image, select your desired image. Once selected, the image appears in your scene background.
- Rotate: The **Rotate** menu allows you to rotate the selected backdrop image clockwise, counterclockwise, or 180 degrees.
- Flip Horizontally: Checking the **Flip Horizontally** checkbox reverses the current backdrop image, making it appear backward.
- Flip Vertically: Checking the **Flip Vertically** checkbox reverses the current backdrop image, making it appear upside-down.

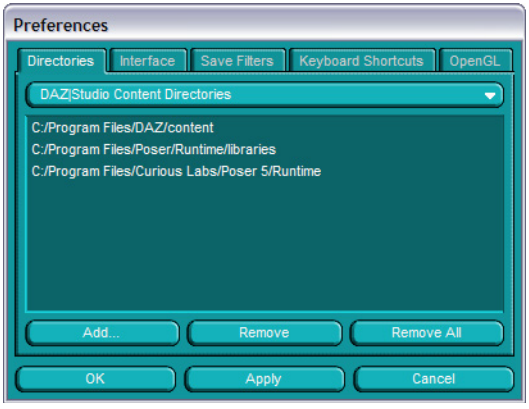
PREFERENCES

Selecting **Edit>Preferences** opens the **Preferences** window, which allows you to specify content directories and interface preferences. Once you have made your changes, you have the following options:

- To implement your changes and exit the **Preferences** window, click the **OK** button at the bottom of the window.
- To implement your changes without exiting the **Preferences** window, click the **Apply** button at the bottom of the window.
- To discard your changes and exit the **Preferences** window, click the **Cancel** button at the bottom of the window.

TIP
On Macintosh systems, the **Preferences** window appears under the **File** menu.

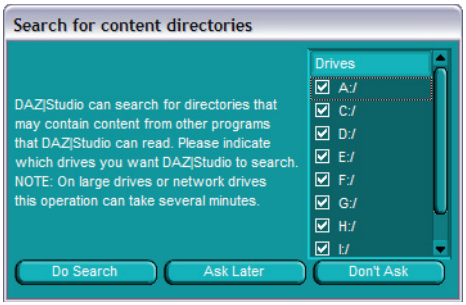
Content Directories



Clicking the **Directories** tab in the **Preferences** window allows you to work with your available content directories. To work with content, begin by using the **Content Category** drop down menu at the top of the window to select which folder category you wish to work with. Your available options are:

- Native Content: Selecting **DAZ|Studio Content Directories** lists the currently available folders containing native DAZ|Studio (*.daz) content.
- Poser Content: Selecting **Poser Content Directories** lists the currently available folders containing Poser® content. DAZ|Studio recognizes all Poser **Runtime** folders and supports all Poser file formats through Poser 4. If you have Poser 5 or later, DAZ|Studio will include those **Runtime** folders in its list. DAZ|Studio does not support any Poser 5-specific file formats or functionality.
- Other Content: Selecting **Other Imported Content Directories** lists the currently available content folders that do not fall into the above categories. For example, you can create folders to organize both DAZ|Studio and supported third-party content on any available drive.

- Search: The **Search** button appears when you have **Poser** Content **Directories** selected in the Content **Category** menu. Clicking this button opens the **Search for content directories** window, which allows you to specify the drive(s) to scan for Poser content directories. Checking a box next to a drive letter includes that drive in the scan and vice-versa. To perform the search immediately, click **Do Search**. To perform the search later, select **Ask Late**r. To cancel without searching, click **Don't Ask**.



Once you have selected your desired content folder category, you can perform the following operations:

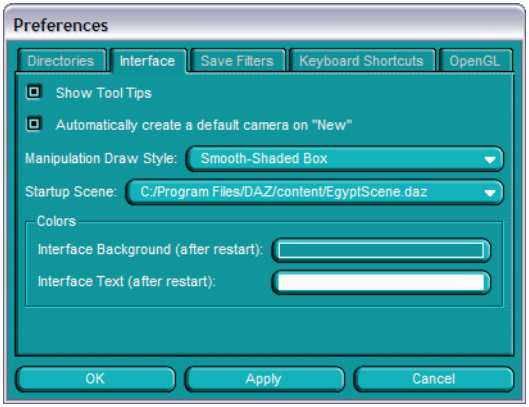
- Add Folder: Clicking the **Add...** button opens a standard **Browse** dialog, which allows you to select your desired folder. When mapping Poser content, you should select the folder above the **Runtime** folder. For example, for the path **X:\My Poser Stuff\Projects\Runtime**, you would select and map the **Projects** folder to make the content within it available inside DAZ|Studio.
- Remove Folder: Selecting a folder and clicking **Remove** removes the selected folder from the list of available content folders. You may re-add this folder at any time by using the **Add...** button. Removing a folder from the DAZ|Studio list does not affect the actual folder or its data.
- Remove All Folders: Clicking **Remove All Folders** removes all folders currently listed in the selected content category. Removing a folder from the DAZ|Studio list does not affect the actual folder or its data.

TIP

Adding and removing folders only affects DAZ|Studio's internal database of available content. These operations have no effect on your actual folders or files. Removing a folder does not delete it from your hard drive.

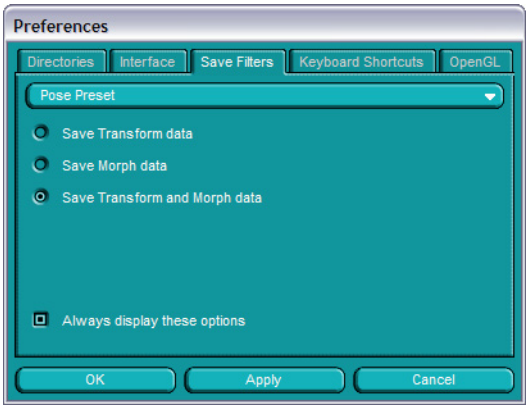
Interface Preferences

Clicking the **Interface** tab in the **Preferences** window allows you to set the following interface preferences:



- Tool Tips: Checking the **Show Tool Tips** checkbox displays information about the tool under your mouse cursor. To view this information, position your cursor above the tool you wish to see information when you place the cursor above them. Clearing this checkbox hides tool tips.
- Automatic New Camera: Checking the **Automatically create default a camera on "New"** checkbox creates a default camera whenever you begin working on a new scene (such as by selecting **File>New**).
- Manipulation Draw Style: The **Manipulation Draw Style** option allows you to conserve computing resources by displaying scene elements in reduced detail whenever you are manipulating (posing or moving) an object. Your available options are:
  - Off: Objects in the scene appear normal at all times. This option consumes the most computer resources.
  - Wireframe Box: Objects appear as wireframes while being manipulated, normal otherwise. This option consumes the least computer resources.
  - Smooth-Shaded Box: Objects appear as smooth boxes while being manipulated, normal otherwise.
- Startup Scene: You can specify a default scene that will load each time you launch DAZ|Studio. To do this, select a scene using the **Startup Scene** drop-down menu. Selecting **Browse for Scene** at the bottom of the list opens a standard **Open** dialog allowing you to navigate to your desired DAZ|Studio-native (.DAZ) scene.
- Colors: DAZ|Studio lets you control the general interface and text colors:
  - Interface Background: Clicking the colored box opens a standard Color Picker that allows you to set the DAZ|Studio interface color. You must exit and restart DAZ|Studio for your changes to take effect.
  - Interface Text: Clicking the colored box opens a standard Color Picker that allows you to set the DAZ|Studio text color. You must exit and restart DAZ|Studio for your changes to take effect.

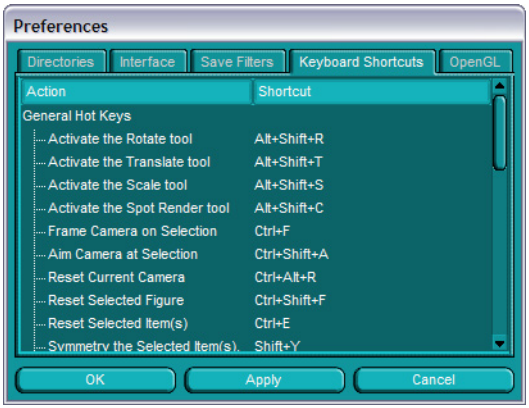
Save Filters



The **Save Filters** tab lets you specify the information you want included when saving content (presets) into the DAZ|Studio Library. Use the pull-down menu to select Pose Preset, Light Preset(s), or Camera(s) Preset. The available choices for each option are:

- Pose Presets: Check the appropriate radio button to indicate whether you want to **Save Transform data** (scale, translation, rotation), **Save Morph Data** (deformations), or both (**Save Transformation and Morph data**).
- Light(s) Presets: Check the appropriate radio button to indicate if your light presets should **Save All Lights** (include all lights in the current scene in the saved preset) or **Save Selected Lights** (only include lights selected at the time you save the preset).
- Camera(s) Presets: Check the appropriate radio button to indicate if your camera presets should **Save All Cameras** (include all cameras in the current scene in the saved preset) or **Save Selected Cameras** (only include cameras selected at the time you save the preset).

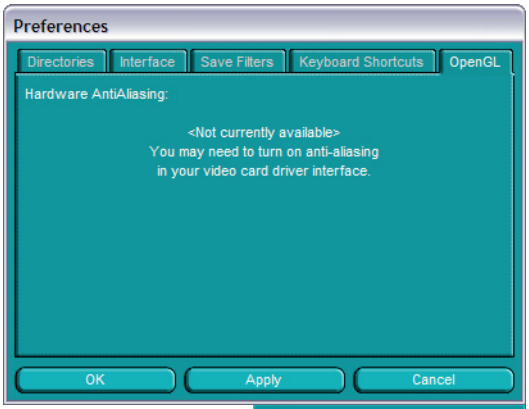
Keyboard Shortcuts



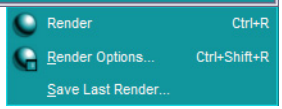
The **Keyboard Shortcuts** tab displays a comprehensive list of all of the keyboard shortcuts available within DAZ|Studio.

OpenGL Preferences

The **OpenGL Preferences** tab TBD



Render Menu



The **Render** menu allows you to *render* (take virtual photographs of) your scene and specify render settings (akin to adjusting a camera prior to taking a picture). To access this menu, either click **Render** or press [ALT]+[R].

RENDER

Selecting **Render>Render** or pressing [CTRL]+[R] renders your current scene from the currently selected camera's vantage point using all lights, surfaces, and objects in your scene.

RENDER OPTIONS

Selecting **Render>Render Options** or pressing [CTRL]+[ALT]+[R] opens the **Render Options** window. Please refer to Section 4: "Rendering" on page 105 for more information about this window.

SAVE LAST RENDER

Selecting **Render>Save Last Render** or pressing [CTRL]+[SHIFT]+[R] saves your last rendered image as a file on your hard drive. A standard **Browse** dialog appears, allowing you to select a filename and folder for your saved image.

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

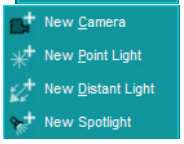
Views Menu

The **Views** menu allows you to select your desired viewport layout. DAZ|Studio allows you to view your scene using up to four viewports at once. To access this menu, either click **Views** or press [ALT]+[V]. Once you have opened this menu, you will see a list of available viewport layout options. Click your desired selection and the viewport layout will immediately change accordingly.

Please see Chapter 9: “Working with Viewports” on page 57 for more information about working with viewports.

Create Menu

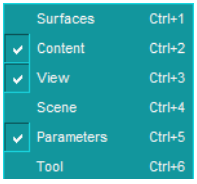
The Create menu allows you to create cameras and lights. Your available options are:



- New Camera: Selecting **Create>New Camera** allows you to create a new camera in your scene. Please see “Adding, Selecting, & Deleting Cameras” on page 65 for more information about cameras.
- New Point Light: Selecting **Create>New Point Light** allows you to create a new point light in your scene. Please see “Point Lights” on page 96 for more information about spotlights.
- New Distant Light: Selecting **Create>New Distant Light** allows you to create a new distant light in your scene. Please see “Distant Lights” on page 98 for more information about spotlights.
- New Spotlight: Selecting **Create>New Spotlight** allows you to create a new spotlight in your scene. Please see “Spot Lights” on page 99 for more information about spotlights.

Windows Menu

The **Windows** menu allows you to customize the DAZ|Studio interface by toggling tabs on and off. If a tab is off, clicking it makes it appear, and vice-versa. A checkmark appears next to each visible tab. To access this menu, either click **Windows** or press [ALT]+[W].



Surfaces

Selecting **Windows>Surfaces** toggles the **Surfaces** tab on and off. A checkmark appears next to this option when the tab is on and disappears when the tab is off. Please see Section 5: “Surfaces” on page 113 for more information about working with this tab.

CONTENT

Selecting **Windows>Content** toggles the **Content** tab on and off. A checkmark appears next to this option when the tab is on and disappears when the tab is off. Please see Chapter 12: “The Content Tab” on page 69 for more information about working with this tab.

VIEW

Selecting **Windows>View** toggles the **View** tab on and off. A checkmark appears next to this option when the tab is on and disappears when the tab is off. Please see Chapter 11: “View Tab (Cameras)” on page 65 for more information about working with this tab.

SCENE

Selecting **Windows>Scene** toggles the **Scene** tab on and off. A checkmark appears next to this option when the tab is on and disappears when the tab is off. .

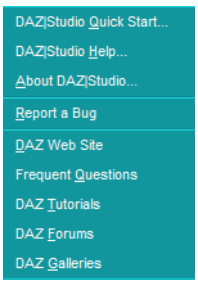
PARAMETERS

Selecting **Windows>Parameters** toggles the **Parameters** tab on and off. A checkmark appears next to this option when the tab is on and disappears when the tab is off. Please see Chapter 13: “The Parameters Tab” on page 73 for more information about working with this tab.

TOOL

Selecting **Windows>Tool** toggles the **Tool** tab on and off. TBD

HELP MENU



The **Help** menu is where you access DAZ|Studio documentation and information about your installation. To access this menu, either click **Help** or press [ALT]+[H].

DAZ|STUDIO QUICK START

Selecting **Help>DAZ|Studio Quick Start** opens the DAZ|Studio Quick Start Guide in Acrobat (PDF) format

DAZ|STUDIO HELP

Selecting **Help>DAZ|Studio Help** opens this Artist’s Guide in Acrobat (PDF) format.

ABOUT DAZ|STUDIO

Selecting **Help>About DAZ|Studio** opens the **About** window, which contains the following information:

- name the copy of DAZ|Studio is registered to
- registered DAZ|Studio serial number

- contact information for DAZ Productions
- DAZ|Studio production credits (use the scroll bar to view the entire list)

To close this window, click **OK** when finished.

REPORT A BUG

Selecting **Help>Report a Bug** launches your Web browser and opens the DAZ Bug Reporting page. DAZ encourages all users to report problems as part of our ongoing efforts to provide top-quality products.

DAZ WEB SITE

Selecting **Help>DAZ Web Site** launches your Web browser and opens the DAZ Web site, your gateway to innovative 3D applications and world-class content that make 3D easy, fun, and affordable for everyone.

FREQUENT QUESTIONS

Selecting **Help>Frequent Questions** launches your Web browser and opens the DAZ FAQ page, where you can view the most frequently asked questions and answers. This should be your first stop when seeking support for DAZ products since you can often get immediate answers and solutions.

DAZ TUTORIALS

Selecting **Help>DAZ Tutorials** launches your Web browser and opens the DAZ Tutorials page. Here you'll find an ever-growing library of tutorials written by our customers, your fellow artists. Find a cool new way to achieve a great effect? Want to help out newbies? Write a tutorial and submit it for possible inclusion on the site and get yourself recognized as a DAZ|Studio expert!

DAZ FORUMS

Selecting **Help>Forums** launches your Web browser and opens the DAZ Forums page where you can meet and interact with fellow artists from all around the globe.

DAZ GALLERIES

Selecting **Help>DAZ Galleries** launches your Web browser and opens the DAZ Galleries page where artists are free to post and share their 3D art. We look forward to seeing your contributions!

Chapter 9: Working with Viewports

Viewports are your window to the virtual universe inside DAZ|Studio. This chapter describes viewports and how to work with them.

About

A viewport allows you to see and work with your scene. It is the virtual equivalent of looking at your scene through up to four cameras at once. You can also select and manipulate objects in your scene using viewports.

Selecting Layouts

By default, DAZ|Studio launches with a single large viewport in the center of the workspace. You can choose various viewport layouts with two, three, or four viewports by opening the **Views** menu and clicking your desired layout.

Viewport Properties

You can customize viewports in a number of ways, as described below.

Selecting the Active Viewport

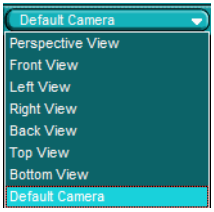
You can access objects in your scene using any available viewport. The viewport you are currently using is the *active* viewport. This is where you can select objects, pose figures, etc. Changes made in the active viewport automatically appear in every other open viewport. To switch active viewports, you can either:

- Click any blank portion of the toolbar above your desired viewport.
- Select an object in your scene by clicking it using your desired active viewport.

Resizing Viewports

Resizing panes may affect the amount of space available for displaying viewports. Please refer to "Moving/Sizing/Hiding Panes" on page 44 for more information on changing pane size.

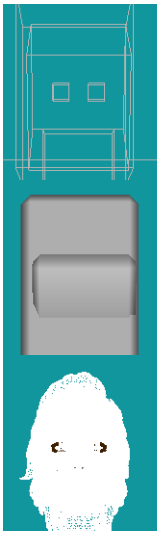
Changing Cameras



Any viewport can view your scene using any default or custom camera. To switch cameras in a viewport, open the **View As** drop-down menu at the upper left of your desired viewport and select the option you wish to use from the list.

DRAWING STYLES

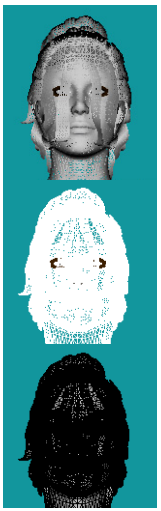
You can select a *drawing style* for each viewport in your workspace while creating your scene (drawing styles only affect the final render when using the OpenGL rendering option as described in "Render Options" on page 53). Using different drawing styles can help you position objects and view relationships between objects. To select a drawing style, open the **Viewport Properties** drop-down menu by clicking the arrow to the right of the **View As** menu, then select your desired drawing style for the current viewport. The available drawing styles are:



- Wire Bounding Box: Selecting **Wire Bounding Box** displays objects as wire bounding boxes, allowing you to see outlines of the areas occupied by each object (figure, body part, prop) in your scene.

- Solid Bounding Box: Selecting **Solid Bounding box** displays objects as solid bounding boxes, allowing you to see the area occupied by each object (figure, body part, prop) in your scene.

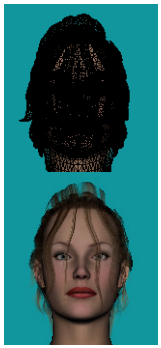
- Wireframe: Selecting **Wireframe** displays objects as polygon meshes, allowing you to see each polygon that makes up the object. Meshes are colored according to the surface's diffuse color. Please see Chapter 25: "About Materials" on page 144 for information about surfaces and "Color (Diffuse)" on page 144 for information about diffuse color.



- Lit Wireframe: Selecting **Lit Wireframe** displays polygon meshes as described above and also simulates your scene's lighting. The portions of the wireframe facing lights are brighter, and those in shadow are darker.

- Hidden Line: Selecting **Hidden Line** is similar to the **Wireframe** style described above, except that this option only displays the outermost layer of the polygonal meshes facing the camera.

- Wire Shaded: Selecting **Wire Shaded** displays both the polygonal meshes and object shading. This is a combination of **Hidden Line** and **Smooth Shaded**.



- Smooth Shaded: Selecting **Smooth Shaded** shows objects as solids with color and lighting but no maps (see "What are Maps?" on page 146 for more information about maps).
- Texture Shaded: Selecting **Texture Shaded** shows objects as solids with all color, light, and map information displayed.
- Cartoon Shaded: Selecting **Cartoon Shaded** shows objects as solids with all color, light, and map information displayed. image TBD

TOGGLING VIEWPORT TOOLS

The right side of the viewport toolbar displays the **Viewport Tools**, which are a shortcut for the most common **View** tab functions. From left to right, these tools are:

- Orbit/Rotate: Left-clicking and dragging this tool orbits the camera about its aim point. Please see "Orbit" on page 67 for more information about the **Orbit** function. Right-clicking and dragging this tool rotates the camera about its current location. Please see "Rotate XY" on page 66 for more information about the **Rotate** function.
- Pan/Dolly: Left-clicking and dragging this tool moves the camera left to right/up and down. Please see "Pan (Move XY)" on page 67 for more information about the **Pan** function. Right-clicking and dragging this tool moves the camera left to right/in and out. Please see "Dolly (Move XZ)" on page 67 for more information about the **Dolly** function,
- Zoom (Focal Length): Left- or right-clicking and dragging this tool moves the camera's focal point, or distance from the lens surface to its focal point. This gives your camera the appearance of moving in and out of your scene. Please see "Zoom" on page 66 for more information about the **Zoom** tool.

Selecting **Show Viewport Tools** in the **Viewport Properties** menu toggles displaying the **Viewport Tools** on and off for the selected viewport.

SETTING THE BACKGROUND COLOR

Selecting **Background Color...** in the **Viewport Properties** menu opens a standard Color Picker that allows you to select your desired background color for the selected viewport.

SHOW/HIDE BACKDROP

Selecting **Show Backdrop** toggles displaying the backdrop image on and off. Please see "Backdrop" on page 48 for information about working with backdrop images.

FLOOR GRID & CENTER AXIS

In addition to the previously described functions, the **Viewport Properties** menu allows you to toggle displaying the "floor" and center axes on and off.

- To toggle displaying the floor on and off, select **Show Floor**. The floor appears as a grid in the viewport and represents the plane oriented in the XZ direction that passes through the Y-axis origin. Please see "Mind Your XYZ's" on page 133 for more information about axes.
- To toggle displaying the center of the DAZ|Studio virtual universe, select **Show Center Axes**. The origin is the point located at (0,0,0) (see "Where Am I?" on page 133 for more information about the origin point). When this option is enabled, you will see bright lines radiating from the origin along the axes, giving you a visual representation of the origin's location and the axes' directions.

Chapter 10: Quick Access Toolbars

The **Quick Access** toolbars contain rows of buttons that give you quick access to commonly used DAZ|Studio functions. By default, these toolbars appear side-by-side just beneath the menu bar. You can reposition these toolbars just as you would any tab. Please see “Customizing Your DAZ|Studio Experience” on page 44 for more information about moving interface elements.

Main Toolbar

The **Main** toolbar contains commonly used file and editing functions. From left to right, the buttons are:

New File

Clicking the **New File** button closes your current scene and creates a new blank scene. This is the same as selecting **File>New**, as described in “New” on page 46.

Open

Clicking the **Open File** button opens a standard **Open** dialog. This is the same as selecting **File>Open**, as described in “Open” on page 46.

Save

Clicking the **Save File** button saves your current scene. This is the same as selecting **File>Save**, as described in “Save” on page 46.

Import

Clicking the **Import** button allows you to import content into your scene. This is the same as selecting **File>Import**, as described in “Import” on page 47.

Undo

Clicking the **Undo** button undoes your most recent actions. This is the same as selecting **Edit>Undo**, as described in “Undo Last Action” on page 47.

Redo

Clicking the **Redo** button reinstates your most recently undone actions. This is the same as selecting **Edit>Redo**, as described in “Redo Last Action” on page 48.

Tools Toolbar

The **Tools** toolbar contains buttons that control joint modes, cameras, and lights.

MANIPULATION MODE

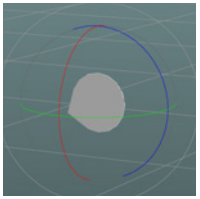
The **Manipulation Mode** buttons appear on the left side of the **Tools** toolbar. They allow you to select how objects will behave when you select and move them. Each mode remains active until you change it. For example, if you click the **Rotation** button, you will remain in rotation mode until you click one of the other mode buttons.

When you select an object, a set of manipulators appears if the selected mode can be applied to the selected object. The manipulators appear differently depending on what mode you are in, but all share the following color scheme:

- Red: The red manipulator moves the selected object about the X axis.
- Green: The green manipulator moves the selected object about the Y axis.
- Blue: The blue manipulator moves the selected object about the Z axis.

Manipulators are great for getting poses, objects, etc., into their rough positions. For fine tuning, you will probably want to use the **Parameters** tab (see Chapter 13: “The Parameters Tab” on page 73) since it gives you precise control.

Rotate



Clicking the **Rotation Mode** button allows you to *rotate* body parts, figures, props, and lights in all three axes when you select an object. On most human figures, the hip is the parent for the entire figure. Rotating the hip will therefore rotate the entire figure while keeping the current pose intact. If you select a prop or other object with no body parts (such as a light, as shown here), you will rotate the entire object.

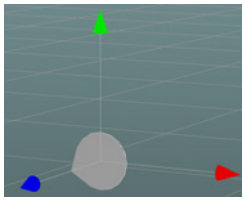
The **Rotation** manipulator appears whenever you click an object in your scene. To use the manipulator, click and drag the circle corresponding to your desired axis.

The allowed amounts and axes of rotation are subject to the *range of motion* and *degrees of freedom* assigned by the object’s creator. They are also subject to the object type. For example, you cannot rotate point lights since they emit light in all directions. You can, however, rotate spot lights.

Please refer to the following for more details on specific subjects:

- “Bones” on page 141 for information about body parts and bones
- “The Pecking Order” on page 142 for information about hierarchical (parent/child) relationships
- Chapter 16: “Posing/Moving Figures” on page 84 for information about posing figures
- “Step Two: Fun with Lights” on page 26 for information about light types
- “Rotation” on page 137 for information about rotation.

Translate



Clicking the **Translation Mode** button allows you to *translate* figures, props, and lights in all three axes when you select an object. In most cases, you cannot translate body parts. On most human figures, the hip is the parent for the entire figure. Translating the hip will therefore translate the entire figure while keeping the current pose intact. If you select a prop or other object with no body parts (such as a light), you will translate the entire object.

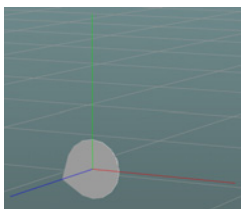
The **Translation** manipulator appears whenever you click an object in your scene. To use the manipulator, click and drag the arrow corresponding to your desired axis.

The allowed amounts and axes of translation are subject to the *range of motion* and *degrees of freedom* assigned by the object's creator.

Please refer to the following for more details on specific subjects:

- "The Pecking Order" on page 142 for information about hierarchical (parent/child) relationships
- "Translation" on page 137 for information about translation.

Scale



Clicking the **Scaling Mode** button allows you to *scale* body parts, figures, props, and lights in all three axes when you select an object. If you select a bone, the resizing applies to the body part associated with that bone. Unlike rotation or translation, scale does not depend on hierarchy. If you scale a body part, you will only affect children to the extent needed to remain connected. For example, stretching the forearm will move the hand and fingers so as to remain at the end of the forearm. If you select a prop or other object with no body parts (such as a light), you will scale the entire object.

To scale an entire figure, select it in the **Scene** tab, then use the **Parameters** pane to perform the scaling. The **Scaling** manipulator appears whenever you select an object. To use the manipulator, click and drag the line corresponding to your desired axis.

The allowed amounts and axes of scale are subject to the *range of motion* and *degrees of freedom* assigned by the object's creator. They are also subject to the object type. For example, you cannot scale point lights since they emit light in all directions. You can, however, scale spot lights. In this case, dragging the manipulators beyond their limits or in restricted directions will have no effect.

Please refer to the following for more details on specific subjects:

- "Bones" on page 141 for information about body parts and bones
- "Scale" on page 138 for information about scale.
- Chapter 14: "The Scene Tab" on page 79 for information about the **Scene** tab.

RENDERING

The **Render Mode** buttons allow you to access DAZ|Studio's rendering functionality.

Spot Render

The **Spot Render** button allows you to render a small portion of your scene for test purposes. To use this feature, click the button, then draw a rectangle around the area you wish to render in any available viewport. Please see "Spot Renders" on page 112 for more information about spot rendering and Section 4: "Rendering" on page 105 for more information about rendering in general.

Render

The **Render** button renders your scene according to your currently set render options. Please refer to "The Render Options Window" on page 108 for more information about render options and to Section 4: "Rendering" on page 105 for more information about rendering in general.

CREATE CAMERA

Clicking the **New Camera** button creates a new camera. The **Camera Name** dialog appears, prompting you to enter a name for the new camera. Once created, your camera will be visible in both the **Scene** tab and the **View As** drop-down menu in each viewport. Please refer to Chapter 11: "View Tab (Cameras)" on page 65 for more information about cameras.

CREATE LIGHT

The **Create Light** buttons allow you to create lights. The **Light Name** dialog box appears, prompting you to enter a name for the new light. From left to right, the available light types are:

Point Light

Clicking the **Create Point Light** creates a new point light. Please refer to "Step Two: Fun with Lights" on page 26 for more information about light types and to Chapter 18: "Lights" on page 96 for more information about working with lights in DAZ|Studio.

Distant Light

Clicking the **Create Distant Light** creates a new distant light. Please refer to "Step Two: Fun with Lights" on page 26 for more information about light types and to Chapter 18: "Lights" on page 96 for more information about working with lights in DAZ|Studio.

Spot Light

Clicking the **Create Spot Light** creates a new spot light. Please refer to "Step Two: Fun with Lights" on page 26 for more information about light types and to Chapter 18: "Lights" on page 96 for more information about working with lights in DAZ|Studio.

Chapter 11: View Tab (Cameras)

As we mentioned in Chapter 9: “Working with Viewports” on page 57, each viewport in your DAZ|Studio workspace views your virtual universe through a camera. Each viewport is therefore analogous to looking through a viewfinder. Unlike a real photo studio, however, DAZ|Studio lets you view and work with your scene using up to four viewports at once. When using multiple viewports, you can assign each viewport to a different camera or have two or more viewports sharing the same camera. Please refer to “Changing Cameras” on page 57 for more information on assigning cameras to viewports.

Adding, Selecting, & Deleting Cameras

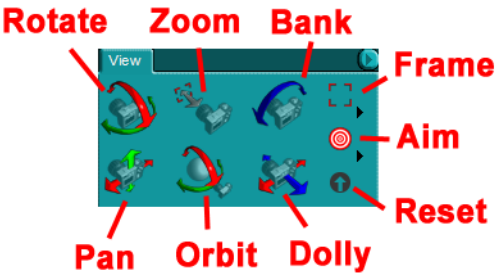
By default, DAZ|Studio has seven views:

- Perspective
- Left (orthogonal)
- Right (orthogonal)
- Top (orthogonal)
- Bottom (orthogonal)
- Front (orthogonal)
- Back (orthogonal)

To assign camera to a viewport, use the **View As** drop-down menu above your desired viewport to switch that viewport’s camera as described in “Changing Cameras” on page 57.

To add a camera to your scene, click the **New Camera** button in the **Quick Access** toolbars. The **Camera Name** dialog appears, prompting you to enter a name for the new camera. Once created, your camera will be visible in both the **Scene** tab and the **View As** drop-down menu in each viewport. Please refer to “Orthogonal and Perspective Views” on page 132 for more information about camera views. By default, your new camera will be a perspective camera. To convert it to an orthogonal camera, use the **Parameters** tab as described in Chapter 13: “The Parameters Tab” on page 73.

The View Tab



The **View** tab controls your cameras' positions and orientation. To use the **View** tab, select your desired viewport, then assign your desired camera to that viewport. Please see Chapter 9: "Working with Viewports" on page 57 for information on working with viewports. Once you have selected a viewport/camera combination, you can control the camera using the controls described below. Before reading this information, you may want to refer to "Rotation" on page 137 and "Translation" on page 137 for more information about rotation and translation if you are not already familiar with these terms. You may also want to refer to "Global vs. Local Coordinates" on page 135 for information about local vs. global coordinates.

Cameras move along their local axes (see "Global vs. Local Coordinates" on page 135). Remember that the X axis runs from left to right, the Y axis runs vertically, and the Z axis runs from back to front (see "Mind Your XYZ's" on page 133). When moving about an axis, you are using the selected axis as your rotation point. Thus:

- Rotating a camera along its X axis will pitch it up or down.
- Rotating a camera along its Y axis will yaw it left or right.

- Rotating a camera along its Z axis will roll (bank) it left or right.

Rotate XY

The **Rotate** control rotates your camera around its origin along either the X-axis (when you move your mouse from side to side), or along the Y-axis (when you move your mouse up and down). To use this control, click it, then drag your mouse in the desired direction(s). This control is not available when using orthogonal cameras.

Zoom

The **Zoom** control narrows or widens the view through your camera lens without moving the camera. This allows you to come in close to capture fine details or move out for a more distant view.

BANK (ROTATE Z)

The **Bank** control rotates your camera along the Z-axis (when you move your mouse from side to side). To use this control, click it, then drag your mouse in the desired direction(s). This control is not available when using orthogonal cameras.

PAN (MOVE XY)

The **Pan** control translates your camera along either the X-axis (when you move your mouse from side to side), or along the Y-axis (when you move your mouse up and down). To use this control, click it, then drag your mouse in the desired direction(s).

ORBIT

The **Orbit** control rotates your camera around its aim point by swinging side to side (when you move your mouse from side to side), or up and down (when you move your mouse up and down). To use this control, click it, then drag your mouse in the desired direction(s). This control is not available when using orthogonal cameras.

DOLLY (MOVE XZ)

The **Dolly** control translates your camera along either the X-axis (when you move your mouse from side to side), or along the Z-axis (when you move your mouse up and down). To use this control, click it, then drag your mouse in the desired direction(s). Z-axis motion is only available when using a perspective camera.

RESET CURRENT CAMERA

The **Reset Current Camera** control resets the currently selected camera to its default state (location, rotation, focus, perspective, etc.).

AIM

To use the **Aim** functions, you may either left-click the currently displayed **Aim** button to use that function or left-click and hold the button to view all available buttons and make your selection. The available **Aim** buttons are:

- Aim at Selection: Clicking the **Aim at Selection** button aims the current camera at the currently selected object.
- Lock on Selection: Clicking the **Lock on Selection** button forces the current camera to always follow the currently selected object in your scene. To disable locking once enabled, you must select the locked camera and toggle this option off.

FRAME

To use the **Frame** functions, you may either left-click the currently displayed **Frame** button to use that function or left-click and hold the button to view all available buttons and make your selection. The available **Frame** buttons are:

- Frame Selection: Clicking the **Frame Selection** button moves the current camera so that the selected object's geometry occupies the majority of the current viewport.

- Frame All: Clicking the **Frame All** button is similar to **Frame Selection** but frames all scene objects in the current viewport.
- Lock Framing: Clicking the **Lock Framing** button forces the current camera to always frame the current selection.

Camera Parameters

User-created cameras have controllable parameters, available in the **Parameters** tab. Please see Chapter 13: "The Parameters Tab" on page 73 for more information about using the **Parameters** tab. The available parameters are:

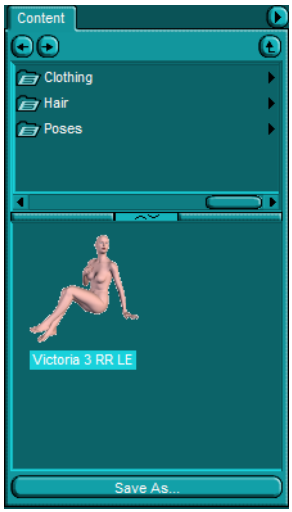
- Translate (XYZ): The **Translate** sliders move the camera along its local X, Y, and Z axes without altering its rotation.
- Rotate (XYZ): The **Rotation** sliders rotate the camera along its local X, Y, and Z axes without altering its location.
- Scale (XYZ): The **Scale** sliders scale child objects of the current camera. Please see "The Pecking Order" on page 142 for more information about parent/child relationships, and "Creating Parent/Child Relationships Between Objects" on page 79 for information about creating hierarchies.
- Perspective: Checking the **Perspective** checkbox makes the current camera a perspective camera. Toggling this option makes the current camera an orthogonal camera. Please see "Orthogonal and Perspective Views" on page 132 for information about perspective and orthogonal views. There is one powerful aspect to this feature: If you use the camera as a perspective camera, you can position and rotate it however you wish. Once you do that, toggling this option makes an orthogonal camera whose local axes are based on the direction in which the camera was last pointing before becoming a perspective camera. The view through the viewport will be looking directly at the camera's negative Z axis, with X and Y perpendicular in the horizontal and vertical directions relative to that Z axis. Please refer to "Mind Your XYZ's" on page 133 for more information about axes and to "Global vs. Local Coordinates" on page 135 for more information about global versus local space.
- Focal Length: A camera's focal length is the distance between the film and the lens's optical center when the lens is focused on infinity and is usually expressed in millimeters. In 35mm-format cameras, lenses that have a focal length of about 50mm are termed *standard*. Focal lengths below 35mm are called *wide angle* lenses, with focal lengths above 85mm being termed *telephoto* lenses. Lenses with user-controllable focal lengths are called *zoom lenses*. The **Focal Length** slider allows you to zoom in and out of your scene and is the same as using the **Zoom** control (see "Zoom" on page 66).
- Depth of Field: The *depth of field* is the distance from the camera at which objects appear most in focus. Setting this value is the same as adjusting the f-stop and focus on any real-world camera.

Chapter 12: The Content Tab

The **Content** tab is where you access all of your DAZ|Studio-native and supported third-party content files.

Navigating Content Folders

The DAZ|Studio Library consists of a series of folders and sub-folders that contain the figures, props, lights, etc. you use in your scenes. If you use Curious Labs' Poser, you can even link to your existing Poser Runtime folders using the Preferences window as described in "Content Directories" on page 49.



From left to right, the top portion of the **Content** tab contains four items:

Back

The **Back** button functions like the **Back** button in your Web browser by taking you back to previously selected content folders. Each successive click takes you back one previous folder level. This button appears grayed out until you have navigated to at least two content folders.

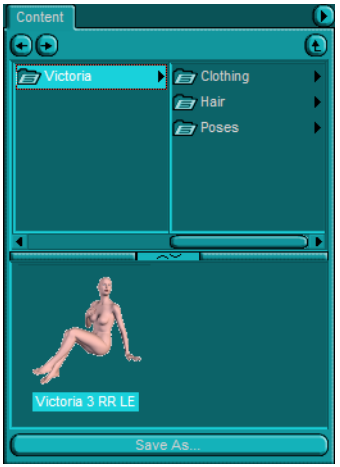
Forward

The **Forward** button functions like the **Forward** button in your Web browser by taking you forward to subsequently selected content folders. Each successive click takes you forward to the next selected folder. This button appears grayed out until you have used the **Back** button at least once.

Up One Level

If you navigate to at least one sub-folder level, the **Up One Level** button is enabled. Each successive click moves you up one level along your current content folder/sub-folder path.

Folder View



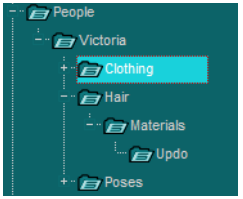
Selecting View Folders as List in the Content Tab Options menu (see "Content Tab Options" on page 71) displays your content folders as icons, as shown here.

By default, a single column appears at the top of the **Content** tab, as shown in the image on the previous page. For convenience, you may widen the **Content** tab (see "Moving/Sizing/Hiding Panes" on page 44) to see two folder columns, as shown in the image on the right. The left column displays the current folder level while the right column displays any folder(s) underneath the folder currently selected in the left column. For example, if you have the default **Victoria** folder selected in the left column, the right column will display the **Clothing**, **Hair**, and **Poses** sub-folders. In a single-column layout, the the three sub-folders mentioned above would replace the **Victoria** folder, which is still accessible by clicking the **Up One Level** button. Double-clicking a folder opens that folder. All content in the currently selected folder appears in the bottom portion of the **Content** tab.

TIP
You can use the navigation buttons and folder view and/or the **Content Folders** menu to navigate your content directories.

Narrowing the **Content** tab returns you to the single-column layout displayed on the previous page.

Tree View



Selecting **View Folders as Tree** in the **Content Tab Options** menu (see "Content Tab Options" on page 71) displays your content folders as a hierarchical tree.

- To expand a tree branch, click the **+** sign next to a collapsed branch.
- To collapse a branch, click the **-** sign next to an expanded branch.

This view allows you to jump quickly to any content folder on any level of your Library. Content within the currently selected folder appears in the bottom portion of the Content tab as described above.

Selecting Content

All content in all folders at the current level appears in the bottom portion of the **Content** tab. To add a piece of content to your scene, double-click it.

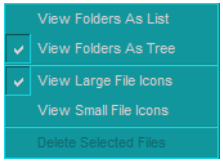
Saving Library Presets

Clicking the **Save As** button at the bottom of the **Content** tab allows you to save items in your scene to the DAZ|Studio Library for future use. To do this:

1. Make sure you have already set your desired save preferences in the **Preferences** window as described in "Save Filters" on page 52.
2. Click the **Save As** button to open a menu with the following options:
   - Scene: Selecting **Scene** saves your entire scene and all objects and settings therein (figures, poses, lights, materials, cameras, props, etc.).
   - Pose Preset: Selecting **Pose Preset** saves the currently selected figure's pose information (transformation and/or morph settings, depending on your previously selected preferences).
   - Material Preset: Selecting **Material Preset** saves all material settings (maps, colors, etc.) from the currently selected figure or prop.
   - Light(s) Preset: Selecting **Light(s) Preset** saves either the currently selected light(s) or all lights in your scene, depending on your previously selected preferences.
   - Camera(s) Preset: Selecting **Camera(s) Preset** saves either the currently selected light(s) or all lights in your scene, depending on your previously selected preferences.
3. The **Filtered Save** dialog box appears. This box is functionally identical to a standard **Save As** dialog. You may navigate folders, create a new folder, name your preset, etc. Make your selections and click **OK** to finish saving the preset.

Your saved preset will now appear in the **Content** tab in the folder you selected. You may need to navigate up or down the folder levels in order to find your newly saved preset depending on its location in your content library and the folder currently selected in the **Content** tab.

Content Tab Options



Clicking the **Content Options** button opens the **Content Tab Options** menu, which has the following options:

- View Folders as List: Selecting **View Folders as List** displays your content folders as one or two columns of folder icons as described in "Folder View" on page 70.
- View Folders as Tree: Selecting **View Folders as Tree** displays your content folders as a hierarchical tree as described in "Tree View" on page 70.
- View Large Folder Icons: Selecting **View Large Folder Icons** displays content and folder icons at an enlarged size.

- View Small Folder Icons: Selecting **View Small Folder Icons** displays content and folder icons at a reduced size.
- Delete Selected Files: If you have a piece of content selected, selecting **Delete Selected Files** removes the selected content from your DAZ|Studio Library.

Chapter 13: The Parameters Tab

The **Parameters** tab gives you fine control over many of the objects in your scenes, including:

- Figures
- Clothing
- Body parts
- Props
- Hair
- Lights
- Cameras
- Morph Targets

Parameters vs. Morph Targets

At face value, *parameters* and *morph targets* seem similar if not identical. There are, however, several key differences:

- In general, parameters deal with object *translation*, *rotation*, and *scale* (see "Getting Around" on page 137 for more information). Additionally, parameters are based on an object's type (such as a light) and sub-type (specific kind of light). For example, all lights have intensity controls that allow you to dim and brighten them. Spot lights have rotation parameters, but point lights don't.
- Morph targets involve specific *deformations* applied to *mesh objects* (see "Objects (Meshes)" on page 140 for more information about mesh objects). These deformations are specifically created for specific figures and props and are only available when installed and the correct figure/prop is selected in your scene.

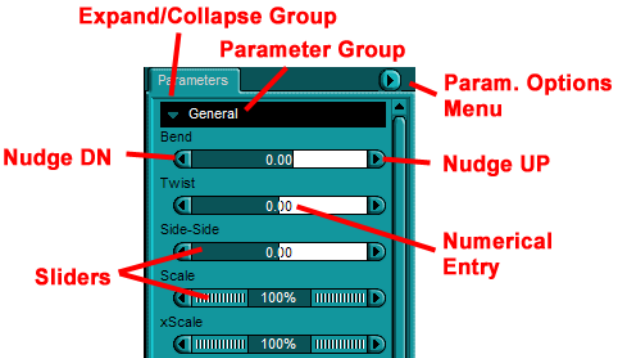
TIP
While different, parameters and morph targets share the same types of interface controls within DAZ|Studio. For simplicity, we will use the term "parameters" in this chapter to mean both parameters and morph targets.

Parameter Organization

DAZ|Studio supports the ability to organize parameters into groups for ease of navigation. When you select a group, only those parameters in that group appear in the **Parameters** tab. This keeps your **Parameters** tab uncluttered and lets you quickly find what you're looking for. Content creators create parameter groups while building objects. Thus, groups will vary by object.

Navigating Parameter Groups

To navigate the parameter groups, select your desired object, then use the **Parameter Groups** drop-down menu at the top of the **Parameters** tab to select your desired group. DAZ|Studio supports *sub-grouping*, meaning that any group can have one or more sub-groups within it. For example, a group called **Face Morphs** might have sub-groups called **Eyes**, **Mouth**, etc. Sub-groups can also have sub-groups within them. For example, the **Mouth** sub-group might have sub-groups called **Smile**, **Worry**, etc.



Back

The **Back** button functions like the **Back** button in your Web browser by taking you back to previously selected parameter groups. Each successive click takes you back to the next previously selected group. This button appears grayed out until you have navigated to at least two parameter groups.

Forward

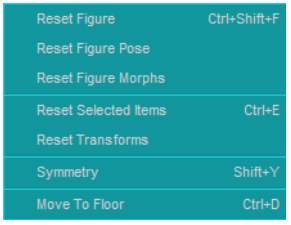
The **Forward** button functions like the **Forward** button in your Web browser by taking you forward to subsequently selected parameter groups. Each successive click takes you forward to the next selected group. This button appears grayed out until you have used the **Back** button at least once.

Up One Level

If you navigate to at least one sub-group level, the **Up One Level** button is enabled. Each successive click moves you up one level along your current group/sub-group path.

Parameter Tab Options

Clicking the **Parameter Options** button opens the **Parameter Tab Options** menu, which contains the following options:



- Reset Figure: Selecting **Reset Figure** resets the selected figure's pose (rotation, translation, and scale) and morph targets to their default positions.

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- Reset Figure Pose: Selecting **Reset Figure Pose** resets the selected figure's pose (rotation, translation, and scale) to its default position without affecting the figure's morph targets.
- Reset Figure Morphs: Selecting **Reset Figure Morphs** resets the selected figure's morph targets to their default settings without affecting the figure's pose (rotation, translations, or scale).
- Reset Selected Items: Selecting **Reset Selected Items** resets the selected figure's translations (rotation, translation, and scale) and morphs to their default positions and settings without affecting non-selected items. This feature has many uses, for example restoring body parts without affecting the entire figure.
- Reset Transformations: Selecting **Reset Transformations** resets the selected figure's transformations (rotation, translation, and scale) to their default positions.
- Symmetry: Selecting **Symmetry** opens the **Symmetry** dialog. Please see "Symmetry" on page 91 for information on using the **Symmetry** dialog.
- Move to Floor: Selecting **Move to Floor** raises or lowers the selected figure or prop until its local Y origin is at the same level as the scene's global Y origin. For most figures and props, this will place the item's bottom at floor level, however the actual level will depend on where the content creator placed the item's Y origin. Please see "Global vs. Local Coordinates" on page 135 for more information about global and local coordinates.

Setting Parameters

Once you have selected your desired parameter group, there are several ways in which you can set values. Each parameter has a numeric value indicator that tells you its current setting. This value changes as you modify the settings. When adjusting a value, be sure to use the same units. For example, a morph target's value is expressed in percent, with 100% being fully on, 0% being fully off, -100% being fully reversed. A rotation parameter is expressed in degrees.

TIP

A parameter's numeric value indicator shows you the correct unit. If a parameter value is expressed in percent, the "%" symbol appears next to the current value.

Sliders

The quickest way to set a parameter's value is to use the slider. Clicking and dragging the slider to the left lowers the parameter's value, and vice-versa. This is a quick and easy way to make rough settings. You can also click anywhere on the slider at any time to instantly set a new value based on the cursor's location.

NUDGE ARROWS

The **Nudge** arrows at each end of a parameter increase or decrease the parameter's value by a small amount when clicked. Clicking the arrow on the parameter's left side lowers the value, and vice-versa. The **Nudge** arrows are great for making fine adjustments once the parameter is near to your desired value.

NUMERIC ENTRY

Right-clicking the numeric value in any parameter temporarily displays an editable field that allows you to enter the exact value you want. This is both a great shortcut if you already know your desired value and a way to add even finer control than the **Nudge** arrows. Enter your desired value, then press [ENTER] to change the parameter's value. If you enter a value outside the parameter's allowed limits (see "The Parameter Settings Dialog" on page 76), then the appropriate limit will be applied. For example, if the parameter's lower limit is -2, then entering any value less than -2 will set the parameter to -2.

SWAPPABLE GEOMETRY

Some DAZ and third-party content supports geometry swapping, where you can substitute one piece of geometry for another. Please refer to "Swappable Geometry" on page 90 for more information.

MENUS AND BUTTONS

Different objects may have drop-down menus, buttons, or both. For example:

- Drop-down menus appear when you might have multiple choices. Certain objects can be *fitted* to others (such as fitting clothing to a figure as described in Chapter 5: "Using Figure-Based Clothing" on page 34). In this case, you will see a **Fit** drop-down menu in the **Parameters** pane when you have an object that can be fitted to another object selected. This menu would list your available choices.
- On or off choices have buttons. Checking the radio button enables the listed function, and vice-versa. For example, most objects have a **Visibility** button that allows you to toggle that object's visibility on and off.

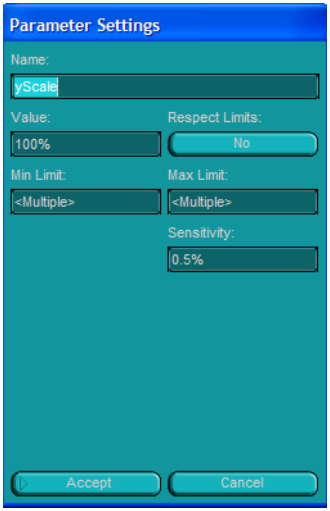
We'll discuss the parameters, menus, and buttons available for different object types beginning with Chapter 16: "Posing/Moving Figures" on page 84.

THE PARAMETER SETTINGS DIALOG

Double-clicking a parameter's name opens that parameter's **Parameter Settings** dialog, which allows you to set minimum and maximum limits, toggle whether or not to obey limits, set the additive/subtractive value used when you press the nudge arrows, and establish parameter linking. When you have completed making changes, clicking the **Accept** button saves them and closes the dialog. Clicking the **Cancel** button discards changes and closes the dialog. The **Parameter Settings** dialog will vary in appearance depending on the type of parameter you selected:

NUMERIC PARAMETER

The **Parameter Settings** dialog appears as shown when you double-click a numeric parameter, that is, a parameter where you can specify a numeric value:



- Name: The **Name** field displays the selected parameter's default name. You can rename the parameter by entering your desired name in this field.
- Value: The **Value** field displays the parameter's current value. You can set a new value by entering it as an integer (such as 1) or decimal (such as .25) in this field. You can only enter numbers and a decimal point in this field.
- Respect Limits: Clicking the **Respect Limits** button toggles limits on (**Yes**) and off (**No**) for the selected parameter. Selecting **Yes** enables the **Min Limit** and **Max Limit** fields (see below) and forces the parameter's value to remain at or between the specified lower and upper limits. Selecting **No** allows you to set any value for the parameter without limits.
- Min Limit: The **Min Limit** field is where you specify the parameter's minimum value. You can set a new minimum limit by entering it as an integer (such as -1) or decimal (such as -.25) in this field. You can only enter numbers and a decimal point in this field. Setting the current parameter to any value below the **Min Limit** value will set the parameter to the **Min Limit** value. This option is only available when the **Respect Limits** button is set to **Yes**.
- Max Limit: The **Max Limit** field is where you specify the parameter's maximum value. You can set a new maximum limit by entering it as an integer (such as 2) or decimal (such as 1.55) in this field. You can only enter numbers and a decimal point in this field. Setting the current parameter to any value above the **Max Limit** value will set the parameter to the **Max Limit** value. This option is only available when the **Respect Limits** button is set to **Yes**.

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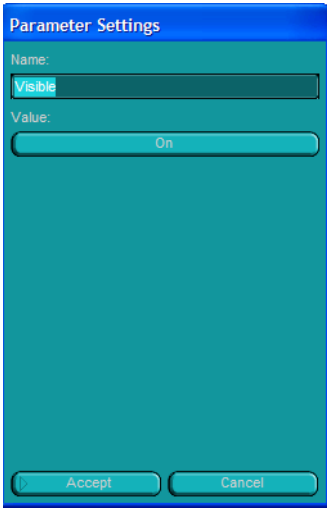
- Sensitivity: The **Sensitivity** field functions in one of two ways:
  - On a slider with limits, the **Sensitivity** value is the increment used each time you click a **Nudge** arrow.
  - On a slider without limits, the **Sensitivity** value sets both the **Nudge** arrow increments and the rate of change when you click and drag the slider.

TOGGLE PARAMETER

The **Parameter Settings** dialog appears as shown when you double-click a toggle parameter, that is, a parameter that can be toggled on or off but that does not accept numeric entry.



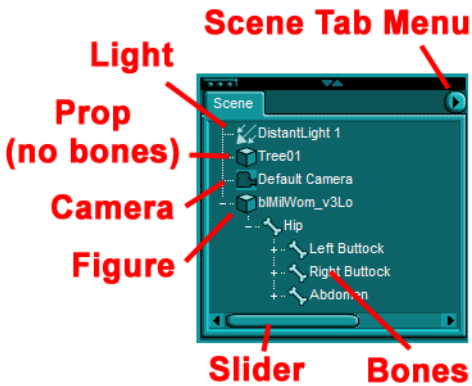
- Name: The **Name** field displays the selected parameter's default name. You can rename the parameter by entering your desired name in this field.
- Value: Clicking the **Value** button selects one of the available values for the current paramter (such as **On** and **Off** for a visibility parameter). Click the button until your desired value appears.

Chapter 14: The Scene Tab

The **Scene** tab displays a hierarchical view of every object in your scene with the exception of the default views (see "Adding, Selecting, & Deleting Cameras" on page 65 for more information about default views). User-created cameras and lights, figures, body parts, and props all appear in this tab, giving you a centralized view of your scene and the relationships between objects.

Scene Hierarchy

As mentioned above, the **Scene** tab presents a *hierarchical* view of your scene. Please refer to "The Pecking Order" on page 142 for more information about hierarchies and parent/child relationships. These relationships are shown in a *tree* format with multiple levels of branches, where children appear in sub-branches. A useful example is to think of a real tree. The parent is the trunk, the children are the large branches, with additional levels of children being the twigs and leaves.



Creating Parent/Child Relationships Between Objects

DAZ|Studio supports drag-n-drop *parenting*, or the creation of hierarchical parent/child relationships between objects. Please see "The Pecking Order" on page 142 for more information about hierarchies and parent/child relationships. As mentioned above, children appear on sub-branches within the **Scene** tab's tree view.

To parent one object to another:

1. Make sure that both the parent and child objects are in your scene. Don't worry about positioning the child object just yet.
2. In the **Scene** tab, click and drag the child object under your desired parent object. You can parent any object to any other object or bone. For example, you can parent a baseball bat to a hand, a ring to a finger.
3. The child object will move so that:
   - Its local origin coincides with the parent object's origin (see "Where Am I?" on page 133 for information about origins)
   - Its local axes are aligned with the parent object's local axes (see "Mind Your XYZ's" on page 133 for information about axes and "Global vs. Local

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Coordinates" on page 135 for more information about global vs. local coordinates.

4 Rotate and/or translate the child object into your desired position relative to the parent.

Child objects retain their position and alignment relative to any parent object. For example, if you parent a baseball bat to Michael's hand and then make the same bat a child of Victoria's hand, the bat will move so as to retain the same position relative to Victoria's hand (distance and alignment) that it had with Michael's hand.

TIP

DAZ|Studio's parenting behaves differently than some other applications that base their parent/child relationships on global coordinates. Thus, the system described above may seem confusing. For example, if the child object bat was created along a different axis than the parent, the child will appear at right angles to the parent. Create the relationship, then align (rotate) and position (translate) the child correctly. Please see "Manipulating/Moving Props" on page 93.

Expanding/Collapsing Branches

For ease of viewing, you can expand and collapse branches and sub-branches in the tree view. To expand a collapsed branch, either click the **+** button next to the branch you wish to expand or double-click the name of the item you wish to expand. The branch will expand one level. When a branch expands, the **+** (**Expand**) button changes to a **-** (**Collapse**) button. To collapse an expanded branch, either click the **-** button or double-click the name of the item you wish to collapse. Collapsing a branch will hide all sub-branch levels under the selected collapse point (see image).

Expanding branches can cause the tree view to grow beyond your **Scene** tab's vertical and/or horizontal area. If this occurs, the vertical and/or horizontal scroll bar will appear as appropriate. Please refer to "Scroll Bars" on page 44 for more information about scroll bars.

Selecting Objects

The **Scene** tab allows you to select any object, bone, user-created camera, or light in your scene. If you're working with a complex scene or simply want to find the exact object you're looking for quickly, this is the place to do it.

To select any object in your scene, you can use the **Scene** tab's tree view to locate your desired object, then click it. This is very useful in a complex scene or where you cannot readily see your desired object using the viewports.

You can move your selection one object at a time by pressing [UP ARROW] or [DN ARROW], and can also scroll quickly by pressing [PG UP] and [PG DN]. You can also expand, collapse, and navigate tree levels by using the [LEFT ARROW and RIGHT ARROW keys, as described in "Scroll Bars" on page 44.

To select multiple objects using the **Scene** tab, you may use any combination of the following methods:

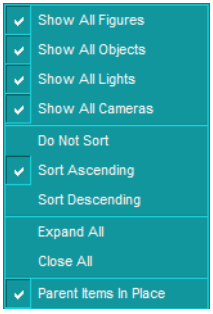
- Click and drag inside the hierarchy view. Children of selected objects are also selected, whether or not their branches are expanded.
- Press [SHIFT] while clicking to select all objects between your previous selection and your next click.
- Press [CTRL] while clicking to make multiple individual selections.

Renaming Objects

You can rename objects within the **Scene** tab's tree view. To do this:

1. Select the object you wish to rename. This object will highlight.
2. Click the object again to open a text field (slow double-click).
3. Enter your desired name for the selected object, then press [ENTER].

Scene Tab Options



The **Scene Tab Menu** button appears on the far right side of the **Scene** tab. Clicking this button opens the **Scene Tab Options** menu, which has the following options:

Show All Figures

The **Show All Figures** option toggles viewing figures on and off. A checkmark appears next to this option when it is enabled. Clearing this checkbox removes all objects that have bones from the **Scene** tab tree view, and vice-versa.

Show All Objects

The **View Objects** option toggles viewing objects (props, etc.) on and off. A checkmark appears next to this option when it is enabled. Clearing this checkbox removes all objects that do not have bones from the **Scene** tab tree view, and vice-versa.

Show All Lights

The Show All Lights option toggles viewing lights on and off. A checkmark appears next to this option when it is enabled. Clearing this checkbox removes lights from the Scene tab tree view, and vice-versa

SHOW ALL CAMERAS

The **Show All Cameras** option toggles viewing user-created cameras on and off (default views do not appear in the **Scene** tab). A checkmark appears next to this option when it is enabled. Clearing this checkbox removes all user-created cameras from the **Scene** tab tree view, and vice-versa.

TIP

The **View** options are a great way to quickly find what you're looking for when working with complex scenes or to free up clutter.

SORTING

The **Scene Tab Options** menu includes three sorting options that control the order in which objects appear in the hierarchy

- Do Not Sort: Checking the **Do Not Sort** option causes objects in your scene to appear in the **Scene** tab in the order you add them.
- Sort Ascending: Checking the **Sort Ascending** option causes objects in your scene to appear in the **Scene** tab sorted by name in ascending (A-Z) order.
- Sort Descending: Checking the **Sort Descending** option causes objects in your scene to appear in the **Scene** tab sorted by name in descending (Z-A) order.

EXPAND ALL

Clicking **Expand All** expands all branches and sub-branches in your scene.

CLOSE ALL

Clicking **Close All** collapses all branches and sub-branches in your scene.

Chapter 15: The Surfaces Tab

The **Surfaces** tab is where you apply custom colors and maps to your figures and props. Each figure and prop in your scene has at least one material group (or *surface*) assigned to it. Complex objects, such as DAZ figures, have many surfaces, giving you fine control over your figure's appearance.

The **Surfaces** tab contains two sub-tabs:

- Basic: The **Basic Surfaces** sub-tab gives direct access to the most common surface channels. If you're new to DAZ|Studio, we recommend that you limit your experimentation with surfaces to the basic channels until you get a feel for how surfaces work.
- Advanced: The **Advanced Surfaces** sub-tab is where DAZ|Studio's powerful rendering engine really shines. Here, you can edit additional controls to fine-tune breathtakingly realistic surfaces.

This manual discusses the **Surfaces** tab and its sub-tabs in detail in Section 5: "Surfaces" on page 113. For background information about surfaces and multi/sub-object materials, please see Chapter 25: "About Materials" on page 144.

Chapter 16: Posing/Moving Figures

Posing figures is one of DAZ|Studio's central functions. As described in "Step Four: Posing" on page 29, there are several ways to pose figures. Let's discuss each method in more detail. If you have not already done so, please take a few minutes to read Chapter 4: "The Basics" on page 24 and complete the tutorial.

Selecting Which Joint to Move

Before you can pose a figure, you must select the *bone* or body part (see "Bones" on page 141) you wish to move. There are two ways to select bones:

- Click the desired bone in any viewport. For example, if you want to rotate the left leg at the hip, click the left thigh.
- Select the desired bone using the **Scene** tab as described in Chapter 14: "The Scene Tab" on page 79.

The **Bone Manipulators** appear at the selected bone's parent joint (see "The Pecking Order" on page 142) whenever you select a bone. These controls will vary depending on the currently selected *mode* (see "Manipulation Mode" on page 62).

You must select the correct bone(s) on the correct figure in order to achieve the desired results. This sounds obvious but can require some advance planning. In many cases, you will need to move several bones in order to achieve the final result. For example, if you want your figure to salute, you will need to move the right shoulder, forearm, and hand. When working with multiple bones, it's usually best to start at the parent (see "The Pecking Order" on page 142) and work towards the children. This avoids having to repeatedly reposition child bones. In this example, you'll want to:

1. Apply some rotation and twist to the shoulder. Try applying -75 degrees of twist and -20 degrees of bend.
2. Twist and bend the elbow. Try applying -85 degrees of twist and 120 degrees of bend.
3. Bend the hand a little. Try applying -3 degrees of twist and 2.05 degrees of bend.

As you can see, starting at the hand in this case would have made the process far more time consuming and difficult. That said, there are times when it might be a good idea to start at the child bones. For example, if you are placing a prop in a figure's hand, you might want to parent the prop to the hand, and adjust the hand into a realistic grasp, (see "Creating Parent/Child Relationships Between Objects" on page 79) before creating the pose. In this example, starting at the child end ensures that the prop will remain in the correct position relative to the figure's hand.

Direct Manipulation

Direct manipulation is the easiest way to adjust your figure's pose. At its most basic, the process is as follows:

1 Select the bone to move, as described in "Selecting Which Joint to Move" on page 84.

2 Click and drag the **Bone Manipulators** to move the joint.

This method is both easy and fast. Some artists use this method to move figures into their rough positions, then switch to the **Parameters** tab to make fine adjustments. The precision of this method depends on your viewing angle and distance; the closer you are the object you're manipulating, the finer control you will have.

TIP
You could use one viewport, one at a wide angle, the other zoomed in, to give to you both gross and fine control using the **Bone Manipulators**.

MOVEMENT MODES

As described in "Getting Around" on page 137 and Chapter 16: "Posing/Moving Figures" on page 84, there are three ways to move figures and bones:

- Rotation: When you select a bone, rotation occurs at that bone's parent joint. For example, if you select the forearm, the bending will occur at the elbow. The hip is the parent bone for the entire figure. If you select the hip, you will rotate the entire figure. Please see "Rotate" on page 62 for more information on working with the **Rotation** manipulator.
- Translation: You usually should not translate individual joints, since doing so would result in scaling the affected bone. The hip is the parent bone for the entire figure. If you select the hip, you will translate the entire figure. Please see "Translate" on page 63 for more information on working with the **Translation** manipulator.
- Scale: When you select a bone, scaling occurs along the entire bone. For example, if you select the forearm, the entire forearm will expand or contract along your selected axis or axes. The hip is the parent bone for the entire figure. If you select the hip, you will scale the entire figure. Please see "Scale" on page 63 for more information on working with the **Scale** manipulator.

TIP
Please see "Step Four: Posing" on page 29 for a quick posing tutorial.

Applying Preset Poses

Many content creators create custom poses for figures. Preset poses are a fast way to get great results without having to spend a lot of time fine-tuning each bone. To apply a custom pose to a figure:

1 Select the figure to apply the pose to.

2 Locate the folder containing your desired pose using the **Content** tab (see Chapter 12: "The Content Tab" on page 69).

3 Double-click your desired pose.

Your figure will assume the selected pose automatically.

Moving Figures

To move a figure:

1 Select the desired figure's hip.

2 Use the **Rotation**, **Translation**, and/or **Scale** manipulators (see "Manipulation Mode" on page 62) as desired.

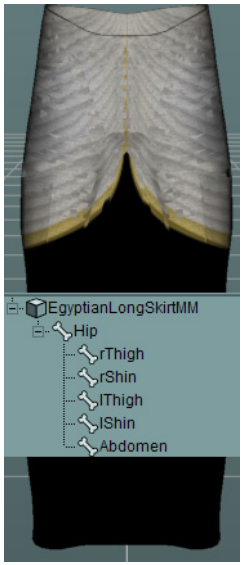
Applying Morph Targets

As described in "Step Five: Morph Targets" on page 31, morph targets are specific deformations created for specific figures. These deformations can range from a simple smile to a weightlifter body and anywhere in between. See "Parameters vs. Morph Targets" on page 73 for information on viewing and adjusting morphs within the **Parameters** tab.

To apply a morph to your figure, select your desired morph in the **Parameters** tab and assign it a new value. Positive values apply the selected morph as created, while negative numbers apply the opposite of the selected morph. For example, applying a negative value to a smile morph might result in a frown. Applying large values can result in excessive distortion and can even *break* the polygon mesh. A break is where a hole or crack appears in the mesh. When working with morph targets, it's usually best to use small values. You can use as many morphs as you like in any combination.

Different figures come with different default morphs. DAZ figures include hundreds of morph targets to allow virtually unlimited customization. Please see Appendix 2: "Other DAZ Products" on page 158 for more information about DAZ products.

Applying Clothing



As you will soon notice, most DAZ|Studio figures are nude. This allows you the greatest possible flexibility to add clothing. Creating a dressed figure would require the model and clothing to be the same mesh object, thus limiting you to only one outfit.

From a technical standpoint, clothing items are figures with body parts and bones of their own. In other words, they are functionally identical to figures such as Michael and Victoria. Select any clothing item in the **Content** tab and add it to your scene. You will see its bones listed in the **Scene** tab. Please see Chapter 12: “The Content Tab” on page 69 for information on navigating content folders and Chapter 14: “The Scene Tab” on page 79 for information on using the **Scene** tab.

Each figure has a unique bone structure tailored to the specific mesh object. In addition, each joint between bones is specifically designed to work with that figure’s mesh. In order to fit properly, clothing items must have both a similar bone structure and joint settings to the underlying figure’s, just like your own clothes must be sized and tailored to fit your body. Therefore, each item of clothing is specifically designed to fit a certain figure. Please see Appendix 2: “Other DAZ Products” on page 158 for more information about DAZ products designed for DAZ|Studio.

TIP

Please see Chapter 5: “Using Figure-Based Clothing” on page 34 for a quick clothing tutorial.

There are two ways to apply clothing to a figure (if the clothing item was originally created with the ability to fit itself to a figure):

Automatic Mode

To automatically fit clothing to your figure:

1. Select the figure to apply the clothing item to.
2. In the **Content** tab, navigate to the folder containing the clothing you wish you wish to fit to the figure (see Chapter 12: “The Content Tab” on page 69).
3. Double-click the clothing item. The selected item is added to your scene and automatically conforms to your figure’s current pose.

Manual Mode

To manually fit clothing to your figure:

1. Add the clothing to your scene.

2 Select the clothing item by either clicking its root object or by using the **Scene** tab (see Chapter 14: “The Scene Tab” on page 79).

3 In the **Parameters** tab, use the **Fit** drop-down menu to select the figure to fit the clothing item to. The selected clothing item will conform to your selected figure.

Items designed for a different figure may work but will probably require additional adjustments.

TIPS & TRICKS

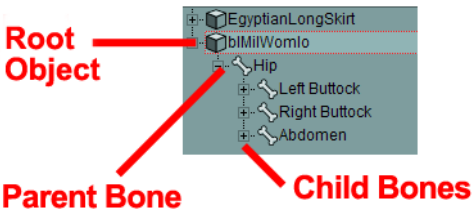
Fitting clothing to figures involves many complex behind-the-scenes calculations and may not be 100% perfect since there are too many variables beyond DAZ|Studio’s control. Keeping the following items in mind will help eliminate problems:

- It is usually best to pose and morph the figure before fitting the clothing to it. It is easier to see your figure’s exact position when nude, and fitting clothes after posing usually results in a more precise fit.
- You may get some *poke-through* where one or more portions of the figure poke through the clothing. If this occurs, you have several choices:
  - Hide the body part(s) poking through the clothing.
  - Hide the surface(s) poking through the clothing. Please see Chapter 25: “About Materials” on page 144 for more information about surfaces and Section 5: “Surfaces” on page 113 for more information on working with the **Surfaces** tab.
  - Scale down the underlying body part a little.
  - Scale up the clothing item a little.

  By applying one or more of these methods, you can quickly eliminate any poke-through that might occur.
- If you are using clothing designed for a different figure, you should try a combination of the above methods.

FIGURE PARAMETERS

To modify parameters for an entire figure, select its root object in the **Scene** tab (see image). Selecting the hip will only affect that body part. Any changes to other body parts will only occur as a result of changes to the hip. For example, if you scale the hip up along the Y-axis, all upper body parts will move up. Selecting the root entry applies all changes equally to all body parts within that figure.



Each figure (including fitted clothing items) has the following default parameters, which you can adjust using the **Parameters** tab, as described in Chapter 13: "The Parameters Tab" on page 73:

- Translate (XYZ): The **Translate** sliders translate the figure along its local X, Y, and Z axes without altering its rotation.
- Rotate (XYZ): The **Rotation** sliders rotate the figure along its local X, Y, and Z axes without altering its location.
- Scale (XYZ): The **Scale** sliders scale the figure along its local X, Y, and Z axes.
- Fit: The **Fit** drop-down menu allows you to fit one figure to another. This is used for fitting clothing to figures. However, this menu appears for both clothing and figures, since they are technically the same. Using the above image as an example, to fit the skirt to Victoria, you would select **bIMilWomIo** in the **Fit** menu. To cancel the selected fit, select **None**. Please see "Applying Clothing" on page 87 for information on fitting clothing to figures.
- Visible: Checking the **Visible** checkbox makes the selected figure visible, and vice-versa.

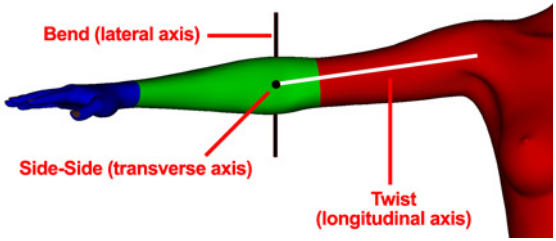
ROOT BONE PARAMETERS

A figure's root (*parent*) bone has the following parameters. On most figures, the hip bone is the figure's parent bone, but this is not required and can vary depending on the content creator's preferences. Figure root bones have the following parameters:

- Translate (XYZ): The **Translate** sliders translate the root bone along its local X, Y, and Z axes without altering its rotation.
- Rotate (XYZ): The **Rotation** sliders rotate the root bone along its local X, Y, and Z axes without altering its location.
- Scale (XYZ): The **Scale** sliders scale the root bone along its local X, Y, and Z axes.

OTHER BONES

Other bones will have various default parameters depending on their *degrees of freedom* (see "Bones" on page 141) and parameter names assigned by the content creator. DAZ uses a standard convention for naming parameters based on their function. Some of the possible parameters are:



- Bend: The **Bend** parameter rotates the selected bone about its own *lateral* axis, that is, the local axis that passes through the parent joint from left to right.

- Side-Side: The **Side-Side** parameter rotates the selected bone toward or away from the figure's centerline. In other words, the rotation occurs along the bone's own *transverse* axis, that is, the local axis that passes through the parent joint from front to back.
- Front-Back: The **Front-Back** parameter rotates the selected bone toward the figure's *anterior* (front) or *posterior* (back) sides. For an example, hold your arm straight out and rotate your shoulder forward and back.
- Twist: The **Twist** parameter rotates the selected bone about its own *longitudinal* axis, that is, the local axis that extends from parent joint to child joint.

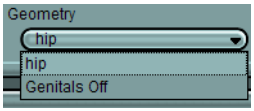
TIP

The terms *transverse*, *lateral*, *longitudinal, anterior*, and *posterior* refer only to common medical terminology, which is the basis for naming the above-listed types of rotation. They do not relate to the Cartesian axes (X,Y,Z) or global & local coordinates.

TIP

In the above image, notice that a human elbow cannot bend along its transverse axis. If you select the forearm on a DAZ figure, you will see that you cannot bend the arm in this manner.

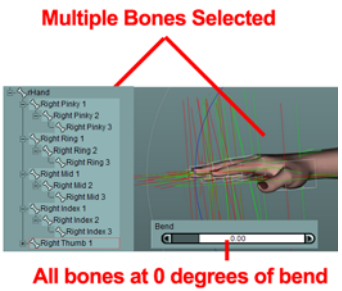
Swappable Geometry



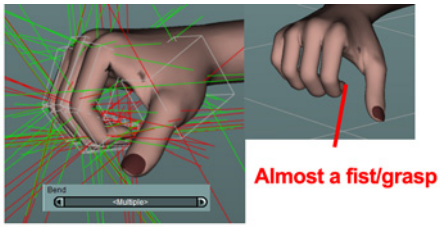
Some DAZ and third-party content supports geometry swapping, where you can substitute one piece of geometry for another. If you have content that supports this feature (such as DAZ's Michael 2 figure), a **Geometry** drop-down menu appears in the **Parameters** tab when you select an object or bone that contains this feature. **Geometry** swapping is typically used with nude male figures to enable or disable displaying genitalia. This menu lists all of your available options (such as **Hip** and **Genitals Off** for a nude mail hip bone). Click the menu and make your selection to enable your desired option.

Multiple Bones

In "Selecting Which Joint to Move" on page 84, we showed you how to pose a figure one bone at a time. DAZ|Studio lets you work with more than one bone at a time. Please see "Selecting Objects" on page 80 for information on making multiple selections in the **Scene** tab. Once you have made your selection, you can modify any parameter shared by all selected bones using the **Parameters** tab (see Chapter 13: "The Parameters Tab" on page 73 for information on using the **Parameters** tab. Here is one example that shows you how to make a fist using multiple selected bones. This image shows the selected bones and initial **Bend** setting.



For this example, we applied 60 degrees of bend to all of the selected bones. This image shows the results of that action. In just a few seconds, we created a hand pose that can be refined into a grasp or fist depending on your needs. The results are approximate, however using multiple joints can save you many hours of posing work.



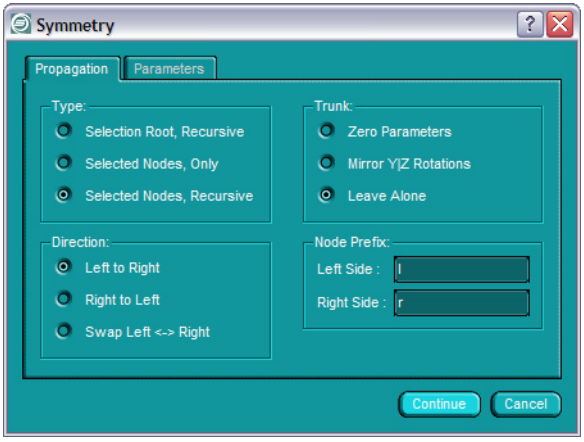
SYMMETRY

The **Parameter Tab Options** menu (see "Parameter Tab Options" on page 74)includes a **Symmetry** option. Selecting this option opens the **Symmetry** dialog, which allows you to apply symmetry to objects in your scene. This can be a great time-saver when creating scenes because you can pose part of a figure, apply symmetry, then adjust individual joints to achieve a realistic result since no person ever stands in a perfectly symmetrical pose. On the other hand, if you are posing a robot (for example), you may indeed want to achieve a perfectly symmetrical result. Either way, the **Symmetry** dialog can make the work of posing much faster and easier.

The **Symmetry** dialog has two tabs: **Propagation** and **Parameters**. After making your selections in one or both tabs, select **Continue** to perform your selected action(s) or **Cancel** to close the **Symmetry** dialog and discard your changes.

PROPAGATION

The Propagation tab controls how the symmetry is applied to the selected figure. Your available options are:



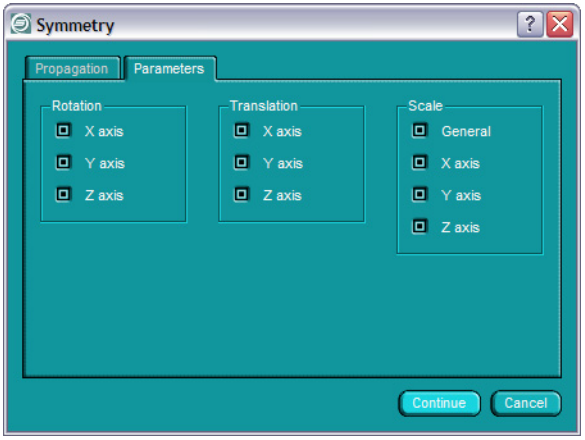
- Type: The **Trunk** options TBD. Your available options are:
  - Selection Root, Recursive: The **Selection Root, Recursive** option TBD
  - Selected Nodes, Only: The **Selected Nodes, Only** mode TBD
  - Selected Nodes, Recursive: The **Selected Nodes, Recursive** mode TBD
- Direction: The **Direction** options control the direction in which symmetry is applied. Your available options are:

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

- Left to Right: The **Left to Right** option applies the settings on the selected figure's left side to the figure's right side.
- Right to Left: The **Right to Left** option applies the settings on the selected figure's left side to the figure's right side.
- Swap Left <-> Right: The **Swap Left <-> Right** option swaps the settings on the selected figure's left and right sides.

- Trunk: The **Trunk** options TBD
  - Zero Parameters: The **Zero Parameters** option TBD
  - Mirror Y|Z Rotations: The **Mirror Y|Z Rotations** option TBD
  - Leave Alone: The **Leave Alone** option TBD
- Node Prefix: The **Node Prefix** options TBD
  - Left Side: The **Left Side** option TBD
  - Right Side: The **Right Side** option TBD

PARAMETERS

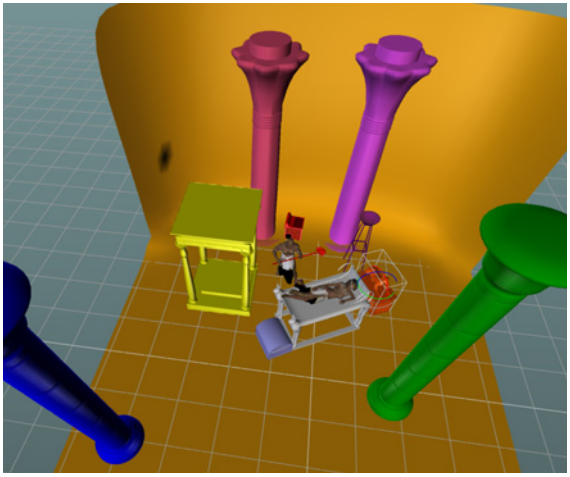


The **Parameters** tab controls which parameters are included when applying symmetry. Your available options are:

- Rotation: The **Rotation** options allow you to apply rotation symmetry in the X, Y, and/or Z axes. Check the appropriate checkbox(es) to make your selection.
- Translation: The **Translation** options allow you to apply translation symmetry in the X, Y, and/or Z axes. Check the appropriate checkbox(es) to make your selection.
- Scale: The **Scale** options allow you to apply scale symmetry in the X, Y, and/or Z axes. Check the appropriate checkbox(es) to make your selection.

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Chapter 17: Props



Props are only conceptually different from figures, hair, or clothing, They can contain a hierarchy of bones, have multiple surfaces, and may also have morph targets depending on the content creator or any add-ons. Props add context, interest, and realism to your scenes.

The image shows all of the props in a scene in false color with their texture maps removed. Just like a real-world photo studio, your virtual universe needs props! By contrast, removing only the two figures wold leave behind an interesting room scene. Every scene or need is different and there are exceptions to every rule. In most cases, however, you'll find that props take up a good part of your content library.

Selecting Which Prop to Move

TIP

These instructions describe selecting props that have no bones. Props with multiple bones behave exactly like figures. Please see Chapter 16: "Posing/Moving Figures" on page 84 for more information on working with figures.

You must select the prop you wish to move before moving it. There are two ways to select props:

- Click the desired prop in any viewport.
- Select the desired prop using the **Scene** tab as described in Chapter 14: "The Scene Tab" on page 79.

The **Prop Manipulators** appear at the selected prop's center whenever you select a prop. These controls will vary depending on the currently selected *manipulation mode* (see "Manipulation Mode" on page 62).

Manipulating/Moving Props

Direct manipulation is the easiest way to adjust your prop's position. At its most basic, the process is as follows:

1 Select the prop to move, as described above.

2 Click and drag the **Prop Manipulator** handles to move the prop.

This method is both easy and fast. Some artists use this method to move props into their rough positions, then switch to the **Parameters** tab to make fine adjustments. The precision of this method depends on your viewing angle and distance; the closer you are to the object you're manipulating, the finer control you will have.

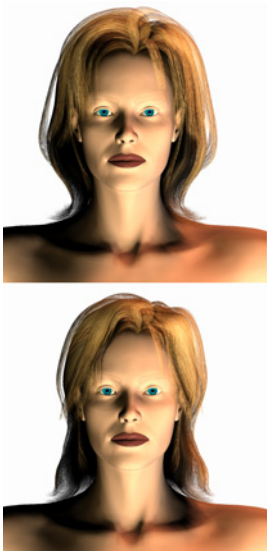
TIP
You could use two viewports, one at a wide angle, the other zoomed in, to give to you both gross and fine control using the **Bone Manipulation** handles.

MANIPULATION MODES

As described in "Manipulation Mode" on page 62 and "Getting Around" on page 137, there are three ways to manipulate props:

- Rotation: Rotation occurs at that prop's center and alters orientation without altering location. Please see "Rotate" on page 62 for more information on working with the **Rotation** manipulator.
- Translation: Translation occurs at the prop's center and alters location without altering orientation. Please see "Translate" on page 63 for more information on working with the **Translation** manipulator.
- Scale: When you select a prop, scaling occurs along that entire prop in your selected axis or axes. Please see "Scale" on page 63 for more information on working with the **Scale** manipulator.

APPLYING MORPH TARGETS



As described in "Step Five: Morph Targets" on page 31, morph targets are specific deformations created for specific objects. See "Clicking the Parameter Options button opens the Parameter Tab Options menu, which contains the following options:" on page 74 for information on viewing and adjusting morphs within the **Parameters** tab.

To apply a morph to your prop, select your desired morph in the **Parameters** tab and assign it a new value. Positive values apply the selected morph as created, while negative numbers apply the opposite of the selected morph. For example, applying a negative value to a smile morph might result in a frown. Applying large values can result in excessive distortion and can even *break* the polygon mesh. A break is where a hole or crack appears in the mesh. When working with morph targets, it's usually best to use small values. You can use as many morphs as you like in any combination. The images on the right show a single hair prop morphed into two distinct styles- and these are only two of hundreds of possibilities.

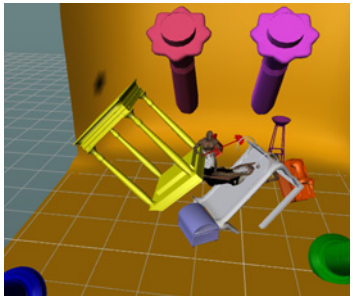
Different props come with different default morphs depending on the type of prop and the individual content creator. For example, some hair props come with morphs that allow several styling variations. DAZ is proud to offer both in-house and brokered third-party content through its online store and Platinum Club. Please see Appendix 2: "Other DAZ Products" on page 158 for more information about DAZ products designed for DAZ|Studio.

Prop Parameters

Each prop has the following default parameters, which you can adjust using the **Parameters** tab, as described in Chapter 13: "The Parameters Tab" on page 73:

- Translate (XYZ): The **Translate** sliders translate the prop along its local X, Y, and Z axes without altering its rotation.
- Rotate (XYZ): The **Rotation** sliders rotate the prop along its local X, Y, and Z axes without altering its location.
- Scale (XYZ): The **Scale** sliders scale the prop along its local X, Y, and Z axes.
- Visible: Checking the **Visible** checkbox makes the selected prop visible, and vice-versa.

Multiple Props

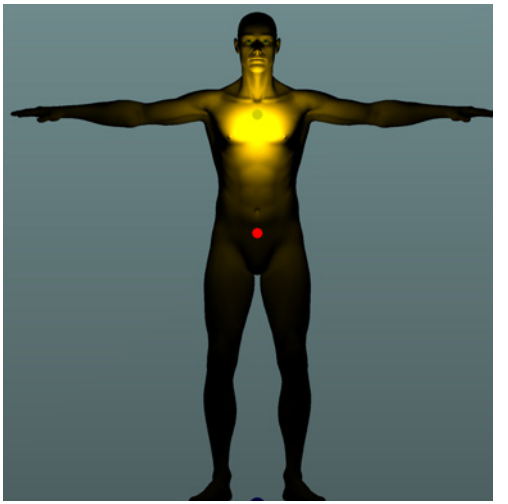


In "Multiple Bones" on page 90, we showed you how to pose multiple bones at once. DAZ|Studio also lets you work with more than one prop at a time. Please see "Selecting Objects" on page 80 for information on making multiple selections in the **Scene** tab. Once you have made your selection, you can modify any parameter shared by all selected props using the **Parameters** tab (see Chapter 13: "The Parameters Tab" on page 73 for information on using the **Parameters** tab). Remember that all movement occurs along each prop's local axes! This image shows an example of rotating several props along their X-axes.

Chapter 18: Lights

Lights illuminate your scene and can create interesting effects and moods. As mentioned in “Step Two: Fun with Lights” on page 26, DAZ|Studio includes a default light that lets you see and work with your scene. This light shuts off when you render your scene, which explains why you might see a black render despite being able to see your scene while working. The above-referenced section also discusses light types.

Point Lights



As described in “Step Two: Fun with Lights” on page 26, point lights are the virtual equivalent of light bulbs. They put out a 360-degree sphere of light. The image shows a figure illuminated by a single yellow point light. You will notice that it appears similar to a spot light (see “Spot Lights” on page 99, below). The difference is that the spot light is only casting light in one direction. In other words, an object behind a spotlight will receive no illumination.

Point Light Parameters

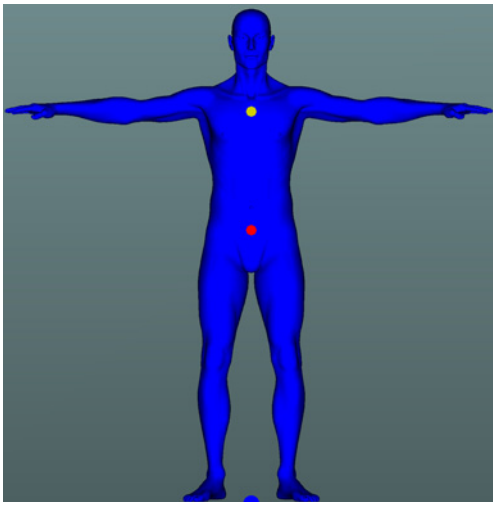
Each point light has the following default parameters, which you can adjust using the **Parameters** tab, as described in Chapter 13: “The Parameters Tab” on page 73:

- Translate (XYZ): The **Translate** sliders translate the prop along its local X, Y, and Z axes without altering its rotation.
- Illumination: The **Illumination** pull-down menu contains the following options:
  - Off: Selecting **Off** turns the selected light off. If you decide to turn a light to 0% intensity, we suggest shutting it off using this menu to conserve computing resources when rendering.
  - Diffuse Only: Selecting **Diffuse Only** specifies that the light will only cast light in the normal (*diffuse*) channel without affecting highlights or *specularity*. Please see “Color (Diffuse)” on page 144 for information about diffuse light and “Highlight (Specular)” on page 145 for information about specular highlights. This selection only affects the appearance of rendered images. It will appear the same as the **On** selection in the interactive display.

- Specular Only: Selecting **Specular Only** specifies that the light will only cast light in the highlight (*specular*) channel without affecting the *diffuse* channel. Please see "Highlight (Specular)" on page 145 for information about specular highlights and "Color (Diffuse)" on page 144 for information about diffuse light. This selection only affects the appearance of rendered images. It will appear the same as the **On** selection in the interactive display.
- On: Selecting **On** turns the selected light on. It will cast light in both diffuse and specular channels. When a light is on, its brightness is determined by the **Intensity** slider.

- Cast Shadow: Checking the **Cast Shadows** checkbox causes DAZ|Studio's rendering engine to calculate shadows cast by objects within the selected light's area of illumination.
- Shadow Bias: The **Shadow Bias** parameter specifies how far to shift samples towards the light source to prevent objects casting shadows across themselves (self-shadowing). Increasing the bias value increases the sample shift, and vice-versa.
- Shadow Softness: The **Shadow Softness** parameter determines how soft the shadow's edges are. Most shadows in nature have at least a little softness around the edges; almost none have completely sharp edges. Increasing the softness value increases the shadow edge softness and vice-versa.
- Color: The **Color** indicator displays the light's current color. Clicking it opens a standard Color Picker, which allows you to select your desired color for the currently selected light.
- Intensity: The **Intensity** parameter adjusts the light's brightness from 0% (totally off) to 100% (totally on) and beyond (extra bright).

Distant Lights



As described in “Step Two: Fun with Lights” on page 26, distant lights are the virtual equivalent of the sun. They put out parallel light rays across your entire scene. Thus, their location does not matter- translating a distant light will not affect your scene’s lighting. In this image, the light is located between the figure’s feet but still casts uniform illumination. Rotation does affect your scene’s lighting just as the sun’s angle in the sky affects lighting on the ground. The image shows an example of a blue distant light.

Distant Light Parameters

Each distant light has the following default parameters, which you can adjust using the **Parameters** tab, as described in Chapter 13: “The Parameters Tab” on page 73:

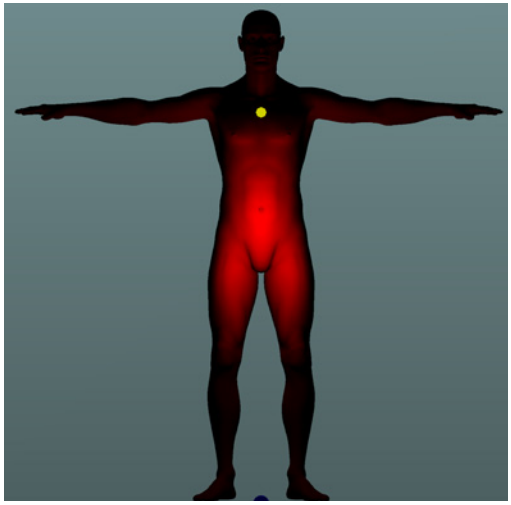
- Translate (XYZ): The **Translate** sliders translate the light along its local X, Y, and Z axes without altering its rotation.
- Rotate (XYZ): The **Rotation** sliders rotate the light along its local X, Y, and Z axes without altering its location.
- Scale (XYZ): The **Scale** sliders scale the light along its local X, Y, and Z axes.
- Illumination: The **Illumination** pull-down menu contains the following options:
  - Off: Selecting **Off** turns the selected light off. If you decide to turn a light to 0% intensity, we suggest shutting it off using this menu to conserve computing resources when rendering.
  - Diffuse Only: Selecting **Diffuse Only** specifies that the light will only cast light in the normal (*diffuse*) channel without affecting highlights or *specularity*. Please see “Color (Diffuse)” on page 144 for information about diffuse light and “Highlight (Specular)” on page 145 for information about specular highlights. This selection only affects the appearance of rendered images. It will appear the same as the **On** selection in the interactive display.
  - Specular Only: Selecting **Specular Only** specifies that the light will only cast light in the highlight (*specular*) channel without affecting the *diffuse* channel. Please see “Highlight (Specular)” on page 145 for information about specular highlights and “Color (Diffuse)” on page 144 for information about diffuse light. This selection only affects the appearance of rendered images. It will appear the same as the **On** selection in the interactive display

- On: Selecting **On** turns the selected light on. It will cast light in both diffuse and specular channels. When a light is on, its brightness is determined by the **Intensity** slider.

- Cast Shadow: Checking the **Cast Shadows** checkbox causes DAZ|Studio's rendering engine to calculate shadows cast by objects within the selected light's area of illumination.
- Shadow Bias: The **Shadow Bias** parameter specifies how far to shift samples towards the light source to prevent objects casting shadows across themselves (self-shadowing). Increasing the bias value increases the sample shift, and vice-versa.
- Shadow Softness: The **Shadow Softness** parameter determines how soft the shadow's edges are. Most shadows in nature have at least a little softness around the edges; almost none have completely sharp edges. Increasing the softness value increases the shadow edge softness and vice-versa.
- Color: The **Color** indicator displays the light's current color. Clicking it opens a standard Color Picker, which allows you to select your desired color for the currently selected light.
- Intensity: The **Intensity** parameter adjusts the light's brightness from 0% (totally off) to 100% (totally on) and beyond (extra bright).

Spot Lights

Spot lights emit a cone of light in a certain direction. You can control the direction and width of the cone in degrees. As mentioned above, the difference between spot lights and point lights can be hard to see from certain angles. The main thing to remember is that spot lights only cast light in their specified cones. Objects outside those cones do not receive any direct illumination. The image shows an example of a red spot light.



Spot Light Parameters

Each spot light has the following default parameters, which you can adjust using the **Parameters** tab, as described in Chapter 13: "The Parameters Tab" on page 73:

- Translate (XYZ): The **Translate** sliders translate the prop along its local X, Y, and Z axes without altering its rotation.

- Rotate (XYZ): The **Rotation** sliders rotate the prop along its local X, Y, and Z axes without altering its location.
- Scale (XYZ): The **Scale** sliders scale the prop along its local X, Y, and Z axes.
- Illumination: The **Illumination** pull-down menu contains the following options:
  - Off: Selecting **Off** turns the selected light off. If you decide to turn a light to 0% intensity, we suggest shutting it off using this menu to conserve computing resources when rendering.
  - Diffuse Only: Selecting **Diffuse Only** specifies that the light will only cast light in the normal (*diffuse*) channel without affecting highlights or *specularity*. Please see "Color (Diffuse)" on page 144 for information about diffuse light and "Highlight (Specular)" on page 145 for information about specular highlights. This selection only affects the appearance of rendered images. It will appear the same as the **On** selection in the interactive display.
  - Specular Only: Selecting **Specular Only** specifies that the light will only cast light in the highlight (*specular*) channel without affecting the *diffuse* channel. Please see "Highlight (Specular)" on page 145 for information about specular highlights and "Color (Diffuse)" on page 144 for information about diffuse light. This selection only affects the appearance of rendered images. It will appear the same as the **On** selection in the interactive display.
  - On: Selecting **On** turns the selected light on. It will cast light in both diffuse and specular channels. When a light is on, its brightness is determined by the **Intensity** slider.
- Cast Shadow: Checking the **Cast Shadows** checkbox causes DAZ|Studio's rendering engine to calculate shadows cast by objects within the selected light's area of illumination.
- Shadow Bias: The **Shadow Bias** parameter specifies how far to shift samples towards the light source to prevent objects casting shadows across themselves (self-shadowing). Increasing the bias value increases the sample shift, and vice-versa.
- Shadow Softness: The **Shadow Softness** parameter determines how soft the shadow's edges are. Most shadows in nature have at least a little softness around the edges; almost none have completely sharp edges. Increasing the softness value increases the shadow edge softness and vice-versa.
- Color: The **Color** indicator displays the light's current color. Clicking it opens a standard Color Picker, which allows you to select your desired color for the currently selected light.
- Intensity: The **Intensity** parameter adjusts the light's brightness from 0% (totally off) to 100% (totally on) and beyond (extra bright).
- Spread Angle: The **Spread Angle** parameter controls the width of the cone of light projected by the spotlight in degrees. Spot lights spread a cone of light that widens

with distance. This cone is aligned with the light's rotation. This parameter specifies the cone's total width. For example, if you specify 40 degrees, the light cone will project 20 degrees to all sides of the centerline for a total of 40 degrees.

Selecting Which Light to Move

You must select the light you wish to move before moving it. There are two ways to select lights:

- Click the desired light in any viewport.
- Select the desired light using the **Scene** tab as described in "Selecting Objects" on page 80.

The **Light Manipulators** appear at the selected light's center whenever you select a light. These controls will vary depending on the currently selected *movement mode* (see "Manipulation Mode" on page 62).

Manipulating/Moving Lights

Direct manipulation is the easiest way to adjust your light's location and/or orientation. At its most basic, the process is as follows:

1. Select the light to move, as described above.
2. Click and drag the **Light Manipulators** to move the light.

This method is both easy and fast. Some artists prefer to use this method to move lights into their rough positions, then switch to the **Parameters** tab to make fine adjustments.

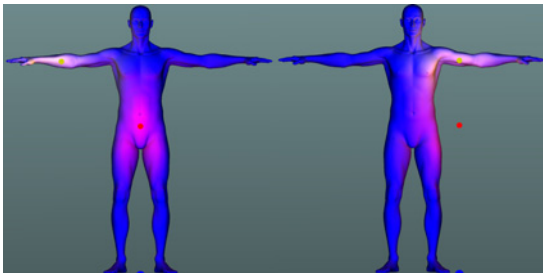
Movement Modes

As described in "Manipulation Mode" on page 62 and "Getting Around" on page 137, there are three ways to move lights:

- Rotation: Rotation occurs at that light's center and alters orientation without altering location. Please see "Rotate" on page 62 for more information on working with the **Rotation** manipulator.
- Translation: Translation occurs at the light's center and alters location without altering orientation. Please see "Translate" on page 63 for more information on working with the **Translation** manipulator.
- Scale: Scaling occurs along the selected light's selected axis or axes. Please see "Scale" on page 63 for more information on working with the **Scale** manipulator.

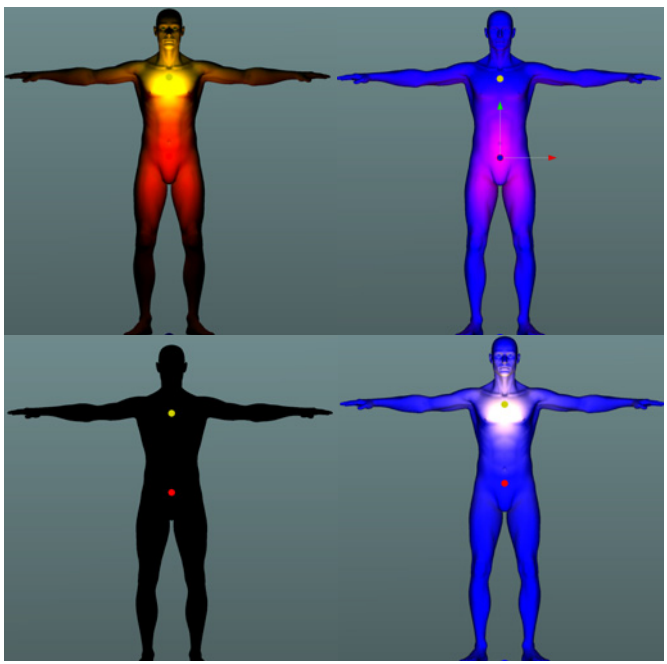
TIP
Positioning lights is just like working with props.

Multiple Lights



In “Multiple Props” on page 95, we showed you how to pose multiple props at once. DAZ|Studio also lets you work with more than one light at a time. Please see “Selecting Objects” on page 80 for information on making multiple selections in the **Scene** tab. Once you have made your selection, you can modify any parameter shared by all selected lights using the **Parameters** pane (see Chapter 13: “The Parameters Tab” on page 73 for information on using the **Parameters** pane). Remember that all movement occurs along each light’s local axes! This image shows an example of translating a yellow point light, a red spot light, and a blue spot light along their X-axes. Notice how each light’s effect changes as it moves- except for the distant light (blue), which emanates parallel rays across your scene.

In this chapter, we’ve shown you how three lights affect a scene, both individually and collectively. Just for fun, here are the effects you can get with any two lights on and the third light off. Three lights can create seven distinct effects (eight if you count having all three lights off). Add a fourth light and that number jumps to nearly 30.



Rendering

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Chapter 19: About Rendering

As we've mentioned elsewhere in this manual, *rendering* is the act of taking a virtual photograph of your scene. You can do this at any time using any available default or custom camera (see Chapter 11: "View Tab (Cameras)" on page 65 for information on working with cameras). When rendering, DAZ|Studio takes everything in your scene into account, including:

- locations of figures and props (see Chapter 16: "Posing/Moving Figures" on page 84 and Chapter 17: "Props" on page 93)
- figure poses (see "Step Four: Posing" on page 29 and Chapter 16: "Posing/Moving Figures" on page 84)
- light locations, types, and settings such as type, color, intensity, location, rotation, etc. (see Chapter 18: "Lights" on page 96)
- surface settings including all colors and maps (see Section 5: "Surfaces" on page 113)
- camera location and settings (see Chapter 11: "View Tab (Cameras)" on page 65)
- render settings

About the DAZ|Studio Renderer

DAZ|Studio uses 3Delight, a fast and powerful RenderMan®-complaint renderer that supports many advanced features such as:

- Support for programmable shading and lighting, including surfaces, displacement, lights, volumetric, and image shaders.
- Camera controls such as depth of field and motion blur.
- Atmospheric effects
- Ray tracing
- Antialiasing
- Fully optimized for WIndows and Mac OS-X

For more information about 3Delight, please visit http://www.3delight.com.

Speeding Up Your Renders

When rendering, DAZ|Studio takes the raw calculation results from your scene and passes them through your render settings to arrive at the final result. Translating all of the 2D and 3D information into individual pixels requires significant computing resources. The actual amount varies by scene complexity; the more items you have in your scene, the more resources are required and the longer the rendering takes. DAZ|Studio is designed to use

your computer's resources as efficiently as possible and we are constantly looking for ways to achieve even greater performance. That said, your scene and your computer will always be the largest factors behind rendering times.

If you rendering is taking too long, there are several things you can do to optimize performance. In order of preference, these steps include:

1. Remove some items from your scene. Lights are particularly costly in terms of required computing resources.
2. Add RAM. Your computer uses its hard drive as *virtual memory*, which behaves like additional RAM and expands the total available memory. The only problem with this is that your hard drive is much slower than your regular memory since the computer must read and write data to the hard drive just like any other file. Adding more regular RAM reduces the need for virtual memory, which can greatly speed up rendering times.
3. Upgrade your computer's CPU. Faster CPUs can process more data in any given amount of time. However, since rendering is memory-intensive, adding RAM usually gives a far greater performance boost than upgrading the CPU. If your computer has insufficient RAM, the faster CPU will simply spend more time waiting for information instead of processing the render, which doesn't do you much good.
4. Turn off shadows. Shadows require extensive computer resources.

Chapter 20: Rendering Your Scenes

This chapter describes how to render your scenes and how to adjust the available render settings.

The Render Options Window

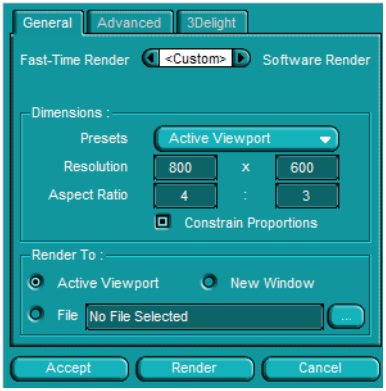
The **Render Options** window appears when you either select **Render>Render Options** or click the **Render Options** button (see "Tools Toolbar" on page 61). Once you have made your selections, you have the following options:

- To render an image using your current settings, click the **Render** button.
- To save your settings without rendering an image, click the **Accept** button.
- To exit the window, click the **Cancel** button.

By default, this window contains three tabs: **General** and **Advanced** (set global rendering preferences) and **3Delight** (sets options specific to the included 3Delight rendering engine).

GENERAL TAB

The **General** tab is where you set the following basic rendering options:



Time vs. Quality

The slider at the top of this tab allows you to select **Fast-Time Render** (fast render with lower quality), **Software Render** (slow render with high-quality) or anywhere in between. Click and drag the slider to your selected value. You can also use the arrows at either end of the slider to nudge the value up or down as desired.

Dimensions

The **Dimensions** section is where you select both the desired rendering resolution in pixels and the desired *aspect ratio* (ration of render width to height). You have the following options:

- Presets: The **Presets** pull-down menu allows you to select your desired aspect ratio from the following list of commonly used options:
  - Active Viewport: Render dimensions are the same as the viewport dimensions/ aspect ratio.
  - Display Standard: 4:3 aspect ratio. This is the standard used by most TV sets.
  - Display Wide: 5:4 aspect ratio.

- Widescreen: 16:9 aspect ratio. This is the standard used by most cinematic releases.
- Square: 1:1 aspect ratio.
- Academy Flat: 1.85:1 aspect ratio.
- Anamorphic Scope: 2.35:1. This is used by some high-end cinematic releases.

- Resolution: Enter your desired resolution (in pixels) in the text fields in **width x height** format. if you have selected a preset, entering one value will adjust the other value to preserve the selected aspect ratio.
- Aspect Ratio: Enter your desired aspect ratio in the fields in **width:height** format. For example, if you select 4:3, the render will be 4 pixels wide for every 3 pixels high.
- Constrain Proportions: Checking the **Constrain Proportions** checkbox forces the selected aspect ratio to remain identical. Values will automatically adjust to preserve your selected setting. Clearing this checkbox allows you to set any dimensions/ aspect ratio you desire.

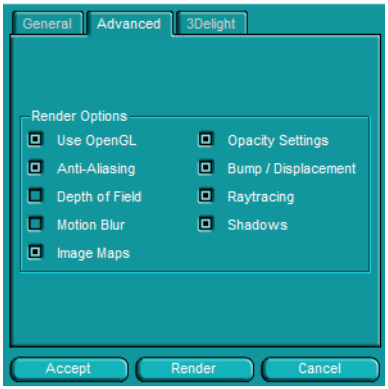
Render To

The Render To options allow you to specify where to output renders. Your available options are:

- Active Viewport: Checking the **Active Viewport** radio button renders images to the active viewport (see Chapter 9: “Working with Viewports” on page 57 for information on working with viewports). Images rendered to the viewport will share the viewport’s height and width. If you have an orthogonal camera selected (see “Adding, Selecting, & Deleting Cameras” on page 65 and “Orthogonal and Perspective Views” on page 132), you will get an orthogonal render. Rendered images will be the same size as the currently active viewport.
- New Window: Checking the **New Window** radio button will make your renders appear in a separate window.
- File: Checking the **File** checkbox saves rendered images directly to an image file on your hard drive instead of to your screen. If this option is selected, you must also select a filename or render to the currently displayed filename. To select a new filename, click the **...** button to open a standard **Browse** dialog, which allows you to select your desired folder and filename to save the new rendering. Clearing this checkbox disables this option. You can also specify your desired image format. DAZ|Studio supports TIF and JPG images.

ADVANCED TAB

The Advanced tab allows you to specify the following render options:

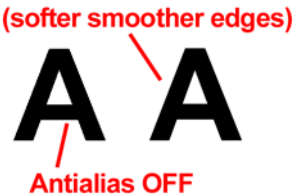


- Use OpenGL: Selecting **Use OpenGL** uses your system's video card to render the final image. This option is essentially identical to a screen capture of the active viewport. Rendering is much faster but not as realistic. If you experience any issues with OpenGL, try updating your video card drivers. Please refer to your video card's documentation for instructions on how to update the drivers.

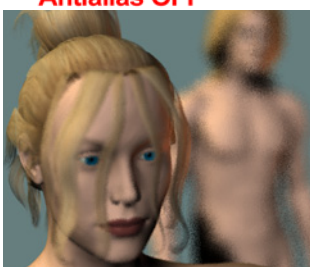
  OpenGL uses dedicated rendering hardware on your video card to render images. The central processor on your video card is specially designed to render polygons, textures, etc. In other words, it is specifically designed to create images based on everything in your DAZ|Studio scenes. This level of specialization plus your video card's on-board high-speed RAM (up to 256MB on some cards as of this manual) makes OpenGL much faster than standard *software* renders. A software render uses an application that instructs your computer's main CPU how to perform the calculations needed for rendering. This combined with system bottlenecks such as virtual memory and RAM speeds can greatly lengthen the time require to render any given scene.

  Clearing this option selects the 3Delight software rendering engine supplied with DAZ|Studio. This option is slower but produces the most realistic rendering results.

- Anti-Aliasing: Checking the **Anti-Aliasing** checkbox applies a small amount of blue to object edges to make them appear smoother. This image demonstrates the effect of anti-aliasing.



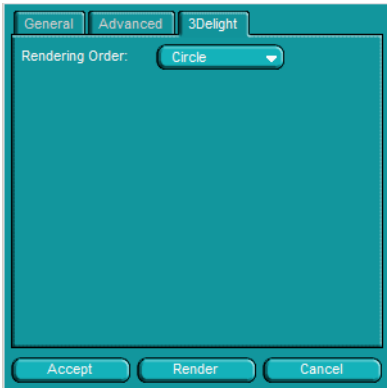
- Depth of Field: Checking the **Depth of Field** checkbox makes objects that are more distant from the camera appear blurry. This image demonstrates the effect of depth of field.



- Motion Blur: Checking the **Motion Blur** checkbox applies a blurring affect to body parts and props to make them appear as though they are in motion. The amount of blue depends on the position of the individual body part/prop. In general, the further a child object is moved from its default position relative to its parent object, the more motion blur will be applied.

- Image Maps: Checking the **Image Maps** option makes the rendering engine use image maps when calculating the final render. Please see “What are Maps?” on page 146 for more information about image maps.
- Opacity Settings: Checking the **Opacity Settings** option makes the rendering engine calculate object opacity for greater realism.
- Bump/Displacement: Checking the **Bump/Displacement** option makes the render engine take bump and displacement settings into account when calculating the final render. Please see “Bump (Strength)” on page 149 and “Displacement (Strength)” on page 149 for more information about bump and displacement.
- Raytracing: Checking the **Raytracing** option makes the render engine use raytracing for calculating light and shadow effects. This greatly enhances realism but slows down the render since raytracing requires significant computer resources.
- Shadows: Checking the **Shadows** option makes the render engine calculate and include shadows in the final render.

3DELIGHT TAB



The **3Delight** tab allows you to specify the following 3Delight rendering engine options:

Rendering Order

The **Rendering Order** drop-down menu allows you to select the order in which pixels are rendered. Your available options are:

- Horizontal (default): Rendering begins at the top left corner and proceeds row by row, left to right, top to bottom.
- Vertical: Rendering begins at the top left corner and proceeds column by column, top to bottom, left to right.
- Spiral: Rendering begins at the center and proceeds outward in a clockwise spiral.
- Circle: Rendering begins at the center and proceeds outward in concentric circles.
- Random: Rendering begins and proceeds randomly.

RENDER!

As mentioned above, clicking the **Render** button renders your image using your current render settings.

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Spot Renders

Want to see how part of your scene will look but don't want to wait for the whole thing to render? Click the **Spot Render** button (see "Spot Render" on page 64), then drag a rectangle in your selected viewport around the area you wish to render.

Quick Render

You can render your image at any time by clicking the **Render** button, as described in "Render" on page 64.

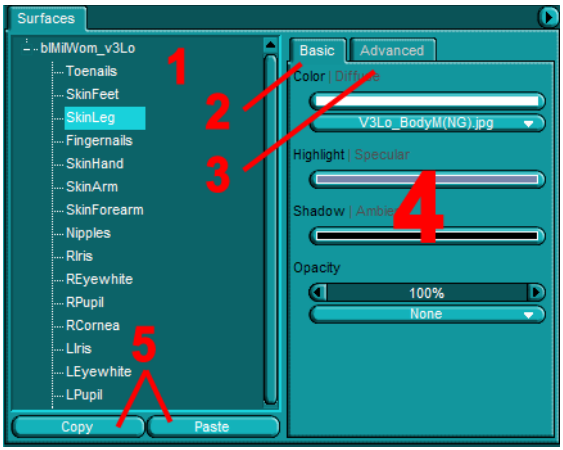
Surfaces

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Chapter 21: About the Surfaces Tab

The **Surfaces** tab allows you to specify material settings for every material group in your scene. In other words, it allows you to specify the appearance of each object. From skin to metal, glass, fiber, and anything else you can imagine, the **Surfaces** tab give you the freedom to visualize whatever you can imagine.

The image above shows the **Surfaces** tab with the tree view expanded.



Material List

The **Material List** displays every surface in your scene. Figures, props, hair, and clothing can all have surfaces, which are defined by the content creator. Please see "Multi/Sub-Object Materials" on page 144 for more information about surface groups.

DAZ|Studio allows you to view surfaces in either a tree or menu mode.

Surfaces Tree

The **Surfaces Tree** (#1 in the previous image) allows you to view every surface in your scene using a hierarchical view. By default, the **Surfaces Tree** is hidden. Check the **Show Surface List** option in the **Scene Tab Options** menu to toggle this option on and off. Every object in your scene that has one or more surfaces appears in this view. You can expand and collapse each object's surfaces. To expand a tree branch, click the **+** sign next to a collapsed branch. To contract an expanded branch, click the **-** sign next to an expanded branch.

The **Surfaces Tree** allows you to select any number of surfaces in one or more objects in your scene. The ability to work with multiple surfaces at once can be a huge time saver, especially when working with complex scenes.

To select any surface in your scene, use the **Surfaces Tree** to locate your desired surface, then click it. You can move your selection one object at a time by pressing [UP ARROW] or [DN ARROW], and can also scroll quickly by pressing [PG UP] and [PG DN].

To select multiple objects using the **Surfaces Tree**, you may use any combination of the following methods:

- Click and drag inside the hierarchy view. All surfaces inside your selection area are selected regardless of the object they belong to.

- Press [SHIFT] while clicking to select all objects between your previous selection and your next click.
- Press [CTRL] while clicking to make multiple individual selection.

If you want to work with one surface at a time, you can use the **Surfaces List** menu, as discussed below:

SURFACES LIST MENU

The **Surfaces List** menu appears when the **Surfaces Tree** is hidden. This drop-down menu allows you to select one or more surfaces in your scene to work with. To use this menu, click the **Surfaces List** button to open the menu, then click your desired selection. The button displays your currently selected surface. If you have more than one surface selected, the indication **<Multiple>** appears.

While this menu is primarily intended for use when working with one surface at a time, you can make multiple selections. Each time you open the **Surfaces List** menu, your previous selection is highlighted. Pressing [CTRL] while making another selection selects your desired surface in addition to any previous selections. The menu closes after each selection. You can keep re-opening the menu to select additional surfaces one by one, or can open the **Surfaces Tree** to speed up multiple selections.

TABS

The **Surfaces** tab has two sub-tabs: **Basic** and **Advanced**.

BASIC

The **Basic** tab (#2 in the previous image) is where you access each surface's most commonly used attributes. Please see Chapter 22: "Basic Surface Properties" on page 117 for more information about the **Basic** tab.

ADVANCED

The **Advanced** tab (#3 in the previous image) is where you access each surface's advanced attributes. This tab is designed for use by more experienced artists who want to be able to control every aspect of a surface's appearance. Please see Chapter 23: "Advanced Surface Properties" on page 120 for more information about the **Advanced** tab.

SURFACE ATTRIBUTES

The **Surface Attributes** (#4 in the previous image) appear in this portion of their designated tabs. You modify materials by altering these attributes. When you have more than one surface selected, changing one of these attributes affects all selected surfaces equally. Please see Chapter 25: "About Materials" on page 144 for more information about surfaces and surface attributes.

Copy/Paste Buttons

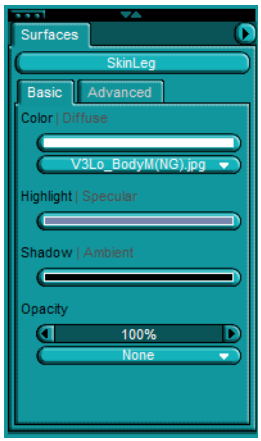
To save time, DAZ|Studio allows you to transfer attribute settings from one surface to another. The **Copy** and **Paste** buttons (#5 in the previous image) provide this functionality. To transfer attributes from one surface to another:

1. Select one or more surfaces to customize.
2. Make your desired attribute changes.
3. Click the **Copy** button.
4. Select one or more surfaces on which to apply the copies settings.
5. Click the **Paste** button.

These buttons are only available when the **Surfaces Tree** is expanded (see “Surfaces Tree” on page 114).

Chapter 22: Basic Surface Properties

As mentioned above, the **Basic** tab is where you access a surface's most commonly used attributes.



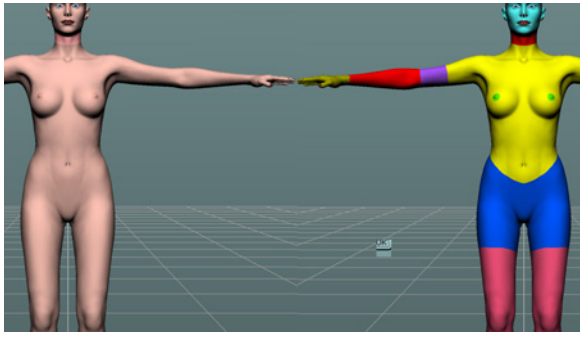
Color/Diffuse

A surface's *diffuse color* is the base color that shows when pure white light strikes the surface. For human skin, this can range from a light yellowish pink to a deep brown. Most plant leaves are shades of green. When someone asks "what colors does this come in?", they are referring to the diffuse color. Please see "Color (Diffuse)" on page 144 for more information about diffuse color.

1 To change a surface's diffuse color:

2 Select the surface or surfaces you wish to work on.

3 The **Color/Diffuse** button shows the currently selected diffuse color. Clicking this button opens a standard Color Picker, which allows you to select any color you desire. Here is an example of Victoria in both her default color and with different diffuse colors applied to her surfaces.



Texture Maps

If you look at the above image, you'll notice two things: First, the Vicki on the left looks far more realistic than her psychedelic cousin. Second, her body lacks any detail such as veins, moles, hairs, birthmarks, and such. This lack of detail results in a plain doll-like appearance. Of course, the only way to achieve a high level of detail is to have exact control over how each detail looks and where it is placed. This cannot be done by simply altering a color.

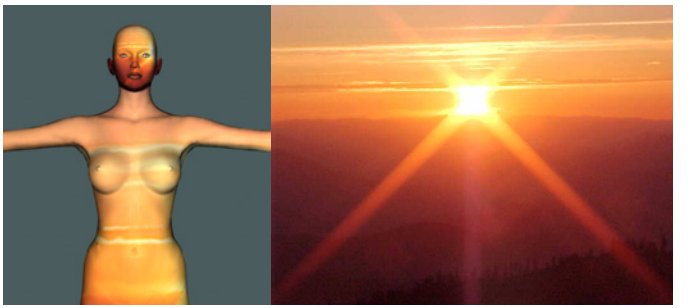
To attain a precise look, you need to use *texture maps*. There are many different types of maps, of which texture maps are the most common. In general, maps allow you to specify the exact appearance of any location on a surface. Please see "What are Maps?" on page 146 for more information about texture maps.

To apply a texture map to your selected surface(s):

1 Select the surface(s) you wish to apply the map to.

2 Use the **Texture Map** pull-down menu to select a map. Your options are:

- Load an existing image: The **Texture Map** menu displays a list of all loaded maps. You can select any one of these by clicking.
- Remove a map: To remove an existing map, select **None**.
- Load a new map: To load a new texture map, select **Browse for Image**. This opens a standard **Browse** dialog, which allows you to navigate to your desired image file.



You can use any image you like as a texture map. However, if you are after a specific look (such as having a mole in an exact location), you must use an image that is designed to work with the currently selected object. This is because texture map images are designed to use a specific object's *U/V coordinates* in order to create a precise result. Here is an example of a figure with a random image applied as a texture map. Please see "What are Maps?" on page 146 for an explanation of U/V coordinates and a sample map used by DAZ figures.

Highlight/Specular

Many surfaces (especially glasses and metals) have highlights that appear when light strikes them. These highlights most often appear as bright spots on the surface but can also appear as a sheen on other glossy surfaces such as polished leather. The color of these highlights is called the *specular color*. Please see "Specular" on page 122 for more information on specular color.

Clicking the **Specular** button opens a standard Color Picker that allows you to specify your desired specular color.

Shadows/Ambient

A surface's *ambient color* is the color that appears when no light is striking the surface. This is usually black, since one requires light in order to see color. DAZ|Studio, however, does not hold you to this real-world limitation. Clicking the **Ambient** button opens a standard Color Picker that allows you to specify your desired ambient color. Ambient color is frequently used in 3D graphics to compensate for the fact that lighting in 3D environments only approximates real-world lighting and therefore frequently requires additional adjustment to obtain maximum realism when the image is rendered. Ambient lighting is one of these adjustments.

Opacity

Opacity measures an object's ability to transmit light. In other words, it specifies how transparent an object is. Glass is very transparent, while brick is not transparent at all. The **Opacity** slider allows you to specify the opacity for your currently selected surface(s). Please see "Opacity" on page 145 for more information about opacity. There are several ways to adjust the amount of opacity:

- Clicking and dragging the slider to the left lowers the opacity value, and vice-versa. This is a quick and easy way to make rough settings.
- The **Nudge** arrows at each end of the **Opacity** slider increase or decrease the opacity by a small amount when clicked. Clicking the arrow on the parameter's left side lowers the value, and vice-versa.
- Right-clicking the numeric value in the **Opacity** slider allows you to enter the exact value you want.

Opacity Maps

The **Basic** tab also allows you to use *opacity maps*. Opacity maps are a great way to achieve fine control over an object's transparency by specifying an exact amount of opacity at any given location. Why is this useful? The image on the right gives you one of many possible examples. In each case, setting the **Opacity** slider would only set the overall level of transparency while giving you no control over the pattern. Modeling all of the details into each clothing item would create a huge object that would consume excessive amounts of computing power to process. Adding opacity maps allows you to create sheer fabrics with intricate patterns.

Please see "Opacity (Strength)" on page 148 for more information about opacity maps.

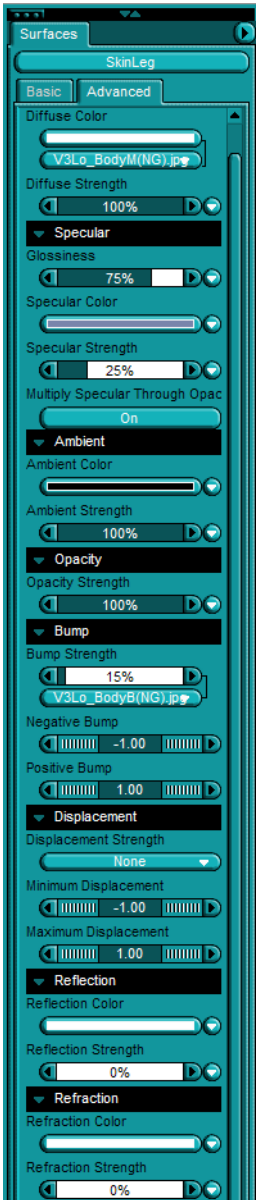
Applying opacity maps is the same as applying texture maps. Please see "Applying Maps" on page 127 for information on applying maps to surfaces.

Chapter 23: Advanced Surface Properties

As mentioned above, the **Advanced** tab provides access to each surface's advanced attributes. This tab is designed for use by more experienced artists who want to be able to control every aspect of a surface's appearance. You have full access to every function available in the **Basic** tab and much more.

DAZ|Studio's 3Delight rendering engine is RenderMan-complaint and supports *shaders*, which consist of numerous *channels*. In turn, each channel contains one or more *components*. Each surface in your scene has a shader assigned to it. You create the material you want for each surface while working in DAZ|Studio. Then, at render time, the rendering engine calculates all of the components to arrive at vales for each channel, then calculates the effect of each channel in each shader to arrive at the surface's final appearance.

Please see "Multi/Sub-Object Materials" on page 144 for more information on surfaces and multi/sub-object material groups, "Inside a Shader" on page 151 for information about shaders, and "What are Maps?" on page 146 for information about maps.



Channels

DAZ|Studio's default shader contains the following channels:

- Diffuse: An surface's diffuse color is the color that appears when the surface exposed to pure white light. Please refer to "Color (Diffuse)" on page 144 for more information.
- Glossiness: A surface's shininess. For example, raw wood is not shiny, while polished wood can be very shiny. Please refer to "Glossiness (Strength)" on page 147 for more information.
- Specular: A surface's specular color is the color of a highlight, if any. For example, most metals and glasses will show a bright white highlight when under direct lighting. Please refer to "Highlight (Specular)" on page 145 for more information.
- Ambient: A surface's ambient color is the color that appears when there is no light. In the real world, this is

black. But DAZ|Studio does not impose this limit on you! Please refer to "Shadow (Ambient)" on page 145 for more information.

- Opacity: How opaque a surface is. Wood is 100% opaque, while clear glass is 0% opaque. Please refer to "Opacity" on page 145 for more information.
- Bump: How rough a surface is. Bump alters surface *normals* to give the appearance of a rough surface. Please refer to "Bump (Strength)" on page 149 for more information.
- Displacement: Displacement is similar to bump except that it actually perturbs a surface's *polygons* (geometry) instead of merely altering normals. Please see "Displacement (Strength)" on page 149 for more information.
- Reflection: Measure of a surface's ability to redirect light waves that strike the surface. A mirror is completely reflective while polished metal is partly reflective and wood is not reflective at all. Please refer to "Reflection" on page 145 for more information.
- Refraction: bending of light rays when they pass through objects of differing densities. For example, if you are wading and see a fish in the water, the fish will appear to be in a different location because the light rays are bending as they enter and emerge from water into the air. Please refer to "Refraction" on page 145 for more information.
- Lighting Model: A lighting model defines how the different shader channels are assembled for rendering. Please see "Lighting Model" on page 127 for more information.

The following segments describe how to use each channel in detail.

DIFFUSE

The **Diffuse** channel controls the surface color under illumination as described in "Color (Diffuse)" on page 144 and "Diffuse (Color)" on page 147. You have the following options when working with this channel:

Color

Clicking the **Diffuse Color** button opens a standard Color Picker, which allows you to select the desired diffuse color for the selected surface. This color *multiplies* through any texture map you might apply, which means that the base color will blend through the map.

Strength

The **Diffuse Strength** slider controls the strength of the diffuse color, or how strongly it reacts to light. A setting of 0% means no response to light, while 100% means that the color is fully responsive to light. This slider works in the same manner as a **Parameter** slider. Please see "Sliders" on page 75 for more information on working with sliders.

Map

You can apply a map to any component in the **Diffuse** channel using the **Select Map** menu as described in “Applying Maps” on page 127. When a map is applied to the diffuse color, it is called a *texture map*. Please see “What are Maps?” on page 146 for more information about maps.

GLOSSINESS

The **Glossiness** channel controls the specular roughness, or the sharpness of a specular highlight.

SPECULAR

The **Specular** channel controls the surface highlight color as described in “Highlight (Specular)” on page 145 and “Specular (Color)” on page 147. You have the following options when working with this channel:

Color

Clicking the **Specular Color** button opens a standard Color Picker, which allows you to select the desired specular color for the selected surface.

Strength

The **Specular Strength** slider controls the strength of the highlight, or how strongly the highlight appears. A setting of 0% means no highlight, while 100% means a bright highlight. This slider works in the same manner as a **Parameter** slider. Please see “Sliders” on page 75 for more information on working with sliders.

Map

You can apply a map to any component in the **Specular** channel using the **Select Map** menu as described in “Applying Maps” on page 127. Please see “What are Maps?” on page 146 for more information about maps.

MULTIPLYING SPECULARITY THROUGH OPACITY

Checking the **Multiply Specular Through Opacity** checkbox causes the specular strength to be multiplied by the opacity strength. If you have a fully transparent (0% opaque) surface, checking this box will cause a fully transparent specular highlight, making it invisible. This is great for non-glossy transparent objects. Clearing this box uses only the specular strength without taking opacity into account (great for glossy surfaces such as glass, corneas, etc.).

AMBIENT

The **Ambient** channel controls the surface color in the absence of illumination as described in “Shadow (Ambient)” on page 145 and “Ambient (Color)” on page 148. You have the following options when working with this channel:

Color

Clicking the **Ambient Color** button opens a standard Color Picker, which allows you to select the desired diffuse color for the selected surface. This color *multiplies* through any map you might apply, which means that the base color will blend through the map.

Strength

The **Ambient Strength** slider controls the strength of the ambient color, or how strongly the color appears in the absence of light. A setting of 0% means no color, while 100% means the full color. This slider works in the same manner as a **Parameter** slider. Please see “Sliders” on page 75 for more information on working with sliders.

Map

You can apply a map to any component in the **Ambient** channel using the **Select Map** menu as described in “Applying Maps” on page 127. Please see “What are Maps?” on page 146 for more information about maps.

OPACITY

The **Opacity** channel controls the surface transparency as described in “Opacity” on page 145 and “Opacity (Strength)” on page 148. You have the following options when working with this channel:

Strength

The **Opacity Strength** slider controls the strength of the transparency, or how transparent the surface is. A setting of 0% means fully transparent, while 100% means fully opaque. This slider works in the same manner as a **Parameter** slider. Please see “Sliders” on page 75 for more information on working with sliders.

Map

You can apply a map to any component in the **Opacity** channel using the **Select Map** menu as described in “Applying Maps” on page 127. Please see “What are Maps?” on page 146 for more information about maps. When applied to opacity, images are called *transparency maps* or *opacity maps*. Please see “Opacity Maps” on page 119 for an example of using transparency maps.

BUMP

The **Bump** channel controls the surface roughness as described in “Bump (Strength)” on page 149. Note that bump only disturbs surface normals, meaning that the surface edges will still appear smooth despite having bump applied. You have the following options when working with this channel:

Map Selection

If no bump map is specified, the **Bump Strength** pull-down menu appears with a value of **None**. To specify a map, click the button and select either:

- Loaded image: The menu displays all currently loaded maps. You can use any of them as a displacement map for the selected object.
- None: Selecting **None** removes any currently selected map.
- Browse for image: Selecting **Browse for Image** opens a standard **Browse** dialog that allows you to browse for your desired bump map.

Strength

When a bump map is selected, the **Bump Strength** slider controls the strength of the bumps, or how rough the surface is. A setting of 0% means perfectly smooth, while 100% means fully rough. This slider works in the same manner as a **Parameter** slider. Please see “Sliders” on page 75 for more information on working with sliders.

Map

You can apply a map to any component in the **Bump** channel using the **Select Map** menu as described in “Applying Maps” on page 127. Please see “What are Maps?” on page 146 for more information about maps. When applied to bump strength, an image is called a *bump map*.

DISPLACEMENT

The **Displacement** channel controls the surface roughness as described in “Displacement (Strength)” on page 149. Unlike bump (see above), displacement perturbs a surface’s underlying polygons (called *geometry*). This means the edges will look rough in addition to the surface itself. You have the following options when working with this channel:

Map Selection

If no displacement map is specified, the **Displacement Strength** pull-down menu appears with a value of **None**. To specify a map, click the button and select either:

- Loaded image: The menu displays all currently loaded maps. You can use any of them as a displacement map for the selected object.
- None: Selecting **None** removes any currently selected map.
- Browse for image: Selecting **Browse for Image** opens a standard **Browse** dialog that allows you to browse for your desired displacement map.

Strength

When a displacement map is selected, the **Displacement Strength** slider controls the strength of the displacement, or how much the surface geometry is affected. A setting of 0% means no effect, while 100% means full effect. This slider works in the same manner as a **Parameter** slider. Please see “Sliders” on page 75 for more information on working with sliders.

Map

You can apply a map to any component in the **Displacement** channel using the **Select Map** menu as described in “Applying Maps” on page 127. Please see “What are Maps?” on page 146 for more information about maps. When applied to displacement strength, images are called *displacement maps*.

REFLECTION

The **Reflection** channel controls the surface reflection as described in “Reflection” on page 145 and “Reflection (Color)” on page 150. You have the following options when working with this channel:

Color

Clicking the **Reflection Color** button opens a standard Color Picker, which allows you to select the desired reflection color for the selected surface. Colored surfaces may give a cast to reflected light, which is what this component controls. This color *multiplies* through any map you might apply, which means that the base color will blend through the map.

Strength

The **Reflection Strength** slider controls the strength of the reflection, or how much the surface geometry redirects light. A setting of 0% means flat (such as wood), while 100% means fully reflective (like a smooth polished mirror). This slider works in the same manner as a **Parameter** slider. Please see “Sliders” on page 75 for more information on working with sliders.

TIP

Specifying a reflection strength by any means (value, map, or combination) forces one of two things to happen at render time: If you specify a reflection color map, DAZ|Studio uses that map as an environment map. If you do not specify a map, DAZ|Studio will invoke the raytracer.

Map

You can apply a map to any component in the **Reflection** channel using the **Select Map** menu as described in “Applying Maps” on page 127. Please see “What are Maps?” on page 146 for more information about maps. When applied to reflection strength, images are referred to as *reflection maps*.

REFRACTION

The **Refraction** channel controls the surface light bending as described in “Refraction” on page 145 and “Refraction (Color)” on page 150. You have the following options when working with this channel:

Color

Clicking the **Refraction Color** button opens a standard Color Picker, which allows you to select the desired refraction color for the selected surface. Light can change color as it bends (such as white light passing through a prism). This color *multiplies* through any map you might apply, which means that the base color will blend through the map.

Strength

The **Refraction Strength** slider controls the strength of the refraction, or how much the light bending effect (called the *index of refraction*) is evident. A setting of 0% means flat the refraction is not visible, while 100% means that the refraction effect is fully visible. This slider works in the same manner as a **Parameter** slider. Please see "Sliders" on page 75 for more information on working with sliders.

TIP

Specifying a refraction strength by any means (value, map, or combination) forces one of two things to happen at render time: If you specify a refraction color map, DAZ|Studio uses that map as an environment map. If you do not specify a map, DAZ|Studio will invoke the raytracer.

Map

You can apply a map to any component in the **Refraction** channel using the **Select Map** menu as described in "Applying Maps" on page 127. Please see "What are Maps?" on page 146 for more information about maps.

Index

The **Index of Refraction** determines the amount of bending that occurs when light passes through the object. The greater the index, the greater the bending. Different materials have indices. For example, here are refraction indices for some common materials:

- Vacuum: 1.00000
- Air (at standard temperature and pressure): 1.00029
- Ice: 1.31
- Water (at 20 degrees Celsius): 1.33
- Acetone: 1.36
- Sugar solution(30%): 1.38
- Sugar solution (80%): 1.49
- Crown glass: 1.52-1.62
- Sodium chloride (salt): 1.54
- Polystyrene: 1.55-1.59
- Sapphire: 1.77

- Diamond: 2.417

LIGHTING MODEL

- A lighting model is a method used to calculate the effects of different shader channels in response to light. The **Lighting Model** pull-down menu allows you to select your desired lighting model. Your options are:
  - Plastic: The **Plastic** lighting model has additive specular highlights. Highlights are generally very bright, and reflect the color of light projected on to it.
  - Metal: The **Metal** lighting model uses metallic (*isotropic* or elliptical) highlights, which are multiplied through the base surface color, thus tending to produce a slightly brighter tint of the same hue.
  - Glossy: The **Glossy** lighting model uses a Fresnel function to make the surface act more reflective at glancing angles. It also calculates specularity in a way that produces a more uniformly bright highlight (sharper), thus making the surface look glossy. Eyeballs are a great example.
  - Skin: The **Skin** lighting model uses sub-surface scattering to give the appearance of a semi-translucent layer (skin) with a blue-ish sheen and a red-ish opaque sub layer (blood/muscle).
  - Matte: The **Matte** lighting model completely ignores the specular channel.

APPLYING MAPS

To apply a map to your selected component:

1. Click the arrow to the right of your desired component.

2. Use the **Map** pull-down menu to select a map. Your options are:
   - Load an existing image: The **Select Map** menu displays a list of all loaded maps (remember that you can theoretically use any image for any type of map). You can select any one of these by clicking your desired selection. Please see “What are Maps?” on page 146 for more information about maps.
   - Remove a map: To remove an existing map, select **None**.
   - Load a new map: To load a new texture map, select **Browse for Image**. This opens a standard **Browse** dialog, which allows you to navigate to your desired image file.

When a texture is loaded into a specific channel, the **Select Map** menu appears as a button underneath the channel to give you quick access. This button does not appear if no map is selected for the given channel.

NO MAP SELECTED

MAP SELECTED

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

About 3D

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Chapter 24: About 3D Space

This chapter describes basic 3D concepts. If you're new to 3D graphics, you should read the entire chapter. Experienced users can use this chapter as a handy refresher guide. You probably skipped ahead to this section from Section 2: "Tutorials" on page 23 and may be feeling more than a bit overwhelmed at this point. Don't worry. Working in 3D is far easier than 2D for reasons we'll get into. Knowing the concepts behind what you're doing will give you a more complete understanding of how DAZ|Studio works and how to use it.

No discussion about 3D space is complete without covering the fourth dimension, which is time. The ability to manipulate 3D objects over time comes in handy when creating animations, or movies. Future DAZ|Studio plug-ins will allow you to convert your existing virtual photo studio into a virtual movie set where you can create both still images and movies. Best of all, you'll be able to load your existing still scenes and bring them to life, meaning that all of your current work will remain fully usable and expandable! We will discuss animation concepts in the plug-in documentation.

The 4D Universe

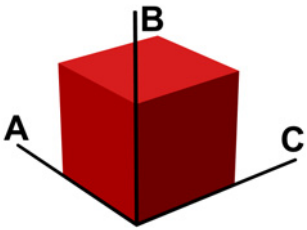
A photo studio has height, width, and depth. A movie set adds the ability to capture changes over time. Likewise, DAZ|Studio creates a four-dimensional universe inside your computer. This allows you to create just about any scene you can imagine without the time, complexity, cost, or possible risks associated with a "real world" production. In order to create realistic results, The DAZ|Studio universe must emulate the real universe. That is, DAZ|Studio must behave as similarly to the real universe as possible. The following concepts apply to both the real and DAZ|Studio universes.

Three Spatial Dimensions

The three spatial dimensions are width, height, and depth. Knowing this, we can define objects by the number of dimensions they have:

- Zero Dimensional (0D): A 0D object defines a location in space, called a *point*, but has no height, width, or depth. A point light (see "Step Two: Fun with Lights" on page 26 and "Lights" on page 96) is a great example of a 0D object within DAZ|Studio since light emanates from a single point.
- One Dimensional (1D): A 1D object defines a single straight *line* that has length but no height or width. We'll label this one dimension "A" for now.
- Two Dimensional (2D): A 2D object defines a *plane* that has any two of the three dimensions (height and width, height and length, or width and length). For now, we'll label these two dimensions as "A" and "B", respectively.

- Three Dimensional (3D): A 3D object has all three dimensions (height, width, and length). All objects in the physical universe, no matter how small, are 3D objects. In fact, it's impossible for a physical object to have any less than three dimensions, which means that 0D, 1D, and 2D, objects are purely theoretical. But these theoretical objects are of immense value when working within DAZ|Studio, as we'll soon see. We'll label the three dimensions "A", "B", and "C" for now.

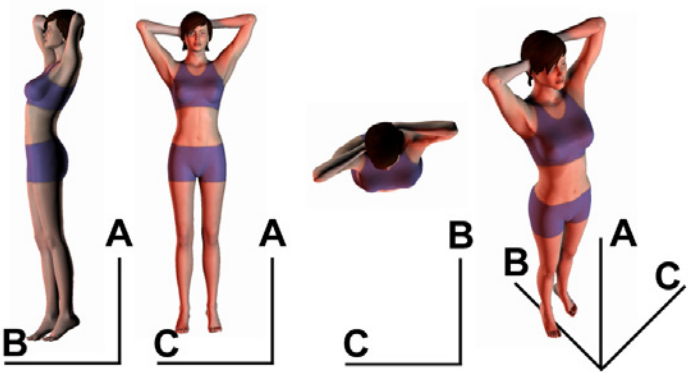


ONE TEMPORAL DIMENSION

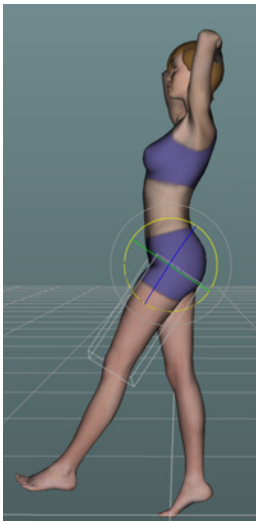
The fourth dimension is time. Thus, it can be said that every object in the physical universe is actually a 4D object, which means that every object is a 3D object moving through time. With the animation plug-in, DAZ|Studio will allow you to manipulate how each object in your scene behaves over time. You will be able to start, stop, and even reverse time within DAZ|Studio to obtain precise control of your scene while creating animations. We'll discuss animation in more detail in the plug-in documentation.

3D ON A 2D SCREEN

So far we've learned that DAZ|Studio allows you to work in at least three dimensions and soon four. So far so good. But this creates a problem: Your computer monitor's viewing surface is 2D. Further, your mouse cursor only moves in two dimensions (side-to-side and up-and-down). Lastly, your rendered images or movies will all be two-dimensional. If your tools and output are all in 2D, how can you possibly work in 3D?



As we mentioned on the previous page, DAZ|Studio creates a *virtual* 3D universe that emulates the real universe. Viewing three-dimensional objects from multiple angles allows us to work in all three dimensions using two-dimensional *views*. Each view allows you to work in two dimensions at once, such as AB, AC, or BC. We can even view all three dimensions at the same time. This image shows how views might look in a 3D application like DAZ|Studio.



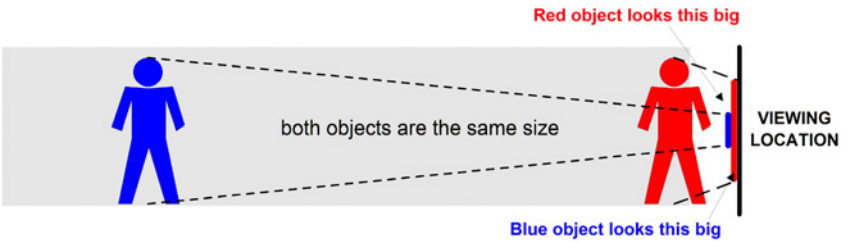
As you can see, separating the three virtual dimensions into views gives you precise control over your figures, props, and other objects within your scene. For example, you can determine the figure's height using the AB or AC views or width using the AB or BC views. The view you use will depend on what you're doing. Using the views as defined in this example, if you want to move the figure's left leg forward, you would probably use the AB view.

Together, the three dimensions are represented by *axes*, with each individual representation termed an *axis*. So far, we haven't cared which axis describes which dimension. The A dimension could represent height, width, or length, with B representing one of the two remainders, and so forth. We did this in order to present the most fundamental concepts behind 3D applications like DAZ|Studio as simply as possible.

ORTHOGONAL AND PERSPECTIVE VIEWS

Take a moment to look at the two preceding images. Notice that the AB, AC, and BC views lack *perspective*, meaning that they lack depth, or distance from the viewer. 2D views without perspective are called *orthogonal* views. There are six possible orthogonal views for any real or virtual object: **Left**, **Right**, **Top**, **Bottom**, **Front**, and **Back**. So, while the above examples show the **Left** (AB), **Front** (AC), and **Top** (BC) views, they could just as easily show any of the six possible orthographic views. This is important to understand because many 3D objects, including humans, are not totally symmetrical, and manipulating them may require viewing from several orthographic directions.

Views that include depth are called *perspective views*. A perspective view allows you to see three sides of an object at once, as shown in the above images. Imagine looking at two people, one near, the other far. The more distant person looks smaller than the closer person, but both are actually the same size. This optical illusion occurs because the nearer person takes up more of your field of vision than the farther person, as shown here. Notice that we are using the term *depth* to represent objects nearer to or further away from the viewer.



AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

To sum up:

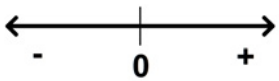
- The three spatial dimensions are width, height, and depth.
- Each dimension is represented by an axis.
- Viewing two axes at once is called *orthogonal*. Viewing all three axes is called *perspective*.

Let's find out how these concepts apply in both DAZ|Studio and the real world.

WHERE AM I?

In the above examples, the A dimension represents height while the B dimension represents depth. In order to facilitate data transfer, speed learning, and simplify operation, 2D and 3D applications use a standard system of axes called *Cartesian coordinates*. The term *Cartesian* refers to Rene Descartes, introduced coordinate systems based on orthogonal (right angle) coordinates (1596-1650). This system defines several important things for us, including:

- where the center of the system is
- how to tell how far from the center any given point is along each of the three axes

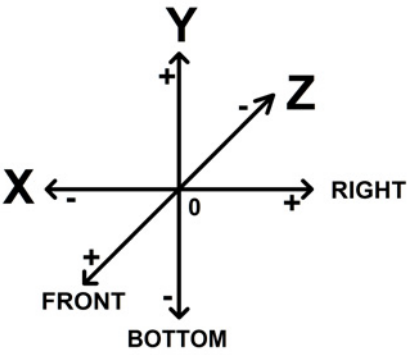


We'll talk about the axes again in the next section. Meanwhile, imagine every number from negative infinity to positive infinity arranged in a straight line with 0 at the center. As shown here, negative numbers are to the left of 0, with positive numbers on the right. If you are standing at the exact center and move three feet to the right, you are standing at +3 feet. Of course, the +3 is only meaningful if you know where 0 is. Thus, we assume that each dimension is infinite, with 0 representing the dimension's center, which is called the *origin*.

MIND YOUR XYZ'S

So far, we've used the generic letters A, B, and C to demonstrate the three dimensions and how you can use orthogonal and perspective views. In keeping with a standard used by the 3D industry at large, DAZ|Studio uses the characters X, Y and Z to refer to the three dimensions:

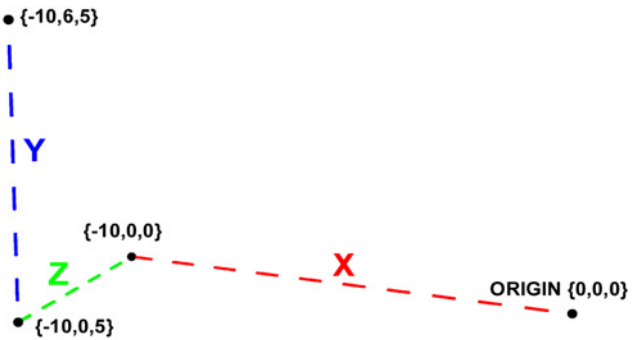
- X: width (left = negative, right = positive)
- Y: height (up = positive, down = negative)
- Z: length (front = positive, back = negative)



Let's combine this with the previous section as shown on the right. The Cartesian coordinate system uses three axes to represent the three dimensions. Positive X lies to the right of the origin, positive Y is up, and positive Z is towards the front. Each axis shares the same origin as its two neighbors. The 3D universe extends an infinite negative and positive distance in each dimension, and the origin is literally the center of that universe. Cartesian notation lists the X, Y, and Z values in brackets separated by commas, like this: (X value, Y value, Z value).

Defining an Object's Location

In the previous section, we used the example of someone moving three feet to the right of the origin point. If the person has not moved in any other direction, they remain at 0 on both the Y and Z axes. Thus, their location is (3,0,0). What if they had walked 10 feet to the left, 5 feet forward, and climbed a 6-foot ladder? Their coordinates would be (-10,5,6). This is how we use Cartesian coordinates to define an object's location relative to the origin.

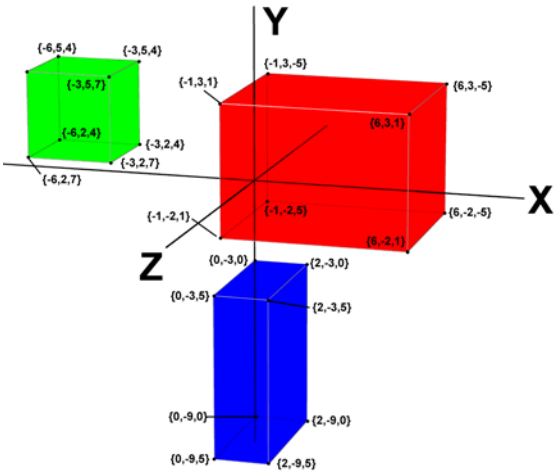


TIP

This example uses feet. The Cartesian coordinate system works equally well with any unit you can think of.

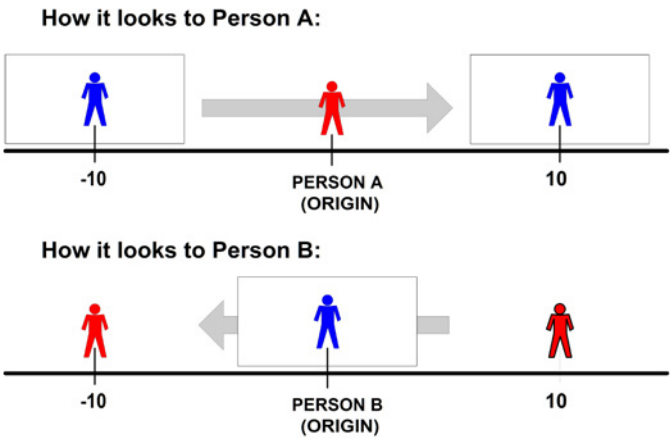
Defining an Object's Shape & Size

In addition to location, Cartesian coordinates can define an object's shape, size, and location, as shown here. In this case, the locations of each of the corners defines the cube's size, shape, and location relative to the origin. A cube is a very simple example. Look at the image on the right and notice how each point defines a corner of a cube. Defining point locations, then connecting the dots gives us our shapes, complete with size and location information. What about a more complex shape like a human? We'll discuss this a little later, beginning with "Objects (Meshes)" on page 140.



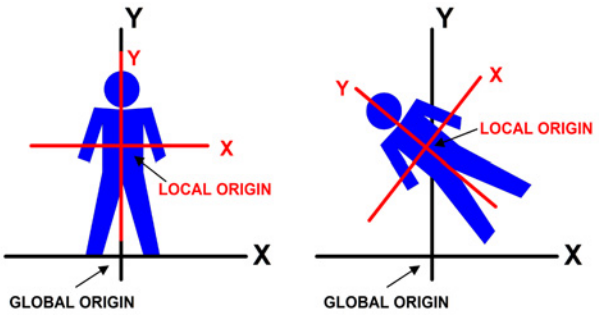
Global vs. Local Coordinates

Person A is standing beside a railroad track watching a train pass. Person B is aboard the train and watches Person A pass. Is the train moving past Person A, or is Person A moving past the train? According to Person A, she is standing still and the train is passing at, say, 60 miles per hour. According to Person B, however, the train is still (assuming a perfectly smooth ride, of course) and Person A is moving at 60 miles per hour. Who's right? Either answer is correct depending on the observer's point of view.



Let's say that Person A and Person B are both six feet tall. Now let's look at Person A's point of view in a bit more detail. From where she is standing, she sees Person B's head move from (-10,6,0) to (10,6,0). Likewise, the spot directly between Person B's feet moves from (-10,0,0) to (10,0,0). Thus, Person B has moved 20 feet from left to right. However, Person B's head remains both six feet above and directly between his feet. Thus, if the

spot directly between Person B is his personal (or *local*) origin point, his head will remain at (0,6,0) while his location relative to Person A's *global* origin changes.



In DAZ|Studio, the center of the virtual universe is the global origin, and each object has its own local origin. It's important to remember that an object's local origin and axes remain the same no matter where the object is located or oriented relative to the global origin and axes. In the left side of the following example, the person's head might be at (0,6,0) in global coordinates and (0,3,0) in local coordinates. In the right side, the person's head has moved to roughly (-2,4.5,0) globally but remains at (0,3,0) locally.

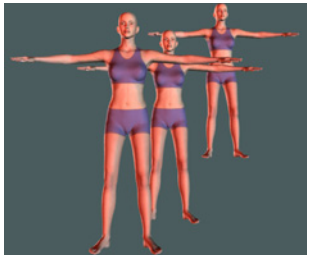
Separating the global and local origins may seem complicated, but it actually makes life a lot easier when creating scenes for reasons we'll explore in the next section. Best of all, DAZ|Studio handles the local coordinate calculations for you!

GETTING AROUND

In DAZ|Studio, when you add an object to a scene, that object will appear at its originally created size, at the global origin with the local origin and axes matching their global counterparts. That's great for getting started, but your scenes would soon get pretty dull unless you could move and position your objects. In a real photo studio, moving, positioning, and aiming people, props, lights, etc. is a time-consuming chore. In DAZ|Studio, you can do all this with a few mouse clicks.

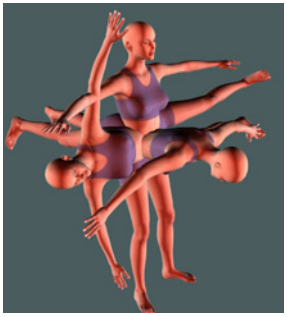
There are several ways to position and aim objects in your scenes. Simply select the proper tool, then click and drag the object you want to move. Please refer to "Click and drag the Bone Manipulators to move the joint." on page 85.

Translation



As you work in DAZ|Studio, you will undoubtedly want to move objects around your scene. You accomplish this by exercising the first and easiest type of motion, *translation*. This occurs when you move an object's local origin relative to the global origin, without moving the local axes relative to the global axes. Sounds complicated, right? It isn't. Remember the example of the person who walked left, forward, then up a ladder? Let's say this person was facing north before they moved and they kept facing north as they went through their motions. This is a great example of translation. Best of all, there is no gravity inside the DAZ|Studio universe, meaning you can place objects anywhere along any one or more axes. The above image shows an example of translation. Notice how the figure's origin has changed global locations while the figure itself remains in the exact same position relative to its own local origin. DAZ|Studio allows you to translate entire objects or, in some cases, locations of objects (such as raising a figure's hand).

Rotation



Need to rotate a figure, body part, prop, light, or other object? Programmatically, this requires trigonometry to calculate each point's new location. Luckily, DAZ|Studio handles this for you. Technically, *rotation* is the opposite of translation. In other words, rotation occurs when you move an object's local axes, relative to the global axes, without moving the local origin. To help this make sense, imagine you are six feet tall. Now, imagine being spun upside down. Your head is still six feet from your feet. And, since humans consider their heads the top side and their feet the bottom, your head will still be above

your feet (in local coordinates) despite being below your feet in global coordinates. The image on the right shows an example of rotation. DAZ|Studio allows you to rotate entire objects or parts of objects (such as turning a figure's head).

Scale

Scale is a fancy term for changing an object's size along one or more of its local axes. Again, this requires complex calculations, which DAZ|Studio performs for you. There are a number of different ways to use scale, including:

- You can scale the entire object uniformly. For example, you could make a figure twice as big while preserving its proportions.
- You can scale the object along one or more axes. For example, scaling the figure by 200% along its X axis will make it look twice as wide while preserving its height and length. This will result in a squashed look.
- You can scale one or more of a figure's body parts. For example, you can enlarge or shrink Mike's head without affecting the rest of his body. And yes, you can scale his head uniformly or along only one or two axes.

The image on the right shows an example of uniform and non-uniform scaling. The figure on the far right has been scaled up (*enlarged*) on its X axis and scaled down (*shrunk*) on its Y axis.

Types of 3D Objects

So far, we've talked about the three dimensions (X, Y and Z). We've explored 0, 1, 2, and 3 dimensional objects, looked at Cartesian coordinates, and made comparisons between global axes and origins vs. local axes and origins. We've also learned about the types of motions you can apply to objects within DAZ|Studio. But what exactly are these objects we keep talking about?

POINTS (VERTICES)

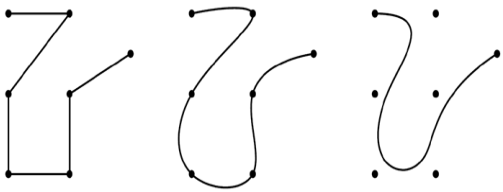
As we touched on previously, a point has no dimension of its own. It does, however, exist at a 3 dimensional position in space and has both a local and a global coordinate. For example, if a six-foot figure is standing ten feet in front of the origin, the point at the top of the figure's head is at (0,6,0) in local coordinates and at (0,6,10) in global coordinates. If a figure at the global origin rotates 45 degrees to the left, the same point remains at (0,6,0) in local coordinates while moving to (-4.242,4,242,0) in global coordinates.

If a point defines a corner of a *polygon* (see "Polygons (Faces/Facets)" on page 139, below), then it is called a *vertex* (singular) or *vertices* (plural).

SEGMENTS (EDGES)

A *segment* is a 1D component with length, but no width or height. A segment connects two points to each other. Several 3D applications, including DAZ|Studio, often use segments to define the edges of polygons (see "Polygons (Faces/Facets)" on page 139, below).

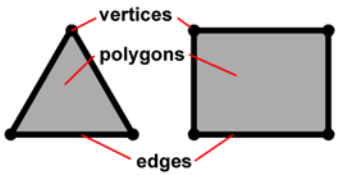
LINES (SPLINES)



A *spline* is similar to a segment in that it is a 1D component with length but no width or height own. It is also similar to a segment, in that it too, connects points to each other. One major difference, however, is that a spline can also be influenced by additional points, called *control points*. Splines are often used to create smooth curved lines using a minimal number of points, curves that would otherwise require many times the number of points, to be made with [linear] segments. Motion paths are perfect examples of splines. There are many types of splines, all of which are variations on the examples shown here. From left to right, they are:

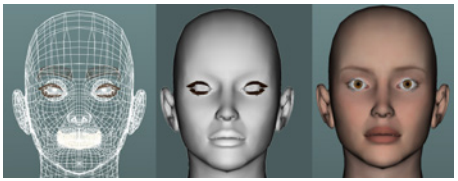
- Linear: Linear splines connect each end point without the influence of additional control points, a straight line.
- Interpolating: Interpolating splines always pass through every control point. Linear splines are a form of interpolating spline. There are many ways to calculate interpolation.
- Approximating: Approximating splines do not necessarily touch all of their control points. For these types of splines, the control points define the approximate shape, hence the term *approximating*. Again, there are many ways to calculate the approximations.

POLYGONS (FACES/FACETS)



A *polygon* is a component whose corners are defined by vertices and connected by edges. Creating a polygon involves placing one point for each corner, then connecting the vertices to form a closed loop, or *face*. Polygons can have 3 sides (*triangle*), 4 sides (*quadrangle*), or more than 4 sides (commonly referred to as *n-sided*). Polygons defined by three points are always considered *planar* (2D), as three points are needed to define an arbitrary plane. Polygons with four or more points may be planar as well, but are subject to becoming *convex* (bowing out) or *concave* (bowing in) depending on the coordinates of the vertices that define the face. Convex or concave polygons are often the culprits behind *artifacts* (anomalies) in a render of a polygonal mesh. Please refer to Section 4: "Rendering" on page 105 for more information about rendering.

OBJECTS (MESHES)

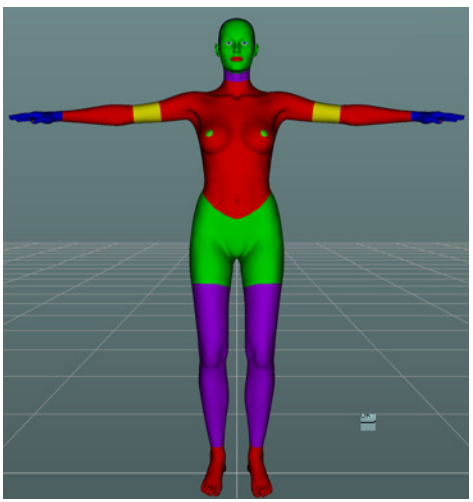


While vertices and edges define polygons, all 3D objects in DAZ|Studio consist of many polygons arranged into a *mesh* that has the form of the desired object, such as a human, chair, dragon, plant, building, etc. The left side of the image shows Vicky as a polygon mesh. If you've ever seen a piece of jewelry, you know that gemstones have facets or a series of flat sides cut in such a way as to create a shape. If DAZ|Studio only displayed polygons, then all 3D objects would have this *faceted* appearance, resulting in a significant loss of realism. DAZ|Studio therefore employs *polygon smoothing*, which makes the collection of planar polygons appear like smooth rounded objects as shown in the center of the image. Throw in a *material* (see Chapter 25: "About Materials" on page 144, below) and you have a realistic 3D object as shown on the right side of the image!

An object that consists of two or more polygons is interchangeably called a *polygon mesh*, a *mesh object*, or simply a *mesh*. DAZ|Studio uses meshes for figures (human, animal, and otherwise) and props (such as furniture, hair, etc.). Other items, such as lights, may appear as polygon meshes but that is strictly for display purposes

Groups

In order for DAZ|Studio to properly assign materials, the polygons that make up a mesh must be assigned to one or more *groups*. Every mesh object is different and will have different groups unique to that object. There are many types of groups; this section covers *surfaces*, which comprise the group type used in DAZ|Studio.



Surfaces: A figure or prop in your scene can have several different surfaces (see "Multi/Sub-Object Materials" on page 144 for more information about surfaces). For example, a human figure may have skin, finger and toenails, irises, etc. Surfaces allow you to change the look of part of an object without affecting the whole thing. For example, you could make a figure's fingernails red without changing the skin color. If you're working with a figure that includes built-in clothing, the upper arm may have skin and shirt surfaces assigned to it. A polygon that belongs to one surface cannot belong to another surface. The image here shows an example of surface groups on DAZ's Victoria 3 figure.

Bones

Your bones control how your body bends. Your knees bend along one axis while your back can bend around all three, and so forth. In addition to defining the type or *degrees of freedom*, your bones define the *range of motion*. Your arm can only extend until it is straight out. Your wrists cannot bend backward more than 90 degrees or so.

Like you, DAZ|Studio figures have bones that were created and placed by its creator. A typical figure creation process works like this:

1. Build the polygon mesh.
2. Build the bones inside the mesh and create a *hierarchy* (see "The Pecking Order" on page 142 for more information on hierarchies and parent/child relationships).
3. Adjust the bone locations.
4. Define which bone controls which vertices (create *vertex weight maps*).
5. Define the degrees and range of motion for each bone.

When you load a figure, DAZ|Studio reads the mesh and the bone information. This information allows the application to deform the mesh in accordance with the *vertex weight maps* (see "Weight" on page 150) or falloff zones, bones, and rotation information. Please see "Create Light" on page 64 for more information about posing figures.

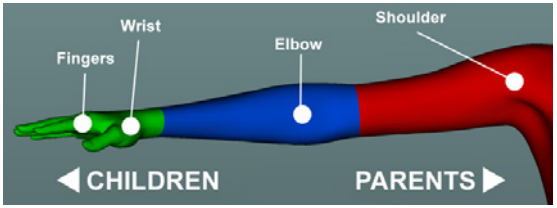
There is one more wrinkle- literally- to bones and deforming meshes. Bend your elbow and notice what happens: The skin on the inside of your elbow contracts while the skin on the outside of your elbow expands. This change is most pronounced right at your joint and decreases with distance. Skin more than a couple inches away from your joint remains unchanged. On your body, this occurs because of your skin's natural elasticity. DAZ|Studio has no intrinsic way of knowing how to handle the deformation. There are two ways to provide this information:

- Falloff zones: A *falloff zone* defines the area affected by the bending motion. In general, the area towards the center of the zone deforms the most, with the amount of deformation decreasing (falling off) over distance until reaching 0 at the edge of the zone. The advantage of falloff zones is their relative simplicity for the content creator. The drawback is lack of fine control. DAZ|Studio can read falloff zone information in imported content.
- Vertex weight map: A *vertex weight map* performs the same function as a falloff zone, but offers far more precise control, since it allows the content creator to define deformations on a per-vertex basis (remember that vertices are points that define polygon corners). Please refer to "Weight" on page 150 for more information on weight maps.

THE PECKING ORDER

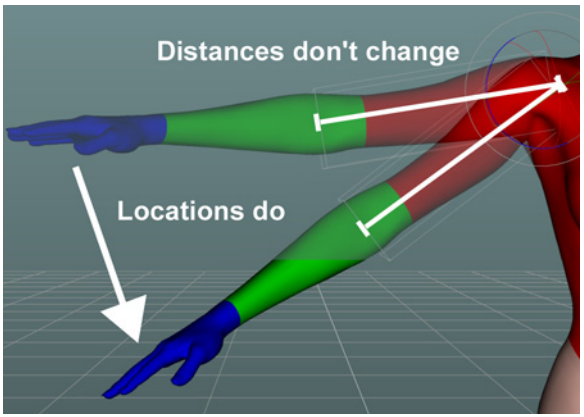
We now have our object and have created a bone structure that defines where and how the figure bends. Now we need to define a *hierarchy* that determines what other bones, if any, are affected when you move any given bone. In addition, you can also use hierarchies to define interactions between objects.

Hierarchies



Hold your arm straight and rotate your shoulder in any direction. Notice what happened: As your shoulder moved, so did your upper arm, forearm, hand, and fingers, while the rest of your body remained in its original position. Now move your fingers and notice that the rest of your arm remains still. Now bend your elbow. Your shoulder and upper arm remain still while your forearm, hand, and fingers move. This is a perfect example of a *hierarchy*, or situation where different components exert a greater or lesser degree of influence over others.

Hierarchies are often referred to as *parent/child relationships* within many 3D applications (including DAZ|Studio). Children are affected by their parents, but not the other way around. Using the previous example, your shoulder is the parent of your entire arm, with your upper arm, forearm, hand, and fingers being children. Your elbow is both a parent of your forearm, hand, and fingers and a child of your shoulder. Thus, bending the shoulder moves your entire arm while bending your elbow only moves your elbow's children.



Remember our discussion about global versus local coordinates (see "Global vs. Local Coordinates" on page 135)? The same concept applies here as well. By moving your shoulder, each part of your arm has changed its absolute position while its relative position remains unchanged. For example, if you raise your arm, your elbow will move higher but will still remain the exact distance from your shoulder. This action is called *forward kinematics*.

Parent/Child Relationships Between Objects

So far, we've only discussed parent/child relationships within the same object, such as a figure or prop. You can also create parent/child relationships between objects in your scene. Here are just a few examples:

- Hair props are children of a figure's head, meaning that the hair will move with the head.
- You can place a hat on a figure's head. If you forget to make it a child of the head, the hat will remain still while your figure moves. Establishing a parent/child relationship allows the hat to remain on the figure's head and in the same position relative to the head. For example, if you parent a baseball cap to a figure's head, the brim will always be over the figure's face just like its real-world counterpart.
- You can place an object in a figure's hand (such as a pen, ball, tool, etc.) and the object will remain in its position. To create a construction worker swinging a hammer, parent the hammer to the figure's hand. As you rotate the figure's arm or move the figure's body, the hammer will remain in the figure's hand.
- You can have a camera follow any body part, prop, or any other item in your scene. There are different ways to do this. Please see "Lights" on page 96 for more information on parenting cameras.

There are many other possible examples. In DAZ|Studio, the chief limitation is your imagination!

Chapter 25: About Materials

Look at any object around you. What color is it? It is smooth or rough? Is the texturing regular or irregular? It is translucent, transparent, or opaque? Does it reflect and/or refract light? All of these components blend to give every surface its unique and distinctive look.

Multi/Sub-Object Materials

Each figure or prop in your DAZ|Studio scene has its own separate list of surfaces. As mentioned above in "Multi/Sub-Object Materials" on page 144, each surface has a unique ID and each polygon is assigned to one of the available surface IDs. You can see the separate surface lists by bringing in two or more objects and clicking the **Surfaces** tab (see Chapter 21: "About the Surfaces Tab" on page 114 for more information). Have two or more copies of the same item in your scene? Each copy will maintain its separate list of surfaces. The advantages of having a separate surface list for each object are flexibility and finer control. It also provides an additional layer of organization.

Content creators define *surfaces* when they create figures and props. These surfaces may vary by object since there are few restrictions on their creation. Most DAZ figures share very similar surfaces for ease of use.

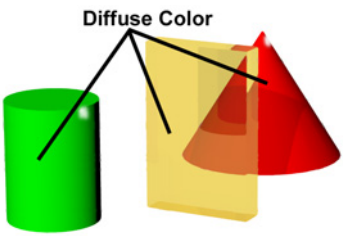
In DAZ|Studio, a material consists of a collection of *colors* and *maps* applied to a surface's properties to achieve a desired look. We'll discuss these properties in the following sections. Colors are applied to surfaces, but many objects also use one or more maps that might or might not adhere to surface boundaries defined for colors.

Types of Color

One of the most obvious components of any material is its color- or, rather, colors. There are several types of color that you can use to make up a material.

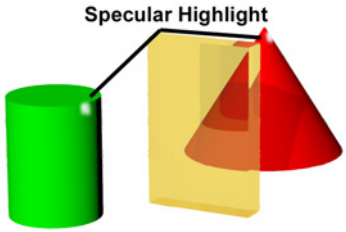
Color (Diffuse)

An object's *diffuse color* is that object's predominant color. For example, pine boards are usually a light golden brown. The arrow in the image shows the objects' diffuse colors.



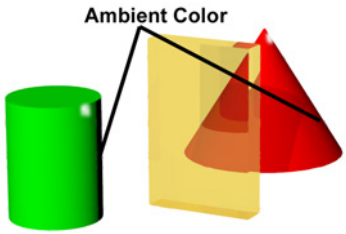
HIGHLIGHT (SPECULAR)

From metal to water, many surfaces show bright highlights when illuminated. These highlights can show up as spots or as sheens. For example, glass can show a white highlight when under bright light and polished leather can show a sheen. The arrow in the image shows the object's highlight color. This is also referred to as an object's *specular* color.



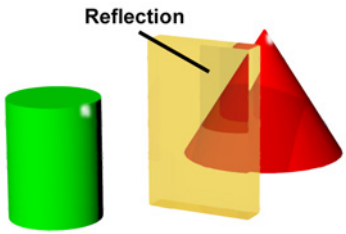
SHADOW (AMBIENT)

An object's *shadow* or *ambient* color refers to the color of an object in the absence of direct light. For most objects, this is black, since it is impossible to see anything without any light in the real world. DAZ|Studio, however, does not hold you to this.



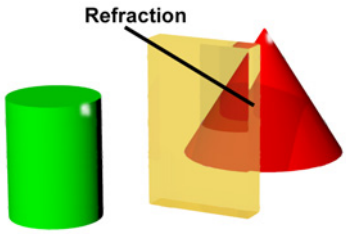
REFLECTION

Reflection is not a color per se. Rather, it measures the ability of a surface to redirect light rays back towards the light source. A smooth mirror is an example of a highly reflective surface. Glass, water, metals, and some plastics are examples of reflective surfaces.



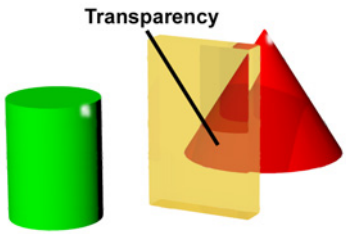
REFRACTION

Light rays bend when passing through objects of differing densities. For example, light passing through air into water will bend. *Refraction* makes objects appear as though they are in a different location than they really are because of the bending effect.



OPACITY

Opacity measures an object's ability to pass light rays completely through the surface. This is also called *transparency*. Sheet window glass is almost perfectly transparent while wood is completely *opaque*, or not transparent at all.



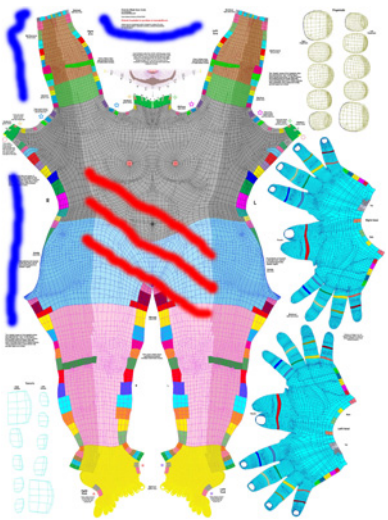
What are Maps?

In most cases, a *map* is a 2D representation of a 3D surface where each point on the 2D map corresponds to a point on the 3D surface. Think of any map you've used, from a local road map to an atlas of the world. In each case, the 2D maps represent locations on the 3D Earth. A map will tell you the locations and distances between any two points.

Any 2D attempt to reproduce a 3D surface results in distortion. For example, look at a Mercator projection of the world. In actuality, longitude lines spread out from a single point at the North Pole and continue spreading out to the Equator, where they again come back together in a single point at the South Pole. Since the longitude lines on a Mercator map remain parallel, the amount of distortion increases the farther one looks away from the Equator in either direction, making land masses nearer the poles appear larger than they are. There are many methods of projection that address distortion in various ways for various purposes. The key point is that distortion will exist in any map. This explains the "flattened out" appearance of object maps.

In 3D applications, maps use *U/V coordinates* to define which location on the map corresponds to which location on the object. U/V coordinates function just like latitude and longitude and have values ranging from (0,0) at the top left corner of the map to (1,1) at the bottom-right of the map.

The following image shows a sample map for a DAZ figure. This is a blank map that can be used for various purposes (discussed in the following sections). The areas with grid lines represent the figure's polygons, while blank areas do not correspond to any area on the figure. Thus, the red streak will appear across the figure's midsection while the blue streak will not appear at all because it is "outside the lines". Only those areas within the grid boundaries appear on the figure when rendered. The colors on this blank map help artists blend seams to avoid telltale lines where edges come together.



Maps wrap around 3D objects. It's a bit like wrapping paper that adds color and patterns to the outside of an object. Unlike wrapping paper, however, you can use several maps at once, each of which contribute to the overall effect.

Color maps define a particular color at any given location. *Value maps* are grayscale (black and white) images that define a particular value at any given location. White areas on value maps represent "fully on", black areas represent "fully off", and the various shades of gray fall everywhere in between. A *bump map* (please refer to "Bump (Strength)" on page 149) is one example of a value map.

Having described the concept and basic types of maps, let's see the many different types of maps DAZ|Studio supports.

DIFFUSE (COLOR)

Wood has grain. Human skin has fine lines, veins, moles, freckles, and other imperfections. Clothing items have patterns and designs. In other words, every material has a characteristic *texture*. Thus, *diffuse color maps* give the underlying object the appearance of a specific material and are therefore the most-used map types. Diffuse color maps are commonly referred to as *texture maps*. This image shows a sample texture map.

DIFFUSE (STRENGTH)

Diffusion is the amount of light scattered by any given surface. The higher the value, the more light is scattered, thus the brighter a surface appears. The lower the value, the less light is scattered and the darker/duller a surface appears. Please see "Applying Maps" on page 127 for more information on working with diffuse strength maps.

GLOSSINESS (STRENGTH)

Glossiness determines how an object's *specularity* (highlight) is distributed. Low values distribute the highlights across a wider area. High values distribute the highlight over a smaller area. Using a *glossiness strength map* allows you to define varying values across a surface. For example, you could use a glossiness strength map to apply a sheen to a leather surface. Please see "Applying Maps" on page 127 for more information on working with glossiness strength maps.

SPECULAR (COLOR)

Typically, highlights on a surface inherit the color of the light source causing said highlight, with the center of the highlight being the color of the light source. *Specular color maps* allow you to define what color of light a surface has the tendency to reflect as the highlight *falls-off* (decreases in intensity the further away one moves from the center) for any given area of the surface. For example, you could define different specular colors for different parts of a stained glass window. Please see "Applying Maps" on page 127 for more information on working with specular color maps.

SPECULAR (STRENGTH)

Smooth, shiny objects reflect light sources directed toward them more acutely (directly). High specularity is commonly seen in the real world on things like glass, chrome, etc. The reflection of highlights clue the viewer in on how shiny or dull the surface is. S*pecular strength maps* allow you to describe areas on any given surface that may be dull, shiny or otherwise, without the entire surface exhibiting the same attributes. For example, you could simulate a shiny piece of metal with rusty spots. Please see “Applying Maps” on page 127 for more information on working with specular strength maps

AMBIENT (COLOR)

We mentioned previously that *ambient* color refers to an object’s color in the absence of direct light (in the shadows). An *ambient color map* allows you to define a variety of colors of your choosing to fill these shadows, meaning that you are limited to one shadow color. Please see “Applying Maps” on page 127 for more information on working with ambient color maps

AMBIENT (STRENGTH)

An *ambient strength map* is used to define the level at which the ambient color (or ambient color map) is applied. DAZ|Studio allows you to map this value and vary it across an object’s surface as you see fit. Please see “Applying Maps” on page 127 for more information on working with ambient strength maps

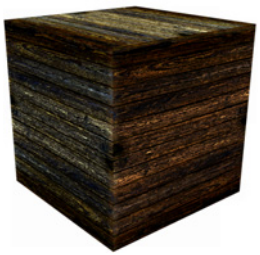
OPACITY (STRENGTH)

As we mentioned above, opacity measures how readily an object allows light to pass through or not. You can use *opacity maps* to fine-tune the amount of opacity at any given location on an object. For example, say you are creating a lace shawl. You can either model the intricate pattern in the mesh itself, which is lengthy, time consuming, and uses far too many polygons, or you can model the overall shape and create an opacity map that creates the same effect. Opacity maps are also used quite often for eyelashes, eyebrows, beards, etc. By combining a texture map (color), bump map (height) and opacity map (space between lashes), you can create an extremely convincing effect of small amounts of short hair in small areas of a figure. Please see “Applying Maps” on page 127 for more information on working with opacity maps.

BUMP (STRENGTH)

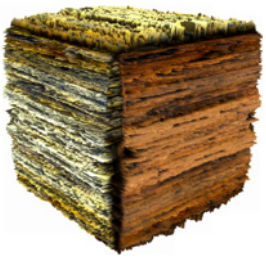
Few materials are perfectly smooth. Veins under skin cause the skin to bulge outward. Wood grain may be rough. Pockets, seams, rivets, buttons, etc. on clothing also add roughness. To simulate this roughness, DAZ|Studio employs *bump maps*, which are grayscale images that define the amount of height or depth at a given location on the object. The whiter a spot on the map is, the higher that spot on the object will look, and vice-versa. These images show off a bump map and the results of a bump map on a sample object:

Why use bump maps? Why not simply model the object to show off all of its roughness? The problem with this approach is that the object's polygon count (number of polygons that comprise the object) would increase exponentially and require correspondingly larger amounts of computing resources to render. Maps provide the same amount of detail without increasing the polygon count, thereby conserving computing resources. Also, if you decide to change the amount and/or locations of roughness, all you need to do is edit the image instead of editing the object.



Bump maps have one limitation. Looking at the cube on the right, it is apparent that the roughness extends over the entire sphere, but the edges still look smooth. This is because bump maps only affect an object's *normals* without affecting the polygons themselves. A normal is a *vector* (line) that normally extends perpendicular to the underlying mesh's vertices with one normal per vertex. A bump map shifts these normals, giving the illusion of depth without affecting the polygons at all. Please see "Applying Maps" on page 127 for more information on working with bump maps.

DISPLACEMENT (STRENGTH)



A *displacement map* functions just like a bump map except for one critical difference: Instead of adjusting normals, displacement maps actually disturb (displace) the underlying polygons. Here is the same sphere and map from the previous example except that we are using the same map as a displacement map. Notice the rough edges (which are greatly exaggerated for this example). Please see "Applying Maps" on page 127 for more information on working with displacement maps.

REFLECTION (COLOR)

Reflection maps are often referred to as *environment maps*. Environment maps are used to fake reflection and can substantially reduce render times, since *raytracing* (see Chapter 19: “About Rendering” on page 106) consumes large amounts of computing resources. They are projected on the inside of a mathematical sphere encompassing the 3D universe. A reflection direction is established using value derived from the direction the surface is being viewed from and the surface normal. This direction is then used to locate a position on the sphere where a color is retrieved from the specified map. Please see “Applying Maps” on page 127 for more information on working with reflection maps.

REFLECTION (STRENGTH)

As you can probably guess, *reflection strength maps* define the amount of reflectivity at each location on an object. For example, you could use a map to simulate an antique mirror that is losing pieces of its reflective coating. Please see “Applying Maps” on page 127 for more information on working with reflection strength maps.

REFRACTION (COLOR)

*Refraction color map*s are similar to reflection color maps. The major difference being that the direction used for color retrieval on the specified map is influenced by the refraction index, or the amount by which the direction is bent. Please see “Applying Maps” on page 127 for more information on working with refraction color maps

REFRACTION (STRENGTH)

Much the same as it's reflection counterpart, *refraction strength maps* define the amount of refraction at each location on an object. Please see “Applying Maps” on page 127 for more information on working with refraction strength maps

WEIGHT

In “Bones” on page 141, we described how joints work and how *weight maps* define the amount of surface deformation that occurs when a joint bends. A Weight map gives the content creator vertex-level control over the amount of deformation and comprises a 3D account of weight values for each vertex as they pertain to a given bone. While they are technically maps, they do not necessarily follow the UV coordinate system used by other maps and may not appear in a visual form.

What are Shaders?

A *shader* is a piece of software used by the rendering engine that takes input supplied in the interface about what a surface looks like and does the calculations needed to render an image.

Inside a Shader

Each color and map type forms one channel of the overall shader. DAZ|Studio lets you determine the strength or effect of each channel. You can also choose maps for each map channel. You can therefore create a nearly infinite variety of realistic and imaginary materials using some or all of the channels contained in the DAZ|Studio shader.

One of the most powerful uses for shader-based materials is the ability to connect nodes to each channel that can change how the channel will contribute to the overall material. For example, if you want to create a marble-like effect, you can either create a texture map or you can connect various functions into a virtual “tree”. Connecting this tree to the **Diffuse** channel will create the effect without the need for maps. The advantage this offers is rapid creation and real-time results, unlike a map that you have to create and then load into your scene for testing. The drawback is that you cannot control the precise location of a particular effect. For example, if you are creating marble, you probably don’t care where each vein of color ends up on the finished object.

On the other hand, freckles and moles on human skin require more precise placement. In the former case, shader nodes are the optimal solution, with maps more suited to the latter example. Future DAZ|Studio releases and/or plug-ins will add this powerful functionality to DAZ|Studio.

How Shaders Work

At its most basic, a shader creates the final material appearance by performing the following functions:

1. For each channel, calculate the effect of each node (if any) to arrive at the initial value for that channel.
2. Repeat the above calculation for every channel.
3. Account for any user-specified options (such as reducing the strength or influence of the **Displacement** channel) for each channel to arrive at the final value for each channel.
4. Combine all of the channels into the final material.

The Complete Material

Combining colors and maps can create stunning results, as shown in “Putting It All Together” on page 40!

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Appendices

AUTHORED BY ANTHONY HERNANDEZ - (415)786-2081 - anthony94122@outlook.com

Appendix 1: End User License Agreement (EULA)

By using the software, you signify that you have read and agree to all the terms of the license agreement.

AGREEMENT. THIS IS A LEGAL AND BINDING AGREEMENT BETWEEN YOU, HEREINAFTER ALSO REFERRED TO AS "USER", AND DAZ 3D Productions, INC., HEREINAFTER ALSO REFERRED TO AS "DAZ 3D". BY INSTALLING THIS PROGRAM OR USING THESE 3-D APPLICATION(S), MOTIONS, TEXTURE MAP(S), BUMP MAP(S) OR ANY OTHER 3D RELATED PRODUCTS, HERINAFTER REFERRED AS 3-D APPLICATION(S), (OR AUTHORIZING ANY OTHER PERSON TO DO SO), YOU INDICATE YOUR COMPLETE AND UNCONDITIONAL ACCEPTANCE OF ALL THE TERMS AND CONDITIONS OF THIS LICENSE AGREEMENT. THIS LICENSE AGREEMENT CONSTITUTES THE COMPLETE AGREEMENT BETWEEN YOU AND DAZ 3D. IF YOU DO NOT AGREE TO THE TERMS OF THIS LICENSE AGREEMENT, YOU MAY DESTROY THE INSTALLED PROGRAM PACKAGE (WITH ALL ACCOMPANYING MATERIALS). YOU MUST DELETE THEM FROM YOUR COMPUTER AND FROM ANY BACKUP DEVICES THAT YOU MAY HAVE USED.

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6 TELLWARE: This application is considered tellware. The user is required to tell two other people where to download this application (www.daz3d.com) in order to install and or use it. Note: During the alpha phase of testing, users will not be required to follow this program due to the test base being a closed group. During the alpha stage of testing, DAZ|Studio will only be distributed to Platinum Club members.

7 PROTECTION AND SECURITY: User agrees not to disclose, publish, release, transfer, or otherwise make available the 3-D Application(s), or any portion thereof, in any form, to any person, without prior written consent from DAZ 3D. User agrees that the 3-D Application(s) is the property of and proprietary to DAZ 3D, and further agrees to protect the 3-D Application(s) and all parts thereof from unauthorized disclosure and use by its agents, employees, or customers. User shall be exclusively responsible for the selection, supervision, management, control, and use of the 3-D Application(s). User agrees to utilize its best efforts to see that its employees or any other user of the 3-D Application(s) complies with the terms and conditions of this Agreement and refrains from taking any steps, such as reverse assembly or reverse compilation, to derive a source code equivalent of the 3-D Applications.

8 EXPORT RESTRICTIONS: The 3-D Application(s) may be subject to the export controls of the United States Departments of State and Commerce and User agrees to fully comply with all applicable United States export regulations governing export, destination, ultimate end user, and other restrictions relating to the 3-D Applications.

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10 PATENT, COPYRIGHT, AND TRADE SECRET INDEMNITY: User agrees to indemnify and hold harmless DAZ 3D against all liability resulting from or related to any claim of patent or copyright infringement, misappropriation, or misuse of trade secrets or other proprietary rights based upon the use by User of the 3-D Application(s), or any portion thereof, in whatever form, or the exercise by User of any rights granted under this Agreement.

11 LIMITED WARRANTY. DAZ 3D warrants that the 3-D Application(s) will perform substantially in accordance with the accompanying written materials for a period of seven (7) days from the date of receipt.

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13 NO LIABILITY FOR HARDWARE: User assumes complete responsibility for all hardware used in conjunction with the 3-D Application(s). DAZ 3D shall not be responsible in any way for the non-performance or malfunction of any hardware used in conjunction with the 3-D Application(s), nor for any damages whatsoever arising out of the use of any hardware.

14 INDEMNIFICATION: User shall defend, indemnify, and hold DAZ 3D harmless from any actions, claims, or proceedings with respect to the 3-D Application(s) or other provisions of this Agreement.

15 REMEDIES: The remedies provided herein shall not be deemed exclusive, but shall be cumulative and shall be in addition to all other remedies provided by law and equity. No delay or omission in the exercise of any remedy herein provided or otherwise available to DAZ 3D shall impair or effect DAZ 3D'S right to exercise the same. An extension of indulgence or forbearance (which must be in writing) shall not otherwise alter or effect DAZ 3D'S rights or obligations nor be deemed to be a waiver thereof. The parties hereto agree that breach of any provisions of non-disclosure, secrecy, confidentiality, copying, use, protection, and security in this Agreement by User will cause immediate and irreparable damage and injury to DAZ 3D. Each of the parties confirms that damages at law may be an inadequate remedy for breach or threatened breach of any such provisions. The parties agree that in such event DAZ 3D shall be entitled by right to an Injunction restraining the User from violating any of said provisions. User hereby acknowledges that DAZ 3D has disclosed or will disclose to User valuable proprietary data set products, which are new and unique and give DAZ 3D a competitive advantage in the marketplace; that DAZ 3D intends

to use such information to expand its business throughout the world; and that a violation of any of the provisions of this Agreement is material and important and DAZ 3D shall, in addition to all other rights and remedies available hereunder, at law or otherwise, be entitled to a Temporary Restraining Order and an Injunction to be issued by any court of competent jurisdiction enjoining and restraining User from committing any violation of said provisions, and User shall consent to the issuance of such Injunction. User acknowledges that the remedies provided for in this Agreement are not injurious to nor violative of any public interest or policy, and will not create a hardship greater than is necessary to protect the interest of DAZ 3D.

16 GENERAL PROVISIONS:.

a Costs and Expenses of Enforcement: In the event of the failure of either party hereto to comply with any provisions of this Agreement, the defaulting party shall pay any and all costs and expenses, including reasonable attorneys' fees arising out of or resulting from such default (including any incurred in connection with any appeal), incurred by the injured party in enforcing its rights and remedies, whether such right or remedy is pursued by filing a lawsuit or otherwise.

b Governing Law, Jurisdiction, and Venue: This Agreement is governed by the laws of the State of Utah. Jurisdiction and venue for the enforcement of this Agreement shall be found exclusively in the courts within Utah County, State of Utah.

c Further Information: Should you have any questions concerning any of the provisions of this Agreement, or if you desire to contact DAZ 3D, please write: DAZ 3D Productions, INC., 1350 E. Draper Parkway, Draper, UT 84020. If you need technical support for a DAZ 3D product, please call (801) 495-1777. Our technical support hours are 9:00 a.m. to 5:00 p.m. M.S.T.

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DAZ 3D Productions, INC., 1995.

- Email: sales@daz3d.com
- Web site: www.daz3d.com
- Phone: 801-495-1777 or 800-267-5170
- Fax: 801-495-1787
- Address: DAZ 3D Productions, Inc., 1350 East Draper Parkway, Draper, UT 84020

Appendix 2: Other DAZ Products

As you continue delving into DAZ|Studio and creating more scenes, you will need to add content to your library. DAZ is the leading creator and broker of high-quality 3D content including figures, props, textures, and more. We also create other software applications. Visit us on the Web at http://www.daz3d.com to see our growing collection of content!

Michael

Michael is the most popular 3D male figure in the DAZ product line. Michael 1.0 debuted in September, 2001, and was followed by Michael 2.0 in January of 2002. The latest version, Michael 3.0, was released in September of 2003.

Michael 3.0 includes an all-new 3D mesh and new skin mapping (referred to as *textures*) obtained by taking high-resolution digital photos of a live model. Also, Michael 3.0 contains over 250 ways to customize the head and face shapes and expressions along with over 120 body modifications. These modifications (called *morph targets*) can be used singly or in any combination for nearly limitless customizing. One figure can be made to look like anyone on Earth- or beyond.

Michael 3.0 includes many of the new ground breaking techniques and assets introduced in Victoria 3.0, DAZ's leading 3D lady. These include true-to-life body shaping and contouring, strategic mesh resolution, photo-realistic skin mapping, and asset management. This latest version makes creating animations, Web designs, illustrations, and photo-realistic projects easier than ever before.

Michael 3's introduction marks the first partnership between DAZ and leading 3D artists where the artists received pre-release versions of Michael in time to create textures, morph targets, clothing, and other accessories tailor-made to fit this new model. This meant that a variety of themes, costumes, and accessories were ready in time for Michael's release, allowing customers to immediately begin creating artwork using Michael 3.0.

Figures like Michael give 3D artists a burst of creative energy. DAZ Productions is the acknowledged leader in developing the highest level of photo-realistic 3D models

Victoria

Victoria is the leading 3D female figure in the DAZ product line, and our most popular and widely used figure ever. She was originally released in February of 2000 followed by Victoria 2.0, with Victoria 3.0 released in December of 2002. As with Michael 3.0, Victoria 3.0 includes a completely reworked 3D mesh, brand new skin mapping (referred to as *textures*) taken directly from high-resolution digital photos of a live model. She is the pinnacle of 3D figure development. Her hundreds of face, head, and body customizing (called *morph targets*) allow artists to create any imaginable combination of ethnicity, face shapes, and expressions.

Victoria 3.0 is absolutely the most advanced human figure commercially available. She represents DAZ's undying commitment to quality, versatility, innovation, and ease of use. Many DAZ models appear in television, film, print, online games, advertising, and other 3D productions.

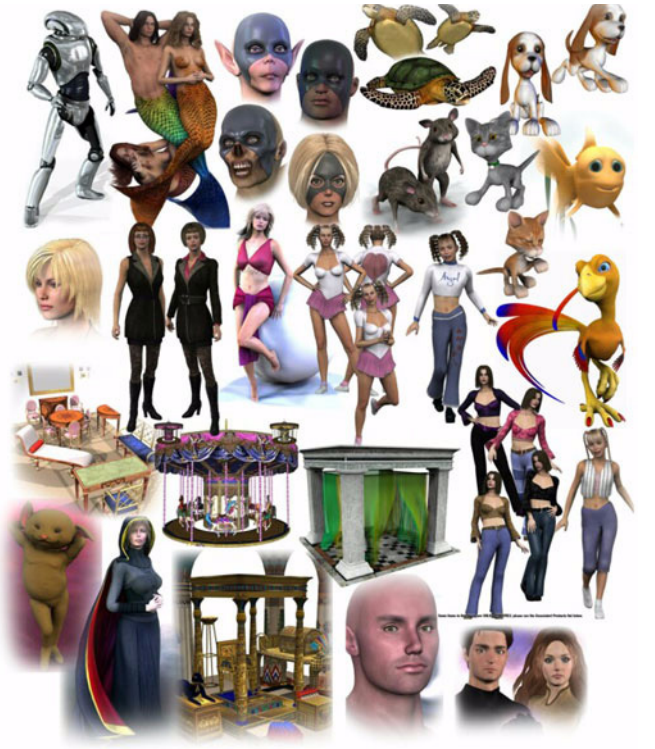
Accessories

In addition to Michael and Victoria and other figures and accessories produced by DAZ, you will find a myriad of DAZ|Studio-ready products available through our professional brokerage program, which is stocked with products created by the top artists within the 3D community. The DAZ Content Library contains the highest-quality, most cutting edge products available anywhere.

DAZ maintains the highest standards of quality and competitiveness. The title of "DAZ|Published Artist" is coveted; many artist invest months improving their talents until they reach the level of quality required to begin having their work published at DAZ. All products are rigorously tested prior to release.

This commitment and stringent testing ensures that all content available from DAZ is 100% compatible with DAZ|Studio's features and capabilities. DAZ|Published Content items are essential additions to DAZ|Studio and serve as wonderful additions to your growing 3D library.

Platinum Club



Want access to the latest and greatest content to add to your library? Join the DAZ Platinum Club and begin receiving special product offerings, sales, and other promotions, along with full-access to the Members Only community on our Web site.

Platinum Club members receive a 30% discount off all DAZ Original products** (excluding Platinum Club items) for as long as your membership remains active. This 30% discount is in addition to any existing sales and can be combined with gift certificates and vouchers!

Upload your favorite images to Platinum Club Gallery! Platinum Club members have full access to this exclusive online gallery and can both submit original images and view images created by other members. Each month, this gallery hosts a contest with the top three winners receiving a $10 gift certificate redeemable on any product DAZ sells. Join the Platinum Club and start submitting images today!

Platinum Club members also receive pre-release information and teaser images regarding upcoming DAZ products. Get the inside scoop on all the latest happenings at DAZ. Go behind the scenes and learn about the live-models and cutting-edge techniques used to create the Michael, Victoria, and the other DAZ products.

Members also have access to new products released every week for only $1.99! With over 350 existing Platinum Club products to choose from and many more released every week, you'll always save big as a Platinum Club member. Join today and tap into resources that other DAZ|Studio professionals are enjoying.

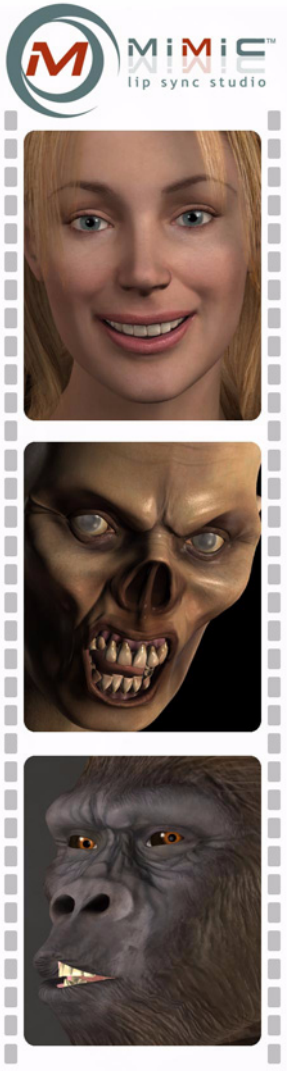
Come meet fellow artists and learn from the pros in the Members Only forum. The Forum also hosts a monthly newsletter packed with the latest news, activities, and contests.

Still not enough? As our thank you for your continued membership, DAZ will grant you a $5 voucher each month good on hundreds of products in our store. These vouchers are good on any DAZ Original item in our inventory (excluding Platinum Club items). And when renewal time comes, you just keep paying your monthly dues of $7.95.

Becoming a Platinum Club member Is easy! Choosing one of our two simple payment plans gives you instant access to every Members Only benefit. Pay just $7.95 a month for 11 months after you sign up for $29.95 in our monthly payment plan, or pay $99.95 in advance for a full year. And every product comes with its own unconditional 30-day money back guarantee.

We're so convinced that you'll like the Platinum Club that we offer a 30-day money back guarantee on your membership. Try out the Platinum Club for thirty days at $29.95. If you aren't 100% convinced that the DAZ Platinum Club is the best subscription savings club in the DAZ|Studio community, we'll refund your money.

The DAZ Platinum Club: Membership has so many privileges!



Mimic

DAZ Mimic 2.0 is an advanced tool for creating and editing facial animation sequences. Its most common use is synching lip motion to sound, allowing them to “talk” and “sing” during animations. Simply take existing WAV audio files in any language and let Mimic do the work for you. Or, record your own speech using Mimic 2.0’s simple recording studio and a microphone connected to your computer. Complete the effect by adding expressions such as winks, nods, and shoulder shrugs to make your figure a fully expressive speaker.

Mimic 2.0’s Talkback™ engine creates the facial animations for you, thus saving hours of production time that you can invest in other areas of your animation projects. By focusing your energy on the nuances within your animation, your characters will come alive with real-life mannerisms and body language.

The best part is that Mimic 2.0 allows you to achieve this incredible realism without the need to be an animation master.

A World of 3D Content

DAZ|Studio is your gateway to turning 3D content into stunningly realistic still images and animations. Pick only the content you need for your particular use and tailor your library to your unique needs and desires.