



**MARI**  
GETTING STARTED GUIDE  
VERSION 1.6v1

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# 1 PREFACE

Mari is a creative texture-painting tool that can handle extremely complex or texture heavy projects. It was developed at Weta Digital and has been used on films such as *The Adventures of Tintin: The Secret of the Unicorn*, *District 9*, *The Day the Earth Stood Still*, *The Lovely Bones* and *Avatar*.

The name Mari comes from the Swahili 'Maridadi', meaning 'beautiful' and carrying connotations of 'usefulness'.

## About this manual

This manual provides you with the basic information you need to start painting with Mari.

The first part of the manual, [Installation and Licensing](#) describes how to install, license, and launch Mari.

The rest of the manual consists of a few short chapters describing Mari's basic functionality and five [tutorials](#) which teach you the basics of creating a Mari project and painting textures. The tutorials provide a series of comprehensive walk-throughs, complete with geometries and associated textures. As you follow the steps in these tutorials, you'll gain a good feel for Mari's user interface and workflow. This, in turn, provides a good working knowledge for creating more complex production projects.

For more detailed information on Mari and its functions, see the accompanying *Mari User Guide* and *Mari Reference Guide*.

## Contact customer support

Should questions arise that this manual fails to address, you can contact Customer Support directly via e-mail at [support@thefoundry.co.uk](mailto:support@thefoundry.co.uk) or via telephone to our London office on +44 (0)20 7968 6828 or to our Los Angeles office on (310) 399 4555 during office hours.

## 2 INSTALLATION AND LICENSING

### Steps for Running Mari

To run Mari, follow these steps:

1. Check the [System Requirements](#)
2. [Install Mari](#)
3. [Launch Mari](#)
4. [License Mari](#)

### System Requirements

#### Officially supported operating systems

- Windows 7 64-bit, or a Linux 64-bit operating system (Fedora 12 or Red Hat Enterprise Linux 5.4)

**Note** *Some newer Linux distributions have changed their network device configuration handling and won't work with Mari without some configuration changes. Known affected distributions at this time include Fedora 16, Red Hat Enterprise Linux 6, and CentOS 6 on certain, notably Dell, hardware. Please see our FAQs for more information: <http://www.thefoundry.co.uk/support/faqs/>.*

#### Minimum hardware requirements

- Quad-core processor
- 250GB disk space available for caching and temporary files (or a minimum of 50GB if you're working on a small project)
- At least 4GB RAM
- Display with 1680 x 1050 pixel resolution
- An NVIDIA or AMD graphics card with at least 1GB of RAM and OpenGL 3.2 support (see [Tested graphics cards](#) below)

#### Virtual memory requirements

It is recommended that the system running Mari has plenty of virtual memory available to use, especially when handling large projects. The use of virtual memory improves stability, helping to prevent data loss on large projects.

### Tested graphics cards

- NVIDIA GeForce GTX 480\*
- NVIDIA GeForce GTX 580\*
- NVIDIA Quadro FX 3800\*\*\*
- NVIDIA Quadro FX 3800M\*\*\*
- NVIDIA Quadro FX 4800\*\*\*
- NVIDIA Quadro FX 5800\*\*\*
- NVIDIA Quadro (Fermi Series) 600\*
- NVIDIA Quadro (Fermi Series) 4000\*
- NVIDIA Quadro (Fermi Series) 5000\*
- NVIDIA Quadro (Fermi Series) 6000\*
- AMD FirePro W7000\*
- AMD FirePro W8000\*
- AMD FirePro W9000\*
- AMD Radeon HD 7850\*
- AMD Radeon HD 7950\*

Please download and install the latest graphics driver for your card from the NVIDIA or AMD websites.

**Note** *Ensure that you are using 8.982.8.1 drivers or higher for AMD cards.*

**Note** *\*Displacement preview is currently only supported by these cards.*

*\*\*\*Please note that as of Mari 2.0v1 we will cease to officially support these cards.*

## Install Mari

Mari 1.6 is available to download from our web site at [www.thefoundry.co.uk/mari](http://www.thefoundry.co.uk/mari). The downloads are in a compressed format (.run or .exe).

## On Linux

1. Download the **.run** installation file from our web site at [www.thefoundry.co.uk/mari](http://www.thefoundry.co.uk/mari).
2. Extract Mari from the **.run** archive with the following terminal command, replacing [version number] with the current version:  
**sudo ./Mari[version number]-linux-x86-release-64.run**  
The installer displays the End User Licensing Agreement (EULA) and prompts you to accept it.

3. If you agree with the EULA, enter **y** and press **Return** to accept the EULA. (If you don't agree with the EULA and press **n** instead, the installation is canceled.)  
By default, Mari is installed in an appropriately named folder in the current working directory.
4. That's it! Proceed to [Launch Mari](#).

**Tip** *You can also use the following options after the terminal command when installing Mari:*

- **--info**  
*This lets you see what the default installation directory is.*
- **--target MyMariDirectory**  
*This lets you specify a different directory to install Mari to (in this case, MyMariDirectory).*
- **--accept-eula**  
*This lets you automate the installation so that you are not prompted to accept the EULA. Note that if you use this option, you agree to the terms of the EULA. To see the EULA, please refer to Appendix D in the Mari User Guide.*
- **--help**  
*This lets you see additional help and installer options.*

*Here's an example of the syntax using the --accept-eula option:*  
**sudo ./Mari[version number]-linux-x86-release-64.run --accept-eula**

**Note** *If you leave out **sudo** from the terminal command, you need to ensure that you have sufficient permissions to install Mari under your current working directory or selected target directory.*

*After the Mari application files have been installed, the installer also runs a post-installation script that creates the following directory:*

**/usr/local/foundry/RLM**

*If you don't have sufficient permissions on the /usr/local folder for this directory to be created, the post-installation script prompts you for your sudo password as necessary.*

## On Windows

1. Download the .exe installation file from our web site at [www.the-foundry.co.uk/mari](http://www.the-foundry.co.uk/mari).
2. Double-click on the installation file to start the installation. Follow the on-screen instructions. By default, Mari is installed to drive letter:\Program Files\Mari [version number].

3. That's it! Proceed to [Launch Mari](#).

### Installing Mari from the command line

To install Mari from the command line, do the following:

1. Download the correct **.exe** installation file from our web site at [www.thefoundry.co.uk](http://www.thefoundry.co.uk).
2. To open a command prompt window, select **Start > All Programs > Accessories > Command Prompt**.
3. Use the **cd** (change directory) command to move to the directory where you saved the installation file. For example, if you saved the installation file in **C:\Temp**, use the following command and press **Return**:

```
cd \Temp
```

4. To install Mari, do one of the following:
  - To install Mari and display the installation dialog, type the name of the install file without the file extension and press **Return**:  
`Mari1.6v1-win-x86-release-64`
  - To install Mari to a specified directory and display the installation dialog, use the **/dir** install option:  
`Mari1.6v1-win-x86-release-64 /dir="E:\Mari"`
  - To install Mari silently so that the installer does not prompt you for anything but displays a progress bar, enter **/silent** after the installation command:  
`Mari1.6v1-win-x86-release-64 /silent`
  - To install Mari silently so that nothing is displayed, enter **/verysilent** after the installation command:  
`Mari1.6v1-win-x86-release-64 /verysilent`
  - You can also use a combination of install options:  
`Mari1.6v1-win-x86-release-64 /silent /dir="E:\Mari"`

**Note** *By running a silent install of Mari, you agree to the terms of the EULA. To see this agreement, please refer to Appendix D: End User Licensing Agreement in the Mari User Guide or run the installer in standard non-silent mode.*

## Launch Mari

### On Linux

1. Open a terminal.
2. Navigate to the directory you installed Mari to.

3. Enter `./mari`.
4. If you haven't installed a license for Mari, you need to [License Mari](#). Once you've done so, click **Launch** in the **Mari Licensing** dialog.  
*Mari checks for [Tested graphics cards](#), and if an untested graphics card configuration is detected, a dialog displays warning you about it. Depending on the configuration detected, you have the option to **Quit** or **Continue** and, in the case of configurations with known issues, also **Ignore Permanently**. Note that if you ignore the warning and run Mari anyway, you may experience instability or performance issues. If a tested graphics card configuration is detected, Mari runs as normal.*
5. If you are launching Mari for the first time, you are prompted to choose a directory for its cache files. In the **Please Pick Cache Directory** dialog, navigate to the directory you want to use and click **Choose**.

Note that the cache directory should be:

- empty
- local to the machine (not a network mount)
- as fast as possible
- a location that's not temporary (to avoid the data disappearing)
- a directory that the user has read and write permissions to.

*The Mari graphical interface displays.*

Project cache locations are directories that Mari uses to store project data files. These directories must be persistent; not in temporary locations. If more than one cache location is specified, Mari spreads each project's data files across all locations. Once a project has been created for a given set of cache locations, that set must not be changed. In order to move a project between different sets of caches, archive the project.

- Warning** *Do not add, remove, or amend cache locations once they have been set unless they are empty. Once projects have been created for a given set of cache locations, that set must not be changed or project corruption will occur.*
- Note** *If the `MARI_CACHE` environment variable has been set, its value is used to determine the location of the cache files. In this case, Mari does not prompt you to choose the cache directory. For more information on environment variables that Mari understands, please refer to the Mari User Guide.*
- Tip** *You can also launch Mari in verbose mode by using the following command:*  
`./mari --verbose`

---

*This way, Mari provides a running log of each action that it performs. You can see this log in a terminal window.*

## On Windows

1. Click **Start > All Programs > The Foundry > Mari 1.6v1 > Mari 1.6v1**.
2. If you haven't installed a license for Mari, you need to [License Mari](#). Once you've done so, click **Launch** in the **Mari Licensing** dialog.  
*Mari checks for [Tested graphics cards](#), and if an untested graphics card configuration is detected, a dialog displays warning you about it. Depending on the configuration detected, you have the option to **Quit** or **Continue** and, in the case of configurations with known issues, also **Ignore Permanently**. Note that if you ignore the warning and run Mari anyway, you may experience instability or performance issues. If a tested graphics card configuration is detected, Mari runs as normal.*
3. If you are launching Mari for the first time, you are prompted to choose a directory for its cache files. In the **Please Pick Cache Directory** dialog, navigate to the directory you want to use and click **Choose**.

Note that the cache directory should be:

- empty
- local to the machine (not a network mount)
- as fast as possible
- a location that's not temporary (to avoid the data disappearing)
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**Warning** *Do not add, remove, or amend cache locations once they have been set unless they are empty. Once projects have been created for a given set of cache locations, that set must not be changed or project corruption will occur.*

**Note** *If the `MARI_CACHE` environment variable has been set, its value is used to determine the location of the cache files. In this case, Mari does not prompt you to choose the cache directory. For more information on environment variables that Mari understands, please refer to the Mari User Guide.*

**Tip** *You can also launch Mari in verbose mode by selecting **Start > All Programs > Mari 1.6v1 > Mari 1.6v1 (Verbose Output)**. This way, Mari provides a running log of each action that it performs. You can see this log in a command line window.*

## License Mari

### About Licenses

If you simply want to try out Mari, you can obtain a trial license, which allows you to run Mari for free for 15 days. See [Install the License](#) on page 15.

To use Mari after this trial period, you need either a valid **activation key** or a **floating license** and server running the Foundry Licensing Tools (FLT):

- **Activation Keys**—These can be used to easily install and activate **node locked** (also known as **uncounted**) licenses. Node locked licenses allow you to use Mari on a single machine. This license does not work on a different machine and if you need it to, you'll have to transfer your license. Node locked licenses do not require additional licensing software to be installed. See [Licensing Mari on a Single Machine](#) for more information.
- **Floating Licenses**—also known as **counted** licenses, enable one of our products to work on any networked client machine. The floating license should be put on the server and is locked to a unique number on that server. Floating licenses on a server require additional software to be installed. This software manages those licenses on the server, giving licenses out to client stations that want them. The software you need to manage these licenses is called the Foundry License Tools (FLT) which can be freely downloaded from our web site. Floating licenses often declare a port number on the server line and a port number on the vendor line. See [Licensing Mari over a Network](#) for more information.

The instructions below run through both licensing methods and you can find a more detailed description in the Foundry Licensing Tools User Guide available on our website:

<http://www.thefoundry.co.uk/support/licensing/tools/>

## Licensing Mari on a Single Machine

### Obtain an Activation Key

You can purchase activation keys over the Internet by clicking **Purchase License** in the Mari licensing dialog that displays when you launch Mari without a license, or by contacting The Foundry Sales Department at [sales@thefoundry.co.uk](mailto:sales@thefoundry.co.uk).

### Install the License

You are prompted to enter your activation key when you start Mari without a license. Mari skips this step if you've already activated the application.

Select an activation option from the **Mari Licensing** dialog:

- **Purchase License**—click to open a web browser directly to The Foundry website to purchase an activation key.
- **Activate Key or Use Server**—click to enter a previously obtained activation key. When you enter the activation key, Mari automatically obtains a license from the web and installs it on your machine. You're good to go.
- **Obtain Trial License**—click to automatically install a trial license valid for 15 days. Whenever you then launch Mari, the **Mari Licensing** dialog displays how many days remain before your trial license expires. Note that you can only obtain a trial license for a major Mari release once on each machine (for example, if you had a trial license for Mari 1.1v1, you can't get another one for Mari 1.1v2 on the same machine).

**Tip** *If you later want to change your license (for example, from a node locked license to a floating license), you can select **Tools > License** in Mari to display the **Mari Licensing** dialog.*

**Note** *If you access the Internet through a proxy server and Mari cannot connect to the activation server, you may get an error dialog prompting you to either:*

- *Click **Use Proxy** to enter the proxy server name, port number, username, and password. This enables Mari to connect to the activation server and obtain a license. Mari then installs the license automatically.*
- *Click on the web link in the dialog and use the System ID (also known as hostid) provided to manually activate and install a license. For more information on how to install a license manually, see the Foundry Licensing Tools (FLT) User Guide available on our website at <http://www.thefoundry.co.uk/support/licensing/>*

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## Licensing Mari over a Network

### Obtain Floating Licenses

Alternatively, you can purchase a floating license key from our website. To generate a license key, we need to know your System ID. The System ID (sometimes called Host ID or rlmhostid) returns a unique number for your computer. We lock our license keys to the System ID. See [Install Floating Licenses](#).

Just so you know what a System ID number looks like, here's an example: 000ea641d7a1.

### On Windows

To display your System ID:

1. Do one of the following:
  - Download the Foundry License Installer for Mari (FLU) utility from <http://www.thefoundry.co.uk/support/licensing/tools/> and run it. Your System ID is displayed.
  - Download the Foundry Licensing Tools (FLT) free of charge from our web site and run C:\Program Files (x86)\The Foundry\LicensingTools7.0\FoundryLicenseUtility.exe.
2. Once you have provided us with your System ID number and a license key has been generated for you, you will receive the license key in an e-mail or Internet download. The license key is contained in a text file called foundry.lic. For information on what to do with the foundry.lic file, see [Install Floating Licenses](#) below.

### On Linux

To display your System ID:

1. Download the Foundry Licensing Tools (FLT) free of charge from <http://www.thefoundry.co.uk/support/licensing/tools/> and run the following command in a terminal shell:  
`/usr/local/foundry/LicensingTools7.0/FoundryLicenseUtility`
2. Once you have provided us with your System ID number and a license key has been generated for you, you will receive the license key in an e-mail or Internet download. The license key is contained in a text file called foundry.lic. For information on what to do with the foundry.lic file, see [Install Floating Licenses](#) below.

## Install Floating Licenses

If you requested a floating license from The Foundry, you will receive your license key (foundry.lic) in an e-mail or Internet download. You should also receive the Foundry License Installer (FLU) application to help you install the license key. The FLU is also available to download from [www.thefoundry.co.uk/licensing](http://www.thefoundry.co.uk/licensing). The instructions below tell you what to do with these.

1. Make sure you have saved both the license key (foundry.lic) and the Foundry License Installer application in the same directory.
2. Run the Foundry License Installer application. The license key should automatically display in the FLU window if the FLU and foundry.lic are in the same directory. If they are not, you can either copy and paste the contents of the license key or drag and drop the file into the FLU window.
3. Click **Install**.  
This checks the license file and, provided that the license is valid, installs it into the correct directory.  
In order for the floating license to work, you need to install the Foundry Licensing Tools (FLT) on the license server machine. For more information on how to install floating licenses, refer to the FLT user guide, which you can download from our web site: <http://www.thefoundry.co.uk/support/licensing/tools/>.
4. Once your license server is up and running, launch Mari (if it isn't already running).
5. Click **Activate Key or Use Server** and enter the server address in the field provided. The format for the server name is <port>@<servername>, for example, 30001@red.

**Note** *You must perform steps 4 and 5 on each client machine that requires a Mari license from the server.*

**Tip** *If you later need to display the **Mari Licensing** dialog again, you can select **Tools > License** in Mari.*

## Further Reading

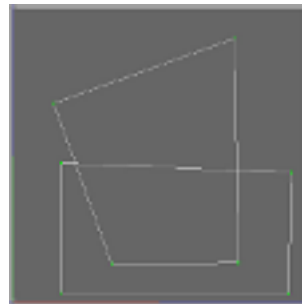
For more information on licensing Mari, displaying the System ID number, setting up a floating license server, adding new license keys and managing license usage across a network, you should read the Foundry Licensing Tools User Guide available on our web site.

### 3 MARI MODEL REQUIREMENTS

#### Model Requirements

Mari requires your model files to be configured in a particular way.

Please bear in mind that Mari allows you to import and paint models with **Overlapping UVs**, like the one shown below. However, if you paint on regions in the 3D views (orthographic or perspective), which also overlap in 2D UV view, then you may encounter painting artifacts, as Mari is forced to choose which of the conflicting overlapping paint strokes to bake down. To avoid this, you should only apply paint to one of the overlapped regions at a time in the 3D views.



For example, if you paint a face where the left and right halves have been mirrored with overlapping UVs, then you should aim to only paint on one half of the face to avoid paint clashes.

**Note** *Paint clashing due to overlapping UVs cannot occur in the UV view, so you can always paint your model in that view if you find that your model is particularly tricky to paint in 3D views.*

Models to paint in Mari *should not* have:

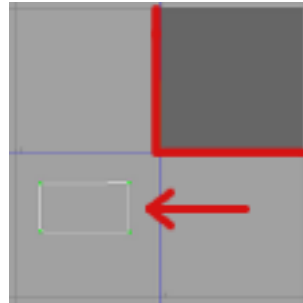
- **UVs that go over 10 on the U axis** — these are ignored.



- **Stacked UVs** — these cannot be individually selected in UV view. If you do have stacked UVs and want to select an individual UV, you need to select it in either Ortho or Perspective view first, and then switch back to UV view.

Models to paint in Mari *cannot* have:

- **Negative UVs** — painting on these is not possible.

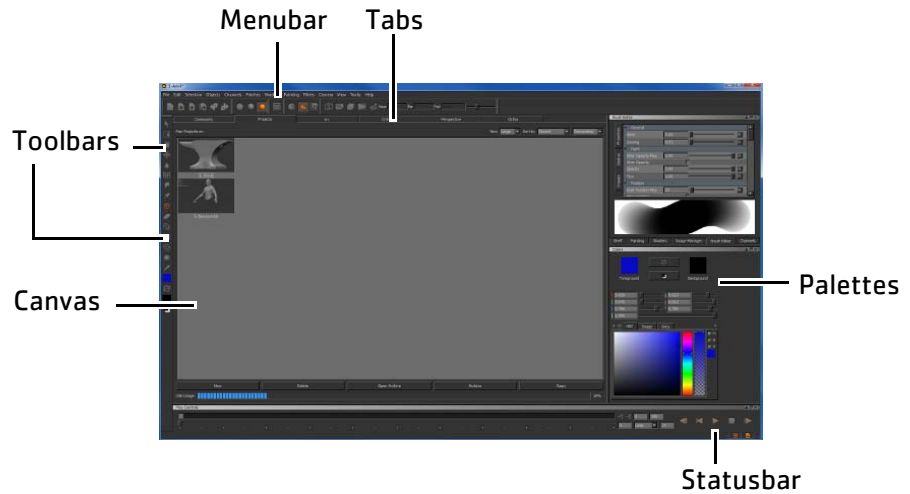


For Ptex modelling, please see the [Ptex Modelling Requirements in Mari](#) in the User Guide for more information.

## 4 THE MARI WORKSPACE

### What It Looks Like

Here is an illustration of the Mari workspace that displays when you first open the program.




Workspace	
<b>Menubar</b>	To select Mari commands (many of which are also available using shortcut keys and/or icons).
<b>Toolbars</b>	To click icons for common Mari functions or settings.
<b>Canvas</b>	Where you view and paint your geometry.
<b>Tabs</b>	To switch between views.
<b>Palettes</b>	Controls for viewing and changing different aspects of what's on the canvas.
<b>Statusbar</b>	Information about the project generally, progress of long operations (such as baking), and icons.

## 5 MANAGING PROJECTS

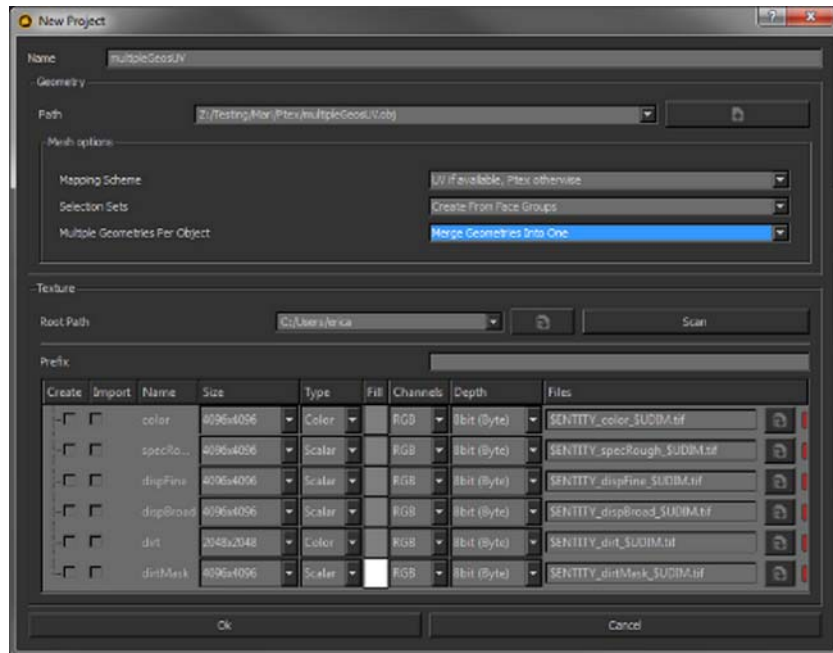
A Mari project stores your work on geometries and associated textures. Mari's Project tab holds all the projects you are working on.


### Creating a New Project

1. Do one of the following:

Select from menubar	or click on toolbar	or click on the Project tab	or type shortcut key
File > New		New	Ctrl+N

*The New Project dialog box displays.*



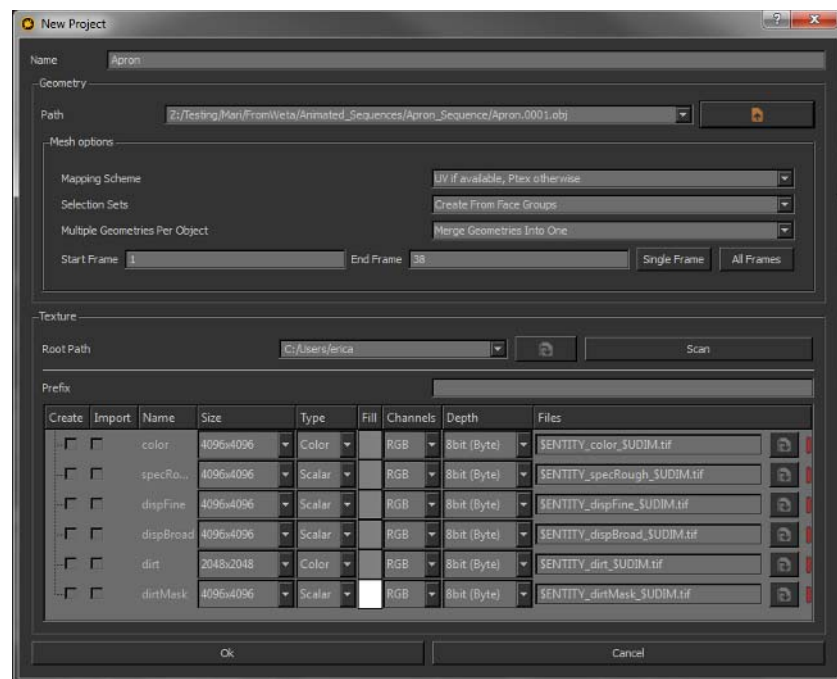
2. Set the project's **Name** (for you to identify it only — this is not a filename).
3. Select the geometry file for the project in the **Path** field. The dropdown menu lists the last 10 files selected, or you can click  to browse to a file.

Various mesh options display in the dialog directly under **Path**, depending on whether you open an **.obj** or **.ptx** file.

- **.obj** files: you can select options for the **Mapping Scheme**, **Selection Sets**, and **Multiple Geometries Per Object**.
- **.ptx** files: you can choose whether the mesh data in the file represents a single new Object or, when there are multiple input files, if the mesh data in each file represents a separate geometry in a single new Object.

For more information on the **Mesh Options**, please see [Create a New Project](#) in the Ptex chapter of the User Guide.

4. If you are loading an animated sequence, the **Mesh Options** tab displays with the additional options **Start Frame**, **End Frame**, **Single Frame**, and **All Frames**. These options provide you with positions for viewing the animated sequence.



5. To create a project from multiple files, browse to a folder and select multiple files before clicking **Open**.

The selected files are all shown in the **Path** field. These files are stored in the history as a single project under the assigned name.

6. On the **Texture** tab, click to select which of the channels in the list to create. You can select a different **Category** from the list – the set of channels updates with channels for your selected category.

Click boxes under **Create** and **Import** to set the options. You can right-click to get a dropdown menu allowing you to easily create or import all the channels.

**Tip** Click **Scan** to make Mari scan the project's root path for any existing textures. If any textures exist for your channels, Mari shows a green dot next to the channel. You can select to import these textures.

As with the project name, the channel **Name** is for you to identify it only — when you export you can select a different name.

For the **Type**, choose **Color** for anything color-dependent (and Mari applies the viewer LUT automatically), or **Scalar** for a mask or displacement.

If you select a different Depth or resolution, file sizes can vary dramatically (for example, a 2K RGB "Byte" texture file is 2MB — whereas a 4K "Float" is 172MB).

7. Click **OK**.

Mari checks the model for any errors that might prevent it from processing, for example touch border edges. A "Mesh Sanity Check" dialog displays any warnings or errors. (**Errors** cancel opening the model, but you can continue with **warnings**.)

8. Click to **Continue**.

Mari renders your selection and displays it on the canvas.

**Tip** Depending on the size and complexity of textures, it can take several minutes the first time you load them into a Mari project. Once saved, however, the project should open quickly in future.

## Opening Existing Projects

1. Click on the **Projects** tab.

*This shows all the projects you have on your computer.*

2. Double-click on the project to open.

**Note** On project load, Mari looks for metadata that is over 250MB and discards anything that is over this size. This is intended to strip corrupt and problematic data, and also affects metadata added via the Python API.

## Using the Command Line

You can also open Mari and a specific, existing project, as well as archives using the command line. From the **Run** dialog on your computer, use a command in the format of:

`./mari /tmp/testproject.mra`

By specifying the project name, UUID, folder path, or project.mri path, you can open Mari and the designated project.

The command line can also be used to run scripts that contain a Python call to open a project. From the **Run** dialog on your computer, use a command in the format of:

`./mari example_script.py`

The `example_script` should contain the Python call to open a project.

## Saving Your Project

Do one of the following:

Select from menubar	or click on toolbar	or type shortcut key
File > Save		Ctrl+S


- Tip**
- *Save your project often!*
  - *Note that while your textures remain cached locally, saving does not export them, so export often too!*
  - *If you don't need to save (no changes since the last save), the toolbar icon is gray.*

## 6 CHANNELS

Channels hold “layers” of paint in your project. For example, a project might have channels for diffuse color, displacement, specular, or mask details.

### Adding a Channel to a Project

1. Do one of the following:

Select from menubar	or click	or right-click on the <b>Channels</b> palette and select
Channels > Add Channel		Add Channel

*The **Add Channel** dialog box displays, allowing you to set the options for the new channel.*


2. Select a name, color channels, depth, type and base color for the channel (as with a new project), and click **Ok**.

*The new channel displays in the **Channels** palette.*

**Tip** *If there are multiple objects in your project, there is no **Ok** button in the **Add Channel** dialog. Instead, you need to choose whether you want to import the channel onto the current object only or **All Objects**.*

### Adding a Set of Channels

1. Do one of the following:

Select from menubar	or click	or right-click on the <b>Channels</b> palette and select
Channels > Channel Presets		Channel Presets

*The **Add Multiple Channels** dialog box displays.*

2. Select the type of object you're creating from the **Category** list.  
*The list of channels at the bottom of the dialog box expands to show all the channels for that kind of model. Select the channels to create.*
3. If you have existing textures to import into the new channels, set the **Root Path** and make sure that the **Files** for each channel show the correct texture files.
4. Click **OK** to create and import the new channels.

**Tip** *To toggle quickly between the last two selected channels (while in the painting canvas), press **T**.*

*For other options, such as duplicating, locking or resizing a channel, right-click in the **Channels** palette.*

*When you Import channels, if there is a corresponding texture for each patch in the model, an indicator (red, green, or number) tells you whether your selection includes a complete set of textures.*

## 7 CONFIGURING YOUR WORKSPACE

The Mari workspace is completely configurable. As detailed on the pages that follow, you can customize how palettes display, your own personalized sets of brushes and colors, and shortcut keys.


### Palettes

Mari uses a number of palettes — windows that you can move around your workspace, with specific information and tools for working on your project. For example, the **Channels** palette shows all the channels in the project, and has controls for editing the channels.

#### To open palettes:

Select from <b>menubar</b>	<i>or</i> right-click on the <b>menubar</b> or <b>toolbar</b> and select
<b>View &gt; Palettes &gt;</b> <palette name>	<palette name>

#### To move, size and arrange palettes:

To...	Do this...
Undock and move a palette	Grab and drag it by its title bar to anywhere on your screen. (Or click  to undock, and then drag by its title bar).
Dock a palette to the window	Move it to one of the edges of the Mari window. <i>A dotted line displays along the edge where it can dock.</i>
Dock a palette to another palette	Move it over another undocked palette. <i>A dotted line displays where it can dock.</i>
Size a docked palette	Grab and drag the dotted bar along the bottom or side.
Size a floating palette	Drag an edge or corner.
Stack palettes	Drag and drop them directly on top of one another. Tabs appear for selecting which of the stacked palettes to display.

## Shelves

The **Shelf** palette lets you store customized “shelves” of brushes, colors, and images. You can also share them with others.



Mari has the following kinds of shelves:

- The **Menu** shelf stores seven items available from the F9 on-screen menu. These items must be numbered from 1-7 to appear.
- The **Personal** shelf stores items you select and configure for all projects.
- The **Basic Brushes** shelf stores a set of predefined basic brushes.
- The **Hard Surface Brushes** shelf stores a set of predefined hard surface brushes.
- The **Organic Brushes** shelf stores a set of predefined organic brushes.
- Customized shelves you create store items you select and configure for all projects.

## Customizing Shelves

To add an item (brush, color, or image) to a shelf, drag it onto the shelf.

## 8 CHANGING THE VIEW

As described below, Mari includes features for 3D navigation to view your model from various angles and perspectives, change the lighting on the mesh, and change the resolution of textures.

### 3D Navigation

You can move the view by holding down **Alt**.

To...	hold down Alt and
Zoom in and out	Ctrl-click and drag OR Right-click and drag
Pan left and right	Shift-click and drag OR Middle-click and drag
Rotate the model	Left-click and drag
To...	
Spin the camera	Ctrl+R+left-click and drag

**Tip** *By default, Mari uses momentum when you are moving the view. When you let go of the mouse button, the model slowly coasts to a stop. You can turn this behavior off so that the model only moves when you are holding the mouse button down. To do so, change the settings in the preferences by unchecking **Momentum Enabled** via **Edit > Preferences > Navigation**.*

The navigation toolbar also provides the ability to control panning, zooming, rolling, and orbiting, with various settings for each. You can easily access the toolbar, shown below, at any time using the following buttons:



- Reset navigation settings to default.
- Enable panning to move the model on the screen.
- Enable zooming to zoom in or out on the model.
- Enable rolling to turn on the momentum system.
- Enable orbiting mimics the orbiting system in Maya and allows you to move the camera around the model.
- Disable rotational snapping gives options to turn on and change the angle at which the camera view snaps to (45 degrees or 90 degrees).

You can also use the keys **1-6** to switch between preset views (left, right,




top, bottom, front, and back).

In the UV view, you can also rotate or reset the model for easier viewing and painting. Press **1** to reset the model back to its default position. Press **2**, **3**, and **4** to rotate the model counter-clockwise in 90-degree increments from the default position.

Press **Home** to cycle between hiding all palettes, hiding docked palettes and showing hidden palettes.

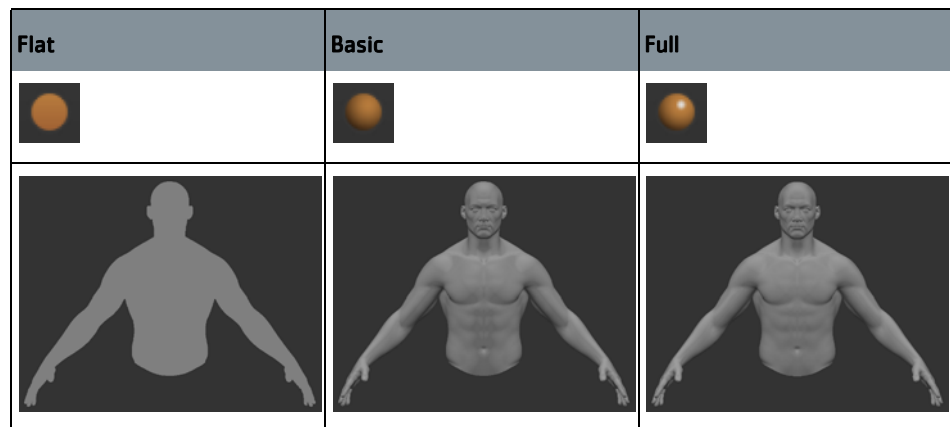
Use the tabs at the top of the canvas to switch between:


- **UV** - a grid view showing the UV patches.
- **Ortho/UV** - a split screen showing the UV patches and the orthographic view.
- **Perspective** - a perspective camera view, or
- **Ortho** - an orthographic camera view.

**Tip** You can also use the , , and  toolbar buttons or the **F10**, **F11**, and **F12** keyboard shortcuts to activate a particular view on any tab.




## Lighting

You can change the lighting on the main mesh by clicking on the toolbar:

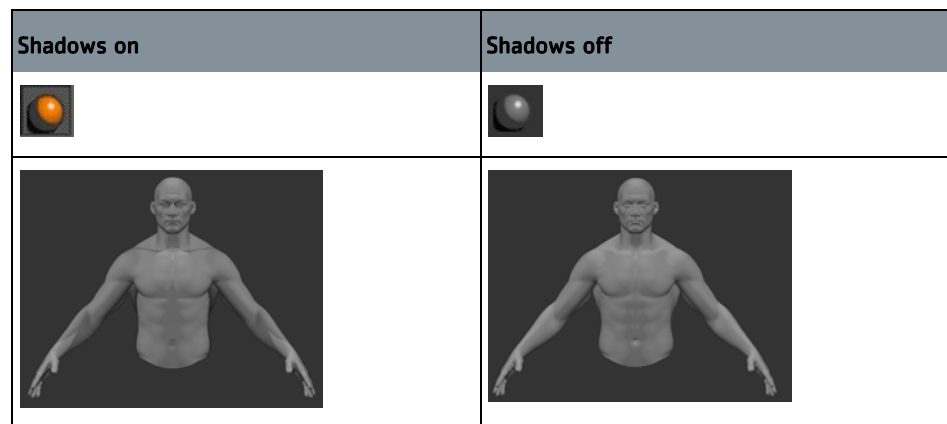


Mari has four custom lights, which appear on the drawing canvas .

You can set the light details in the **Lights** palette. Mari uses these in the **Basic** and **Full** lighting modes:

- To turn a light on or off, click on the  icon in the list, or use the **General > On** checkbox.
- To change a light, click on it in the **Lights** list, and then set the color and strength.
- Select whether the light is fixed to the **Scene** or **Camera**.
- To move a light around, select the **Pan Object** tool , then click and drag the light around on the canvas.
- To move a light to the camera position, click on the  icon on the **Lights** palette, or right-click on the light and select **Move to Camera Position**.

You can toggle the shadows on and off in the **Lighting** toolbar:



This simply toggles the display of shadows on the canvas, but does not disable shadow processing.

- You can control **Shadow Rendering** through the option on the **Lights** palette.
- Toggle shadows by clicking on the **Shadows** icon in the **Lighting** toolbar or the **Shading** menu.
- If you want to enable shadow processing, you need to enable the **Depth Projections** checkbox under **Preferences > Data | Graphics Card**. By default, this preference is disabled.



















## 9 PAINTING

Painting in Mari is similar to other standard paint programs. Paint using the various tools, then bake it onto your model. Most tools work on unbaked paint, but one or two work directly on the baked paint on the surface.


**Tip** *Each tool has a set of keys that control how it works. By default, the option keys for the current tool are shown on screen at the top of the canvas.*

### To select a tool:

Choose from your shelves or the Tools toolbar:

Paint tools			
 Select	 Marquee select	 Transform paint buffer	 Zoom paint buffer
 Pan object	 Vector Inspector	 Blur	 Warp
 Slerp	 Pinup	 Paint	 Vector Paint
 Erase	 Paint through	 Paint gradient	 Clonestamp
 Towbrush	 Color picker/ Pixel analyzer		

### Painting a Constant Color

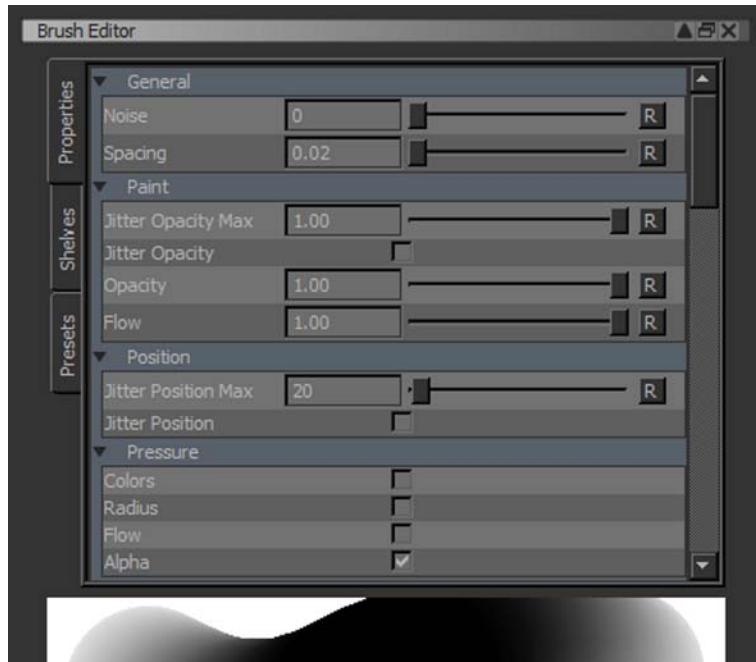
1. Click 
2. Click and drag to paint on the model.

**Tip** *You can paint a straight line by:*

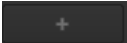
- *clicking one end point, moving the cursor, pressing **Shift** and clicking the second endpoint.*
- *pressing **Shift** and holding down the mouse button while moving horizontally or vertically.*

## Customizing Your Brush



1. Open the **Brush Editor** palette.  
*The **Brush Editor** displays.*




**Tip** *Resize the brush editor palette to minimize scrolling. There are many options for customizing your brush, including setting values for **Paint**, **Pressure**, **Radius**, **Rotation**, **Bitmaps** to use, **Geometry** and **Noise**. You can test the brush in the scratch pad at the bottom of the palette.*

2. You can select a brush to modify from those available in your **Shelves**.
3. When you have finished creating a brush, click  to add it to the selected shelf.

## “Painting Through” an Image

1. Open the **Image Manager** palette.
2. To load an image, click , navigate to and select the image file, and click **Open**.  
*A thumbnail of the image displays, along with information about the selected image.*
3. In the **Tools** palette, click  (the **Paint Through** tool).


4. Drag and drop the image from the **Image Manager** to the canvas.
5. Adjust the image size and position:

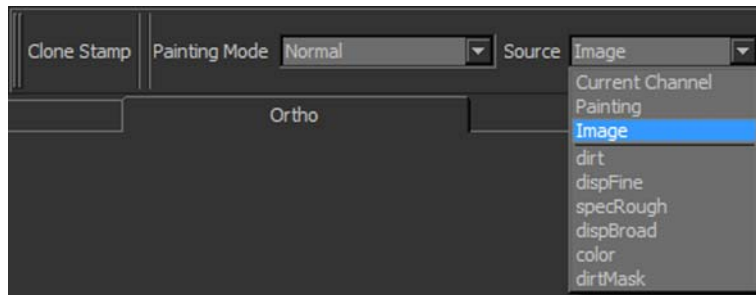
To...	Do this...
Resize	Grab and drag its edges or corners, or press <b>Ctrl+Shift</b> then click and drag.
Move	Grab the "handle" in the center of the image (or press <b>Shift</b> and click anywhere on the image), and drag.
Rotate	Click and drag outside the image, or press <b>Ctrl</b> and drag inside the image.  Press <b>Shift</b> when dragging outside the image to rotate in increments.
Crop	Double-click the image in the <b>Image Manager</b> , drag the area you want to crop, and click  .
Change the opacity	In the <b>Tool Properties</b> palette, select <b>Texture &gt; Preview</b> , and change the <b>Preview Alpha</b> (enter a number or drag the slider). Pre-multiply alpha if your image has transparency.
Reset the image	In the <b>Tool Properties</b> palette, select <b>Texture &gt; Transform &gt; Reset</b> .

6. Paint!

**Tip** *You can quickly switch between the **Paint** and **Paint Through** tools by pressing **P** and **U**. To hide the image, hold the **?** key, to paint the whole image onto the model in one step, press the **'** (apostrophe) key. Toggle repeat image to paint past the edge of the floating image and have the paint continue, by pressing the **;** (semicolon) key.*

## Clone Stamping

1. Click .
2. Use the **Source** menu on the toolbar to select where to take the clone source from.



3. Hold down the **Ctrl** key and click to select the clone source point.


**Tip** *When cloning from a channel, you can clone directly from the surface. In this mode, the tool clones the paint from the channel surface straight up into the paint buffer directly above that point. This lets you copy the model's surface into the paint buffer so you can edit it and then re-bake.*

*To use this mode, hold down **Ctrl+Meta** (or **Windows** key) when you click to set the origin point.*

4. Paint to stamp your selection onto the model.




## Moving and Warping Paint

To move paint on the model before baking:

1. Click .
2. Left-click anywhere on the paint buffer and drag to move the painting around on the model.
3. **Ctrl**+left click and drag to rotate the painting, or left-click and drag outside the paint buffer.
4. **Ctrl+Shift**+left-click and drag to resize the painting, or grab the corners of the paint buffer and drag.

**Tip** *The paint buffer is visible on screen as a white box, but it may be larger than the view window and not visible. It becomes obvious if you move or resize the painting. To reset the paint buffer to its default values click the **Reset** button in the **Painting** palette under **Paint Buffer > Transform**.*

To warp paint before baking:

Using this tool...	You can...
 <b>Warp</b>	<b>Shift</b> -click and drag to create a warp grid. Click and drag the points around to warp the paint. To increase or decrease the grid resolution, press the up or down arrow keys.
 <b>Slerp</b>	Use the <b>Slerp Mode</b> menu on the toolbar to set the mode (from <b>Pull</b> , <b>Grow</b> , <b>Shrink</b> , or <b>Rotate</b> ). Click and drag to apply your effect. <b>Erase</b> distortion by selecting the <b>Erase</b> mode.
 <b>Pinup</b>	<b>Shift</b> -click to set "pins". Then click and drag to move the pins. You can use pins to protect parts of the paint that you don't want affected by the distortion.


## Baking Paint onto the Model

1. Make sure all patches you want to bake are selected.
2. Do one of the following:

Type shortcut key	or click on <b>statusbar</b>
<b>B</b>	

**Tip** *Whenever you change your view of the model, it bakes automatically. You can change this setting in the **Projection** palette if required.*

## Blurring Baked Paint

1. Click .
2. Left-click and drag to blur paint baked on the surface.

**Tip** *As with the paint tools, you can edit the blur brush tip. When you have finished blurring the paint, you need to bake.*

## Vector Brushing

The **Vector Paint** tool works a little differently to the **Paint** tool. Instead of painting specific colors onto your model, the **Vector Brush**, which has colors assigned to directions, determines the direction you are painting in and displays a pre-set color (or blend of colors, in the case of diagonal directions) to show you the way a vector appears on your model. This is especially useful for creating flow maps.

## 10 SHADERS

Shaders control how Mari displays the model on the canvas. Mari's default shader shows the color from the current channel. You can build your own custom shaders by combining shader modules. Each module controls a single display effect. The modules you can use include:


- combining two diffuse channels
- showing a channel as a displacement map
- using a channel as a luminosity map
- combining channels using a third channel as a mask.

So you can build a shader that takes the details from multiple channels in your project to render the canvas on screen.

**Tip** *Shaders do not affect the contents of the channels, only how Mari displays the model on the canvas. For example, if you have a shader that combines two diffuse channels, the model on screen is displayed with a mixture of both channels. However, the channels are still separate and contain different data.*

### Create a Shader

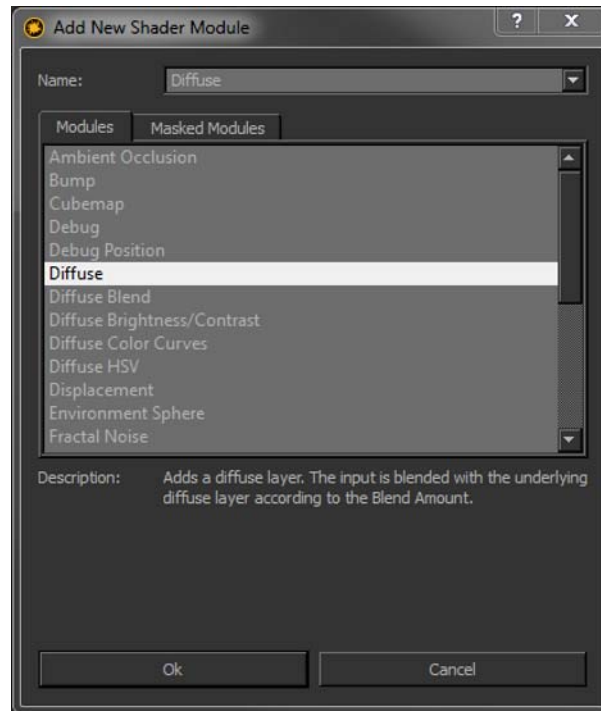
To create a custom shader:

1. In the **Shaders** palette, right-click and select **Add SurfaceShader** or click .

*The new shader displays in the list, with details at the bottom of the palette.*

2. New shaders start as a copy of the default shader. You can:
  - edit the existing modules
  - click the **Add New Shader Module** button to add modules to your shader.

The **Add New Shader Module** dialog displays.



*Enter a name and select the **Module** to add. For example, to create a shader that shows one channel as a bump map, select the **Bump** module.*

3. Set the details of the shader modules.

*Each module has different details. Adjust the values until you get something you like.*

You can add as many modules as you need to build up your shader.

**Tip** *If you build a shader that takes data from multiple channels, it can be hard to remember which channel you're currently editing. In this case, you can switch back to the default shader, which just shows the contents of the current channel.*


*For full details of the shader modules available, see the Mari User Guide.*

# 11 EXPORTING AND IMPORTING

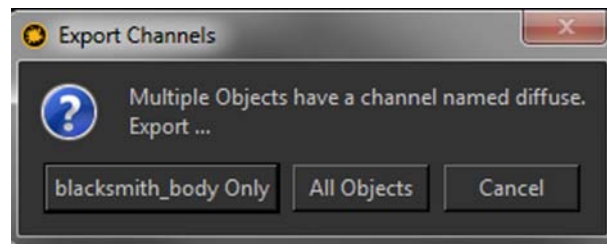
## Exporting

To export a channel:

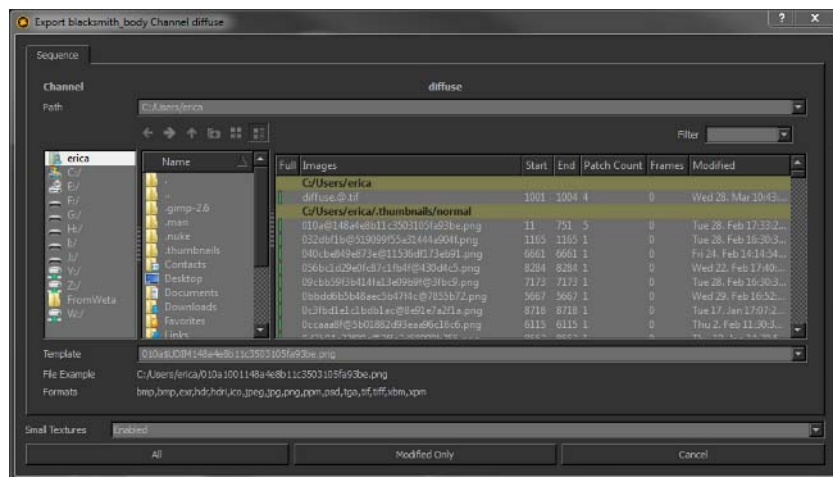
1. Manually select patches to export (if you don't select any, Mari exports all patches).
2. Do one of the following:

Select from menubar	or click on toolbar	or right-click in Channels palette and select
Channels > Export		Export

*If other objects in your project have the same channel name, Mari prompts you to choose whether you want to export the channel for the current object only or all objects.*



*Next, the Export Channel dialog box displays.*



3. On the **Sequence** tab, enter the **Path** where you want to store the export, or use the browse panes (the two left-hand navigation panes) to browse to it.
4. For the **Template**, either use the default filename template or edit it as required.
5. If you are exporting an animated sequence and want to export only the textures for a particular frame range, enter the range in the **Frame Range** field on the **Mesh Options** tab.
6. Click either **All** (to export all patches on the model) or **Modified Only** (to export only the patches that have been modified since the project was last exported).

If **Small Textures** is enabled, Mari exports any patches that you haven't painted yet as 8x8-pixel textures. When you start to paint on a particular patch, Mari exports it as the correct size.

**Note** *The steps above assume you are exporting a sequence of patches with the udim number (1001, 1002, etc.) in the file names. For more information on how UDIM numbers are allocated to patches, please see the section on Using UDIM Values in the Working with Patches chapter of the User Guide.*

**Note** *If you'd rather assign individual files to each patch, you can do so on the **Named Files** tab of the **Export Channel** dialog. Click the buttons on the right to open a file browser and pick a file for each patch. Then, click **All** or **Modified Only** to export the files. Note that by default the **Named Files** tab doesn't display if you have more than 20 patches in your object. To change this number, you can use the **Patch Cutoff** preference or set the `MARI_NAMEDFILEIMPORT_SEQUENCELIMIT` environment variable to a new value.*

**Tip** *Make sure you check the path and name carefully, especially if you have been swapping between assets — Mari defaults to the last place you've exported. Don't risk overwriting your textures!*

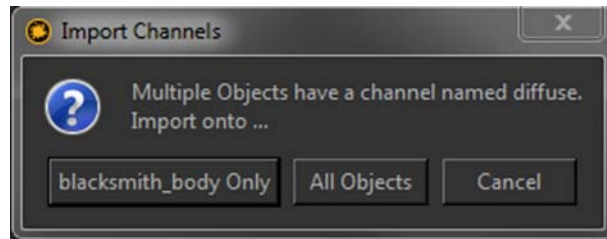
## Importing

To import a channel you have exported:

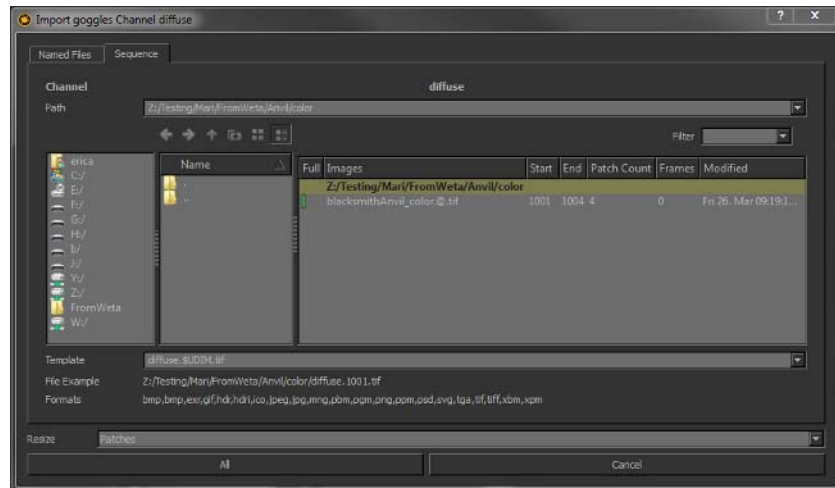
1. If you want to manually select which patches to import, select the patches to import onto.
2. Do one of the following:

Select from <b>menubar</b>	<i>or</i> right-click in <b>Channels</b> palette and select
<b>Channels &gt; Import</b>	<b>Import</b>

*If other objects in your project have the same channel name, Mari prompts you to choose whether you want to import the channel onto the current object only or all objects.*



*Next, the **Import Channel** dialog box displays:*



3. Enter the **Path** for the files to import, or use the browse panes (the two left-hand navigation panes) to browse to them.

**Note** *The steps above assume you are importing a sequence of patches with the udim number (1001, 1002, etc.) in the file names. For more information on how UDIM numbers are allocated to patches, please see the section on Using UDIM Values in the Working with Patches chapter of the User Guide.*

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**Note** *If you'd rather assign individual files to each patch, you can do so on the **Named Files** tab of the **Import Channel** dialog. Click the buttons on the right to open a file browser and pick a file for each patch. Then, click **All** to import the files. Note that by default the **Named Files** tab doesn't display if you have more than 20 patches in your object. To change this number, you can use the **Patch Cutoff** preference or set the `MARI_NAMEDFILEIMPORT_SEQUENCELIMIT` environment variable to a new value.*

## 12 ABOUT THE TUTORIALS

The tutorials included in this manual are:

- [Tutorial 1: Setting up a Mari Project](#)
- [Tutorial 2: Setting the View and Lighting](#)
- [Tutorial 3: Painting!](#)
- [Tutorial 4: Painting Through and Clone Stamping](#)
- [Tutorial 5: Exporting and Importing](#)

The tutorials are self-paced but designed to take roughly 10 to 45 minutes each. You might find yourself breezing through one while spending a lot of time on another to soak up details you're not quite sure about.

### Download Sample Files


Sample files are provided for use with all of the tutorials. You can download these files from our web site at [www.thefoundry.co.uk/mari](http://www.thefoundry.co.uk/mari) and try Mari out on them. From the Mari product page, click on the **Demo Assets** link.

### Tutorial Format

Mari tutorials include the following conventions:

### Steps

Steps are the specific instructions for you to perform. Steps are organized into major actions. For example, all the steps involved in loading the geometry when creating a project are grouped on a page with the title "Load geometry". The individual steps are numbered, and describe what you should do and what happens in Mari. For example:

1. Next, to bring in the geometry, click .

The **Pick Mesh** dialog box displays.

Note that the response to each step (what happens when you do it) is in *italics*, and the name of any dialog box that displays as part of that response is **bold**.

### Tips

Throughout the tutorials, you'll notice tips in italics. These are extra bits of information, not necessarily critical to the procedure you're performing but worth knowing. For example, here's a tip about following the tutorials generally:

**Tip** *When reading through the steps, don't worry too much about memorizing details or performing it in Mari. The tutorials are designed for you to familiarize yourself with the instructions, and then get some hands-on experience with the Sandbox items — referring back to the instructions as needed.*

## **Sandbox**

Throughout the tutorial, you'll also see sandbox items. These are instructions for you to have a play, using the sample files set up for the tutorial. For example:

**Sandbox** *Try opening an exported .tif file from this project in another program (such as Adobe® Photoshop®), changing it in some obvious way, saving it, then re-importing the changed texture into your Mari project.*

Playing is an important part of learning! You can see how the procedures in the tutorial might work for you in the real world.

# TUTORIAL 1: SETTING UP A MARI PROJECT

## About this lesson

### What This Lesson Teaches You

This lesson teaches you what Mari projects are, and how to create them.

### What You Should Know Before Starting This Lesson

This lesson assumes:

- a basic knowledge of computers and graphics applications
- that you have read the *Mari Getting Started Guide* up to this point
- that you know how to start Mari (see [Launch Mari](#)).

### Resources You Need to Complete This Lesson

To complete this lesson, you need access to a computer that can run Mari, and the following sample file:

- `blacksmith_body.obj`

### How Long Should It Take?

Plan on spending about 20 minutes to complete this lesson.

## About Mari Projects

A **Mari project** holds your work on geometries and associated textures. Once you've created a Mari project, you can work on it, save and close — and then re-open it to continue working on the same textures later.

Projects also hold other items, such as projectors, shaders, and so on. Mari saves some settings at the project level. For instance, each project has:

- a project **shelf**, to hold brushes, colors, and images for you to use specifically in that project
- contents of the various palettes — **Image Manager**, **Brush Editor**, and so on.

When you first create a project, you can specify its parameters, including:

- the details (such as resolution and color depth) of the initial channel in the project
- the range of animation frames to import.

## Steps for Creating Mari Projects

To create a Mari project, follow these steps:

1. [Open a New Project](#)
2. [Specify Project Options](#)
3. [Load Geometry](#)
4. [Save Your Project](#)

## Open a New Project

1. Start Mari (see [Launch Mari](#)).

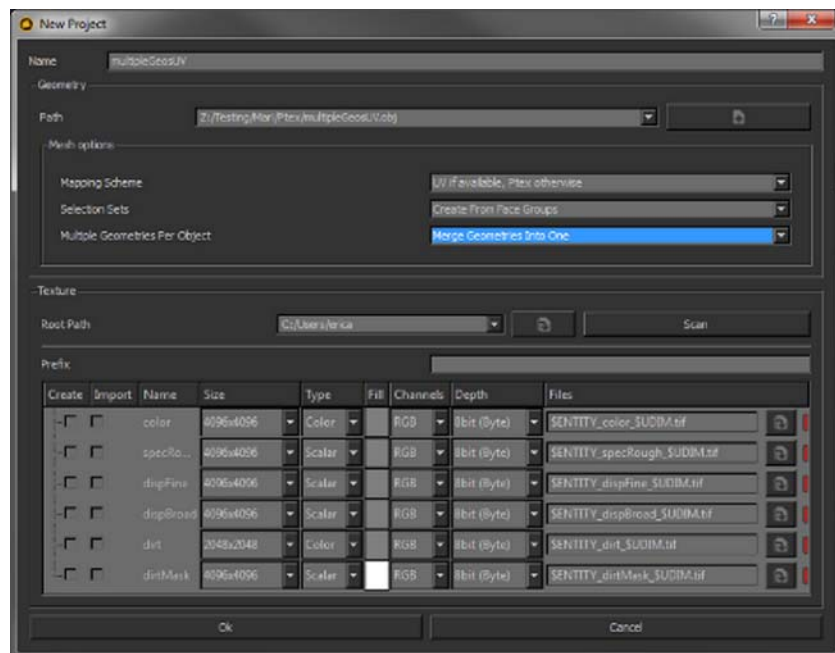
The Mari workspace displays, showing the **Projects** tab. This holds all the projects you have been working on.

2. As with most commands in Mari, you can select the **New Project** option a few different ways:

- from the **File** menu, select **New**,
- click  on the toolbar,
- click the **New** button, or
- press the **Ctrl+N** shortcut key.

Pick any one of the options above.

*The **New Project** dialog box displays.*



*The **New Project** dialog box has three parts:*

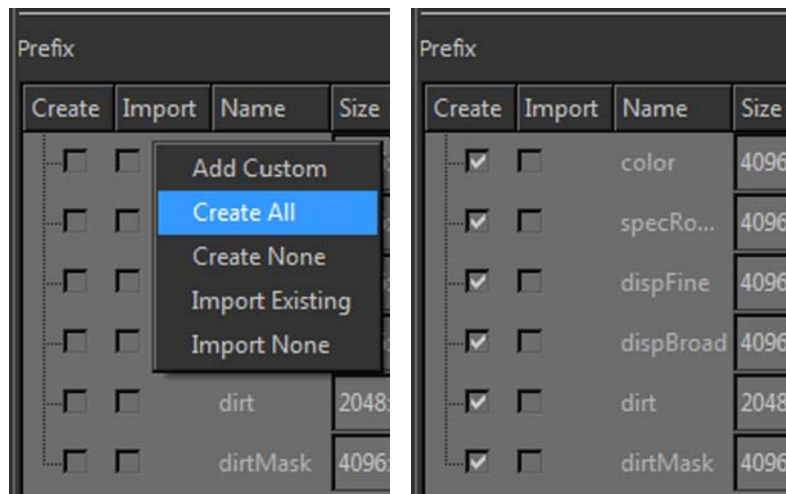
- **Name** — a name for your project.
- **Geometry** — the model you'll be painting on.
- **Texture** — parameters for the textures you'll be creating.

Next we'll specify the name and texture options, and then select the geometry.


**Tip** *For more on the different options in the **New Project** dialog box — and other dialog boxes illustrated in this tutorial, see the *Mari Reference Guide*.*

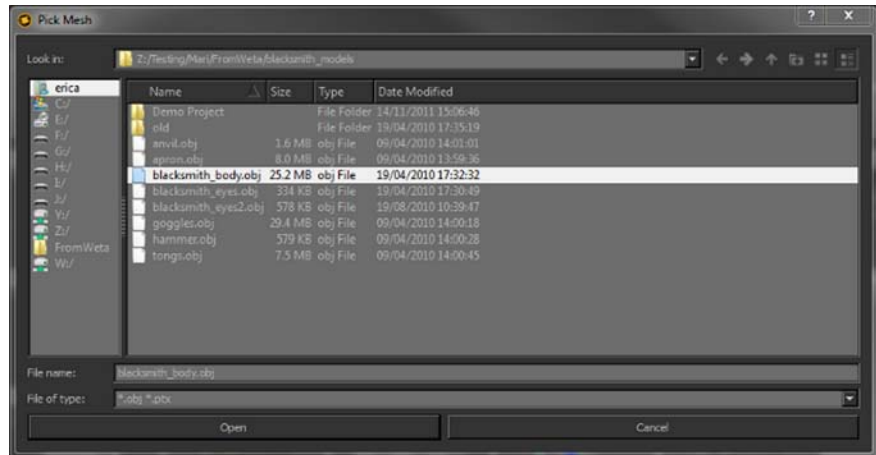
## Specify Project Options

1. For the project **Name**, type **1-Blacksmith**.
2. For the Texture options, right-click on the list of channels and select to **Create All**.



## Load Geometry

1. Next, to bring in the Geometry, click  .  
*The **Pick Mesh** dialog box displays.*



2. Navigate to your tutorial folder, click to highlight **blacksmith\_body.obj**, and click **Open**.
3. Click **Ok**.

Mari conducts a quick “sanity check” on the model to make sure there are no obvious problems. If there are any problems, it displays **warnings** or **errors**. If there are warnings, you can continue. If there are errors, you must stop and fix them.


For more information on what kind of models Mari expects, see [Mari Model Requirements](#). This model displays with no errors. Mari loads the geometry and displays it in your workspace.



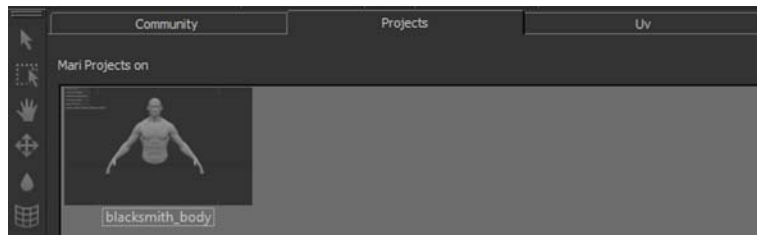
**Tip** Depending on the size and complexity of a model, it can take several minutes the first time you load it into a Mari project. Once saved, however, the project should open quickly in future.

## Save Your Project

Save your project — again you can do this a few ways:

- from the **File** menu, select **Save**,
- click  on the toolbar, or
- press the shortcut key **Ctrl+S**.

Mari saves the project into its cache directory. Now, if you click on the **Projects** tab at the top of the screen, you see your new project in the list.



## Where Do You Go from Here?

At this point, you should have a basic idea of what a Mari project is and how to create one. You learned how to:

- Name the project.
- Set texture options.
- Load geometry.
- Save the project.

Next, you'll use this project to practice some basics about setting the camera and lighting on the geometry in your project, before you begin to paint on it. When you're ready, proceed to [Tutorial 2: Setting the View and Lighting](#).

## TUTORIAL 2: SETTING THE VIEW AND LIGHTING

### About This Lesson

#### What This Lesson Teaches You

This lesson teaches you how to open a Mari project, and then set the view and lighting on your geometry (before painting on it).

Setting the **view** includes:

- rotating
- zooming in or out
- panning
- viewing from six basic directions
- displaying a split view showing a 3D view plus UV patches

Setting the **lighting** includes:

- picking “flat”, “basic”, or “full” lighting,
- choosing whether to toggle shadows on or off,
- moving lights around and adjusting their properties.

#### What You Should Know Before Starting This Lesson

This lesson assumes:

- a basic knowledge of computers and graphics applications
- that you have read the *Mari Getting Started Guide* up to this point
- that you know how to start Mari (see [Launch Mari](#))
- that you have completed [Tutorial 1: Setting up a Mari Project](#).

#### Resources You Need to Complete This Lesson

To complete this lesson, you need access to a computer that can run Mari, and the following sample file:

- **1-Blacksmith** — the Mari project file you created in Tutorial 1

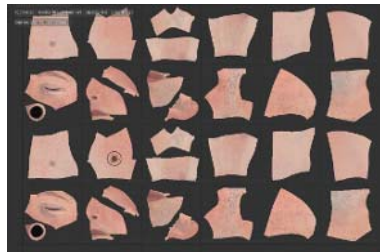
#### How Long Should It Take?

Plan on spending about 25 minutes to complete this lesson.

## About Mari View and Lighting

The **view** in Mari is a view on the object you are painting. By default, Mari has four types of view:

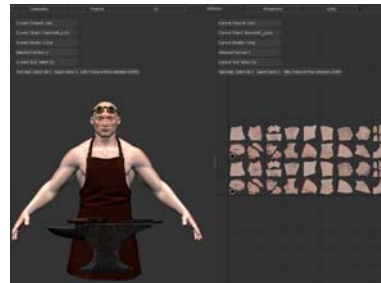
- **UV** — this gives you a “flat” view of the patches in the model.
- **Perspective** — this show the model as a whole in 3D space, through a perspective camera.
- **Ortho** — this shows the model as a whole in 3D space, through an orthographic camera.
- **Ortho/UV** — this is a split screen, showing both the UV patches and the orthographic view.



*UV View*



*Ortho View*



*Ortho/UV View*

You can move each view separately.

**Tip** You can also use the , , and  toolbar buttons or the **F10**, **F11**, and **F12** keyboard shortcuts to activate a particular view on any tab.

Within the views, you can:

- **Spin** or **rotate** the model (3D views only). Spinning turns the model on one axis, while rotating lets you turn the model in all three axes. Think of spinning as like turning the model on a turntable, while rotate is turning it around in midair.
- **Pan** to move the view across the model.
- **Zoom** in or out.

- **Focus** on a selected patch.

You separately configure the **lighting** on the object, by choosing pre-set settings for “flat”, “basic”, or “full”, or specifying fine details such as shading parameters and lighting for each of the four configurable lights.

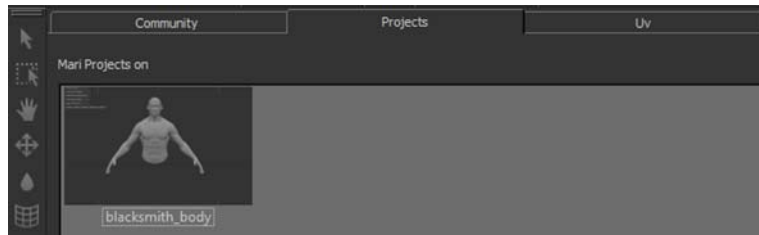
## Steps for Setting the Camera and Lighting

To set the camera and lighting, follow these steps:

1. [Open Your Project](#)
2. [Adjust the View](#)
3. [Adjust the Lighting](#)

## Open Your Project

1. Start Mari (see [Launch Mari](#)).  
*The Mari workspace displays.*
2. On the **Projects** tab, double-click on your **1-Blacksmith** project to open it.



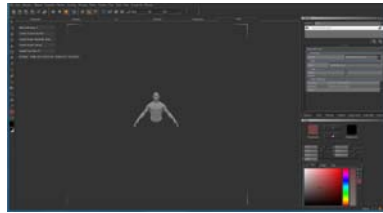
*Your project opens and switches to the **Ortho** view.*



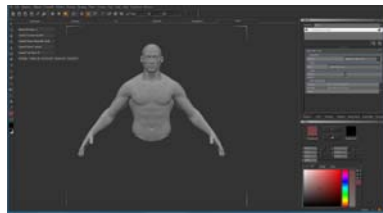
## Adjust the View

To adjust the view on your project, you can zoom, pan, rotate, choose one of six pre-set views, display your model and patches in a split screen, or use perspective and orthographic views.

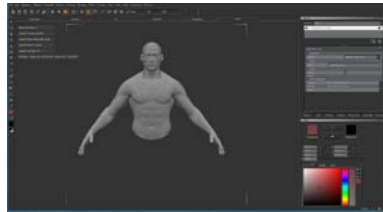
1. To **zoom out and in**, hold down the **Alt** key, right-click and drag the cursor to the left and right.



2. To **pan**, hold down the **Alt** key and middle-click (or hold **Alt** and **Shift** and left-click and drag).

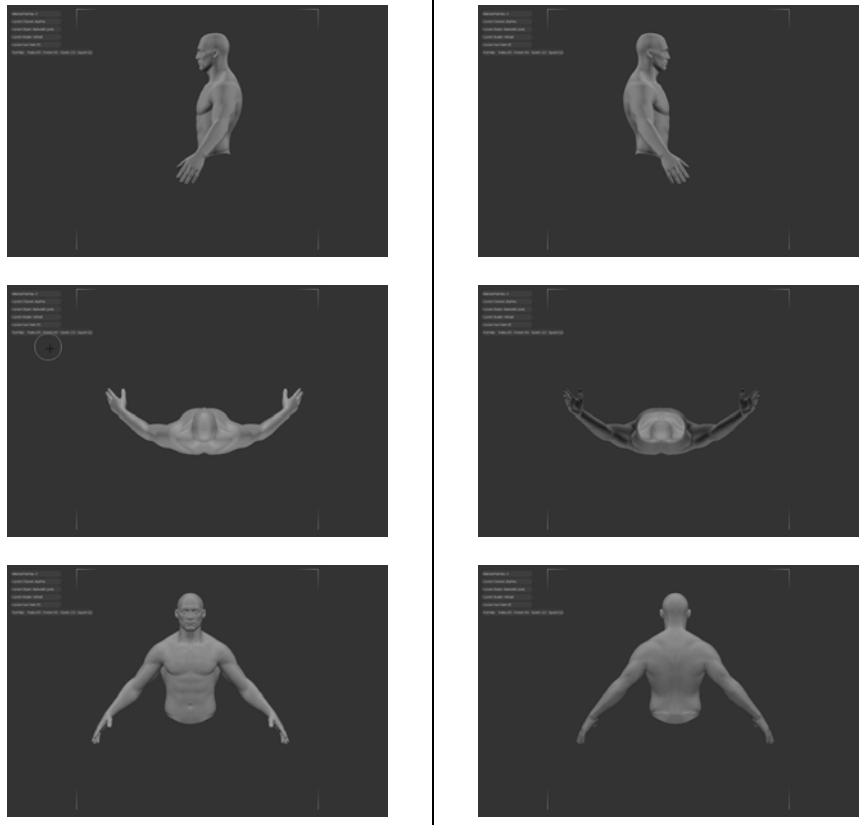


3. To **rotate**, hold down the **Alt** key and left-click and drag.

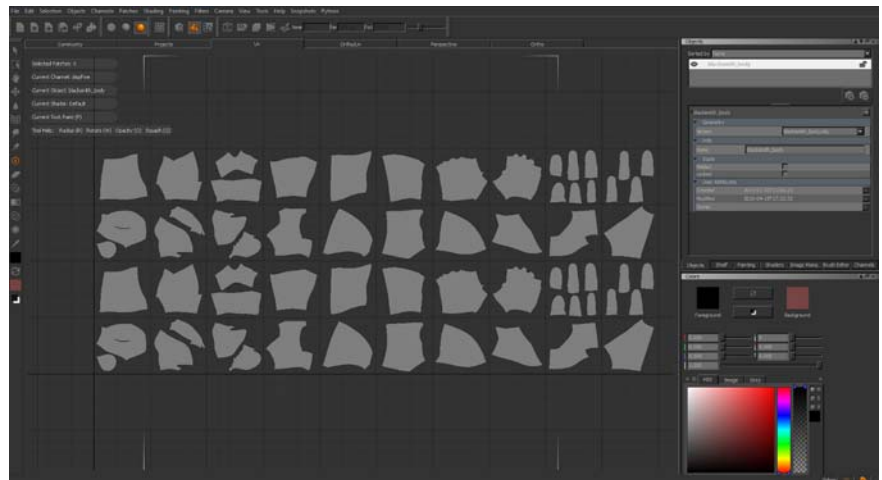


**Tip** You can also "spin" around a fixed point by pressing **Ctrl+R**, left-clicking, and dragging. When you rotate or spin, the pivot point is located in the center of the current view.

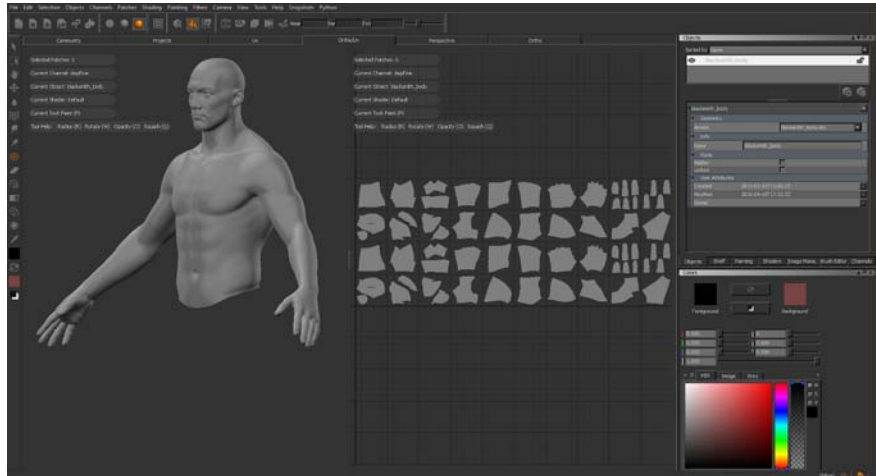
4. To view from six preset angles (camera left, right, top, bottom, front, and rear), press 1, 2, 3, 4, 5, or 6, or select the angle from the **Camera** menu.



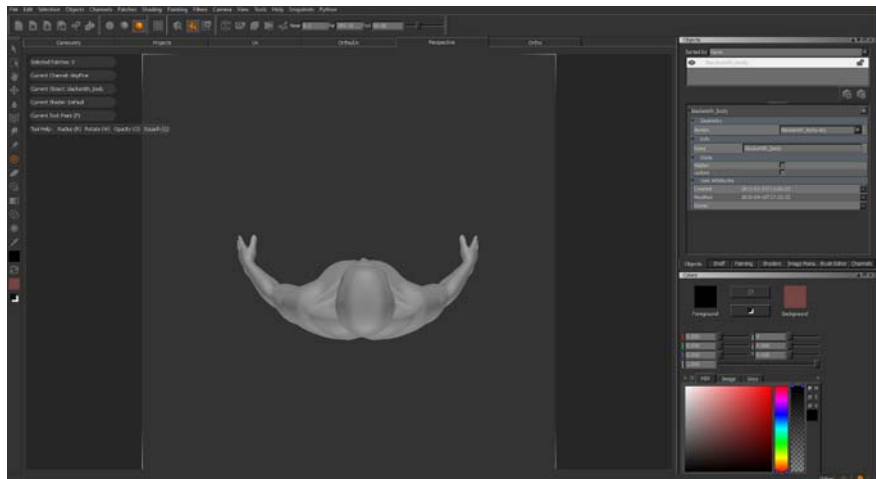
5. To see a flat view of the UV patches on the model, click the **UV** tab.



- To see a split screen showing both the Ortho and UV views, click the **Ortho/UV** tab.

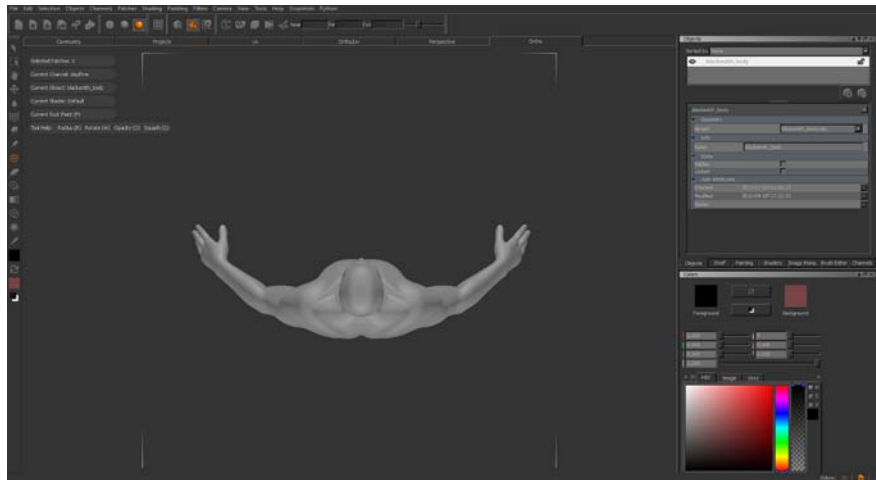


- To see a perspective view of your model, click the **Perspective** tab (or press **F1**).



In the **Perspective** view, you can alter your model's appearance in the viewer by entering **Near**, **Far**, and **FoV** values in the **Canvas** toolbar. See chapter 2 in the *Mari User Guide: Set the perspective camera details* for more information.

- To see an orthographic view of your model, click the **Ortho** tab (or press **F10**). This is the default view mode, that is, the view you see when you start Mari.



**Note** *The model is in the same position in steps 7 and 8; only the view mode has changed. Notice that the model's arms appear closer to the body due to the application of perspective.*

**Tip** *You can paint in any of the views.*

9. To switch the view to display all selected patches, press **A**.  
If you don't have any patches selected, the view focuses on the model as a whole (changing to show the whole model).

**Tip** *If you find that the view starts cutting through the front clipping plane, try pressing **A**.*

10. To center the view at a particular place, move the cursor there and press **F**.

*At the current size and angle, the view changes to center on the selected point.*




**Tip** *Moving the view bakes the current paint if **Bake Behavior** is set to **AutoBakeAndClear**. You can set this on the **Projection** palette, under **Projection** (if you can't see the **Projection** palette, select **View > Palettes > Projection** to display it).*

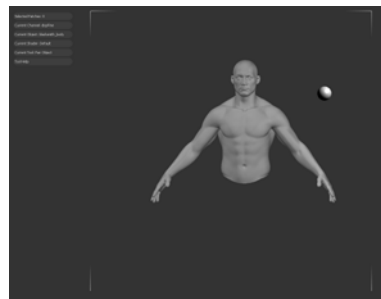
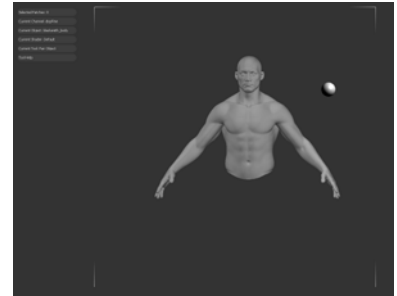
**Sandbox** *Play around with zooming, panning, and rotating the camera. Try changing between **Ortho** and **Perspective** modes. Notice that objects closer to the camera distort far more than objects further away?*


## Adjust the Lighting

Mari comes with three lighting presets: flat, basic, or full. In basic and full modes, you can move the lights around the model.


1. To change the lighting:

- from the **Shading** menu, select **Flat**, **Basic**, or **Full**, or
- click , , or  on the toolbar.



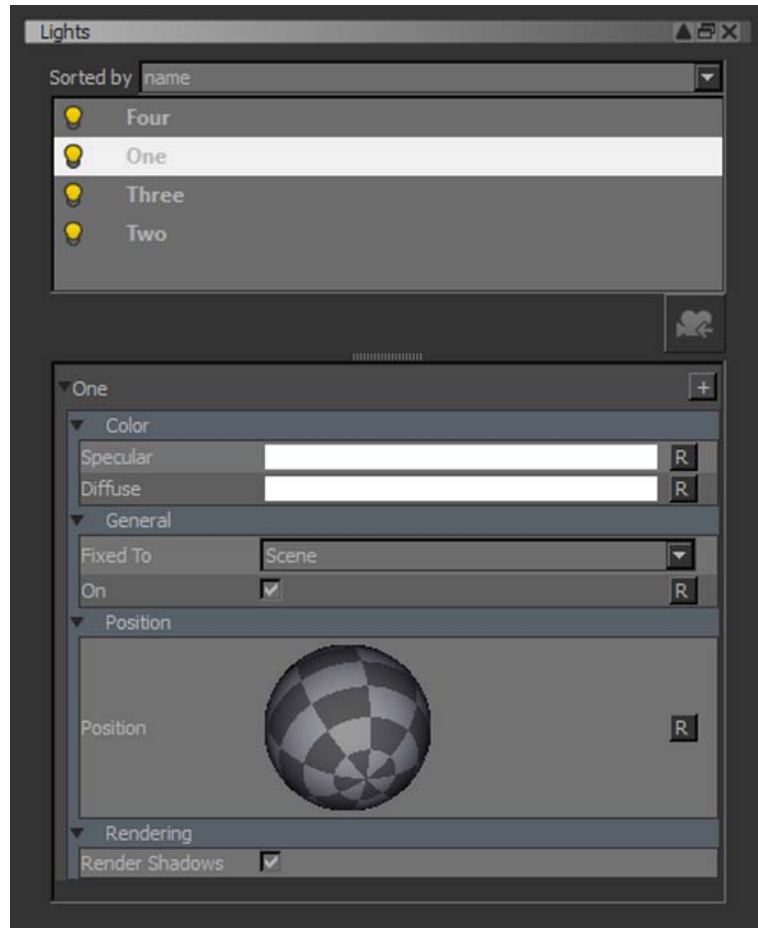
2. Notice the four lights in the viewport (you may need to select the **Pan Object** tool  to see them).

By default, the lights appear as gray spheres .

3. To move a light around, select the **Pan Object** tool  (if you didn't already). Click on a light and drag it around the viewport.

*As you move the light, you can see the effect on the model.*

4. You can also make fine adjustments to lighting using the **Lights** palette. If it's already open, click the **Lights** tab to give it focus; or if it's closed, right-click in the toolbar area on top of the Mari workspace and select **Lights** to open it.




*The **Lights** palette displays details of four lights, which you can enable or disable, and customize by adjusting their **Color** and **Fixed To** information — for details, see Chapter 2, “Customizing the view” in the *Mari User Guide*.*

5. Lighting can be relative to the **Scene** or a **Camera**:
  - **Scene** (default) — the light is fixed to the model, for example if a light is set at the model's back, it always points at the model's back, no matter how you move the view.
  - **Camera** — the light is fixed to a camera view, for example you can have a light always shining from above the camera, allowing you to move the model around and cast light on different areas.
6. A single light can be moved to the position of the current camera by right-clicking the light and selecting **Move to Camera Position** or clicking on the **Move to Camera Position** icon when the desired light is selected.

7. To choose whether to **Render Shadows** for an individual light, select the checkbox.

*Shadows render and display immediately for the selected light.*

8. Shadows can be enabled or disabled in the display by toggling the **Shadows**  icon in the **Lighting** toolbar or the **Shading** menu.

**Note** *Mari saves custom lighting with the project. If you need the same lights in another project, you need to set them up separately.*

## Where Do You Go from Here?

At this point, you should have a basic idea of the different options for adjusting the view and lighting on your model. You learned how to:

- zoom, pan, and rotate
- choose one of six preset angles
- toggle split view
- change to flat, basic, or full lighting
- move and configure lights.

Now that you know how to create a project, load geometry, and adjust the position of the view and lighting, you can (finally) begin to paint! When you're ready, proceed to [Tutorial 3: Painting!](#).

## TUTORIAL 3: PAINTING!

### About This Lesson

#### What This Lesson Teaches You

This lesson teaches you the basic steps to painting on a model in Mari. This includes:

- selecting a brush
- selecting a color
- painting with that brush and color

#### What You Should Know Before Starting This Lesson

This lesson assumes:

- a basic knowledge of computers and graphics applications
- that you have read the *Mari Getting Started Guide* up to this point
- that you know how to start Mari (see [Launch Mari](#))
- that you have completed [Tutorial 1: Setting up a Mari Project](#) and [Tutorial 2: Setting the View and Lighting](#).

#### Resources You Need to Complete This Lesson

To complete this lesson, you need access to a computer that can run Mari, and the following sample file:

- **1-Blacksmith** — the Mari project file you created in Tutorial 1 and configured in Tutorial 2

#### How Long Should It Take?

Plan on spending about 25 minutes to complete this lesson.

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## About Painting in Mari

Painting in Mari is similar to painting in other standard paint programs — you can choose and configure both brushes and colors, and then use them to paint an object. In Mari, you configure brushes through the **Brush Editor** and colors through the **Color Palette**. You also have the option of saving colors and brushes to your **Shelf** for easy access. The Mari **Shelf** comes with lots of presets, as well as any items you have created or customized for yourself (and saved there).

After you paint (also as with other programs), in Mari you need to **bake** the paint buffer into the object. Mari includes various ways of baking onto selected patches, including an **Autobake** option that bakes by default every time you move the camera.

## Steps for Painting in Mari

To paint in Mari, follow these steps:

1. [Open Your Project](#)
2. [Open the Colors and Shelf Palettes](#)
3. [Select a Color](#)
4. [Select a Brush](#)
5. [Paint!](#)
6. [Bake Your Painting](#)

## Open Your Project

1. Start Mari (see [Launch Mari](#)).  
*The Mari workspace displays.*
2. On the **Projects** tab, double-click on your **1-Blacksmith** project to open it.  
*Your project opens and switches to the **Ortho** view.*

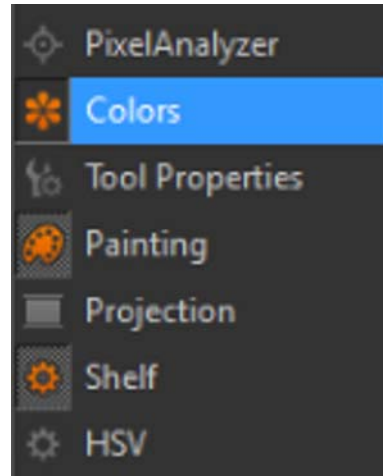
## Open the Colors and Shelf Palettes

Basic painting on your model involves selecting a brush, selecting a color, and using them to paint. In the steps below, you'll select a color from the **Colors** palette and a brush from your **Shelf**. To begin, let's open and arrange those palettes.

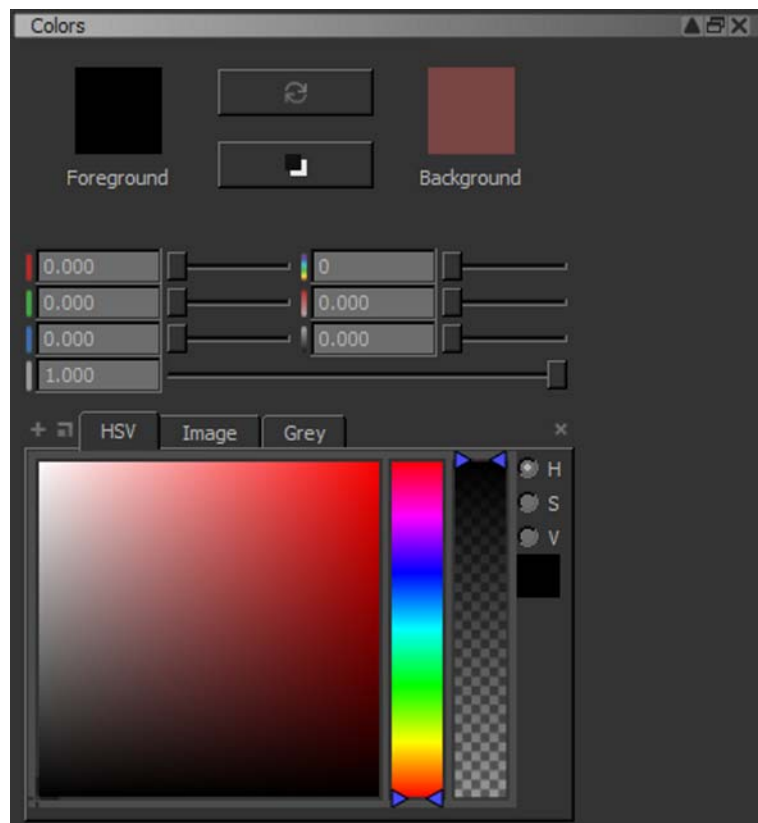
**Tip** *By default, the **Colors** and **Shelf** palettes are already open when you start Mari (but follow the instructions below to see how to open and close palettes).*

1. To open the **Colors** palette:
  - from the **View** menu, select **Palettes > Colors**, or

- right-click in the toolbar area and select **Colors** from the popup menu.

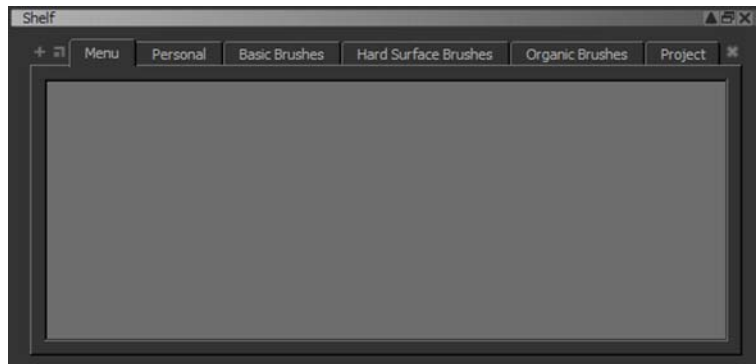


*The Colors palette displays.*



2. To open the **Shelf** palette:
  - from the **View** menu, select **Palettes > Shelf**, or
  - right-click in the toolbar area and select **Shelf** from the popup menu.

*The **Shelf** palette displays.*

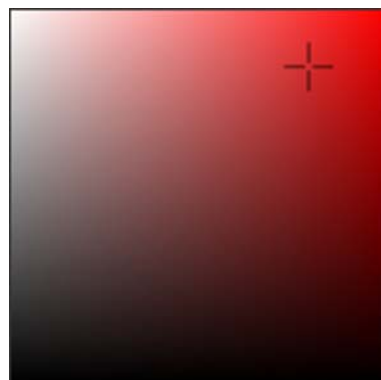


*The shelf can hold your customized sets of colors and brushes — but when you first start Mari, the shelf is empty.*

**Sandbox** *The Mari Reference Guide outlines the different options for arranging palettes. Take a few minutes to experiment with docking, undocking, sizing, moving, collapsing, and stacking palettes (including the **Colors** palette and **Shelf**). Over time, you'll find a configuration that works best for you. And when you exit Mari, it remembers that configuration for the next time you re-start the program.*

## Select a Color

1. You can select a color from the **Colors** palette a few different ways:
  - click in the color field

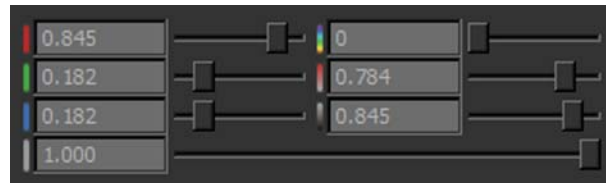


- click to select the **H**, **S**, or **V** next to the vertical sliders (to the right of the color field), then click and drag the sliders up or down to select color and alpha



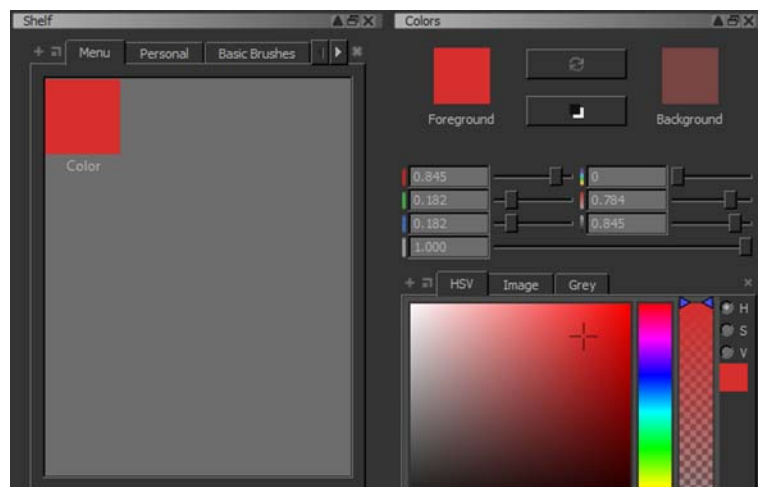
- drag the horizontal sliders left or right, or type specific values in the boxes, to specify:

RGB(  ) or HSV(  ), and Alpha()



*The selected color displays in the **Foreground** swatch (and in the swatch to the right of the vertical sliders).*

2. When the color you want is selected in the **Colors** palette, drag the swatch to the **Shelf**.



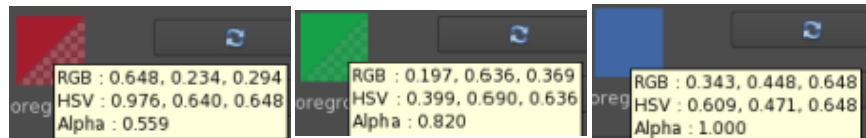
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*You don't have to drag the color to the shelf to use it, but it's useful for storing colors you use regularly.*

**Sandbox** *Play around with all the different options for selecting colors. See if you can get these:*



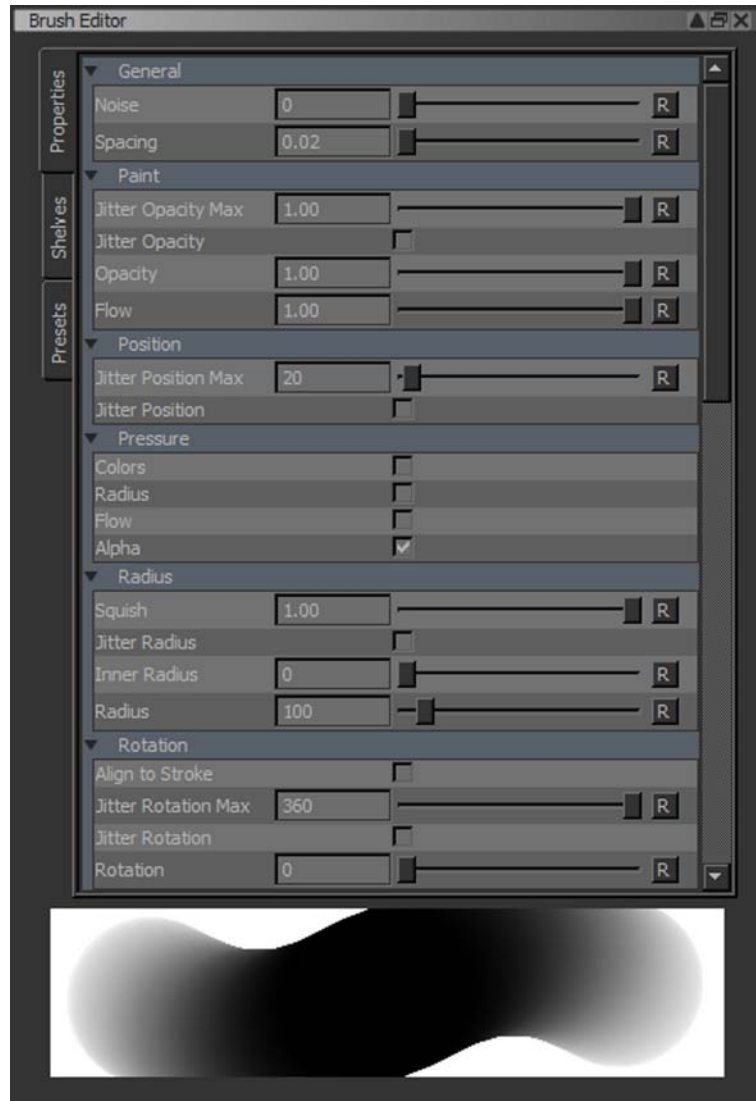
**Tip** *If you hover the mouse over a swatch, it displays RGB, HSV, and Alpha values:*



## Select a Brush

1. To select a brush, open the **Brush Editor** palette:
  - from the **View** menu, select **Palettes > Brush Editor**, or
  - right-click in the toolbar area and select **Brush Editor** from the popup menu.

*The **Brush Editor** palette displays.*

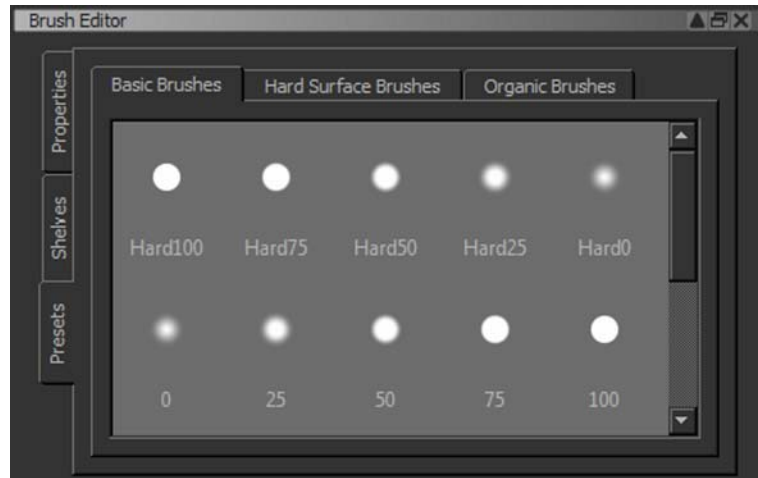


*The **Brush Editor** has three tabs:*

- **Properties** — configurable properties of the selected brush (see the *Mari Reference Guide* for details).
- **Shelves** — the same shelves that display in your **Shelf** palette.
- **Presets** — an array of predefined brushes that come with *Mari*.

2. Click the **Presets** tab.

*Three tabs display along the top for different sets of predefined brushes.*




3. Click a brush to select it.

**Tip** *At the bottom of the **Brush Editor** is a scratch area for you to test out the selected brush.*

**Tip** *You can press **N** to swap back to the last brush tip you used. This lets you quickly swap back and forth between two brush tips.*

**Tip** *You can also customize brushes from the **Brush Editor**, and save them to the **Shelf**. This is covered in the *Mari User Guide*, but basically involves:*


- *selecting a preset brush from the **Presets** tab*
- *custom-configuring that brush by selecting options on the **Properties** tab*
- *saving it by clicking the  button on the **Shelves** tab.*



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*Redoing an action in Mari only reverses a previously undone action. You cannot use the Redo command in Mari to repeat a command — it's reversing an Undo (not a "do that again").*

## Bake Your Painting

1. As with other paint programs, what you paint stays in a paint buffer until you "bake" it onto the model. To bake in Mari, make sure all patches with unbaked painting are selected, and then:
  - from the **Painting** menu, select **Bake**, or
  - click  on the status bar, or
  - press **B**.

**Tip** *The **Projection** palette also includes a **Bake Behavior** option, which by default (**AutoBakeAndClear**), automatically bakes every time you adjust the view.*

2. When you exit Mari, **do not save** the project. (We'll start the next lesson with the unpainted blacksmith you imported in Tutorial 1.)

## Where Do You Go from Here?

This lesson covered the most basic options for painting in Mari:

- selecting a color in various ways, and dragging it to the **Shelf**
- selecting a brush from the **Brush Editor**
- painting on the model and baking.

The next tutorial, [Tutorial 4: Painting Through and Clone Stamping](#), covers two main options for using images to create textures in Mari.

## TUTORIAL 4: PAINTING THROUGH AND CLONE STAMPING

### About This Lesson

#### What This Lesson Teaches You

This lesson introduces using images to create textures in Mari. This includes:

- “painting through” an image onto your model
- “clone stamping” part of an image onto your model

#### What You Should Know Before Starting This Lesson

This lesson assumes:

- a basic knowledge of computers and graphics applications
- that you have read the *Mari Getting Started Guide* up to this point
- that you know how to start Mari (see [Launch Mari](#))
- that you have completed [Tutorial 1: Setting up a Mari Project](#), [Tutorial 2: Setting the View and Lighting](#), and [Tutorial 3: Painting!](#)

#### Resources You Need to Complete This Lesson

To complete this lesson, you need access to a computer that can run Mari, and the following sample files:



- **1-Blacksmith** — the Mari project file you created in Tutorial 1 and used in Tutorial 2 and Tutorial 3
- **Tattoo.png** — an image of a tattoo, in your Mari tutorial directory

#### How Long Should It Take?

Plan on spending about 25 minutes to complete this lesson.

## About Painting from Images in Mari

Like with other paint programs, Mari lets you superimpose image files onto the surface of an object. To manage image files, Mari includes the **Image Manager** palette. To paint with images you've loaded into the **Image Manager** palette, Mari has two main tools: **Paint through** and **Clone stamp**:

- The **Paint through** tool (  ) lets you position an image *over* an object, and then as you paint, copy from the image directly onto what's under the brush.
- The **Clone stamp** tool (  ) lets you position an image *alongside* an object, with a source point on the image relative to where the brush is on the object. Then as you paint, the source point on the image moves in sync with the brush on the object, and Mari copies from the image onto the corresponding spot under the brush on the object. (You can also clone stamp from painting already on an object, in the paint buffer, or in another channel.)

## Steps for Painting Through and Clone Stamping

To paint through and clone stamp in Mari, follow these steps:

1. [Open Your Project](#)
2. [Load an Image](#)
3. [Paint Through](#)
4. [Clone Stamp](#)

## Open Your Project

1. Start Mari (see [Launch Mari](#)).  
*The Mari workspace displays.*
2. On the **Projects** tab, double-click on your **1-Blacksmith** project to open it.  
*Your project opens and switches to the **Ortho** view.*

## Load an Image

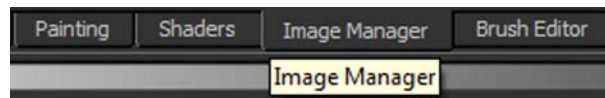
For both painting through and clone stamping, we'll use an image of a tattoo that looks like this:



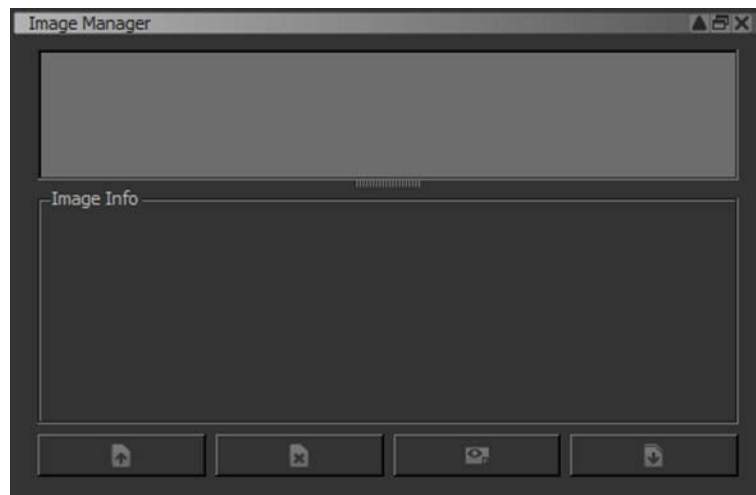
We'll start by loading that image in Mari's **Image Manager** palette.


1. To open the **Image Manager**:

- click the **Image Manager** tab if it is already open but hidden (as in the default Mari layout),

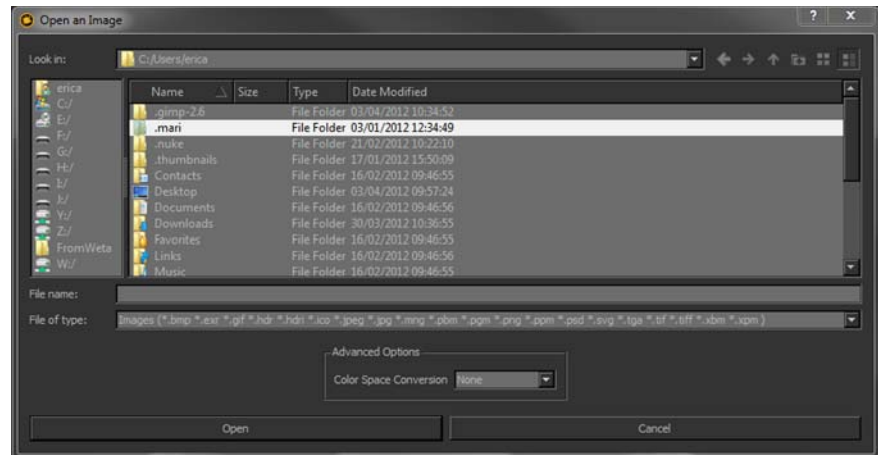


- from the **View** menu, select **Palettes > Image Manager**, or
- right-click in the toolbar area and select **Image Manager** from the popup menu. The **Image Manager** palette displays.



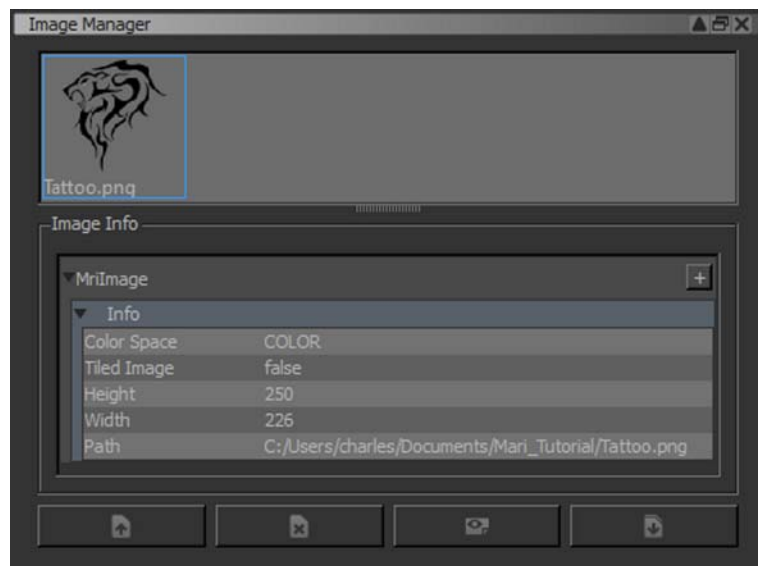
- To load an image, click .

*The **Open an Image** dialog box displays.*



- Navigate to your tutorial folder, and select **Tattoo.png**.

*That image displays in the **Image Manager**.*




## Paint Through

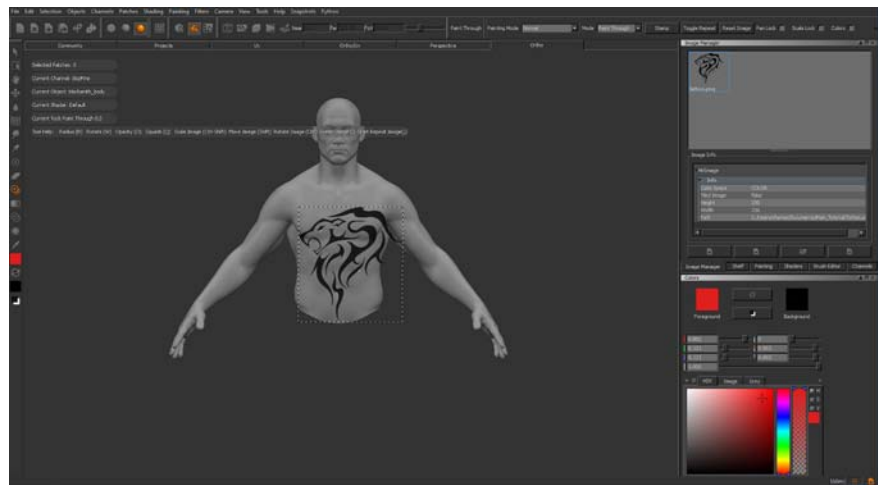
Painting through an image basically involves:

- selecting the **Paint Through** tool
- dragging an image onto the canvas
- painting.

1. Select the **Paint Through** tool:

- click  on the toolbar, or
- press **U**.

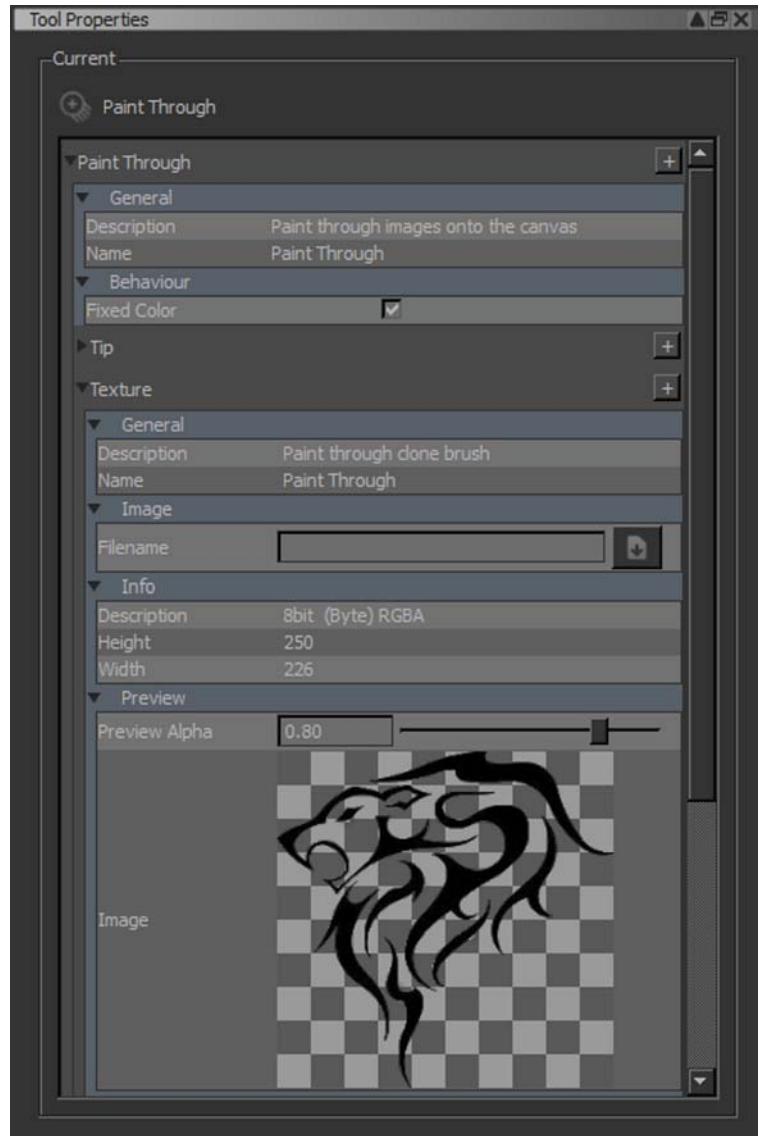
2. Drag the image from the **Image Manager** and drop it onto the model.



3. Move and resize the image:

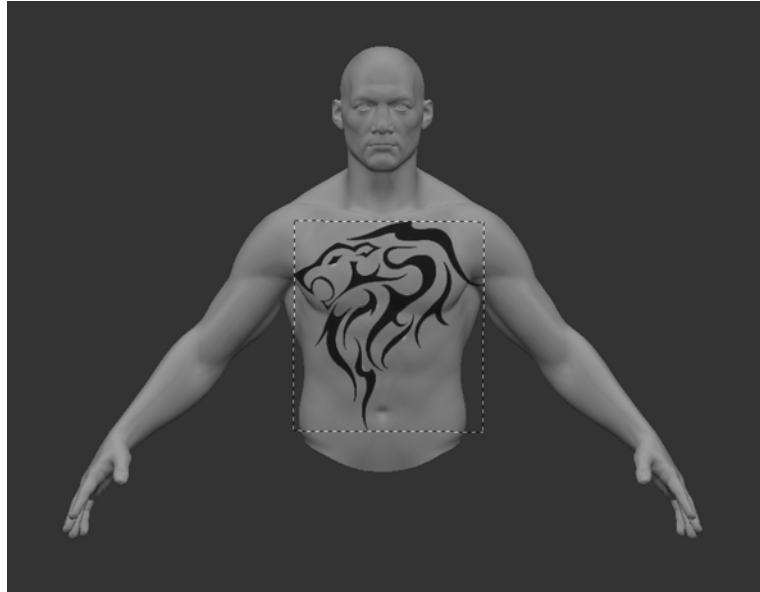
- To resize the image, hold down **Ctrl+Shift**, click and drag.
- To move the image around the canvas, hold down **Shift**, click and drag.
- To rotate the image, hold down **Ctrl**, click and drag.

**Tip** *The **Tool Properties** palette includes many options for manipulating paint-through images.*

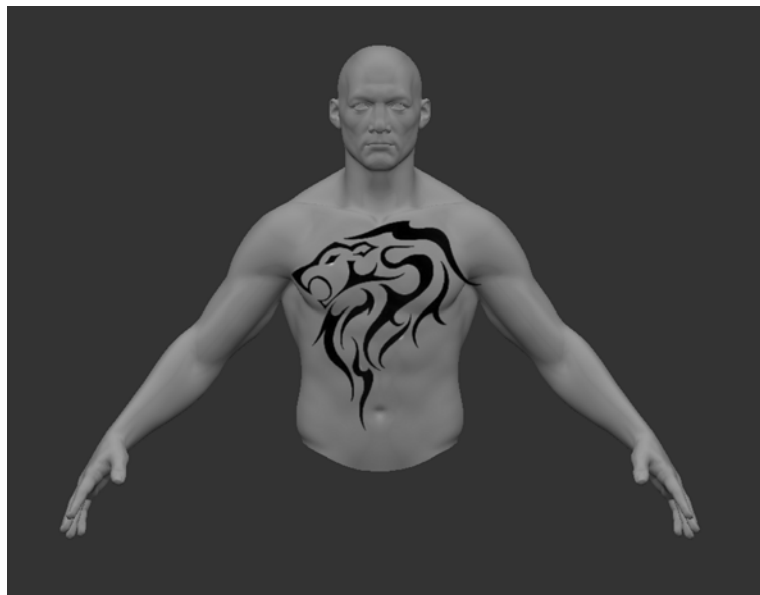


*You can also double-click the image in the **Image Manager**, and crop a smaller portion to use for painting through and clone stamping.*

**Sandbox** *Try sizing, moving and rotating the image. See if you can get it to look like this:*




4. Paint through the image onto the model (hold down the left mouse button and move, as you do in any standard paint program).
5. When you're done painting through, press **P** to see just the painted-on object.




**Tip** *To hide the overlying image, press the ? (question mark) key. To paint the whole image onto the model in one step, press the ' (apostrophe) key. To repeat the source image (so you can paint past the edges and have the source image repeat), press the ; (semicolon) key.*

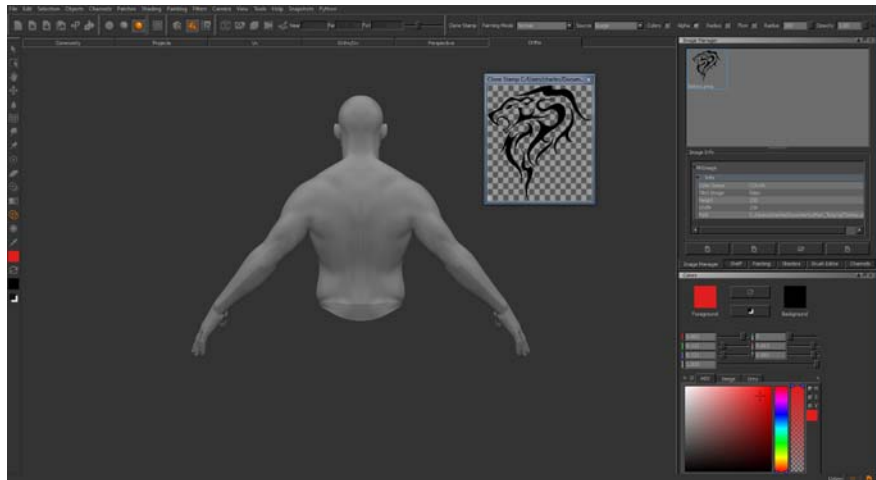
## Clone Stamp

Clone stamping is like painting through, but the image does not have to sit directly on top of the model.

1. First, clear the painted-through textures:
  - from the **Painting** menu, select **Clear Painting**, or
  - click  on the toolbar.

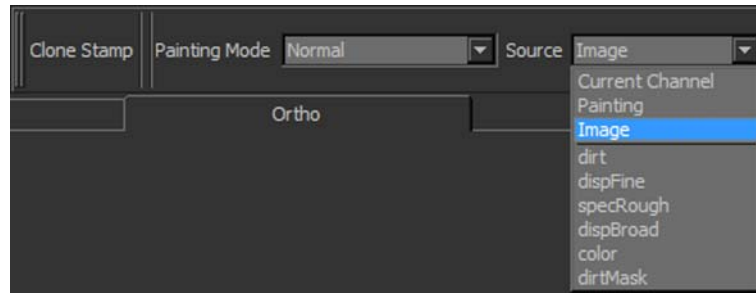
*This removes any un-baked painting on the model. In this case, the model re-displays as imported.*

2. Select the **Clone Stamp** tool: click  on the toolbar.
3. Drag the image from the **Image Manager** and drop it onto the canvas. *The image displays in a separate window.*
4. Re-size and position the image window alongside your model. To scale the image within the window, hold down **Alt**, right-click and drag. To pan the image, hold down **Alt**, left-click and drag.

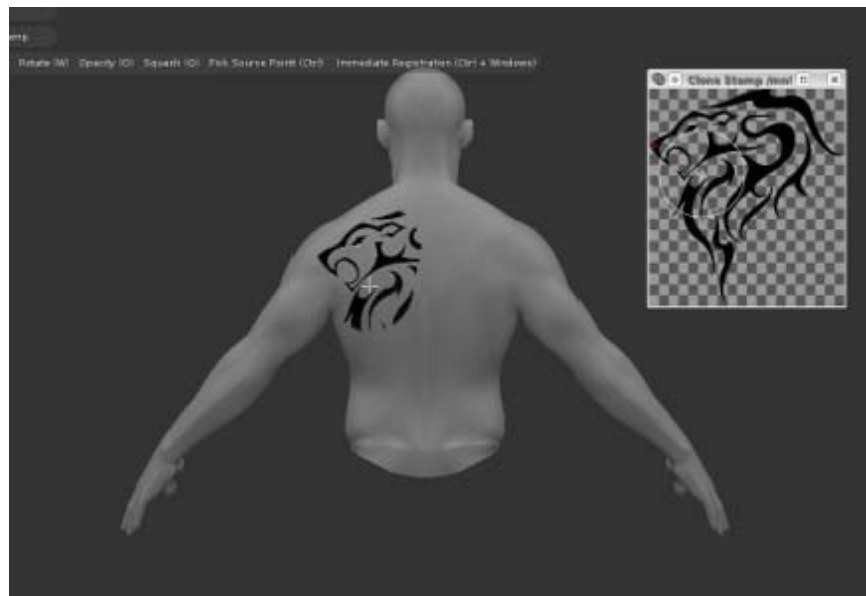


5. To select the source point for cloning on the image, press **Ctrl** and click. *Once you start painting, a magenta + displays the source point on the image.*

**Tip** You can also clone stamp from existing textures — painting on the surface of the object, in the paint buffer, or painted in another channel. To select a clone source, use the **Source** menu in the **Project** toolbar and select from the origins available.



6. Once you've selected the source, you can paint. The cursor moves on the image in sync with the cursor on the model as it clone stamps from the image onto the model.



**Sandbox** Change the view (as covered in [Tutorial 2: Setting the View and Lighting](#)), and try both painting through and clone stamping the image onto another side of the object. Do you like one method of using images to paint more than the other?

## Where Do You Go from Here?

This lesson covered the two main options for painting images onto a model:

- dragging an image and positioning it on top of an object, then **Painting through** the image onto the surface of the object
- dragging an image and positioning it on the canvas next to an object, then **Clone stamping** from a part of the image to the surface of the object.

The next tutorial, [Tutorial 5: Exporting and Importing](#), covers procedures for saving and re-importing your work.

## TUTORIAL 5: EXPORTING AND IMPORTING

### About This Lesson

#### What This Lesson Teaches You

This lesson explains how you can **export** channels you've painted in Mari as a set of image files, work on those files in another program, and then re-**import** them into your Mari project.

#### What You Should Know Before Starting This Lesson

This lesson assumes:

- a basic knowledge of computers and graphics applications
- that you have read the *Mari Getting Started Guide* up to this point
- that you know how to start Mari (see [Launch Mari](#))
- that you have completed tutorials 1 through 4 — so you know the basics of creating a Mari project, setting up the camera and lighting, and painting textures.

#### Resources You Need to Complete This Lesson

To complete this lesson, you need access to a computer that can run Mari, and the following sample files:

- **1-Blacksmith** — the Mari project file you created in tutorial 1 and used in tutorial 2, tutorial 3, and tutorial 4

#### How Long Should It Take?

Plan on spending about 25 minutes to complete this lesson.

#### About Mari Exports

Mari includes the facility to **export** the painting in a project to a series of image files. You might use this, for example, to modify part of your work in an external program (such as Photoshop®) and then re-**import** those modifications into the project. Mari lets you select a format and naming conventions for the export. Each export contains the painting baked in a selected channel, one image file per patch. When you import a series of previously exported files, Mari lets you know whether it's a complete set.

## Steps for Exporting and Importing

To export and import Mari painting, follow these steps:

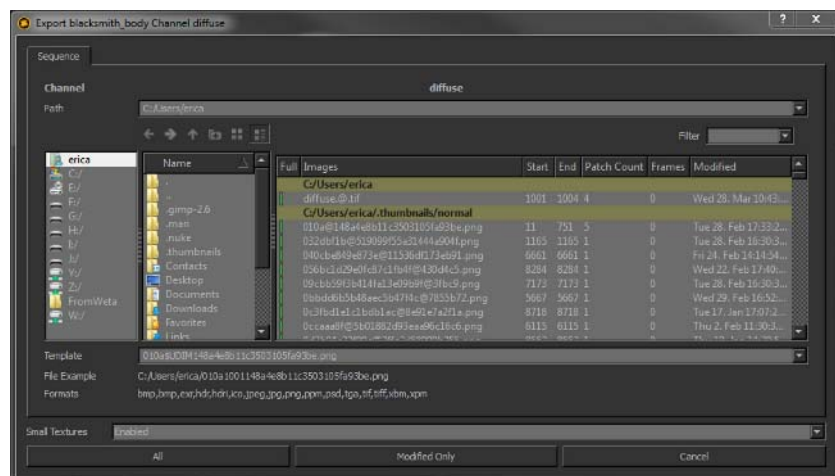
1. [Open Your Project](#)
2. [Export a Channel](#)
3. [Import a Channel](#)

## Open Your Project

1. Start Mari (see [Launch Mari](#)).  
*The Mari workspace displays.*
2. On the **Projects** tab, double-click on your **1-Blacksmith** project to open it.  
*Your project opens and switches to the **Ortho** view.*

## Export a Channel

1. To export the current channel, from the **Channels** menu, select **Export**.  
*This exports the currently selected channel (in this case, **Color**). To export any channel, right-click the channel you want to export in the **Channels** palette, and select **Export** from the popup menu.*  
*The **Export <channel name> Channel** dialog box displays (in this case, **Export color Channel**).*



2. If necessary, use the two left-hand navigation boxes to navigate to your tutorial folder.
3. Note the **Template** field. Mari names each image file in the export, one per patch, based on this template. The default is **\$CHANNEL.\$UDIM.tif**. Note also the **File Example** below it, which displays what a filename will look like with that template. In the illustration, it's: **color.1001.tif**

So each filename includes the following (with examples from the illustration):

- **\$CHANNEL** — the name of the channel you're exporting: **Color**.
- **\$UDIM** — an incremental number identifying each patch: **1001** (followed by **1002**, **1003**, and so on).
- **tif** — the extension for the selected file format. You can set the format for the exported files by changing this extension. Mari supports standard image formats (such as **.tif**, **.exr**, **.png**, **.jpg**, **.tga**, and **.dds**).

**Tip** *The formats available to export depend on the color depth of the channel. Channels with color of Half or Full can only export to .exr format.*

4. Click **All**.

*This exports all patches. To only export the patches that have been modified since the project was last exported, select **Modified Only**.*

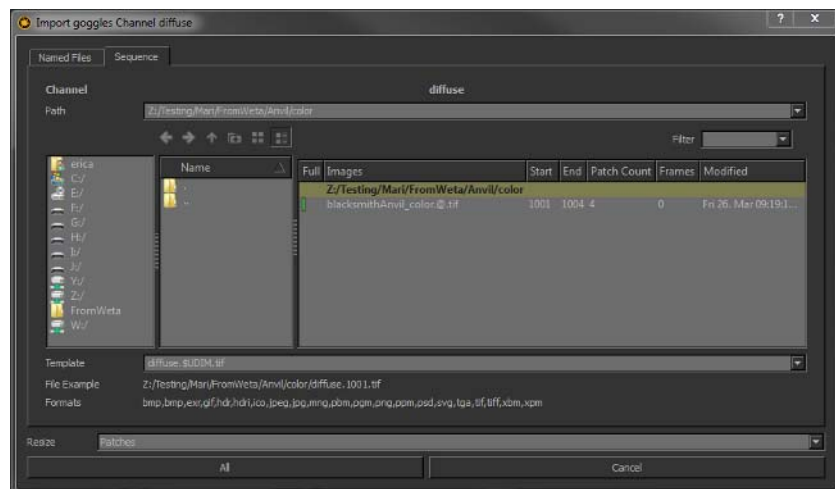
*You may be prompted that the selected directory does not exist, and asked whether you want to create the channel. Select to create it.*

**Tip** *For a complete explanation of export fields, see the Mari Reference Guide.*

## Import a Channel

1. To import a channel (for example if you've tweaked some exported image files in another application and now want them back in your texture):
  - from the **Channels** menu, select **Import** for the currently selected channel, or
  - right-click on the channel where you want to import the textures (in this case, **Color**) in the **Channels** palette, and select **Import** from the popup menu.

*The **Import <channel name> Channel** dialog box displays (in this case, **Import color Channel**).*



2. Select the path for the imported images, by either:
  - typing it in the **Path** field at the top of the dialog,
  - clicking on it in your directory bookmarks (to the left), or
  - browsing to it in the middle pane.

*If you are using the middle pane to browse to the directory, you can use the buttons above the view to navigate back, forward, up one directory level, create a new directory, or switch between icon only and full details directory view.*

3. Select the texture set to import.

*Mari shows all the texture sets available under the selected directory, arranged by subdirectory.*

For each texture set, the **Import <channel name> Channel** dialog box includes:

- **Full** — shows a green bar if the selected image sequence has a full set of images for the current model, a yellow bar if the selected image sequence has a partial set of images for the current model, or a red

bar if the selected image sequence has no images for the current model.

- **Images** — the name of each image to import, with the udim number represented as @ (in this case, **color.@.tf**).
  - **Start** and **End** — the first and last UDIM numbers in the image set (in this case, **1001** to **1055**).
  - **Count** — the number of images in the set (in this case, **50**).
4. From the **Resize** dropdown menu, select how Mari should act when importing a texture at a different resolution to the patch:
    - **Patches** — Mari resizes the patch to match the size of the imported image.
    - **Images** — Mari resizes the imported image to match the size of the patch.
  5. Click the buttons at the bottom of the dialog to import onto either **All** patches in the project, or **Selected only**.

*Mari imports the textures from the selected files.*

**Sandbox** *Experiment with your options for importing textures. Note how you can import textures to either one or all patches, or select individual patches for your changes.*

## Where Do You Go from Here?

This lesson showed you how to:

- **export** a channel in a Mari project to a series of image files
- **import** an exported channel, for example after having manipulated the exported textures in another program.

*Congratulations! You have now completed all modules in the Mari Tutorials. To better familiarize yourself with the features you are particularly interested in or to get answers to specific problems that arise during painting, please refer to the accompanying Mari User Guide and Mari Reference Guide.*