ZBRUSH 4.0

WHAT'S NEW DOCUMENTATION

Pixologic™
makers of ZBRUSH®

WELCOME

Welcome to the ZBrush 4 What's New documentation. While much of ZBrush 4 is very similar to versions 3.1 and 3.5, there are quite a few new features to help make your ZBrushing even more productive. We hope that the information you find here helps you understand the differences between this release and previous versions of ZBrush.

Since ZBrush 3.5 was the first step in the direction of ZBrush 4, we leave in this ZBrush 4 documentation the addition made in ZBrush 3.5.

You're invited to visit our ZClassroom for a huge database of free high quality movies explaining all the main features of ZBrush. Here you will also find the Artists Spotlight, where famous 3D Artists explain how they use ZBrush, helping inspire you to create like the pros.

Additionally, there is a link to the online documentation for ZBrush, where you can learn more about features not covered in this guide which was already in previous versions of ZBrush. A good strategy is to read this guide first in order to familiarize yourself with where changes have taken place. Then as you use the online documentation you will be able to easily refer back to this guide any time you encounter something online that doesn't match your copy of ZBrush.

Don't forget to subscribe for free to our ZBrushCentral community with over 200,000 members to discover tips, view artists' creations, locate useful help for all things related to ZBrush or post your works-in-progress!

ZClassRoom Portal: http://www.pixologic.com/zclassroom/

Artist Spotlight: http://www.pixologic.com/zclassroom/artistspotlight/

ZBrushCentral: http://www.zbrushcentral.com/

ZBlog: http://www.pixologic.com/blog/

Pixologic.com: http://www.pixologic.com

The Pixologic Team

MAC OS X & WINDOWS VERSIONS OF ZBRUSH

Instead of the Windows Ctrl key, the Macintosh uses the Command (Apple) Key. This documentation will always refer to using the Ctrl key name, although it may sometimes list both as Ctrl/Command. When the Ctrl key is mentioned anywhere in the documentation a Macintosh user will want to use the Command key instead.

The same is true for the Windows Enter key, which the Macintosh calls Return. When seeing the Enter key mentioned anywhere in this documentation, a Mac user will want to use the Return key instead.

The Close/Quit, Hide, Minimize and Maximize buttons are located on the top right in Windows and at the top left on Mac OS X

ZBrush 4 Documentation - version 1.0

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For all documentation questions and inquiries, please contact thomas@pixologic.com

ZBrush Artist - Yiannis Tyropolis

TABLE OF CONTENTS

ZBrush Artist - Magdalena Dadela

I NOTICE FOR PREVIOUS USERS OF ZBRUSH

If you are already a ZBrush user, please read this important information regarding several changes in ZBrush 4.0.

- The Standard brush now has Lazy Mouse activated by default. If you want to revert it to its original behavior, disable Lazy Mouse in the Stroke palette.
- The Alt Key is now the alternative operation for hiding polygons as well as for masking. For example, start to draw a marquee to hide polygons outside the marquee. Then if you want to switch the marquee to hide polygons inside it, release the CTRL+Shift shortcut without releasing the mouse button and press the Alt key.
- CTRL+Alt is the new shortcut to assign hotkeys.
- Several hotkeys for selecting brushes with the ABC mode have changed. As an example, the shortcut to call the Move brush was B,M,V in ZBrush 3.5 and is now B, M, B in ZBrush 4.
- To customize your interface when Preferences >> Custom UI >> Enable Customize is on you will now need to hold CTRL+ALT to move any interface buttons.

II INSTALLATION, UPGRADE & ACTIVATION

This is the useful information that you will need to know when installing ZBrush on your computer. This chapter also describes the activation and de-activation process.

1. Minimum requirements

Recommended:

- OS: Windows XP SP2 or newer, Mac OS X 10.5 or newer. 32 bits or 64 bits. (ZBrush 4 is a 32-bit application, but can use up to 4 GB of system RAM when run under a 64-bit OS.)
- CPU: For Windows: Pentium D or newer (or equivalent such as AMD Athlon 64 X2 or newer) with optional multithreading or hyperthreading capabilities. For Mac: Intel Macintosh.
- RAM: 2048MB recommended for working with multi-million-polys.
- Monitor: 1280x1024 monitor resolution set to 32 bits or Millions of Colors.
- Pen tablet: Wacom or Wacom compatible.

Minimum System Requirements:

- OS: Windows XP SP2, Mac OS X 10.5.
- CPU: Windows P4 or AMD Opteron or Athlon64 Processor (Must have SSE2: Streaming SIMD Extensions 2) or Intel Macintosh.

- RAM: 1024MB. (2048 MB recommended)
- Monitor: 1024x768 monitor resolution set to 32 bits or Millions of Colors.

2. Installation

Installation process (PC):

1. After purchasing or upgrading to ZBrush 4 on our Cleverbridge web store, a serial number and a download link will be provided to you. Save this information for your records.
2. Download the ZBrush installer file and double-click on it to run the Install Wizard and follow the steps. You can do a default installation or chose to do a custom install.
3. When the installation process is done, double click on the ZBrush shortcut created on the desktop folder or launch it through the Program files >> Pixologic >> ZBrush 4 >> ZBrush.exe on Windows.
4. Before first launching on Windows Vista or 7, ZBrush will need to be executed as an Administrator. Right-click on the ZBrush.exe file in the root ZBrush 4 folder and choose Properties. Go to the Compatibility tab and choose the option to Run as an Administrator. (That is the only option that should be activated on that tab.) Click Apply, then close the window.
5. Launch ZBrush. If prompted by Windows, give ZBrush permission to run. Please, read the included documentation, located in the ZBrush folder for the activation process.

Notes (should not be necessary, but are provided in case the installer fails to configure ZBrush correctly for your environment):

If ZBrush displays a windows error on first launch, please install the vcredist_x86_VS2008_sp1.exe located in the TroubleshootHelp folder. It may also be necessary to disable DEP as described in the text file found in the TroubleshootHelp folder.

Please, check that a "vmem" folder is available on the root of ZBrush 4 folder, and also a "TempFiles" folder in the ZStartup folder.

Installation process (Mac):

1. After purchasing or upgrading to ZBrush 4 on our Cleverbridge web store, a serial number and a download link will be provided to you. Save this information for your records.
2. Download the ZBrush installer, which is a DMG file. On most computers, this file will mount automatically after the download completes. If it does not, locate the downloaded file and double-click on it to mount it.
3. A window will open that shows the ZBrush icon on the left with an arrow pointing to the Applications folder on the right. Drag the ZBrush icon across the arrow and drop it on the folder.
4. The installation will proceed. When it completes you can close the window and

unmount the installer's disk image.

5. Use the Finder to go to Application >> ZBrush 4.0 OSX >> ZBrush.app. You can drag its icon onto your dock to create a shortcut.
6. Double-click on the ZBrush application (or the dock icon) to launch ZBrush.

3. Activation

This step must be completed in order to launch ZBrush successfully.

The single-user ZBrush license allows you to have ZBrush activated on two of your computers, provided that both copies are not actually used at the same time. For example it may be activated on a workstation and a laptop. Please keep in mind that only one copy of ZBrush can run at the same time.

Volume licenses allow only the number of activations for which seats have been purchased.

ZBrush activation window.

Activation process:

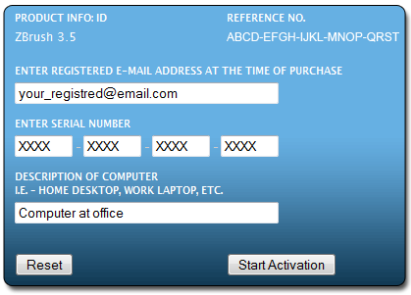
On first launch, ZBrush will ask for activation. Without activation, ZBrush will not run.

At the Splash screen, choose your method of installation: Web, Email or Phone. We recommend Web Activation for faster processing. (Do NOT choose the Activation Code option, except to complete an email activation after receiving the activation code back from Pixologic Support. Your serial number is NOT an activation code.)

- **Web**: Please read the agreement and validate it. Your web browser will then

launch and be forwarded to a dedicated webpage. Enter your registered email address (this is your most recent email address -- the one that you used when purchasing or upgrading to ZBrush 4), your serial number and a description for the computer. For the description you can enter anything that you like. Please make sure it's something that you can recognize to identify this specific computer if you see the description again in the future. After processing this information, an activation code will be provided on the web page. To begin using ZBrush immediately, copy that key and return to ZBrush. Click on the Enter Code option. A small window will open in ZBrush. This is where you will paste the activation code that you copied from the web page. Click Ok, which will activate your copy of ZBrush. If you activate using the copy & paste technique you may disregard the email that will be sent to you (see the next paragraph).

- If you did not copy the activation key from the web page, you will need to follow the instructions found in the email that will be sent to you. This email will have a copy of your activation code, which you can paste into ZBrush. Please remember that if you already activated ZBrush by copying the key from the web page you can disregard this email completely. There is no need to save this activation code for future reference, as each activation code only works for a single activation of ZBrush. If you ever need to reinstall ZBrush on your computer, a new activation code will need to be created via a brand new Web Activation.



The Web activation form

- **Email**: Clicking this will launch your default email application and generate a new message. In that email, enter all requested information including your serial number. It is also recommended that you provide a descriptive name (such as "Jim's Desktop") for your computer, which will help to identify the machine if you need support at a later time. After our technical support team processes your email, you will receive an email with an activation code.
- When you have the activation key, launch ZBrush and click on the Enter Activation Code option. Copy and Paste the Activation code to complete your activation. You can then delete the email with your activation code, as that code will never be used again. Any future activation will need you to start with an all new activation process.
- Please note that email activation only works if you use an email client. If you only use webmail on this computer you will need to do a web activation or phone activation instead.

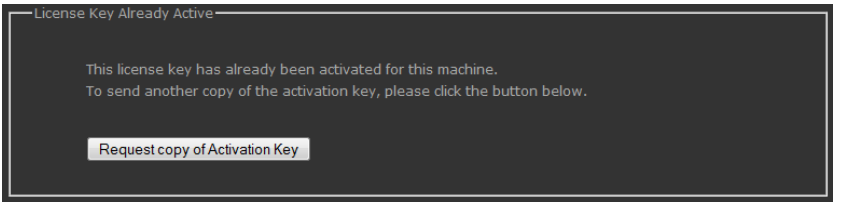
- **Phone**: Please read the agreement and validate it. A popup window will display a Request Code and the phone number of our technical support line. Please call the

phone number provided. The Request Code will need to be provided to our support team to activate ZBrush, along with your serial number and email address. Please have all three ready before calling Pixologic support. After taking the request code, the support representative will provide you with an activation code. Click on the Proceed button in ZBrush and in the next popup window, enter the activation code as the representative reads it back to you. After activating by this method you will also receive an email with the activation code, in case you prefer to copy it from the email rather than having the support representative read it to you.

- Once activated, ZBrush will start immediately.

4. Re-activation

If for any reason you need to re-install ZBrush again, you may re-activate ZBrush. After re-installation follow the web activation or email activation process to receive a new activation code. Re-activating ZBrush on the same computer will not normally consume an additional activation. Instead, you will see a message notifying you that ZBrush has previously been activated on that computer and asking if you would like to have the key resent to you. This will generate a new activation code without deducting another activation from your account. You can then copy the new code from the web page or the confirmation email that you will receive to complete the re-activation.



On entering the license information, the Activation process can offer you a license re-activation.

5. Deactivation

This process lets you remove an activation from a computer, returning it to the activation server so that it can be used on another computer. This process is important if you want to move ZBrush from one computer to another, are about to reinstall your operating system, or plan to make a major hardware upgrade to your computer. Completing this process will not uninstall ZBrush. It will merely restore the copy to a pre-activation state and credit the activation back to your serial number.

This process should also be used if you're preparing to reinstall Windows on your computer.

The Deactivation plugin in the ZPlugin menu.

Deactivation process (method one):

1. Launch ZBrush, pull down the ZPlugin palette and open the Deactivation menu.
2. Choose Web or Email Deactivation.
3. Enter your registered email address in the form to start the deactivation process.
4. If presented with a list, choose the machine that you wish to deactivate.
5. A confirmation email will be sent when deactivation is complete.

For an email deactivation, our support team will complete the deactivation process and send you an email when this has been completed. Response time is usually within one business day. You will then be able to use your serial number to activate ZBrush on another computer.

Deactivation process (method two):

If you are unable to deactivate ZBrush due to a hardware failure or forgetting to do so before reinstalling your operating system, there is a second way to deactivate. Please use the following steps:

1. After reinstalling ZBrush, launch it and choose Web Activation.
2. Follow the steps as usual. When you reach a message that says you are out of activations you will be given a button to list the activations that currently count against your serial number.
3. In the list, locate the activation that has been lost. Click the box next to that activation to select it, then submit the form by clicking the button below the list.
4. After confirming submission of the request, a Support ticket will automatically be created with the information that we need to fix your serial number. These are processed a few times each day, after which you will receive an email to let you know that you can proceed with a new Web Activation.
5. If you need the deactivation processed as soon as possible, please wait until you receive an email with your support ticket ID number. You can then call Support with your ticket ID and we will be happy to pull the ticket for immediate processing. Please note that it is impossible for us to pull the ticket until you have received the ID number by email.
6. Once your deactivation has been completed, launch ZBrush again and proceed with a new Web Activation. This time it will create an activation code for you.

6. Updating to 4

Because ZBrush 4 is a stand-alone version, upgrading to 4 is the same process as for a fresh installation. ZBrush 3.1, 3.2 or 3.5 will remain an independent application and the upgrade process will create a new ZBrush folder in your Program Files or Applications folder. At any time ZBrush 3.1, 3.2 or 3.5 can be used on your system after the upgrade to ZBrush 4. Do not run multiple instances of ZBrush (any version) at the same time on any system, however.

Since ZBrush 4 is a free upgrade and all official plugins have been updated to version 4, support for earlier versions of ZBrush has been discontinued. The only exceptions are for users who cannot yet upgrade to 4, such as a school lab in the middle of a semester or a major company in the middle of a production. You may continue to use the older version of ZBrush but if it stops working for any reason you will not be able to receive support to reinstall or reactivate it.

Please follow the Installation steps above.

6.1 Important note for fromer users of ZBrush 3.2 GoZ on Macintosh

ZBrush 3.2 introduced GoZ, which is a bridge between ZBrush and other 3D software. For temporary operations and configuration files, GoZ uses a folder named Pixologic, which is located in your Public folder. This folder is renamed and its contents will remain intact while the ZBrush 4 installer will copy a fresh one at the same location.
If you have ZTL files located in this folder, they won't be deleted.

Also, it is impossible to use GoZ on ZBrush 4.0 and 3.2 at the same time as all configuration files in the target applications will be changed.

7. Un-installation

This process completely removes ZBrush from your computer.

Un-installation process:

1. In the ZPlugin menu, choose Web Deactivation and proceed with the license deactivation as explained in a previous section. If you do not, the un-installed machine will continue to count against your serial number.
2. On Windows, use the Windows Control Panel uninstall utility and follow the steps. On Mac OS X, simply move the ZBrush folder to the trash and also the Users/Public/Pixologic folder.
3. Check the location of your installed ZBrush for extra files which haven't been deleted by the installer. You can delete those folders if you do not intend to use ZBrush

on this computer again.

Note:

ZBrush doesn't write files outside its own folder.

8. Support Registration

As of ZBrush 3.5, it is now required to have a current Support account at http://support.pixologic.com in order to receive technical support for ZBrush. This account is free.

Activating an earlier version of ZBrush is not the same as having a registered Support account. The Support system is relatively new, created in early 2009. It does not use any existing log-ins that you might have for ZBrushCentral, Cleverbridge or any other ZBrush-related sites.

If you have not already registered on the Support site:

1. Go to http://support.pixologic.com
2. Click the Register icon.
3. Enter your email address and whatever password you would like to use for the Support site. These will become your login info for the future.
4. Fill in your system information. We need this info in order to respond to your support requests more efficiently.
5. Also provide your ZBrush 4 serial number and the Cleverbridge reference number for your copy of ZBrush 4. This information identifies you as someone who has actually purchased a ZBrush license. For upgrades, both numbers will be different from what they were in earlier versions. Please use the ZBrush 4 info, only!
6. After you submit the form you will receive a confirmation email at the address you used to register. Follow the instructions in that email to complete your registration..

If you have already registered on the Support site:

1. Go to http://support.pixologic.com
2. In the box on the right, use your email address and password to log in.
3. The box on the right will now have a "My Account" button. Click this to manager your account.
4. Update your account to make sure that your system information is current.
5. Also update your account to have your new ZBrush 4 license info. This includes your serial number and your Cleverbridge reference number. You will no longer need the reference number and serial number from your earlier version of ZBrush.

Once your Support account is current with your ZBrush 4 license information you will be able to submit tickets to receive technical support. You will also be able to call for phone support. All phone support calls will create a support ticket, which you will then be able to follow up on via the Support system or by email.

ZBrush Artist - Kristian Davidson

III WHAT'S NEW IN ZBRUSH 4?

ZBrush 4 includes many new features and major improvements, which will boost your creativity and unleash your imagination to create breathtaking art.

Some of these improvements won't be visible in the UI, but you'll notice them as you sculpt.

1. Main New Features

ZBrush is continuously pushing the limits of what is possible in digital art. Version 4 builds upon what was already introduced with 3.5 in order to continue this trend through key workflow enhancements. These enhancements allow you to work faster and have a seamless workflow more than ever before. Some of the items below were first introduced in version 3.5 and are provided for the benefit of Mac upgraders, while others are new to ZBrush 4.

ZProjects

- Save all loaded tools, document size, light, material, timeline and render settings in one click.
- ZBrush 4 even includes sample projects to help you discover new features.

Best Preview Render

- Renders Shadows, Ambient Occlusion, Fibers, SSS and Transparency with advanced antialisasing.
- Multi-pass rendering with Shadow, Color, Ambient Occlusion, Mask and Depth as separate maps.
- Render for still images or animations.

Project presentation

- Timeline for more than just simple turntables and animations.
- Keyframe managment: copy, move, etc.
- Audio support with color beats for manual animation synchronization.
- Fade in/out and cut keyframes for nice transitions.
- Ease in/out keyframes.
- MDD animation file format support for exporting and importing animation.
- Animation-capable layers, Tools, ZSpheres, background and more.

Concept creation

- Shadow Box for free-form creation.

- Move Elastic Brush to create stretch-free extrusions.
- Reproject improved for more finely tuned control of the results.
- Mannequin for quick scene setup.
- TransPose units to help you in proportions and sizes.

Hard Sculpting

- Clip brushes for slicing your models.
- By Radius and By Polygroups modes for the Clip brushes.
- Shadow Box to create original sculpting bases, combined with radial symmetry.
- New Strokes: Circle, Square, Curves.

Major brushes

- Match Maker, the perfect brush to deform your mesh to conform to other 3D models.
- Deco brushes, turn, spin - perfect for creative patterns!
- Clay Buildup will be your new Clay brush for the rough sculpting.
- Move Elastic, Move Topo, Move Parts: Stretch and deform with no constraints.

ZBrush Artist: Brendan Cheatham

Strokes

- Roll mode improved with the Roll distance.
- New lasso/marquee selection mode, circle by center, perfect circle, curve for masking and hiding.
- Marquee, Lasso and Circle strokes working with symmetry for hiding, masking and slicing.

Pipeline and Productivity

- GoZ with Autodesk Maya (2008, 2009, 2010, 2011), Autodesk 3DSMax (2009, 2010, 2011), Luxology modo 401 (Sp2 to sp5), Cinema 4D R11 and R11.5
- GoZ SDK for integrating GoZ in additional software packages.
- Xpose to explode all SubTools, making it easy to work on a hidden one or create stunning animated effects.
- SubTool Duplicate and Insert, List All + ABC, Merge All for more flexibility when working on complex models.
- Solo mode to quickly isolate the current SubTool without affecting the visibility settings in the SubTools list.

3D Painting and Materials

- PolyPaint Layers for more freedom in 3D painting.
- SpotLight to edit textures on the fly and then use them to paint by projection.
- Gradient transparency for antialiased transparency in PolyPainting.
- New shaders: Fast Overlay and Fresnel Overlay for more effects in your materials.
- New Fresnel and SSS settings for more realistic materials!
- New Blinn Specular added to the default shader for a better skin specular effect.
- Large number of blending modes between materials: Add, Subtract, difference, darken, etc.

Misc

- Topology auto masking to protect closed areas which are not directly connected.
- Elasticity settings to stretch your model without stretching the topology.
- Orientation settings: rotate your alphas while sculpting.
- Tile alphas for more creativity with brushes.
- Non-Square alphas are supported, avoiding distortions.
- Contact support for SubTools: deform multiple SubTools while maintaining your defined contact points between them!
- Relax Deformation: relax your topology without altering the shape.
- Inflate Balloon Deformation for a variation of the relax deformation.
- Deformations are now in real-time when moving the sliders, giving you live feed-

back.

- New File menu to manage all content.

Plugins (available from the Download Center)

- Decimation Master is now 64 bits.
- Original size is kept when exporting with 3D Print Exporter.
- Unwrap all SubTools at once with UVMaster.
- New Multi-map exporter for fast and easy creation of many maps at once including: normal, displacement, ambient occlusion, etc.
- Various additions in SubTool Master and TransPose Master.

ZBrush Artist: André Holzmeister

IV ZBRUSH PROJECTS

ZBrush has always allowed you to save your work on a per-element basis through the various palettes such as Texture, Alpha and ToolThis functionality remains in ZBrush 4In addition, ZBrush can now save its current state at any time as a Project.

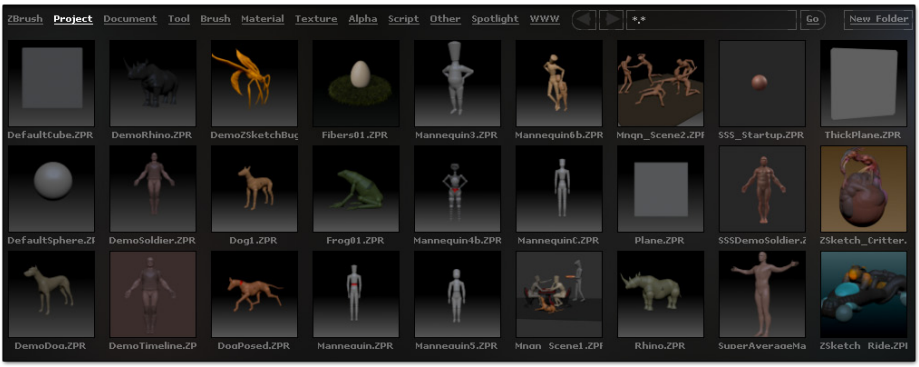
The Project feature allows you to save nearly every aspect of what you're working on, with a single click.

The Project file contains the most important elements loaded in ZBrush:

- Document size and colors.
- Loaded Tools and their SubTools.
- Current Tool position.
- Camera position.
- All maps assigned to a Tool or SubTool.
- Floor visibility.
- Perspective value.

The Project file doesn't contain:

- Textures residing in the Alpha or Texture palettes.
- Position of the elements in the User Interface like opened menus.
- Brush settings if they have been changed, or brush inventory.



The projects displayed in Light Box.

Notes:

Project files can be large depending of the number of loaded Tools in ZBrush.

If you wish to save only the current Tool as an incremental save, we strongly advise to save the Tool through the File or Tool palettes and not use the Project feature for this.

1. Saving a project

Saving a Project is similar as saving a Tool or any other kind of element:

- Go to the File palette and click on the Save As buttonA system window will appear.
- Choose the destination folder and enter a name.
- Click on the system window's Save button.

Hotkey: CTRL/Command + S

The File >> Open and Save As Project buttons

Note:

We advise you to save your projects in the ZProject folder, located at the root level of the ZBrush folder.

2. Loading a project

We advise you to save your projects in the ZProject folder, located at the root level of the ZBrush folder:

- Go to the File palette and click on the Load buttonA system window will appear.
- Browse your computer to select the Project to open and click on the Open button(Some operating systems allow you to double-click the Project file to select and open it.)
- Your Project will now load. If a non-empty document already exists, ZBrush will ask first about saving it first.

Alternatively:

- Open Light Box.
- Select the Project section.
- Double click on the desired Project to open it

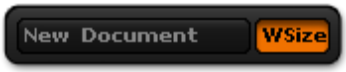
3. Reverting a project

At any time, you can revert your current project to its originally loaded state or the last saved state (whichever is more recent) by clicking the Revert button located in the File palette.

A confirmation dialog box will ask for approval or will let you cancel the operation..

4. Projects and Document Size

The WSize option (located in the Document palette) defines the size of the document as the maximum size that will fit within the ZBrush interface. If this option is activate when saving a project, then upon opening an existing project which has a defined Document size ZBrush will automatically change it to the maximum size that will fit within the current interface.



The WSize switch, located in the Document palette to the right of the New Document button..

If you want to load your Project with the saved Document size, press the Shift key while opening a Project. You can also just turn the WSize switch off.

5. Removing un-necessary Tools before saving a project

You can now remove unused Tools before saving your project to reduce its file size or simply to reduce interface clutter:

- Select the Tool to delete.
- Go to the Tool >> SubTool menu.
- Delete all SubTools: When deleting the last one, the Tool will be completely removed from the Tool palette.

1: Select the SubTools to delete. 2: Click Delete, located in the SubTool menu. 3: Repeat this step until you have removed all SubTools.

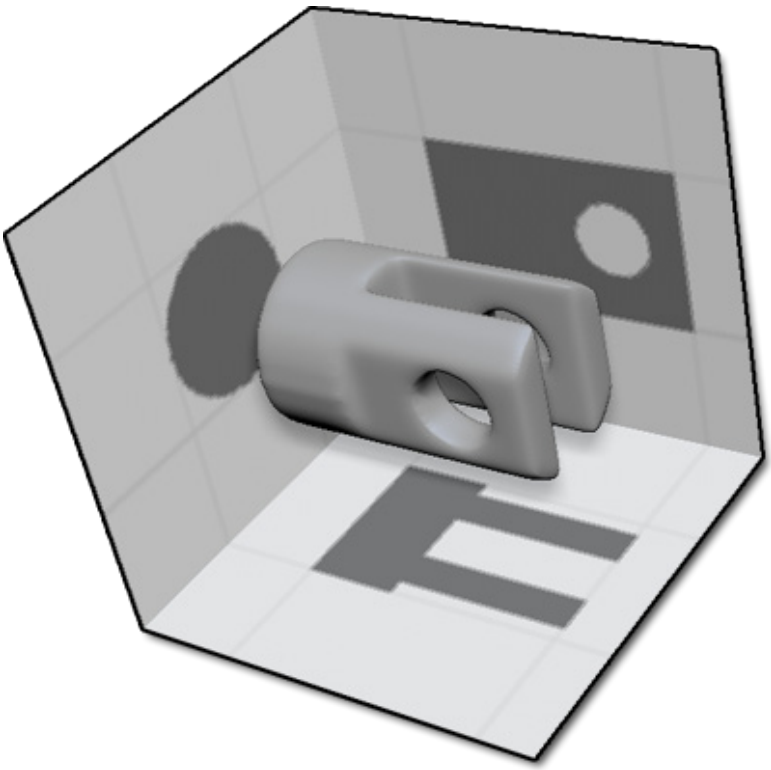
Keep in mind that when deleting a Tool (by deleting all of its SubTools) the Tool palette will be reorganized. If you have several custom tools loaded in the Tool palette, deleting one may cause the others to appear to have been deleted as well. All you need to do is click the large Tool thumbnail on the left shelf (or in the Tool palette) to see the entire list of available models.

V SHADOW BOX

Shadow Box is a tool which is able to create all kinds of 3D primitives based on the projection of shadows toward a center volume. Use masks to paint the front, side and bottom shadows of a model onto the dedicated cubic Shadow Box and your model will be dynamically generated inside it!

The main purpose of Shadow Box is to create whatever primitive you need with a few strokes, ready for additional sculpting. It is not meant to sculpt and refine models or create finely detailed models. Shadow Box is based on the Remesh All function and is resolution dependant: A low resolution setting will create few polygons and a rough shape while a high resolution setting will create a lot of polygons and a more accurate shape.

It is strongly advised to use a low resolution setting wherever possible and then later subdivide the model while sculpting with ZBrush 4's many brushes rather than trying to use Light Box with a high resolution to create overly detailed base meshes. In other words, use Light Box to create the lowest resolution base mesh that can be used as a starting point for your sculpts!



This is an example of a primitive built with Shadow Box, using all three planes. A variation could have been built without a mask for the bottom shadow.

It is strongly advise to work on a low resolution and then Subdivide later the model and use all the sculpting brushes to work on the shape than working on a high resolution and trying to paint the shadows in too accurate way.

1. Entering Shadow Box Mode

Shadow Box is in fact an editing mode. You must first have a Polymesh3D object selected before activating Shadow Box, which is located in the Tool >> SubTool menu under the Remesh section. Your object will then be converted to its shadow representation: The front, side, and bottom shadows of the loaded object will be projected as masks on the corresponding planes and the mesh will be reconstructed as you edit these masks.

This process will display the original mesh with shadows cast on the three ShadowBox planes. This is however dependent upon the Resolution set before activating Shadow Box mode.

The Shadow Box button, located under the Remesh All function.

If you want to create a new shape and not start from an existing one, you must load one anyway. The fastest solution is to load a primitive like the Polymesh3D and then clear the converted masks that will be projected (as described above) on the Shadow Box walls.

Shadow Box uses masks to represent the shadow. To edit the shadow you must use the regular Mask brushes and operators.

Note:

As Shadow Box is an editing mode, your original 3D model will be lost. If you want to keep a copy of it, create a clone before activating Shadow Box.

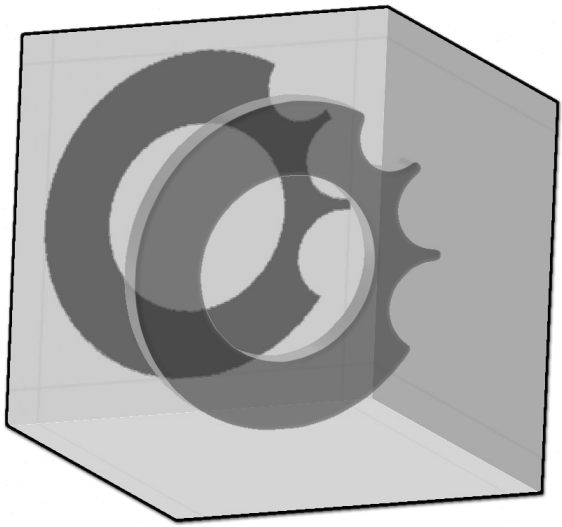
An alternative way is to load one of the Shadow Box projects found in Light Box. Bear in mind that loading a project will delete all custom objects currently in the Tool palette.

1.1 MODIFY IN SHADOWBOX

Upon entering Shadow Box you will see the three working planes which create the mesh's shadow. You can start to work on them by using ZBrush's masking features to add or remove parts of the shadows. To clear the existing masks and erase everything, hold the Ctrl+Alt drag a selection marquee across the entire Shadow Box.

Before starting to work with Shadow Box, please keep the following points in mind for best results:

- Switch your display mode from perspective to orthogonal view (P Hotkey).
- Turn on Ghost transparency (found on the right shelf or in the Transform palette). This will prevent the 3D object from obscuring the masks on the projection planes.
- Set the resolution of Shadow Box before starting to work on your construction (see below).
- Avoid going in and out Shadow Box several times when creating your model. Each time you go back into Shadow Box, ZBrush will evaluate the projection shadow and rebuild your mesh, which can destroy some changes that you'd made outside of Shadow Box.



Shadow Box in orthogonal view, with Ghost transparency enabled. For this screenshot the Shadow Box has been turned slightly but it's strongly advised to draw the shadows with the working plane square to the canvas

Once you are ready to work in Shadow Box, start to draw your masks on the Back working plane. If you need to create only a kind of extrusion based on a single projection, it is advised to work in this plane to get the cleanest mesh.

With each new stroke, thin lines will be created on the three working planes to show the bounding box of your model so far on all three views. This helps you to know where you can safely continue masking on the other working planes: ZBrush will build a model in the center of the box which can be described by the existing masks. If you create a mask on one side and a second mask on another side which is not aligned with the existing mask, only the part in common will be created.

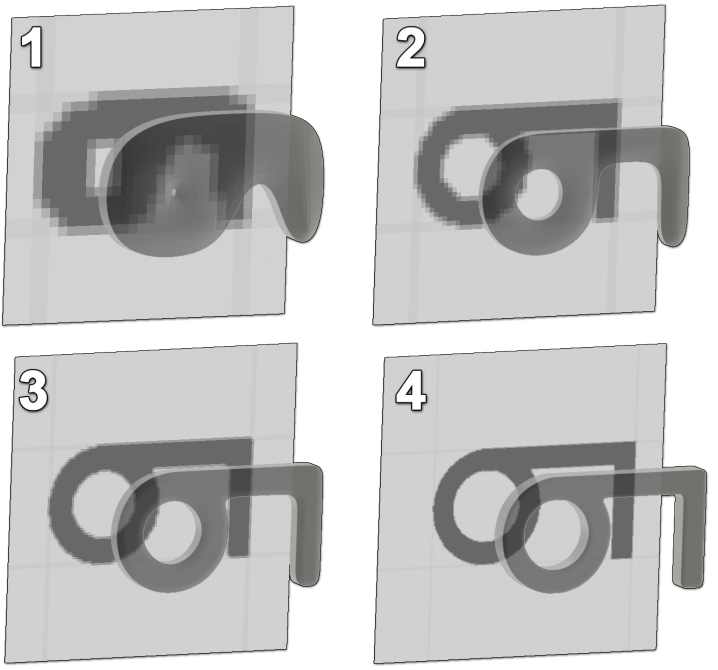
Don't forget that you can erase masked areas by holding the ALT key at the same time you are using Ctrl. You can also combine the mask with the new Stroke types (Circle, Square, Curve) or use the new masking brushes (Mask Rectangle, Mask Circle, etc.).

Do not forget to use the LazyMouse and Backtrack features to get crisp lines for hard-edged meshes.

When your model is finished in Shadow Box, just turn off the Shadow Box switch. Your new base mesh is now ready to be sculpted with all the ZBrush brushes.

1.2 Shadow Box resolution

Shadow Box objects are based on ZBrush's Unified Skin technology. This technology uses Voxels, combined with the Remesh All functions. By changing the Remesh All settings, you will affect the quality (and results) of the Shadow Box object.



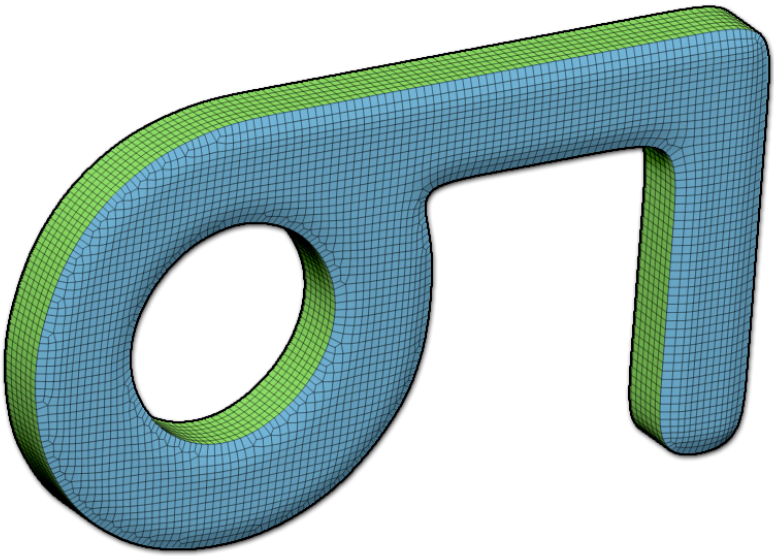
Different results by Shadow Box resolution: 1: 32, 2: 64, 3: 128, 4: 256. The difference is minimal between 128 an 256, except for the sharper edge angles.

Use the ReMesh Resolution slider to Increase or decrease the polygon count of your Shadow Box object. With a default resolution of 128, your Shadow Box object will be described in a cube of 128x128x128. If you need to create accurate objects with no subdivision levels directly in Shadow Box or if you only plan to add a couple subdivision levels while sculpting, increase this resolution. If you need to create a rough base mesh which you will then do important sculpting on, keep the default resolution or even decrease it.

By increasing or decreasing the resolution, your Mask will be more or less accurate.

Change the ReMesh Resolution slider value before activating Shadow Box. If you need to change it while in Shadow Box, turn it off, change the resolution and activate it again.

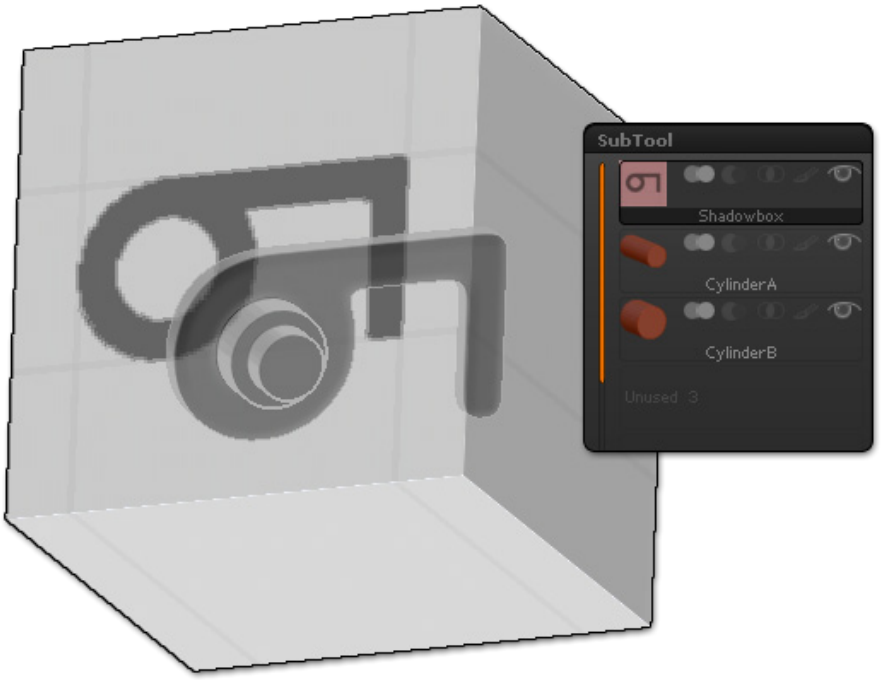
- Change the Polish slider if you want to have sharp or soft edges on the mesh. By clicking the circle, you will affect the type of Polish: an open circle will maintain the overall shape while a closed circle will smooth the edges.
- By toggling the Polygroup option you can create automatic Polygroups based on the shape you are creating within Shadow Box.



Two polygroups have been created for this single-plane projection model: One for both faces and another for the extruded sides.

1.3 Working with SubTools

Shadow Box can't work with SubTools directly, but you can edit a SubTool or load a Shadow Box model as a SubTool. With the Ghost Transparency mode activated, you will be able to see all visible SubTools while in Shadow Box but will not be able to edit them. This is an easy way to create props or base meshes with the help of other SubTools as a reference.

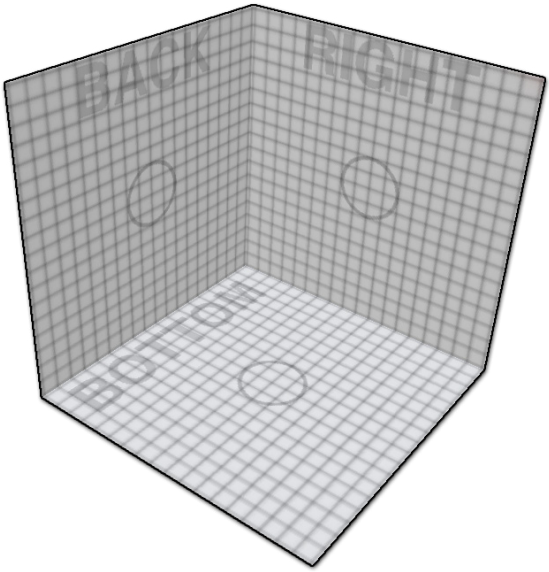


Two SubTools displayed with transparency while creating a new mesh In Shadow Box.

1.4 Using references on working planes.

The Shadow Box working planes are default 3D planes which include UVs. This means that you can load a texture and apply it to the planes directly so that the image can be used as a reference.

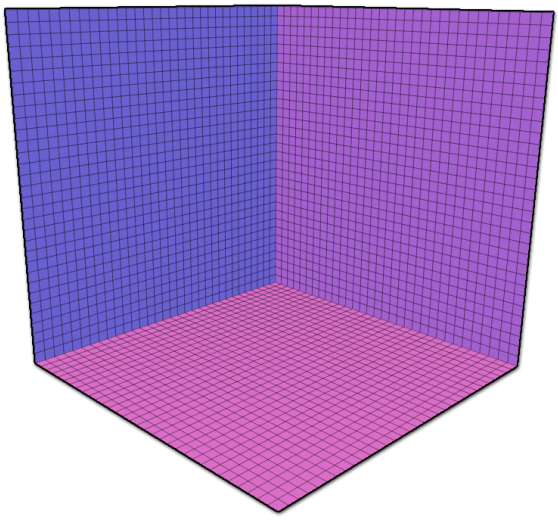
Another solution is to use PolyPaint to paint directly on the planes. This can be done via SpotLight or with the traditional method of PolyPainting.



A texture which displays a grid and the three working plans names, applied to the Shadow Box.

1.5 Hiding Working planes

Each Shadow Box working plane has a different Polygroup. This means that you can hide any or all working planes at any time (except for the active plane) by Ctrl+Shift+Clicking on the desired plane.



Each working plane has its own polygroup, ready to be hidden.

Using this workflow will allow you to focus on one plane at a time and then later bring one or both of the other planes back as one Shadow Box.

It is also possible to use the new Unwrap UV feature in the Tool >> UV Map menu to unfold Shadow Box for flat painting. When you click on Unwrap UV again ZBrush will create a mesh where the masking on your three planes intersects.

1.6 Key sculpting points for shadowbox

This is a list of important things to consider when working with Shadow Box:

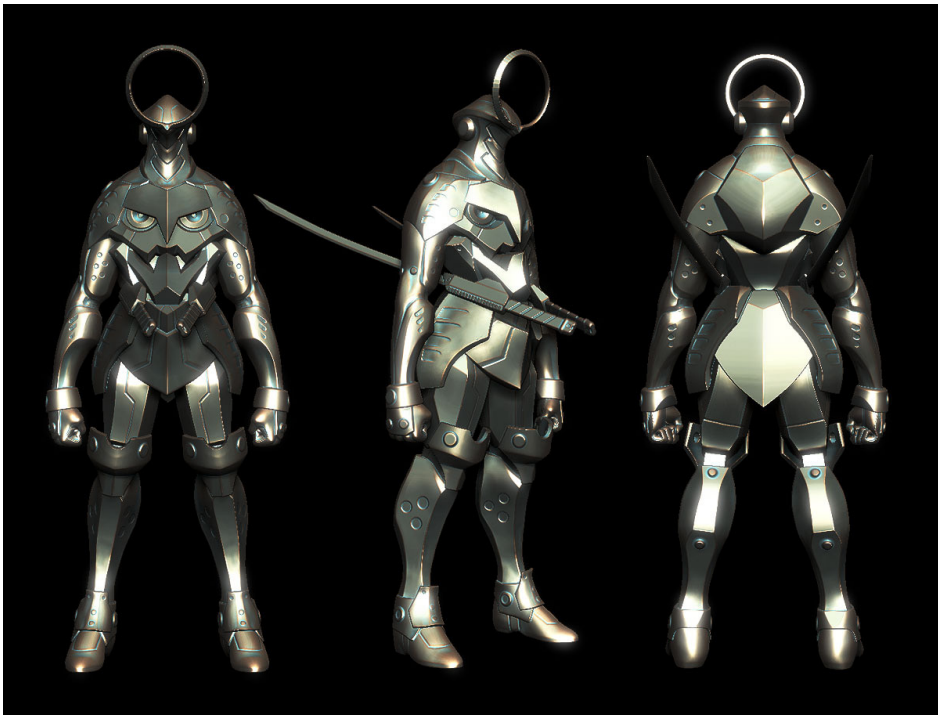
- Shadow Box is designed to create base meshes rather than finely detailed models. Most of the time, it's better to create a rough model with few polygons, then subdivide and sculpt it with traditional tools rather than trying to create your object entirely using Shadow Box.
- If you need to create holes, do it directly in Shadow Box by using Ctrl+Alt to erase part of the mask.
- Don't forget to use the new masking Brushes to create accurate shadows. They can be combined with the new stroke functions to create perfect circles and more.
- Shadow Box works fine with Symmetry, based on an axis or with the Radial (R) option enabled. If your symmetry is off axis, don't forget to enable the Local Symmetry option located in the Transform palette.

VI ZBRUSH NEW BRUSHES, SETTINGS AND BEHAVIORS

ZBrush 4 introduces several new brushes that use new dedicated settings, bringing even more possibilities for your creative process: from creating rough shapes to global deformations or fine tuning of your sculpts.

Some of these new brushes work as modifiers: when selected, you can call them through a hotkey like how the Smooth brushes can be activated on the fly with the Shift key.

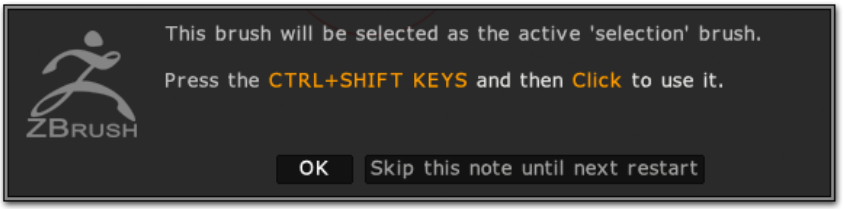
They are also connected with new Stroke types. Please refer to the Stroke New Features chapter for more information.



ZBrush Artist - Trevor Hennington

1. Modifiers as Brushes: Masks, Selections, Smooth and Clip

Introduced in ZBrush 3.5, several functions of ZBrush are now accessible as brushes: Mask, Hide polygons, Smoothing and more. Several of the new brushes are accessed by holding hotkeys (Ctrl/Command, ALT and/or Shift).



When selecting a brush which is assigned to a modifier, ZBrush will warn you.

As with Smooth, these brushes can't be use like a normal brush and are only accessible as an alternative by holding the associated hotkey.

This is the list of the hotkeys corresponding to brush types:

- Mask brushes: Ctrl
- Smooth Brushes: Shift
- Hide/Show: Ctrl+Shift
- Clip Brushes: Ctrl+Shift

The ALT key isn't used to call brushes as it is used to inverse operations. Pressing ALT will:

- Erase the Mask while drawing it.
- Hide the polygons in the selection areas.
- Change the direction of the Clip brushes.

As these brushes are now used as modifiers, it is important to keep in mind that any modifications that you might want to make to these brushes (such as changing an Alpha, the Z intensity setting, etc.), must be done while pressing the corresponding shortcut. If you want to save one of these brushes after customizing it, you must hold the corresponding modifier when clicking the Save As button located in the Brush palette.

Note:

Any brush stored as an alternative brush will be reset each time you restart ZBrush. The default brushes are Smooth for Shift, Marquee selection for Ctrl+Shift, Mask Pen for Ctrl when doing a stroke on the model and Mask Marquee when doing a stroke outside of the model.

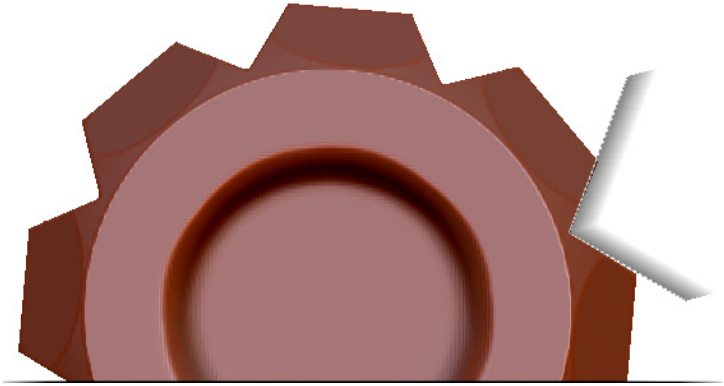
1.1 Brush type

ZBrush uses many different types of brushes, which combine with the various settings, strokes and alphas to give you thousands of different brushes for total sculpting freedom. To know which type of brush is the base, just mouse over a brush and the brush's foundation behavior will be displayed in the floating preview window.

The brush type name is displayed at the bottom of the brush pop-up.

2. Clip Brushes

The clip Brushes are different from any other brushes as their operation is always perpendicular to the canvas. These brushes are similar to how the Eraser tool cuts away pixols on the canvas, except that they are used to cut away areas of your model and slice its borders. These Clip brushes do not change the topology of your model; they only push the polygons based on the stroke you apply to your model.



The Clip Curve brush in action, combined with radial symmetry.

Since the clip Brushes use open and closed curves, it is important to know which side the clipped polygons will be pushed to. For this purpose, the curves have a shadow on one side and polygons will be pushed in the direction of the shadow. If you create your stroke in the wrong direction, just press the ALT key to tell ZBrush that you want to push the polygons in the other direction.

The clip brushes respect masking. If you want to protect an area from being pushed, simply paint a mask on it. Don't forget to check your model for unprotected areas as the clip brushes operate through the whole depth of the model relative to the curve.

When tapping the ALT key once with the ClipCurve brush you will create a curved line that can be changed in direction every time ALT is clicked. If you double-tap the ALT key when using the ClipCurve brush, the change in line direction will be a sharp angle rather than a smooth curve.

When holding the ALT key while using the Circle or Rectangle Clip brush, ZBrush will cut away all of the mesh that is inside the drawn circle or rectangle. Understand that if you hold the ALT key and the cross indicator is over any part of the mesh there will be a result of geometry being pushed out.

The clip brushes all share the same behaviors; only the Stroke type makes them different.

2.1 Clip brushes additional features

Stroke option

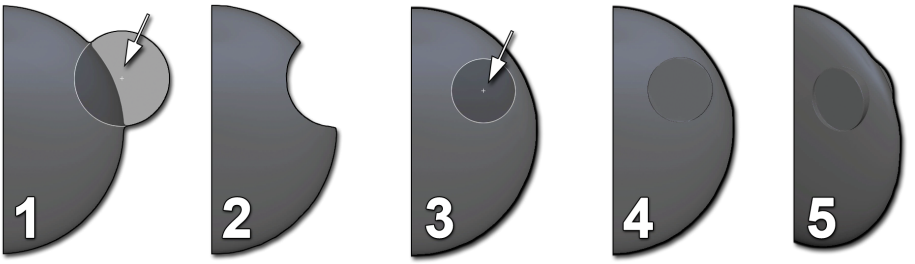
By pressing Ctrl+Spacebar while using a Clip brush, a pop-up window will appear offering two options:

- Brush Radios: When enabled, the polygons will be partially pushed to the line depending upon the brush size and the distance of the mesh from the camera.
- By Polygroup: When enabled, a polygroup will be created based on the pushed geometry included in the circle or rectangle stroke.

Brush Radius and By Polygroups are also located in the Transform palette.

Center position for Circle and rectangle Clip Brushes

When drawing a Circle or Rectangle stroke, a small cross appears in the middle of the shape. When the cross is outside of the mesh, the polygons are cut to the edge of the circle or rectangle to create a notch in your model. When the indicator is inside the mesh, polygons will be pushed out which results in an expansion of geometry rather than a cut.



1: The Circle Clip brush is used with the center of the stroke outside of the model. 2: The result, with the polygons pushed inside the circle. 3: For this new stroke, the center is inside the model. 4: The polygons are pushed outside the circle. 5: The same as 4, but at a different angle to show how the clip takes place relative to the canvas.

Note:

When pressing ALT while the indicator is inside the mesh, the stroke switches from white to black and the polygons located inside the stroke are pushed perpendicular to the screen, in both directions.

If you start to create a stroke and need to move it, hold the spacebar and move your cursor; the stroke will move. Release the spacebar to continue or finish the stroke.

2.2 Selecting and using Clip Brushes

As with the Smooth brushes, the Clip brushes are activated by hotkey. When selecting a Clip brush in the Brush palette, it will automatically be assigned to a specific hotkey: Ctrl+Shift.

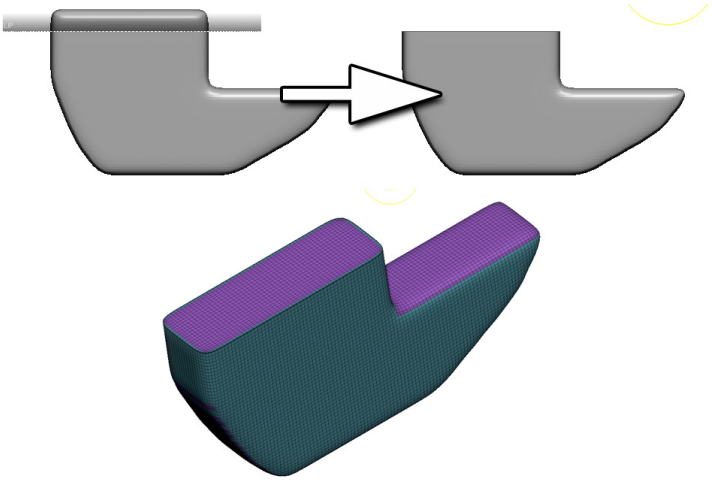
When using a normal brush, press Ctrl+Shift to activate the last selected Clip brush. Release Ctrl+Shift to return to using the normal brush.

Selecting another Clip brush will replace the previously selected one without changing the active normal brush.

2.3 Clip Curve

The Clip Curve uses a curve to push the polygons. By default, this is a straight line.

Tap the ALT key to create an invisible point that will transform the line into a curve.

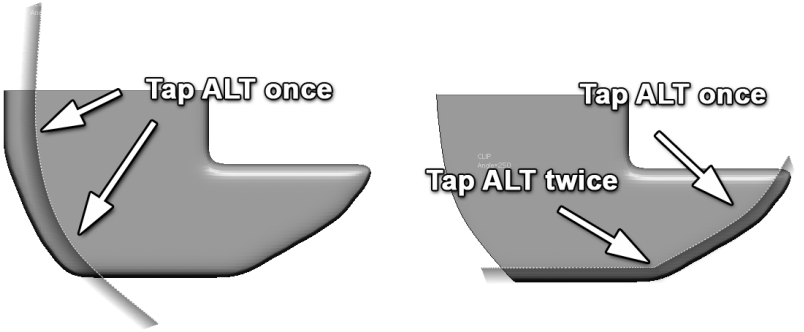


By default, the Clip Curve creates a straight line, which pushes all the polygons to the same plane.

If you want to create an angle at the point position instead of a curve, double-tap the ALT key.

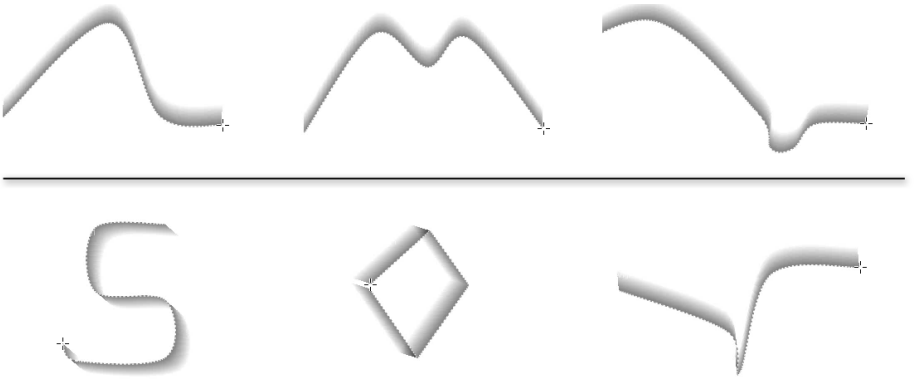
If needed, press the space bar to move your curve while creating it.

Press the ALT key when releasing the cursor if you want to push the polygons on the other side of the curve, according to the curve shadow position.



On the left, the Alt key has been tapped once in two different positions to create the curve. On the right, the Alt key has been tapped once to create a curve and then tapped twice to create an angle.

The shadow of the Clip Curve must always be on the same side of the curve. Basically, the Curve pushes all polygons in the direction of the gradient side of the curve. A curve which looks like a letter "S" would not work as the curve gradient will reverse twice and produce an unexpected result.



On the top: Valid clip curves. Note that the bottom section of the last one on the right is at the limit of working. On the bottom: invalid curves which can produce unexpected results. The curve is crossing its shadow.

Note:

It is not possible to edit the clicked points after they have been created.

2.4 Clip Circle

The Clip Circle uses an ellipse to push the polygons. By default, all the polygons outside of the circle will be pushed to the border of the drawn circle.

Hold the ALT key when releasing the mouse button if you want to push the polygons located inside of the circle. This will allow you to create clean circular edges in a mesh's existing hole. (The clip brushes cannot be used to create holes in topology, but they can reshape existing holes.)

By activating the Center and Square features in the Stroke Palette you will draw a perfect circle with the center located at the initial brush click.

If the Middle Cross indicator is over the mesh when holding the ALT key, the geometry within the circle will be pushed out instead of being clipped.

If needed, press the spacebar to move your curve while creating it.

Note:

It is not possible to edit the clicked points after they have been created.

2.5 Clip Circle Center

Clip Circle Center is the same brush as Clip Circle, except that the stroke creates a perfect circle using the Square and Center options located in the Stroke palette. By default, all the polygons outside of the circle will be pushed to the edge of the drawn circle.

Hold the ALT key when releasing the mouse button if you want to push the polygons located inside of the circle.

If needed, press spacebar to move your curve while creating it.

Note:

It is not possible to edit the clicked points after they have been created.

2.6 Clip rectangle

Clip Rectangle uses a rectangle to push the polygons. By default, all the polygons outside of the rectangle will be pushed to the border of the drawn shape.

Hold the ALT key when releasing the mouse button if you want to push

the polygons located inside of the rectangle. This will allow you to create clean square holes in a mesh that already has a hole. (The clip brushes cannot be used to create holes in topology, but they can reshape existing holes.)

By activating the Center and Square features in the Stroke Palette you will draw a perfect square centered on the initial brush click.

If the Middle Cross indicator is over the Mesh when holding the ALT key then the geometry within the rectangle will be pushed out instead of being clipped.

If needed, press the spacebar to move your curve while creating it.

Notes:

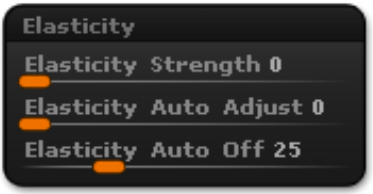
It is not possible to edit the clicked points after they have been created.

3. New Brush settings:

ZBrush 4 includes several new settings for brushes, adding more freedom of creation to your toolset.

3.1 Elasticity

The new Elasticity setting lets you deform your topology while at the same time avoiding stretched polygons. When using this setting (mainly with the Move brush), ZBrush will relax the topology while deforming your model.



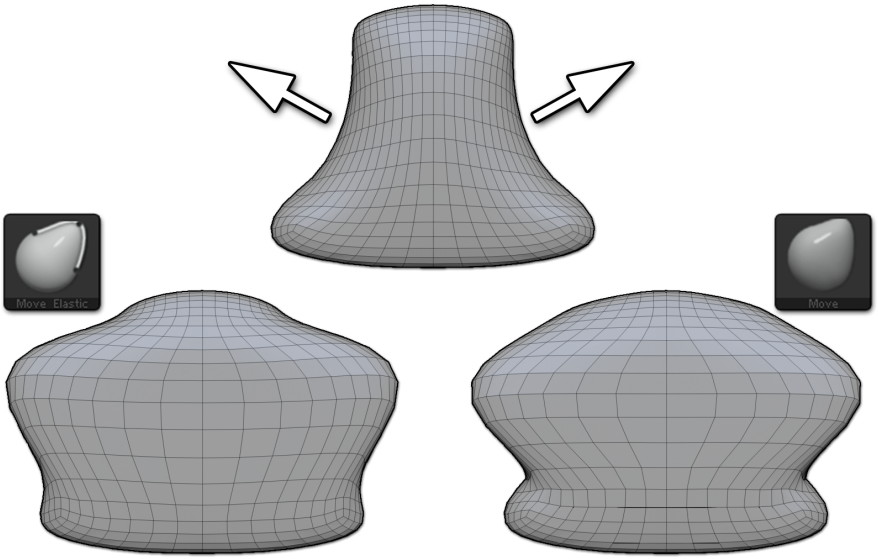
Elasticity Strength: Controls the amount of relaxation that will be applied to maintain the geometry of a mesh while it is being edited.

Elasticity Auto Adjust: Affects the strength of the elasticity on the fly by moving your stroke back to the starting point. Set this setting to 1 for no effect when reversing stroke direction.

Note:

The best way to understand this is to see it in action. Use the Move brush with Elasticity and pull a piece of the surface away from the mesh, then move your pointer back to the starting point to see how this will affect the shape you create in the surface. Now toggle the "elasticity auto adjust" to see how this changes the effect when reversing your brush stroke.

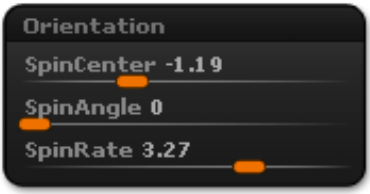
- Elasticity Auto Off: Determines what polycount must be reached for a mesh before ZBrush will automatically disable the elasticity settings. Once the polycount has been reached, any brush with an Elasticity Strength will take on the same behavior it had before Elasticity was applied.



On the top, the original model with two strokes which illustrate cursor movement. On the bottom left, the result with the Move Elastic brush and active Elasticity settings. It generates a mesh with uniform topology and a smooth deformation, as opposed to the traditional Move brush shown on the bottom right.

3.2 Orientation

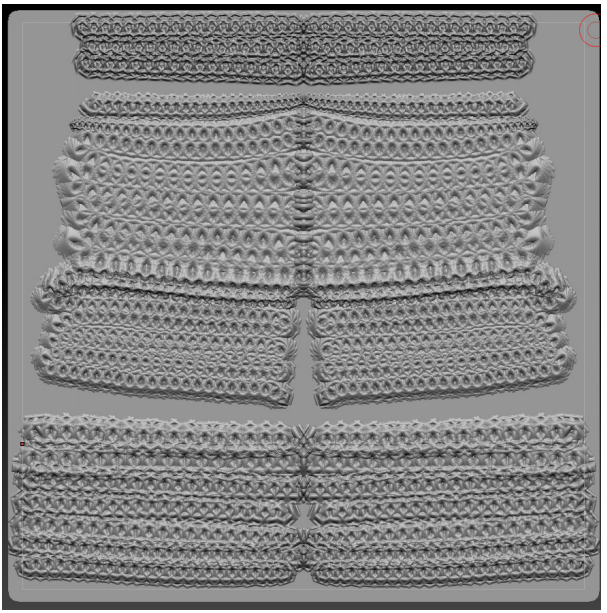
The new Orientation setting makes the brush spin around the stroke line, letting you create creative strokes and patterns which would have taken a lot of time in a more traditional way.



- Spin Center slider: Controls the amount of distance the alpha will spin from the

center line of the brush stroke. The higher the slider the wider the arcs will be.

- Spin Angle slider: Controls the angle the alpha will spin around the center line of the brush stroke. The higher the slider the larger the arcs will be.
- Spin Rate slider: Controls the speed at which the alpha spins along your brush stroke. A high setting will cause the alpha to spin more often.



Spin researches by Magdalena Dadela.

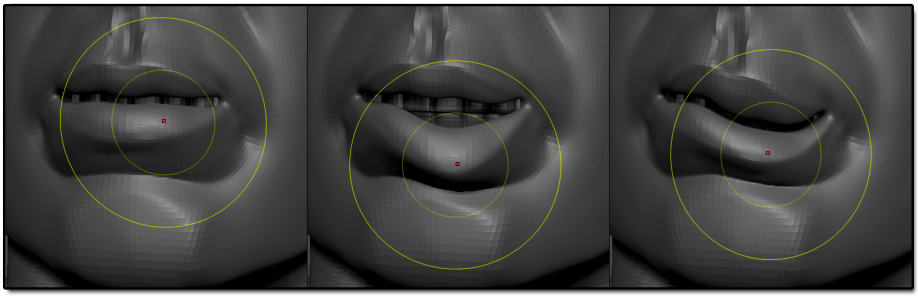
3.3 Auto Masking: Topological

This new Auto Masking function, located in the Brush >> Automasking menu lets the brush evaluate the topology of the model. Prime examples would be opening or closing a character's mouth. With this active ZBrush will not affect the lower lip of a character when the upper lip is being worked on. The Topological Range is vital in evaluating the topological flow of a mesh when this feature is active.

- Topological mode: When the Topological option is activated on any brush ZBrush will respect the topological flow of the mesh.
- Range slider: Determines the distance ZBrush will evaluate along the topology of a mesh when calculating points to be affected by the selected brush. If the setting

is 3 then ZBrush will evaluate a distance of 3 times the current Draw Size to establish a range of vertex points that can be affected as the brush is moved along the surface.

- Smooth slider: Determines the distance ZBrush will evaluate along the topology of a mesh. If the setting is 3 then ZBrush will evaluate the mesh up to a distance of three times the current Draw Size.



Topological masking in action with the Move brush: On the left, the non-deformed lips. In the center, the result with Toplogical Auto masking. On the right, the result without Topological Automasking.

4. New Brushes

Making use of the new settings introduced in ZBrush 4, several new brushes have been added. At the same time, some brushes previously found in the Brush palette have been moved to the Brush section of Light Box.

At any time, you can add brushes to the startup Brush palette by placing them in the ZBrush 4.0\ZStartup\BrushPresets folder. ZBrush will display up to 256 brushes in the pop-up Brush palette.

4.1 Clay Buildup

TThe Clay Buildup brush is a variation of the Clay Tubes Brush. It will produce more displacement of the polygons when used but respect the build up of the various strokes. This brush is perfect to block out the volume of your model, before switching to the "traditional" Clay brush.

4.2 Clay Spin

The Clay Spin brush is a variation of the Clay Buildup brush, combined with the new Spin settings.

4.3 Move Elastic

The Move Elastic brush is a variation of the Move brush, combined with the new Elastic settings. This brush is very powerful to drastically deform your base mesh's shape while avoiding undue stretching of important polygons.

The roses were created using the Move Elastic brush. Image by Magdalena Dadela.

4.4 Move Parts

The Move Parts brush is a variation of the Move Brush, combined with Topological masking at its maximum settings. Even if the Draw Size is very large, the non-connected geometry around your stroke won't be affected by the Move Parts brush.

Adjust the Focal Shift to -100 to have less mesh distortion.

4.5 Move TopoElastic

The Move TopoElastic brush is a variation of the Move Brush, combined with Topological masking and the Elasticity settings. It generates nice deformation on the models by protecting the topology around the working areas and avoids high stretching of the polygons.

4.6 Move Topological

The Move Topological brush is a variation of the Move Brush, combined with Topologocal masking. This brush will allow you to modify areas without affecting the surrounding geometry, like modifying a character's bottom lip without affecting the top lip.

Change the Topological settings located in the Brush >> Auto Masking menu to change the brush topological influence.

4.7 Deco 1 to 7

A new set of brushes named Deco1 to Deco7 has been added, which use the new Orientation settings found in the Brush palette and described above. These new brushes, customized with different alphas will let you create advanced patterns. They are not similar to the 2.5D Deco Brush Tool, but rather are decoration brushes for sculpting.

4.8 Rope1

The Rope1 brush uses the new capability of creating a rectangle alpha on a brush to create an endless rope.

4.9 Weave 1 to 3

The new Weave brushes use the new Roll Distance slider located in the Stroke palette to stretch the selected Alpha along the path.

These brushes use different Alphas and different Roll distance settings.

Please see the New Stroke Additions chapter for more information about the Roll Distance slider.

ZBrush Artist - James Van Den Bogart

VII STROKE

Several enhancements have been made to ZBrush's Stroke features. Most of them are related to the creation of masks, the Clip brushes and hiding or unhiding polygons.

1. Moving the Stroke while drawing it

If you need to move your stroke while drawing it, simply hold the spacebar without releasing the mouse button (or tip of your pen tablet). The cursor will change to a four axis cross, letting you know that you are now in move mode. Move your cursor to move your stroke across the screen, parallel to the canvas.

When releasing the spacebar, ZBrush will allow you to continue the active brush stroke.

2. Inverting the content of a stroke

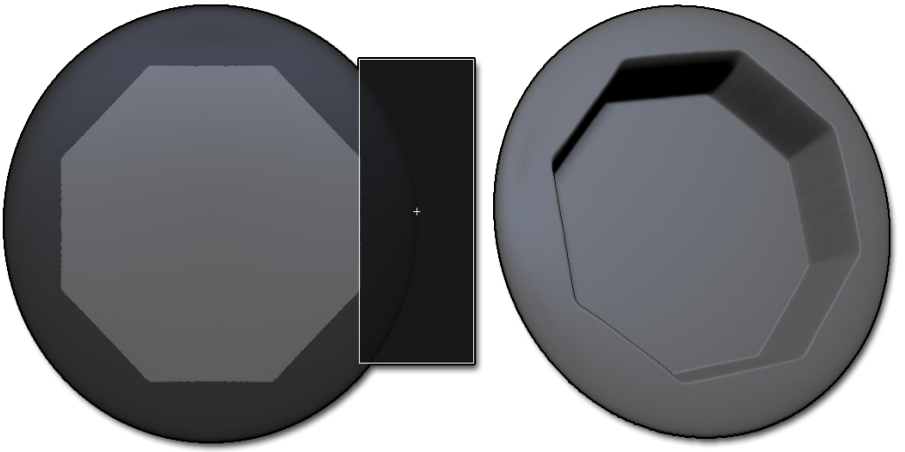
While drawing a brush stroke, hold the ALT key. ZBrush will switch to the function's opposite operation:

On the left, adding a Mask. On the right, holding the Alt key to partially remove a Mask.

- If you were drawing a mask, holding the ALT key will erase the mask at the location of the stroke.
- If you were drawing a selection to hide all the polygons except the content of the stroke, holding the ALT key will hide all the polygons inside the stroke.
- If you were using a clip brush, holding the ALT key will invert the direction of the pushed polygons. Please refer to the Clip Brush section of this documentation for more information about these brushes.

3. Lasso and Marquee in symmetry

When using any stroke, if the current Tool has symmetry activated, the stroke will be applied symmetrically. This includes the options for curves, circles and squares. Symmetry will affect mask creation, the clip brushes and hiding/showing polygons.



When masking is combined with radial symmetry it's easy to create a hex screw.

4. Circle, Rectangle, Curve and Lasso Strokes

In previous versions, ZBrush already had the Rectangle and Lasso strokes for masking and hiding/showing polygons. ZBrush 4 now adds Circle and Curve strokes.

The Lasso and Rectangle strokes remain the same, except that they can now use two new options described below.

4.1 Circle Stroke

The Circle stroke creates an ellipse by default when it is drawn on the canvas.

It can be combined with the Square and Circle stroke options (see below).

4.2 Square Stroke

The Square stroke creates a rectangle by default when it is drawn on the canvas. This stroke was the one used in previous versions of ZBrush for marquee selections and masks.

It can be combined with the Square and Circle stroke options (see below).

4.3 Curve Stroke

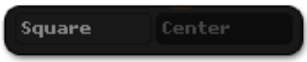
The Curve Stroke creates by a straight line by default, combined with a shadow on one side. The side that the shadow is on is the side on which the operation will take place.

4.4 Lasso Stroke

The Lasso stroke creates a closed curve by default when it is drawn on the canvas. This stroke was the one used in previous versions of ZBrush for lasso selections and masks.

4.5 Square option

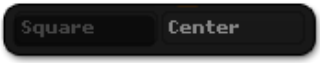
When enabled, the Square option forces the creation of a perfect circle or a perfect square.



This option is available only with the Circle and Square strokes..

4.6 Center option

When enabled, the Center option will cause your stroke to be drawn outward from the stroke origin and centered on that point.



This option is available only with the Circle and Square strokes.

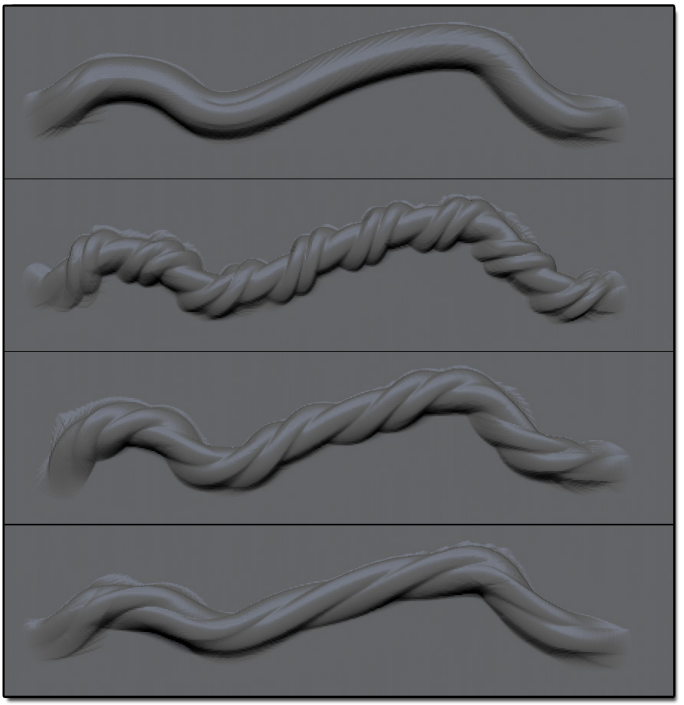
4.7 Center cross in Circle and Square stroke

When drawing a Circle or Square stroke, a small cross (+) is displayed in the center of the stroke. This small cross is a visual indicator that is helpful when using the Clip brushes as the result of the operation be different depending on whether the cross overlaps the model or is outside of it.

Please refer to the Clip Brush section of this documentation for more information about the Clip brushes and the cross position.

5. Roll distance

TThe Roll option located in the Stroke Palette has a new option: the Roll Distance slider. Modify it to stretch your alpha along the rolled stroke. High values mean your alpha will be highly stretched.



The same stroke with the same alpha. From top to bottom: no roll option, roll at 0.5, at 1 and at 2

The Waves brushes and the Rope brush use this new Roll Distance option, combined with different Alphas.

VIII SUBTOOLS

The SubTool is at the center of your Sculpting process. Creating rich scenes invariably means more and more SubTools. ZBrush 4 introduces new functions to help make managing SubTools easier.

The SubTool menu. For documentation layout purposes it has been split in two parts.

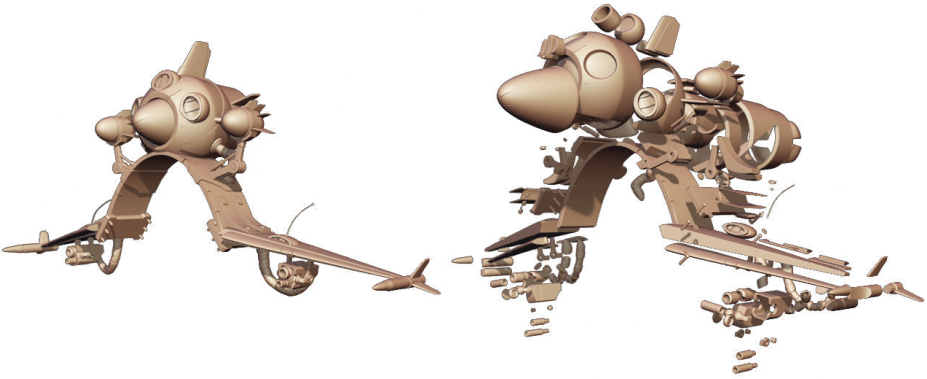
1. SOLO MODE

Solo mode isolates the selected SubTool by temporarily hiding all other SubTools in a single click, without the need to change the current visibility of all the SubTools in the SubTool menu. When Solo mode is turned off, all previously visible SubTools will become visible again while those that are hidden in the SubTool menu will remain hidden.

By default, Solo mode does not have an assigned hotkey. You can enable Solo mode's single-click option by activating the Preferences >> Edit >> Click to Solo switch. When clicking in any empty part of the document you will isolate the selected SubTool and temporarily hide all others.

2. Xpose View

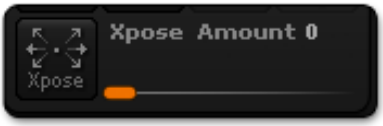
he Xpose View, located in the Transform palette, will temporarily move all of your model's SubTools (Visible or not) to separate them from each other in space. This gives you the freedom of navigating around or editing each SubTool without having to hide the rest of the model.



ZBrush Artist - Frederik Storm

Xpose View is a mode in which you can do all normal SubTool operations as desired (changing the active SubTool, hiding or making visible, sculpting and more). When you are done with your current operations, click Xpose View again to bring all your SubTools back to their original positions.

By changing the Xpose Amount slider located in the Transform palette, you will be able to partially move all your SubTools. This is useful for animation purposes as the 0 value (meaning no Xpose) and the 1 value (meaning full Xpose) can be key framed. These values are also the same as clicking the Xpose View switch off or on.



The Xpose Amount slider, located in the Transform palette.

Hotkey: Shift+X

3. All Low and All High

The All Low and All High buttons, located in the Tool >> SubTool menu will set the subdivision levels of all visible SubTools to their highest levels or lowest level with a single click.

These two functions were previously part of SubTool Master. Now that they are native to ZBrush they have been removed from the newest release of this plugin.

4. SubTool List All

The SubTool List All function, located in the Tool >> SubTool menu will display all of your active model's visible SubTools as a floating list. This is a quick overview of your SubTools and makes it faster to select a specific one.

The List All function uses the same selection mode as brushes: Type the first letter of a SubTool to display only the SubTools starting with this letter. Each of these remaining SubTools will have a letter displayed in orange at the top left of its icon. You can either click on the desired SubTool or simply type the assigned letter to select it.

The List All pop-up which appears under your cursor when pressing the N hotkey.

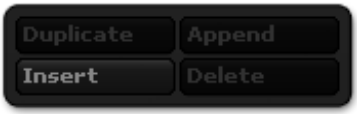
Hotkey: N

5. Duplicate

Duplicate the selected SubTool and immediately add it to the SubTool list. This is different from the Clone feature (located at the top of the Tool palette) in that Clone copies the selected SubTool as an entirely new Tool.

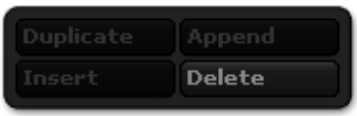
6. Insert

The Insert function is similar to the Append SubTool function, except that the SubTool added to the list is placed below the currently selected SubTool while Append adds the new SubTool to the end of the list.



7. Delete SubTool

In ZBrush 4, when deleting the final SubTool will remove the model from the Tool palette. Before deleting the last SubTool of a model, remember that this operation can't be undone. If you do this operation to clear the Tool palette, don't forget to save your Tools or Project first!



8. Merging SubTools: Merge Down and Merge Visible

Merging SubTools allows you to weld two items or more into one SubTool or Tool.

If the different SubTools are at the same level of SubDivision, the merged SubTool will retain the number of subdivision levels equal to that of the model with fewest levels. (See the note, below.) If not, the subdivision levels will be deleted.

- **Merge Down: Merges the selected SubTool with the next visible SubTool in the list.**
- **Merge Visible: Merges all visible SubTools into one Tool. A new Tool will be created in the Tool Palette with the prefix "merged_" followed by the name of first visible Subtool. For example: merged_soldier body.**
- **Weld: This modifier affects the Merge Down and Merge Visible functions. When active, all overlapping border vertices of the SubTools will be welded. (This only occurs if they are at the exact same 3D position.)**

Notes :

Merging Down and Merging visible are undoable operations.

If all the visible SubTools have the same Subdivision level count before the operation, the created new ZTool will keep these subdivision levels.

If all the visible SubTools have different Subdivision levels before the operation, the newly created ZTool will keep the maximum number of subdivision levels possible, but may delete lower or higher levels depending on which SubTool was selected before the operation.

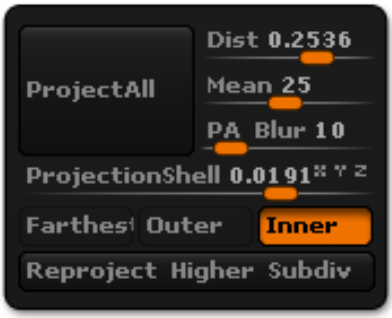
Welding only affects points that share identical positions. This feature cannot be used to perform Boolean operations.

Merging several SubTools into one new ZTool:

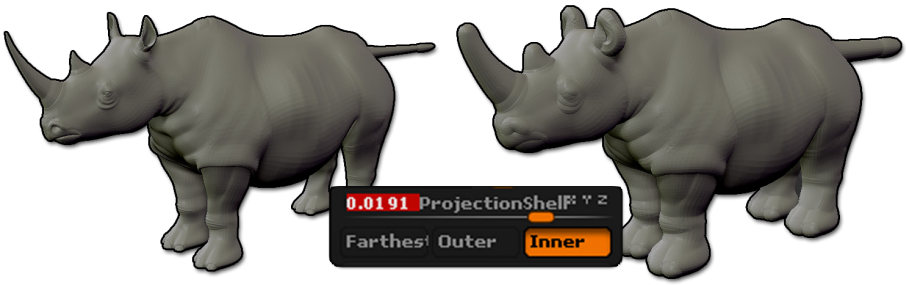
1. Load a ZTool with several SubTools.
2. Hide the unwanted SubTools.
3. Check the Subdivision level of all the SubTools.
4. Select the desired main SubTool. If other SubTools have a higher subdivision level, those levels won't be kept. For example, if one tool has 4 levels but the other SubTool has 5 levels you will lose the fifth level when merged.
5. Click on the Tool >> SubTool >> Merge Visible button to create a new ZTool.
6. If you no longer wish to keep the original model with all its SubTools, delete the SubTools one at a time until all are gone. This will remove the model from the Tool palette.
7. In the Tool palette, choose the new ZTool and continue working..

9. SubTool Projection

The SubTool Projection feature lets you project visible details from other SubTools to the selected SubTool. For example, you can easily transfer all the accessories from the DemoSoldier sample model to the body mesh, creating a single mesh which includes all the details.



- **Project All**: Projects sculptural detail from the visible source mesh(es) onto selected mesh, even if the topology is totally different. For best results if any of the source SubTools have overlapping parts project their details one at a time starting with the innermost SubTool. (Hide all SubTools that you do not wish to be part of the projection operation.) The PA Dist and PA Blur modifiers will affect the results of your projection.
- **PA Dist** - Project All Distance slider: Affects the projection distance for each normal from the source mesh to the target mesh. If you put the slider to 1 the distance will increase to the greatest possible range.
- **PA Mean** - Project All Mean slider: Takes the average of the point difference from target mesh to source mesh and sets this as the plateau for Project All.
- **PA Blur** - Project All Blur slider: Before the projection is calculated, ZBrush will apply a blur to the normals. This will create a smooth effect on the normals.
- **Projection Shell slider**: By modifying this slider value, you will define the Maximum or Minimum range of the projection. While moving the slider, a projection preview will be displayed, allowing you to have a visual feedback of the maximum and minimum values that you are setting up. Depending on the value of this slider, the Outer or Inner modes will be automatically enabled.



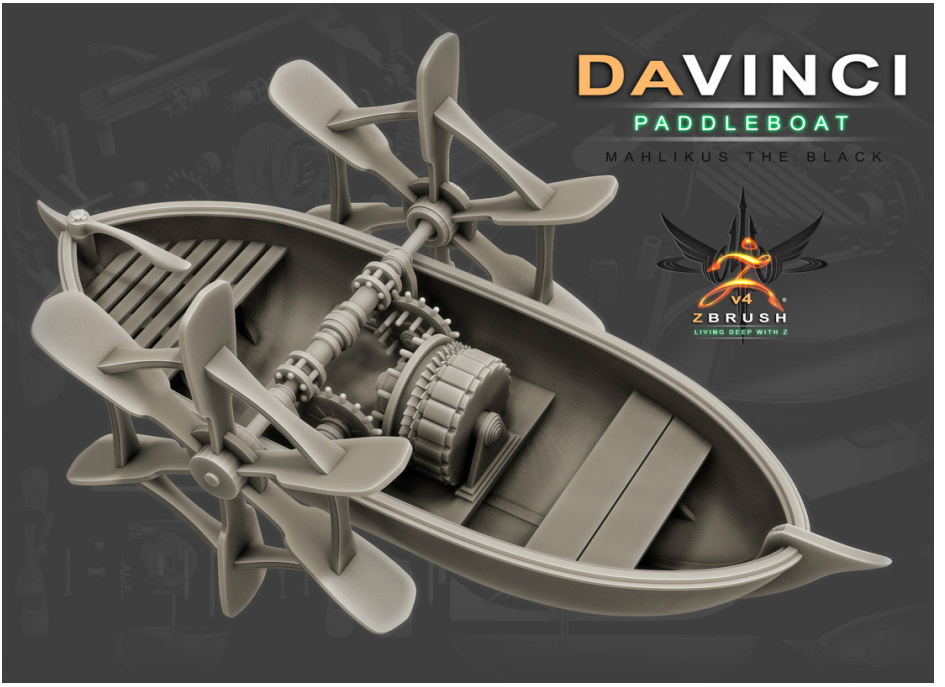
Projection Shell in action: On the left, the original model. On the right, the projection preview.

- **Farthest mode**: Projects from the target mesh to the farthest point(s) of the source meshes.
- **Outer mode**: Projects from the target mesh to only the outer point(s) of the source meshes. If there is any of the source mesh inside of the target mesh then that portion will not be projected. This mode is automatically activated when the Projection Shell

slider is set to a negative value.

- **Inner mode**: Projects from the target mesh to only the inner point(s) of the source meshes. If there is any of the source mesh outside of the target mesh then that will not be projected. This mode becomes live automatically when the Projection Shell is set in a positive value.
- **Reproject Higher Subdivisions**: Use Reproject Higher Subdiv to relax your mesh topology while reprojecting your high frequency details onto it. To use this powerful function, follow these steps:

1. Go one or more subdivision levels lower than your highest level to get to a point where the polygons have a more even distribution. You may want to sculpt or smooth a bit at this level to get an ideal distribution.
2. Activate Reproject Higher Subdiv. ZBrush will compute a new distribution of polygons at the highest subdivision level that is more relaxed (even) while still preserving the geometry of the model. Depending on the complexity of your model, this may take some time.
3. After the computation is done, your model will be displayed at the highest subdivision level.



ZBrush Artist - Michael Angelo Hernandez

IX (3D) LAYERS

(3D) Layers allow for a non-linear workflow. Artists are able to work with a model at many different stages of development simultaneously. Artists can add details such as a reptile's skin scales then turn those details off and refine the major forms underlying them.

Layers support geometry, PolyPainting, and Masking. Mix them and change their opacity to create new results in a few clicks. You can also turn off a layer if it's decided that the details aren't needed or change the strength of details sculpted on the layer.

Layers can be easily animated with the help of the Timeline, allowing you to create and visualize the Morph target or Blend Shapes that you can create in ZBrush for other 3D packages.

ZBrush reads layers from the top of the list to the bottom. This information is important for good layer management in your models.

1. The Record mode

As with the layers in ZBrush 3, you must enable a layer in order to record changes to sculpting, PolyPaint or masking. If layer only has the eye icon active there can be no changes made to the layer. To make any changes to a layer you must first put the selected layer in REC mode. Once complete the layer must be taken out of REC mode by clicking on the REC incon.

Record mode is represented by a plain circle and the REC label, on the right of each layer in the list.

Note:

If a layer is not in recording mode and you are trying to sculpt or paint on it, a note will be displayed asking you to switch on record mode.

2. Layers at different levels of subdivision

Layers can now be transferred from a lower level of subdivision to a higher subdivision. Layers will also be available for adjustment at every subdivision level. Once a layer has been transferred to the top subdivision level it may not be sent back to the original creation level but the intensity and visibility can be adjusted on any level.

For example: If you create a layer on level 3 with sculpting, PolyPaint and/or masking changes you can later transfer the layer to the highest level by simply adjusting the Intensity slider or by turning the eye icon off and then back on. Once the layer is at the highest subdivision level its intensity can continue to be adjusted while at any subdivision level. If you wish to add more detail to the layer you must be on the highest level in order to put the layer in REC mode.

3. Erasing the PolyPaint on a Layer

Any layer that has PolyPainti information can be erased locally with your current brush by holding the ALT key while applying your stroke.

Note:

To locally erase the sculpted contents of a layer, hide it by clicking on its visibility icon and then store a morph target. Unhide it and pick the Morph brush: while drawing your stroke, ZBrush will erase the contents of your layer.

4. Layer functions

Several new layer functions have been added. For this reason, the Layer palette and its tools have been reorganized.

Layer list: Displays the name and active status of the layers: visible or not, in recording mode or not and the layer intensity value.

Layer visibility: Toggles display of the layer's content by clicking on the eye icon. Changing the Intensity slider (see below) to 0 provides the same result.

Layer intensity slider: Lets you change the intensity of the layer's content. The default value of 1 means a 100% intensity of the layer content. It is possible to use negative values, which will produce the opposite of the layer content or to use a value higher than 1, which will magnify the layer contents.

Any slider within the Layer list is limited between -1 and 1. The slider located beneath the Layer list is limited between -5 and 5. Bother sliders have the same effect; only the available intensity range differs.

- **New Layer**: Creates a new layer and adds to the bottom of the existing list.
- **Select Up / Down**: Selects the layer above or below the active one.

- **Move Up / Down**: Moves the active layer up or down within the list.
- **Rename Layer**: Opens a dialog box to change the name of the active layer. Press Enter/Return to validate the new name.
- **Duplicate Layer**: Duplicates the selected layer and adds it down the Layer list..

Note:

The duplicate layer has the same name. It is advised to rename it after the operation.

- **Delete Layer**: Deletes the selected layer.
- **Split Layer**: If a layer has different types of information such as geometry, PolyPaint and/or Masking, the Split command will separate these data types into individual layers.
- **Merge Down Layer**: Merges the active layer with the one located below.
- **Invert Layer**: Inverts the current intensity of the layer. If the layer has indentations, they become bumps and vice versa. This operation also applies to PolyPaint. The Invert command work only when the active layer is not in REC mode.
- **Bake All**: Transfers the information of all visible layers directly to the 3D model. The visible layers are then deleted from the list.
- **Import MDD**: Import an MDD file (which contains a vertex animation) to the active layer. Please read the Animation chapter for more information about MDD files.
- **MDD Speed slider**: Applies a speed factor the imported MDD animation file.

ZBrush Artist - Geert Melis

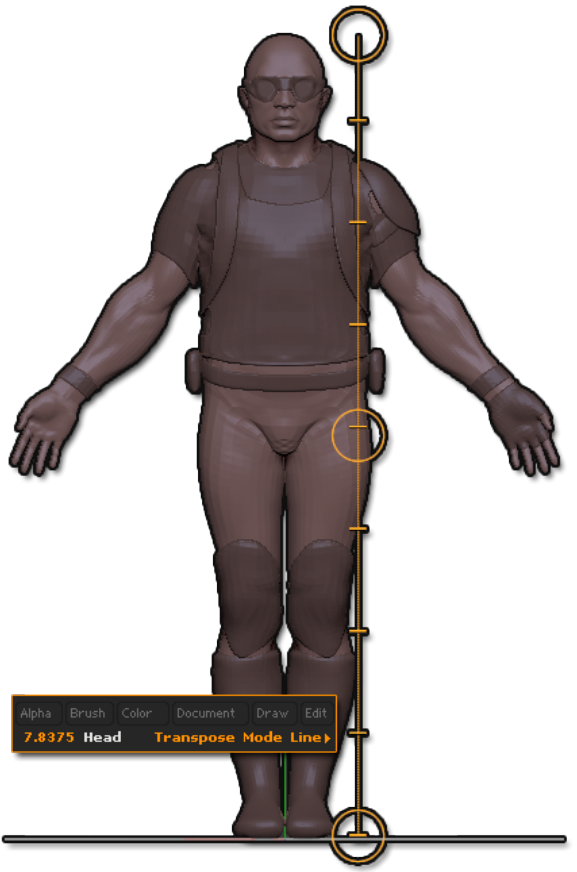
X TRANSPOSE

TransPose is the action line, activated by being in Edit mode and turning on Move, Rotate or Scale. Its main usage is to create quick poses by mixing topological masking and the position of the action line to do bends, twists, moves and scaling. These transformations can be symmetrical if desired.

TransPose can also be useful to simply manipulate your Tools or SubTools in space without deforming them.

ZBrush 4 brings several enhancements to TransPose:

1. TransPose Units



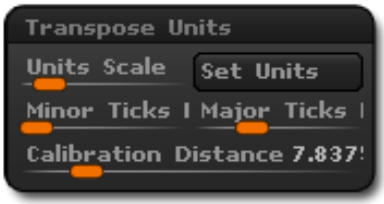
TransPose Unit in action, with Head units.

TransPose can now display graduations on its line to do measurements. The graduations are enabled by default and can be changed in the Preferences >> TransPose Units menu.

The purpose of the units in ZBrush is to let you easily verify the dimensions of an object while working on the proportions of a model. At any time you can set the units value to one of your choice and initialize the length of the action line to 1 unit. Then when you increase or decrease the length of action line, you will be able to measure in the defined units.

To give you an example, load the DemoSoldier project. Activate Move and draw on the model to create a action line that has the length of the head. After setting this length to 1 unit in the preferences and naming the units "Heads" (see below), you can increase the length of the action line from the top of the head to the foot to see that the demo soldier is 7.8 Heads in length!

1.1 TransPose Units Preferences



Changes the TransPose Units preferences to fit your needs, depending of your project:

- **Unit Scale**: Sets a scale factor to the current units. When calibrating the units it is advised to set this slider to 1 first.
- **Set Units**: Click on this button to enter your units. As it is virtual units, enter any text you want: cms, inches, heads, light years, clicks, rocks, etc. Press Enter to validate your unit.
- **Minor Ticks Per Units slider**: This is the number of small graduations between the Major ones, like millimeters marks between centimeters or 8ths of an inch.
- **Major Ticks Per Units slider**: This is the number of main ticks in the action line, like the half inch marks on a ruler.
- **Calibration Distance slider**: Display the distance of the action line, from one extremity to the other. Change this value to calibrate the action line.

1.2 Calibrate TransPose

The steps below will calibrate TransPose to suit your needs:

1. Switch to TransPose by clicking on Move, Scale or Rotate while in Edit mode.
2. Move the ends of the TransPose line to define the beginning and end what will be the unit length.
3. Open the Preferences >> TransPose Units menu.
4. Change the Units Scale slider value to 1.
5. Click on set units and enter the unit name of your choice.
6. Change the Major Ticks Per Unit slider value to 1.
7. Change the Minor Ticks Per Unit slider to a value of your choice, like 2. The line will display a mark between each major tick.
8. Change the Calibration slider value to 1. This sets the current action line length to 1 unit length.

Now drag an end of the action line to increase its length. Notice that new tick marks will appear. Also, the total length will be displayed in the status bar.

2. Various changes and additions

- The action line can be moved while creating it by holding the spacebar. Release it to continue drawing the action line.
- While in Move or Scale (not Rotate) you can hold the Alt key before clicking on your 3D object. This will execute the operation directly without drawing the action line.
- When in Move mode you can change the model's Z depth. Do this by holding the Alt key, clicking on the mesh and releasing Alt before you start to drag the cursor. Dragging back and forth will now change the depth.
- When drawing the action line, tap the CTRL/Command key once to launch the Move, Scale or Rotate operation. When using Rotate or Scale, the center of the operation (scale center or rotation pivot) will be located on the part of the action line that is opposite from your cursor.

XI GOZ

GoZ (for GoZBrush) is a dynamic bridge between ZBrush and other 3D packages. It is built around a specific file format: the .GoZ file. With a single click, you can send your 3D mesh from ZBrush to one of the supported applications. In the process, GoZ also sends your maps and sets up the necessary shader networks for rendering. You can also edit your geometry or add an element to your model as needed, then send everything back to ZBrush – again, with a single click!

GoZ even works with multiple SubTools, whether they are visible or not.

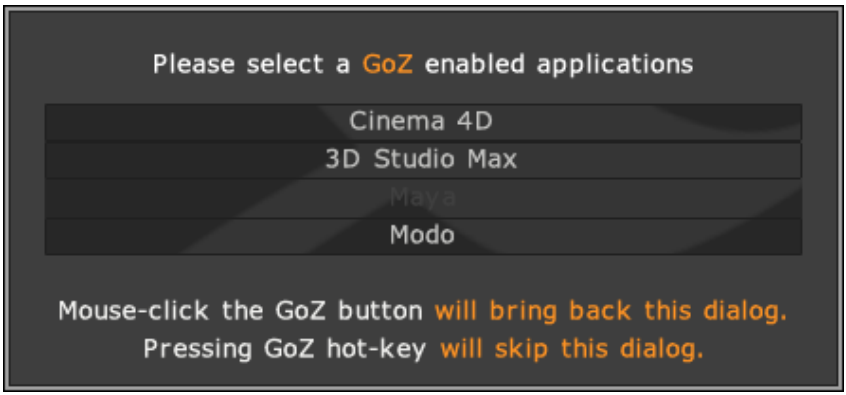
Thanks to GoZ, you devote more of your precious time to working on your model, rather than micro-managing file transfers between applications.

GoZ currently supports:

- *Autodesk 3DSMax 2009, 2010 and 2011 (Windows)*
- *Autodesk Maya 2009, 2010 and 2011 (Windows and Mac OS X)*
- *Luxology modo 401 SP2 and (Windows and Mac OS X)*
- *Maxon Cinema 4D R11 and above (Windows and Mac OS X)*

Additional applications will be added in the future, so we invite you to pay regular visits to gozbrush.com, ZBrushCentral.com or our ZBlog for more information. You can also sign up for news by email or RSS feed at support.pixologic.com.

GoZ's communication system is open for 3rd party developers to integrate GoZ into their own applications, with the help of our SDK. If you wish to support GoZ, please contact us at gozsdk@pixologic.com.



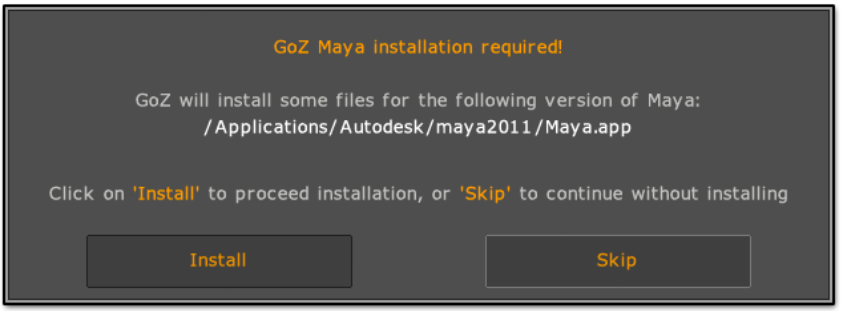
The GoZ application selector. In this example, Autodesk Maya isn't installed.

1. Installing GoZ on Windows and Mac OSX

GoZ installation is split into two parts:

- A set of files which are installed by default in your computer's shared folder.
- Several sets of files, each specific to one of the supported target 3D applications.

The ZBrush installer will install the first set of files in the shared folder. The second set of files is then installed by ZBrush itself. When you first launch GoZ from within ZBrush it will search your computer for any supported applications and will then install the files needed to make the bridge. During this installation stage, ZBrush will ask for permission to install the files and your OS may prompt for an administrator authorization and/or password. Please approve any requested prompts in order to have a successful installation.



GoZ will not be available in your other applications until after you have run it from within ZBrush the first time.

At any time, if you need to reinstall GoZ add a new supported application, you can go to Preferences >> GoZ within ZBrush and click on "Update all Paths" to perform a new application search and full GoZ installation. Alternatively, you can click on "Path to xxx application" and then navigate to the GoZ-enabled application of your choice.

During the application search and install process, you may be prompted to choose the version that you wish to use. You might also be asked to manually browse to select the application file.

1.1 Extra installation steps for Cinema4D:

- Launch Cinema4D, open the "Script Manager" (menu "Window:Script Manager"), and select the script "GoZBrushFromCinema4D.csc"
- Drag and drop the GoZ icon where you want in the interface (for example in the toolbar just under the menu).
- Save the current layout as your startup layout (menu "Window:Layout:Save as Startup Layout") and exit Cinema4D.

1.2 The GoZ Commands Set

GoZ commands are located at the top of the Tool palette, split into several functions:

- **GoZ**: send the current Tool or the selected SubTool to the application of your choice.
- **All**: Send all SubTools of the selected Tool to the application of your choice, whether they are visible or not.
- **Visible**: Send only the visible SubTools of the selected Tool to the application of your choice.
- **Reset (R)**: Reset the current GoZ application selected in ZBrush. On the next press on GoZ, All or Visible, the application selection box will prompt you to choose a new application (see below).

2. Choosing an application to communicate with

When you first click one of the GoZ buttons located in the Tool palette, ZBrush will search for supporting applications and install the needed files. Please refer to the GoZ installation chapter for more information. A window will then ask you to choose between the detected applications.

This application will be kept in memory by ZBrush and will be used each time you click on one of the GoZ buttons (GoZ, All and Visible).

If you need to change the target application, simply press the R button. This will reinitialize GoZ. When you next click on one of the GoZ buttons you will again be prompted with the application selection box.

3. GoZ Workflow

The GoZ workflow is quite easy and you will see how your productivity can be drastically increased by allowing you to edit the topology of your models in the software of your choice or set up a quick render. With a single click, your model appears in other software – complete with any maps that you have created for it -- ready to be rendered.

You are free to edit your topology by adding loops or extrusions, changing the silhouette if needed. When you go back to ZBrush via the other application's GoZ button, your sculpt will be updated and all high resolution details will transfer to the new version. You can now regenerate the maps if needed or continue work before eventually sending everything back for a new render. Your other application becomes a full partner with ZBrush!

GoZ works with the current SubTool, all of a model's Subtools, or only the visible SubTools. This allows great liberty for modifications without the need to waste time manipulating temporary files, imports and exports.

When creating new 3D objects in the 3D software, the imported object can be created as a new Tool, or as a SubTool of the active Tool. This behavior is determined by the "Import as SubTool" preference, located in Preferences >> GoZ.

An important extra point to consider about GoZ and the selected software: You can change the target application at any time. This means that you can always do operations in the external software that you find best suited to your needs. For example, you can use GoZ to send your work to a 3D modeler during the sculpting process and later use GoZ to do UV creation in a different package before finally using GoZ to send everything for rendering in a 3rd software. Because GoZ is an open file format, more applications will be added in the future. This means ever expanding workflow possibilities for you!

To proceed with GoZ, follow these simple steps:

In ZBrush:

- Create any Diffuse, Displacement and/or Normal maps, leaving them applied to their specific SubTools. (There is no need to Clone them to the other palettes for export.)
- Depending of your needs, click on the Tool palette's GoZ, All or Visible button to respectively send the selected Tool or SubTool, all the SubTools of the current Tool, or just the visible SubTools of the current Tool.
- On the first click, GoZ will present you with a pop-up window that asks which software to work with. Click on the application of your choice.
- If the application of your choice is not running, GoZ will launch it and your model will appear. If the target application is already open, your model will automatically appear in it.

In the target application:

- Do your topology operations or renders, depending of your needs.
- If you want to send your model back to ZBrush, click on the GoZ icon available in the interface or the GoZ command located in a menu. The location of this icon or command will depend on each application.

Note:

If you wish to send multiple objects at the same time, select them first. GoZ will always send back the active selection.

Back in ZBrush:

- After few seconds, your updated model will appear in ZBrush.
- If you changed the topology, a message window will ask whether to reproject the sculpting details or not. Choose the operation which corresponds to your needs.
- You are now back to the first step and free to continue working in ZBrush like normal.
- You can redo all these steps as often as you need, sending your work to any supported target application. Remember that if you wish to change to use a different target application you must click the Reset (R) button.

3.1 GoZ for mesh addition and the projection of details

One of the most powerful features of GoZ is to allow you to send your model in another 3D software to edit your topology or even add props, then bring it back to ZBrush again. This can dramatically streamline your pipeline.

To edit your topology, just press the appropriate GoZ button. ZBrush will go to the lowest level of subdivision of your model and send it to your application of choice.

It is advised to mainly refine topology by adding loops and minor extrusions to refine your shape. You should as much as possible avoid major additions like converting a sphere from ZBrush to a teapot in your other application. Upon sending back your model back to ZBrush, a message will ask you if you want to transfer the existing sculpting information to your updated model or simply replace it and delete the existing sculpting. If you have made major changes to the model and choose to transfer details, you may receive unexpected results..

When applying geometry extrusion from external applications the Project All Dist Slider will be used to project the geometry difference. By default this slider is set to 1. This slider will have to be adjusted from Subtool to Subtool.

Every Subtool will not have the same distance range. If the projection is not exact follow these steps to locate the Perfect Project All Distance (Dist):

1. Undo the last projection.
2. Change your Dist in the Project All section to a new level.
3. Tab back to your external application.
4. Click the GoZ back to ZBrush again.
5. When the questions pops up again that asks if you would like ZBrush to project the difference into the sculpted mesh, click Yes.
6. If you still do not get your desired result complete steps 1-5 until you find the correct range for your Subtool.

Notes:

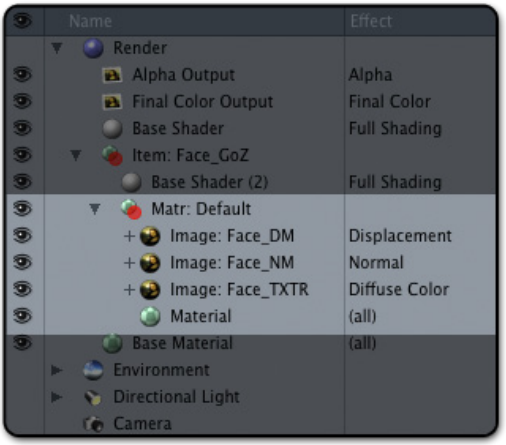
Best Results are found when the Project All Dist is 0.01 - 0.09, however this will vary from Subtool to Subtool

The projection of details can be time consuming and requires a large amount of memory.

The Projection may alter the quality of the sculpting somewhat. For best results, try to minimize the projections by not making unnecessary transfers between applications.

3.2 GoZ for the rendering

When you SubTools have displacement maps, normal maps and/or diffuse maps assigned to them, sending your model to another application the first time with GoZ will automatically create a new shader. This shader which will include all the information needed to do a render with appropriate settings such as displacement intensity value or normal map directions. You need only to add few lights, tweak the shader and your model is ready to be rendered.



The Shader tree in modo, with the shader and the corresponding maps: diffuse, normal map and displacement map.

A shader will only be created if there is at least one map selected in the Tool palette's

Displacement Map, Texture Map or Normal Map menu. GoZ won't automatically create these maps for you. If you want to export your model with maps, you must do the following before using GoZ:

- At the lowest subdivision level, create UVs or import UVs (through GoZ or manually).
- Choose the size of your texture in the Tool >> UV Map menu.
- Create your diffuse, normal map or displacement map in the Tool palette menu of the same name. GoZ will only send the displacement, normal and/or diffuse map(s) if the map(s) are in the small preview thumbnail of the associated sub-palette.
- Once all necessary maps are applied to the desired SubTools you can send your model through GoZ to the application of your choice for rendering.

If you add new maps or regenerate existing ones after the creation of the shader, GoZ will try to automatically update them in the previously created shader. Wherever possible, it will try not to affect any edits that you've made to the shader's settings.

Note about 3DSMax :

3DSMax creates a Shell shader, which will let you choose a real-time shader and a rendering shader. The real-time shader is based on a DirectX Shader, to have the normal map displayed in the viewport while you work.

3.3 GoZ for base mesh creation

If you need to create your 3D base mesh in another application, you can send your ZBrush model to that application for use as a template to create new models and even props.

Once your model is done, select it (along with any props that you've created) and send it back to ZBrush through GoZ. Depending upon the Preferences >> GoZ >> Import as SubTool setting, your model will be created as a new Tool or added to the currently selected Tool as a new SubTool.

3.4 Working with several Tools and SubTools

GoZ is able to work with several Tools or SubTools at the same time, sharing them between different target applications. The only important thing to consider is ensure that each object has a unique name. As the models are sent between several applications, this is the only way to keep track of all your edits and changes.

GoZ can work with:

- Different Tools which contain no SubTools.

- SubTools which are in different Tools.
- All the SubTools of a Tool, visible or not.
- A new 3D model imported from another application as a new Tool or as a new SubTool.

When doing all your GoZ operations, ZBrush will be able to automatically select the corresponding Tool or SubTool or the corresponding mesh in the target applications.

4. GoZ RESTRICTIONS

As explained in the Working with Several Tools and SubTools section, the main restriction of GoZ is to have unique Tool or SubTool names, including between all the loaded Tools. If you have two loaded Tools of different names which each have a SubTool named "Polymesh3D_1", it is possible that the wrong model's "Polymesh3D_1" SubTool could be edited when bringing work back into ZBrush.

Additionally, GoZ only works with Polymesh objects. If you want to use GoZ with an Adaptive Skin preview, an Unified Skin preview, a 3D Primitive or a ZSpheres skeleton, you must first convert them Polymesh 3D objects.

5. GoZ PREFERENCES

The GoZ Preference menu -- located in the Preferences palette -- includes several utilities which are important to be familiar with:

- **Import as SubTool:** When enabled, this option will make all new 3D models imported via GoZ a SubTool of the active Tool. If it is disabled, all the new 3D models will be imported as a new Tool.
- **Clear cache files**: GoZ uses temporary files and maps, which are located in your Users/Public/Pixologic folder (or similar, depending upon operating system). These temporary files are not automatically deleted. From time to time you should clear all cache files to remove unnecessary temporary files and free up room on your hard

drive.

- **Force Reinstall**: by clicking this utility, ZBrush will reinstall all GoZ files for the target application of your choice so that it can support GoZ.
- **Update all Path**: By clicking on this utility, ZBrush will search for all GoZ-enabled applications located in your default applications folders: C:\Program files(x86) and c:\ Program files (or similar) on Windows and Applications on Mac OS X. For each application found, ZBrush will display a dialog box which will let you choose between the different versions found. Also, in case ZBrush can't find the application (most often because it's not located in the usual application folders), you can browse your hard drive and select it manually. After choosing the application, ZBrush will install the necessary files in the Target application and may ask you for the administrator password.
- **Path to...**: Different applications are listed, depending on the installed GoZ-enabled applications. Once a new GoZ-enabled application has been added, a new Path to "name of the new application" will appear. Click on it to do the same operation as Update all Path action, but only for the application corresponding to the button you pressed. This step is useful if you installed a new version of the target application or reinstall that application.

6. GoZ with non-supported applications

GOZ is an automatic system which uses several functions of ZBrush that were introduced in ZBrush 3.2 for Mac OSX and ZBrush 3.5 for Windows. These functions have mainly to do with topology editing.

If you need to edit your topology in a non-supported application, do the following steps:

- Go to the lowest level of subdivision.
- Export your model as an OBJ file.
- Import it in the application of your choice.
- Do your topology edits or UV modifications.
- Export your model as an OBJ file.
- Switch back to ZBrush. With the original Tool still selected at its lowest subdivision level, click Tool >> Import and load the modified OBJ file.
- If you changed the topology, ZBrush will prompt you to project the details or not. Choose yes if you want to transfer your original sculpting to the new topology. Choose no if you wish to discard your original sculpting.

7. SDK

A GoZ SDK is available on request by email to gozsdk@pixologic.com. With this SDK, any developer will be able to integrate GoZ into their application very easily. Please contact us with any GoZ development questions, as well as to let us know when support has been completed!

8. GoZ in the future

Thanks to its public SDK, several new applications will be added in the future, expanding the abilities of GoZ. Please, visit the http://www.GoZBrush.com webpage on a regular basis, the ZBlog at http://www.pixologic.com/blog or ZBrushCentral.com to discover the new applications. You can also be sent GoZ news by RSS feed or email announcement: simply subscribe to one of the news options at http://support.pixologic.com.

9. Thanks!

The Pixologic team would like to thanks Norman Schaar who created GoMax, the first community GoZ project around 3DSMax, with the help of Björn Albihn, Till Maginot and Mark Hancock, who inspired us for some 3DSMax interesting functions to implement in GoZ!

You can visit the GoMax project thread: http://www.zbrushcentral.com/showthread.php?t=81506 and its creators websites:

- Norman: www.norman3d.com
- Björn Albihn: www.albihn.net
- Till Maginot: www.blog.maginot.eu
- Mark Hancock

ZBrush Artist - Maarten Verhoeven

XII SPOTLIGHT

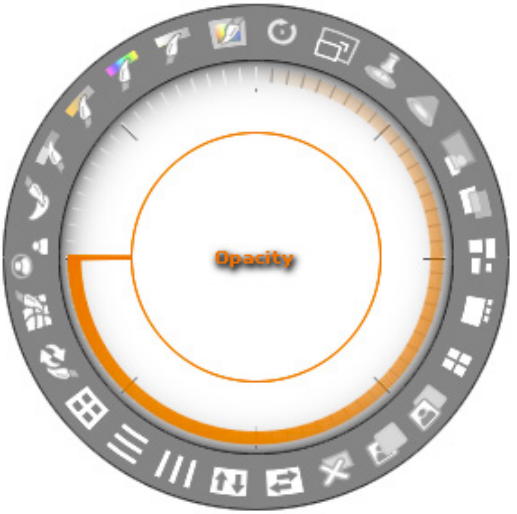
SpotLight is a new projection texturing system which allows you to prepare your source texture directly in ZBrush, then paint your model with it in 3D. It is similar in some ways to the ZBrush Stencil feature.

You first need to load your textures using the Texture palette or Light Box. You can then use SpotLight to change their scale, rotation and position; nudge them to match any sculpt; clone parts of the texture; fill colors; change the hue to match another texture's hue and more.

There is a tremendous amount of functionality packed in a simple interface. Your painting productivity will increase more than you can imagine!

1. SpotLight Widget

When clicking on a texture loaded in SpotLight, this texture will have a red outline to indicate that SpotLight will operate on this texture. SpotLight is constructed around a widget which is not only used as a manipulator, but also serves as a selector for 2D features like Hue, Clone, Smudge and many more.



The SpotLight widget can be manipulated in different ways:

- Click on a texture or in the document to position the widget on your cursor click position.
- Click and drag between the orange circle and the outer ring of the widget to move

the texture and the widget in unison. This will maintain the position of the widget relative to the texture, which can be useful for some operations.

- Click on a function icon located in the widget to activate or deactivate that feature. Some 2D functions use a click and drag operation which is initiated by clicking on the feature's icon.

For some of these features (like rotation and scale), the center of SpotLight acts as a pivot point. Manipulate the SpotLight widget to set this pivot point by clicking on the desired center point.

2. Working with SpotLight: the basic

SpotLight workflow is very simple. It will be your knowledge of its various features that will let you unleash your painting abilities.

ZBrush Artist - Dave Wolf

1. Load a Project or a ZTL file.
2. SpotLight is based on PolyPaint technology, so make sure that your model has enough polygons to support the resolution of what you wish to paint. (Divide the model if you need more polygons.) You don't need to have UVs and a Diffuse texture to use SpotLight.
3. In the Texture palette, load or import a source texture with which you will paint on the model.
4. Also in the Texture palette, click on the Add to SpotLight button. Your texture will be displayed as an overlay on the document and the SpotLight widget will appear. An alternative is to double click on a texture of your choice in Light Box.
5. Using the SpotLight widget, manipulate your texture as desired, using the controls

described below. Basically, the SpotLight wheel includes several features which can be enabled by clicking on them or by doing click and drag of them. As an example, if you want to rotate your texture, move the SpotLight widget by clicking a point on the texture to define a rotation pivot point, then click and drag on SpotLight's rotation icon to rotate your texture around the selected point.

6. You can toggle SpotLight on and off by clicking the Turn On SpotLight button, located in the Texture palette or by using the shortcut Shift+Z

7. To enter Paint mode so that you can begin painting, press Z on your keyboard. Pressing Z again will bring SpotLight back, allowing you to edit the texture some more.

8. When the SpotLight widget is visible you can load new textures as described in steps 3 and 4 above. You can also switch between loaded textures by clicking on any of the textures in the SpotLight overlay on the ZBrush Document. The active texture will have a red outline to show that it's ready to be modified using the SpotLight widget.

9. When you have finished painting, turn off SpotLight in the Texture palette or press Shift+Z.

To learn more about SpotLight functions and features, please, read the sections below.

3. Organizing and Working with multiple textures

You can open as many textures as you need in SpotLight. This lets you combine textures in many different ways before painting them onto your model.

Click on any texture to select it for manipulation.

Clicking in the empty space outside the textures to select them all. This will allow you to manipulate all the textures at once.

Multiple textures loaded at the same time. Selected textures have a red outline.

4. Saving / restoring SpotLight

Whatever textures you have loaded into SpotLight can be saved as a separate file. The main purpose of this is to keep your best textures available for future production. You can create texture sets, such as for skin, walls, concrete and more.

At any time, you can load your previously saved SpotLight set, which will replace the current one.

For this purpose, you can find the Save SpotLight and Load SpotLight buttons in the Texture palette.

5. SpotLight Functions

The SpotLight ring contains a variety of functions to edit and change the selected texture. Several of these functions offer multiple possibilities. The functions can be combined together to let you customize your textures on the fly before projecting them.

5.1 Lock

When lock is on you may control all of the images that have been loaded into SpotLight as a group. This will for example allow you to scale, move and rotate all of the images at the same time. You can turn lock on and off by simply pressing the lock icon in the SpotLight dial.

Note

You can also temporarily group your SpotLight images by clicking on an empty area of the canvas. This temporary grouping will allow you to move, scale, rotate, flip, and tile all of your images at the same time.

5.2 Rotate

You can click on and drag the rotate icon in both a clockwise and counter-clockwise direction in order to rotate an image. By holding the Shift key while rotating you can snap your rotation to the notches seen on the inner part of the SpotLight dial.

5.3 Scale

You can click on and drag the scale icon in both a clockwise and counterclockwise direction in order to scale an image. By default, the width and height will remain proportional. Using Scale while holding the CTRL key will scale the image non-proportionally.

5.4 Spot Radius

Spot looks very much like the circular light you might see a flash light make when shined on a wall. When in paint mode the spot will allow you to see a certain portion of the image(s) your cursor is currently over.

- By default the Spot radius is set to 0, which means when you enter paint mode you will see all the images you currently have loaded in SpotLight.
- You can click on and drag the Spot radius icon in a clockwise direction in order to increase the size of the SpotLight radius. By dragging in a counterclockwise direction you can decrease the radius of the Spot back to 0.
- The Spot radius does not control the amount of the image you paint and sculpt on a model. Those continue to be controlled by your Draw Size, RGB Intensity, and Z Intensity. SpotLight simply gives you a preview of what part of an image you are about to paint and sculpt with.

Keep in mind that if you increase your Draw Size to be larger than the Spot radius, the Spot radius will automatically increase to the size of your brush.

5.5 Spot Pin

Spot Pin allows you to choose and constrain what part of an image you want to use at the start of your stroke. The portion that will be used is located under the center of the SpotLight dial. To put it simply, if you were to place your dial over the eye on a face photograph, you could paint that eye over and over again in different locations of your model.

5.6 Opacity

You can click on and drag the opacity icon in both a clockwise and counterclockwise direction in order to increase or decrease the opacity of all of images loaded within SpotLight.

Note

The amount of opacity applied to your images will not affect how much of the image is painted and/or sculpted onto your model. This is instead controlled by the RGB Intensity and Z Intensity

sliders. To reduce an image's effect relative to the Intensity settings, use the Fade feature instead.

5.7 Fade

In SpotLight you can layer images on top of one another in order to mix and blend the images as you paint and/or sculpt them onto your model. Fade will control how much influence a specific image will have in a stack of images.

By default, images in SpotLight have their Fade value set at 100% which means that no fading has been applied. By decreasing the Fade amount you will see an image start to dim. This means if it is placed on top of another image it will blend with the image below as you paint and or sculpt.

You can click on and drag the Fade icon in both a clockwise and counterclockwise direction in order to increase or decrease the amount of fading an image has applied to it.

5.8 Tile Proportional

Clicking on the Tile Proportional will tile the textures on the left side of the document space, based on the pixel size of each texture. The largest pixel texture will be identified by being at the top of the tile and will also be visually larger.

When a texture is selected the actual pixel size will appear in the top left of the ZBrush Interface.

5.9 Tile Selected

Clicking on the Tile Selected will keep the selected image large but tile all other textures below the selected texture at a smaller size.

5.10 Tile Unified

Clicking on the Tile Unified will tile all textures to the same size and position them on the left of the document space.

5.11 Front

By clicking on the Front icon you will bring the active image to the front of all the other images loaded into SpotLight.

5.12 Back

By clicking on the Back icon you will send the active image to the back of all the other images loaded into SpotLight.

5.13 Delete

By clicking the Delete icon you will remove the active image from the SpotLight interface.

Note

Because the active image has been deleted the SpotLight dial will now control the movement, rotation, and scale of all the remaining images as a group until a new active image is specified.

5.14 Flip H

By clicking the Flip H icon you will flip the active image horizontally.

Note:

By clicking on an empty area in the canvas you can temporarily group all of the images loaded in SpotLight and flip them together.

5.15 Flip V

By clicking the Flip V icon you will flip the active image vertically.

Note

By clicking on an empty area in the canvas you can temporarily group all of the images loaded in SpotLight and flip them together.

5.16 Tile H

You can click on and drag the Tile H icon in both a clockwise and counterclockwise direction in order to tile the active image horizontally. If you hold the Shift key while dragging you will tile your image both horizontally and vertically at the same time.

Note:

By clicking on an empty area in the canvas you can temporarily group all of the images loaded in SpotLight and tile them together.

5.17 Tile V

You can click on and drag the Tile V icon in both a clockwise and counterclockwise direction in order to tile an image vertically. If you hold the Shift key while dragging you will tile your image both vertically and horizontally at the same time.

Note

By clicking on an empty area in the canvas you can temporarily group all of the images you have loaded in SpotLight and tile them together.

5.18 Grid

A checker pattern or grid lines can be used for measurements, alignment and proportion.

You can click on and drag the grid icon in a clockwise direction in order to apply a checker pattern to your image. You can click on and drag the grid icon in a counterclockwise direction in order to apply grid lines to your image.

The color of your grid or checker pattern is determined by ZBrush's currently selected main color, as specified by the Color palette. Additionally, by choosing pure black for your grid or checker pattern you will make the lines and/or squares fully transparent.

Grid lines and a checker pattern can be applied to an image at the same time by first clicking on and dragging the grid icon in a clockwise direction to apply the checker pattern. Then click on and drag the grid icon once more in a counterclockwise direction to apply grid lines on top of the checker pattern.

The Grid and or Checker pattern can be cleared by clicking on and dragging the Restore icon in a Clockwise direction. (See Restore, below)

5.19 Restore

Within SpotLight you have ability to apply many effects to your images like, clone, smudge, saturation, hue, intensity, color and fill. These effects are non-destructive and the original image can be restored at any time.

- You can restore an entire active image back to its original state by clicking on and dragging the Restore icon in a clockwise direction.

- You can also use Restore as a brush and paint the areas of the image you want to restore back to the original state. Simply click on the Restore icon in the SpotLight dial to activate the Restore brush. The amount of Restore strength that is painted can be controlled by adjusting the RGB Intensity slider.
- You can replace the original state of an image with the edited version by first holding the Alt key, then clicking on and dragging the Restore icon in a clockwise direction. Please note that this will permanently replace the original state of your image with the current edited version.

While the Restore brush is selected you will be in brush mode. At this point you can click and paint on any image loaded within SpotLight to begin restoring them back to their original state.

While in brush mode you will not be able to move the SpotLight dial around by clicking on an image. Instead you will need to click and drag within the orange circle at the center of the SpotLight dial in order to move the dial around the canvas.

To exit this brush mode, click on the Restore icon once more.

Restore will not undo any Nudging done to the texture. See Nudge below.

5.20 Nudge

The Nudge brush will allow you stretch, distort and move portions of images loaded within SpotLight. To activate the Nudge brush, click on the Nudge icon in the SpotLight dial. The strength of the Nudge brush is determined by the Z Intensity slider. While using the Nudge brush you can hold the Shift key to smooth back areas that have been nudged.

- While the Nudge brush is active you have 4 levels of nudge resolution you can work with. To move up to a higher nudge resolution level press the "D" key. To move to a lower nudge resolution level press shift+D.
- At higher nudge resolution levels you will have finer control over how you nudge an image, while at lower nudge resolution levels, smoothing with the Shift key will have a great effect.
- You can also reset an active image back to its original state before any distortion has been applied by clicking on and dragging the Nudge icon in a clockwise direction.
- While the Nudge brush is selected you will be in brush mode. At this point you can click and nudge portions of any image loaded within SpotLight.
- While in brush mode you will not be able to move the SpotLight dial around by clicking on an image. Instead you will need to click and drag within the orange circle at the center of the SpotLight dial in order to move the dial around the canvas.

To exit this brush mode, click on the Nudge icon once more.

Any Nudge can be undone by clicking CTRL+Z. The Restore function will not undo

any nudge. Restore the image back to original state by clicking on the Nudge Icon and dragging in a clockwise motion.

5.21 Clone

The Clone brush allows you to clone parts of an image onto its self or onto any other images you have loaded in SpotLight.

- To activate the Clone brush click on the Clone icon in the SpotLight dial.
- The strength of the Clone brush is affected by the RGB Intensity slider. The center of the source area that will be cloned from is located underneath the orange circle within the SpotLight dial.
- While the Clone brush is selected you can click and paint on any image loaded within SpotLight to begin cloning from the source location. To clone another texture onto any other image in SpotLight click on the image you wish to edit, click on the Clone Icon, use the orange circle to move the SpotLight dial over the other texture that you wish to clone from (Do not click on the other texture as this would select it), then move the brush back to the texture you wish to edit and paint.

You can restore part of your image that you have cloned to with the Restore brush. (See Restore brush)

While in brush mode you will not be able to move the SpotLight dial around by clicking on an image. Instead you will need to click and drag within the orange circle at the center of the SpotLight dial in order to move the dial around the canvas.

To exit this brush mode, click on the Clone icon once more.

5.22 Smudge

The Smudge brush allows you to smudge portions of the images you have loaded in SpotLight.

- To activate the Smudge brush click on the Smudge icon in the SpotLight dial.
- The strength of the Smudge brush is affected by the RGB Intensity slider.
- While the Smudge brush is selected you will be in brush mode. At this point you can click and paint on any images loaded within SpotLight to begin smudging them.

You can also use the smudge brush to blur an entire image, all at once.

To blur an image, first make sure that the orange circle at the center of the SpotLight dial is located over the correct image.

To create a box blur, click on and drag the Smudge icon in a clockwise direction the complete length of the SpotLight dial.

To create more of a radial blur, click on and drag the Smudge icon in a clockwise di-

rection for only a small portion of the SpotLight dial before releasing. Repeat this process several times until you have achieved the desired amount of blur.

You can restore parts of your smudged or blurred images by using the Restore brush. (See Restore brush)

While in brush mode you will not be able to move the SpotLight dial around by clicking on an image. Instead you will need to click and drag within the orange circle at the center of the SpotLight dial in order to move the dial around the canvas.

To exit this brush mode, click on the Smudge icon once more.

5.23 Contrast

TThe Contrast brush allows you to adjust the contrast of the images you have loaded in SpotLight.

- To activate the Contrast brush click on the Contrast icon in the SpotLight dial.
- The strength of the Contrast brush is affected by the RGB Intensity slider.
- While the Contrast brush is selected you will be in brush mode. At this point you can click and paint on any image loaded within SpotLight to begin changing the contrast.
- You can hold the Alt key while using the Contrast brush to reduce contrast in an image.

You can also use the Contrast brush to increase or decreased the Contrast of an entire image, all at once.

- To do so, first select the image you want to adjust contrast for by making sure the orange circle in the center of the SpotLight dial is located over the correct image.
- To increase the contrast for an entire image, click on and drag the Contrast icon in a clockwise direction.
- To decrease contrast for an entire image, click on and drag the Contrast icon in a counterclockwise direction.

You can restore parts of your image that you have increased or decreased contrast for by using the Restore brush. (See Restore brush).

While in brush mode you will not be able to move the SpotLight dial around by clicking on an image. Instead you will need to click and drag within the orange circle at the center of the SpotLight dial in order to move the dial around the canvas.

To exit this brush mode, click on the Contrast icon once more.

5.24 Saturation

The Saturation brush allows you to add or remove saturation from parts of the images you have loaded in SpotLight.

- To activate the Saturation brush click on the Saturation icon in the SpotLight dial. The strength of the Saturation brush is affected by the RGB Intensity slider.
- While the Saturation brush is selected you will be in brush mode. At this point you can click and paint on any image loaded within SpotLight to begin adding more saturation.
- Hold the Alt key while using the Saturation brush to take away saturation from an image.

You can also use the Saturation brush to add or take away saturation from an entire image, all at once.

- First select the image you want to add or remove saturation from by making sure the orange circle in the center of the SpotLight dial is located over the correct image.
- To add saturation to an entire image, click on and drag the Saturation icon in a clockwise direction.
- To remove saturation from an image click on and drag the Saturation icon in a counterclockwise direction.

You can restore part of the images that you have added to or removed saturation from by using the Restore brush. (See Restore brush)

While in brush mode you will not be able to move the SpotLight dial around by clicking on an image. Instead you will need to click and drag within the orange circle at the center of the SpotLight dial in order to move the dial around the canvas.

To exit this brush mode, click on the Saturation icon once more.

5.25 Hue

The Hue brush allows you to change the hue on parts of the images you have loaded in SpotLight.

- To activate the Hue brush click on the Hue icon in the SpotLight dial.
- The strength of the saturation brush is affected by the RGB Intensity slider.
- While the Hue brush is selected you will be in brush mode. At this point you can click and paint on any image loaded with in SpotLight to begin changing its hue.
- To change the Hue to an entire image click on and drag the Hue icon in a clockwise direction.

You can Restore part of your image that you have added or removed Hue from by using the Restore brush (See Restore brush)

While in brush mode you will not be able to move the SpotLight dial around by clicking on an image. Instead you will need to click and drag within the orange circle at the center of the SpotLight dial in order to move the dial around the canvas.

To exit this brush mode, click on the Saturation icon once more.

5.26 Intensity

The Intensity brush allows you to change the intensity on parts of the images you have loaded in SpotLight.

- To activate the Intensity brush click on the Intensity icon in the SpotLight dial.
- The strength of the Intensity brush is affected by the RGB Intensity slider.
- While the Intensity brush is selected you will be in brush mode. At this point you can click and paint on any image loaded within SpotLight to begin adding Intensity.
- You can hold the Alt key while using the Intensity brush to take away intensity from an image. (Note that when the intensity of a part of your image is lowered to the point of pure black that portion will become transparent.)

You can also use the Intensity brush to increase or decreased the intensity of an entire image, all at once.

- To do so, first select the image you want to add or remove Intensity from by making sure the orange circle in the center of the SpotLight dial is located over the correct image.
- To increase the intensity for an entire image, click on and drag the Intensity icon in a clockwise direction.
- To remove intensity from an entire image, click on and drag the Intensity icon in a counterclockwise direction.
- When the intensity of an entire image reaches pure black the image will become completely transparent.

You can restore parts of your image that you have increased or decreased intensity for by using the Restore brush. (See Restore brush).

While in brush mode you will not be able to move the SpotLight dial around by clicking on an image. Instead you will need to click and drag within the orange circle at the center of the SpotLight dial in order to move the dial around the canvas.

To exit this brush mode, click on the Intensity icon once more.

5.27 Paint

The Paint brush allows you to paint strokes of color, fill a portion of an image, or fill the entire image with a selected color.

- To activate the Paint brush, click on the Paint icon in the SpotLight dial.
- Painting a stroke of color: While the Paint brush is selected you are now in brush mode. At this point you can click and paint on any of the images loaded within SpotLight. The color that you will be painting with will be the main color as set by the Color palette. While painting, you can press the Alt key to switch to the secondary color as set by the Color palette.
- The strength of the color that is painted is affected by the RGB Intensity slider.

- Filling the entire image with color: You can fill an entire image with either the main color or the secondary color all at once.
- To fill the entire image, first select the image you want to fill by making sure the orange circle in the center of the SpotLight dial is located over the correct image.
- Now to fill an image with the main color click on and drag the paint icon in the clockwise direction.
- To fill an image with the secondary color, click on and drag the paint icon in a counterclockwise direction.

5.28 Fill portions of an image

When the Paint brush is selected you can fill a portion of and image with the main color. This is done by first holding Ctrl key and clicking on and dragging on the portion of the image where you want the fill to start. As you continue to drag away from the starting point, the main color will begin to fill the image. You can continue this drag and fill action until the color has filled the area of the image you want.

During this drag and fill process the color may spill into an area of the image you do not want it to, in which case you can reverse the direction of the drag and start to move back to the starting point. By dragging back to the start position you will see the color start to recede back from the area you were filling.

Upon releasing the mouse button, the fill will stop. You can then repeat this drag and fill in other areas of the image with any color you like.

Based on the image that you are trying to fill you may not be able to fill the area you want with a single stroke. Images that are more complex may require several short drag and fill actions to completely fill the area you want.

There are several variables that effect how a color will fill across your image:

- **Borders**: A border in an image can be any major area of change. For example in a picture with a red balloon set against the backdrop of a blue sky, the edge where the

balloon ends and the sky begins would be a strong border, which the color fill action will attempt to respect.

- **Sample area**: The size of your brush when beginning the drag and fill action will determine how intensely borders in your image are respected. The larger the brush, the less borders will be respected, while a small Draw Size will pay more attention to the borders in your image.
- **Drag distance**: As you drag across an image you are increasing the sample area. As the sample area is increased, what is considered a border will decrease. This means that the farther you drag, the more color will spill into other areas of you image.

Because of these variables it is a good idea to start your drag and fill actions near clear and distinct borders.

While executing the drag and fill action you can hold Shift to slightly contract around the perimeter of the area that is being filled. This can be used to more precisely control how you fill an area. It can also be repeated with another color inside the first filled color in order to create a small outline.

After you have filled an area of an image with a color you can replace that filled area with any color you want. First place the orange circle at the center of the SpotLight dial over the filled color you want to replace. Then while holding the CTRL key, click on and drag the Paint icon in a clockwise direction to replace the filled color with the Color palette's selected main color. By rotating in a counterclockwise direction you will replace the filled color with the Color palette's secondary color.

You can make any part of an image transparent by painting or filling it with pure black. Note that even though transparent parts of images will not have any effect on your model, the transparent area has not been deleted from the image. You can simply fill that transparent area with a color to bring it out of transparency.

You can Restore any part of your image that you has been painted on by using the Restore brush. (See Restore brush)

While in brush mode you will not be able to move the SpotLight dial around by clicking on an image. Instead you will need to click and drag within the orange circle at the center of the SpotLight dial in order to move the dial around the canvas.

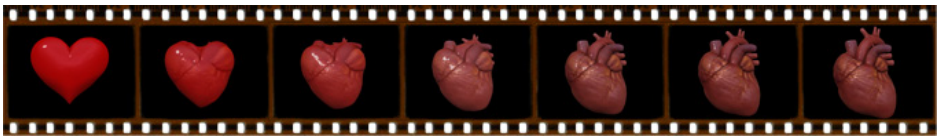
To exit this brush mode, click on the paint icon once more.

XIII TIMELINE

In addition to its sculpting and painting features, ZBrush 4 adds a large number of animation features to its toolset. Rather than attempting to provide a full animation system, these new functions have been added to bring more power to the sculpting and painting processes. One of the main purposes is to allow you to create better presentations of your 3D models or work with more accuracy on your Morphs and Blend Shapes by being able to animate them.

The Timeline will allow you to save different points of view while sculpting, to save the position on the area you are currently working on and then switching very easily to a global point of view to have an overall look before going back to your area of sculpting.

The Timeline feature lets you animate several elements, from the camera position to 3D layers, ZSpheres and more.



ZBrush Artist - Dave Wolf

1. Enabling the Timeline: basic Key framing and Timeline options

Before working on an animation or just storing information through key frames, you must enable the Timeline. To do so, go to the Movie Palette and in the Timeline menu click on the Show button. The Timeline will appear at the top of your Document.

Now that the Timeline is displayed, discover its main elements:

Two lines which have the same width of the document, one with graduation and another one above it without. The one with graduation receives key frame manipulation points and can zoom in and out while the other one always displays the animation's whole Timeline.

On the left, the name of the active track is displayed.

Under the Timeline, you can find the time cursor (scrubber), which will let you move forward and backward in time and which displays the number and time of the current frame.

To create a new key frame, simply click anywhere on the Timeline. The time cursor will automatically be placed at this position.

If you want to remove a key frame, click on it and drag it outside of the Timeline before release the mouse button.

You can also click and drag a key in the Timeline to change its time position, making the event come sooner or later within your animation.
Click and drag the time cursor to preview your animation.

Please, read the next chapters for additional control over your animation.

The Timeline includes several options and controls, located in the Movie >> Timeline menu:

- **Load**: Load a previously saved Timeline.
- **Save**: Save the current Timeline. It can be useful when working with different iterations of an animation by avoiding the need to save extra data like all the 3D models.

Note:

When saving a Project (see the project chapter), the Timeline is also saved.

- **Show**: Show or hide the Timeline on the top of the Document.

Note:

This option state is saved in a Project file.

- **Export Name** (save as MDD): When clicking on this button, a system window will appear for saving an MDD file. This file saves all the vertex animation information that was created by recording a movie. MDD files can be edited in other 3D software (some packages require a plugin) and can also be reloaded by ZBrush in a new 3D layer to play the saved animation as a loop.
- **Go Previous & Next**: Press these buttons to move from one key to another. You can also skip to the beginning or the end of the Timeline by double-clicking one of these two buttons.

Hotkey: Arrow left and right.

- **Timeline Magnification slider**: Sets the amount of magnification of the Timeline when a selected key is clicked.
- **Auto mode**: When enabled, this mode will automatically set the optimum value for the magnification of the Timeline and won't use the Timeline magnification slider value (see above).
- **Load Audio**: When pressing this button, a system dialog box will open, asking you to select an audio file. The mp3, aiff, sd2, amr, aac, 3gp m4a and wave file formats are supported.

The length of the Timeline will be resized to the length to the audio track.
Please refer to the Set/Remove audio beats section for more information.

- **Remove Audio**: removes the existing audio track.
- **Duration Slider**: Use this slider to define the length of your animation in seconds. If an audio file is loaded, the Timeline Duration value will be set to the length of your audio track.

2. Playing and saving an animation

At any time, you can play your animation by pressing Shift and clicking on the time cursor. Based on the complexity of the scene, ZBrush will do its best to display all frames but will skip frames if necessary.

The animation will loop until you stop it by clicking on an element of the Timeline or in the Document.

Note:

To preview all movie frames you must do the record action (see below), which will always play all frames of the animation without skipping any.

3. Navigation in the track

The Timeline has several controls to help you in navigating it to achieve accurate control when creating your animation:

- Press Shift and move your mouse cursor over either end of the track to pan the Timeline.
- Click on a selected key to magnify the Timeline. Click again on a selected key to zoom out. The magnification factor is defined by the Timline Magnification slider located in the Movie >> Timeline menu.

4. Working with Animation Tracks

When creating your animation, ZBrush will automatically select the Timeline track corresponding to your action: if you are manipulating a layer setting, the Layer track corresponding to the active layer will be enabled. Whenever empty space in the canvas is clicked the track will be switched to Camera.

If you want to manually select the track of your choice, go in the Movie >> Timeline Tracks menu. In the Edit section, click on the track you want to choose. ZBrush will display this track's content, letting you edit it as needed. Please read the Different Tracks of ZBrush chapter for more information on these tracks and their purpose.

ZBrush can only work with one active track at a time. When selecting a new track, the previous track's contents are displayed as light grey dots. This lets you see where the key frames of the previous track are located.

The animation keys can be selected or not: The selected key is always plain orange in color while the unselected keys are represented by an outlined orange circle.

Several animation controls are available, allowing you to create advanced animations:

4.1 Creating keys

To create a new key, click in an empty part of the Timeline. The new key will be represented by an orange circle at the location of your click.

4.2 Selecting a single Key

To select a key, simply click on it. The outlined orange circle will switch to a plain orange one.

4.3 Deleting keys

To delete a key or a selection of multiple keys, move the selected key off the track with a simple click and drag.

4.4 Multiple selections

To select multiple keys, click on the first key to select it. With Shift pressed, click on any other keys to select them. It is only possible to select the keys which are adjacent to the current selection.

To select a range of keys, select the first one, hold Shift and select the last one. All the keys between these two selected keys will be selected as well.

4.5 Moving Keys

To move keys, first select the keys to move, then click and drag one of the keys along the Timeline track. Moving keys can work with a single key or a selection of multiple keys.

4.6 Duplicate Keys

To duplicate a key or several keys, you must first select it/them. Move the Time cursor to the location you want to copy the key(s), then hold the Shift key and click in the Timeline. A confirmation message will ask you for approval. Validate to create the copy of the selected keys.

4.7 Replace Key information

To replace the content of a key frame (like a new position for the camera), first set your new position then press CTRL+Shift and click on the key frame of your choice. The previous information will be deleted and replaced by the new data.

4.8 Cut your animation

To create a cut in your animation, you can insert a specific Cut key which will, when played, stop all animation in the selected track until the next key frame is reached. This allows you to set a new behavior for your animation without the need for external video editing software.

To create a Cut key, first create your animation by using standard keys. Then if you

need to do a cut, press Ctrl/Command Key and click on the key of your choice. Its appearance will change from a circle to a square.

When your animation is played and the time cursor reaches this cut key, the animated actions will stop until the time cursor reaches the next key. Depending of the number of frames before the next key, you can create long pauses or short ones.

4.9 Add Ease In and Ease Out

To create an Ease In and Ease Out in the Timeline, you will need to create a key frame between two existing Key frames. Ctrl+click on the new key frame to turn that into a circular arrow icon. Add another key frame between this new circular key frame and the next key frame. Ctrl+click on this new key frame so that you will have four key frames total with the first and last keys solid orange and the two keys in between being circular.

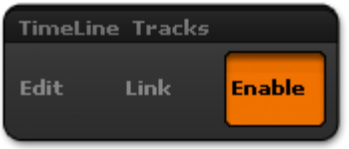
Moving the first circular key frame closer to the solid key frame will create a slower ease in and the second circular key frame distance from the fourth key frame will control the ease out. The further you have the second circular key frame from the fourth key frame, the faster the ease out will be.

Note:

If you only create one circular key frame between two solid key frames then ZBrush will automatically use the location of the circular key frame as the end of the ease in and beginning of the ease out.

5. Enabling / disabling tracks

To select and work on a track of your choice, go in the Movie >> Timeline Tracks menu and while in Edit mode, activate the desired track. If you wish to protect a certain track from editing, you can temporarily disable it by going in the Enable section of the Timeline Tracks menu and disabling the track(s) of your choice.



6. Linking Tracks

Timeline tracks are linked together to be on the Camera Track. By default ZBrush has Tool and Subtool linked to the Camera Track.

In this way, you can organize and work on several elements at the same time in one track. This is useful when you need to create simple animations which include different elements.

7. The different tracks of ZBrush

ZBrush automatically swaps from one track to another when the corresponding content is selected in ZBrush. For example, activating a layer will turn on and switch to the Layer track.

The Camera track is the default track. Some tracks may be disabled in the list of available tracks if the corresponding element doesn't exist.

7.1 Camera

This track is dedicated to animation of Move, Scale and/or Rotate of the selected Tool or SubTool, similar to a camera animation. Note that the Timeline does not create cameras; just like with sculpting, you are moving the scene element in front of the camera rather than moving the camera relative to the scene.

7.2 Color

This track is dedicated to animation of the color applied to the selected Tool or SubTool. Change the main color value in the Color palette and store it with key frames to create a color animation. PolyPaint can't be animated (although the visibility of PolyPainted layers can be using a Layer track). The Color track only works with Tools or SubTools that have not had PolyPaint applied to them.

7.3 Material

This track is dedicated to animation of the selection of Material. The material modifiers can't be animated. No transition between two MatCaps is possible. Material can be animated only through a transition type key frame.

7.4 Wireframes (Polyframe)

This track is dedicated to animation of the Polyframe of the selected Tool or SubTool, through its visibility and its settings located in the Preferences >> Draw menu.

7.5 Transparent

This track is dedicated to animation of the Transparency of the selected Tool or SubTool by toggling the Transparent mode and / or Ghost mode and the corresponding settings located in the Preferences >> Draw menu.

7.6 SubTool

This track is dedicated to animation of SubTool visibility, by clicking on the eye icon in the Tool >> Subtool menu.

7.7 ZSphere

This track is dedicated to the ZSphere animation of the Subdivision levels of the current Tool or SubTool as set by the Subdivision level slider located in the Tool >> Geometry menu.

7.8 Subdivision levels

This track is dedicated to animation of the Subdivision levels of the current Tool or SubTool by changing the Subdivision level slider located in the Tool >> Geometry menu.

7.9 Layers

This track is dedicated to the simultaneous animation of all 3D layers at once for the current Tool or SubTool, by changing their visibility and/or intensity. Changing the visibility is done by setting the intensity slider to 0 (hidden) or 1 (fully visible).

7.10 Layer

Different from the Layers track, each Layer track is dedicated to animation of the selected layer of the current Tool or SubTool. In other words, each layer of the 3D model can have its own animation track.

Changing the visibility is equivalent to setting the intensity slider to 0 (hidden) or 1 (fully visible).

Note:

Take the time to name your layers when creating them as the layer's title will be displayed in the Timeline, helping you to know which layer is currently animated.

7.11 Explode

This track is dedicated to animation of the Explode function and its Amount slider, both found in the Transform Palette.

Note:

Depending on the number of SubTools and the total polygon count, the Explode animation may not visible in real-time when playing an animation. It will normally only be fully visible with no dropped frames when recording the animation.

7.12 Contacts

This track is dedicated to animation of the Contact function and its settings, found in the Tool Palette. It allows you to change the contact information during your animation.

7.13 Background

This track is dedicated to animation of the canvas background settings, found in the Document palette. You can change the gradient range, center, rate and color settings.

7.14 Adjustments

This track is dedicated to animation of the document Adjustments settings which are available in the Render >> Adjustment menu.

7.15 Tool

This track is dedicated to animation of the loaded tools, like swapping from one tool to another during the animation.

7.16 Solo

This track is dedicated to animation of the Solo mode, temporarily isolating the current SubTool and hiding all other SubTools.

7.17 Perspective

This track is dedicated to animation of perspective mode and its settings, located in the Draw palette.

7.18 Floor

This track is dedicated to animation of the Floor settings.

The Floor can be hidden or shown by animating the Floor visibility mode. You can also animate adjustments to the Floor settings located in the Draw palette: Elevation, Grid Color, Opacity, Grid size, Tiles and Axis color order.

8. Working with Audio

While creating your ZBrush animation, you may need to work with an audio track. It can help create a better presentation, or can be used to synchronize your animation with your audio when working on lip-sync, checking morph targets/blend shapes and more.

ZBrush can recognize with these audio file formats: SD2, AMR, AAC, 3GP, AAC, M4A, AIFF and WAV.

When loading an audio file, the Timeline duration is automatically synchronized to correspond to the length of the audio track.

To add an audio file, do these simple steps:

- If the Timeline is not enabled, enabled it in the Movie >> Timeline menu by pressing the Show button.
- In this same palette, click on the Load Audio button. A system dialog box will ask you to select an audio file. Don't forget to first specify the desired audio format.
- When selected and validated, the audio track will be added to the Timeline

8.1 Working with Beats markers

When working with your animation and audio track, you can create audio beat marks in your Timeline which will help you visualize the important parts of your animation and ensure that your animation will be synchronized to the audio.

These marks can be created in any color, providing more flexibility in your marks creation. Colored beats are an excellent way to separate different parts of your audio.

To create audio beats:

- Use the Color palette to select the color of your choice for the markers.
- Start playing your animation by Shift+clicking on the Timeline cursor.
- While listening the audio, hold Ctrl and click in the Timeline to create an audio beat mark.

Note:

You don't need to put your cursor on the location of the marker. You only need to Ctrl+click anywhere within the Timeline when you hear a beat. The mark will automatically appear at the correct point along the Timeline that corresponds with the timing of your Ctrl+click.

You can remove the created Audio Beat markers by clicking on the Clear Beat button,

located in the Movie >> Tilmeline Tracks menu.

To the left of this button you have the Color Beat switch, which is turned on by default. Disable it to create Audio Beats markers without colors.

9. Record and Preview the final Animation

To record an animation, Press Ctrl and Shift at the same time and click on the Time cursor. ZBrush will play all animation frames, recording them as a movie stored in memory.

At any time, play the movie by clicking on the Play movie button, located at the top of the Movie palette.

When playing a movie, ZBrush will use post-process compositing to add the Overlay image and Title image according to the settings located in the Movie palette menus of the same name. You don't need to re-record the movie to change these settings. Instead, you can adjust them and then visualize the result by clicking on the Play Movie button.

You can mix your animation with the original way of creating movies in ZBrush 3. So Timeline animation can be combined with using the Turntable tools or just clicking the Record button in the Movie palette and manipulating the canvas freely.

If you wish to record a movie in Best Render or with BPR you will need to render first before Ctrl+Shift+clicking on the Time Cursor. Each frame will then be rendered until the animation is complete. Please keep in mind that depending on your settings, hardware and the complexity of the scene this can take quite a while.

10. Save and Export an animation

ZBrush lets you save and record a movie in its own format, the ZMovie (.zmv). You can open a previously created movie at any time, even if the Tools used to create this movie are not loaded.

After recording your animation you can also export it as a Quicktime movie. When pressing the Export button, located in the Movie palette, a system dialog box will prompt you to choose a filename. When done, a Quicktime dialog box will ask you for the compression codec and quality. After a few seconds or minutes for conversion, your animation will be exported, ready to be played on your computer or uploaded online.

ZBrush Artist - Marco Plouffe

XIV MATERIALS

There is a new menu in the Materials palette - the Shader Mixer. This provides options for changing how the different shader channels that make up a material interact. It is particularly useful if you want to change transparency or subsurface scattering effects. Each Shader channel can have its own settings within the Material >> Shader Mixer menu.

1. SHADER MIXER

TThe Shader Mixer settings are bound to a shader. When selecting a material or a MatCap, you can copy and paste its shader to another Material to create a new one or variations. The Shader Mixer settings are copied at the same time.

- **Fresnel**: Fresnel blending effect. Shader mixing is calculated based on the normals of the mesh. Higher values give a stronger effect.
- **F Exp**: The Fresnel exponent. Set this slider to adjust the falloff of the fresnel effect.
- **SSS**: Subsurface scattering strength. Shader mixing is based on the thickness of the mesh. Higher values give a stronger effect.
- **Front**: Subsurface scattering will be rendered for the front of the object.
- **S Exp**: The SSS exponent. Set this slider to adjust the falloff of the subsurface scattering effect.
- **BlendMode**: Click this button and select a blend mode from the list of options.
- **OnBlack**: Blending of each shader channel starts from black. When this button is off blending is cumulative.
- **MinOpacity**: Subsurface minimum opacity. Set this slider to adjust the minimum opacity for the subsurface scattering blend colors.
- **MaxOpacity**: Subsurface maximum opacity. Set this slider to adjust the maximum opacity for the subsurface scattering blend colors.
- **PreviewOpacity**: Adjust this slider to change the look of the material in Preview

render mode when adjusting the SSS parameters. Setting the slider to show the approximate effect of SSS can be useful when balancing with other materials and effects. This slider has no effect on a BPR or Best Render.

Note:

When working with materials you may find it useful to turn off the Preferences>Interface>One Open Subpalette button. This will mean you can have the Shader Mixer and Modifiers menus open at the same time. Alternatively, you can Shift+click on the specific menus you would like to stay open.

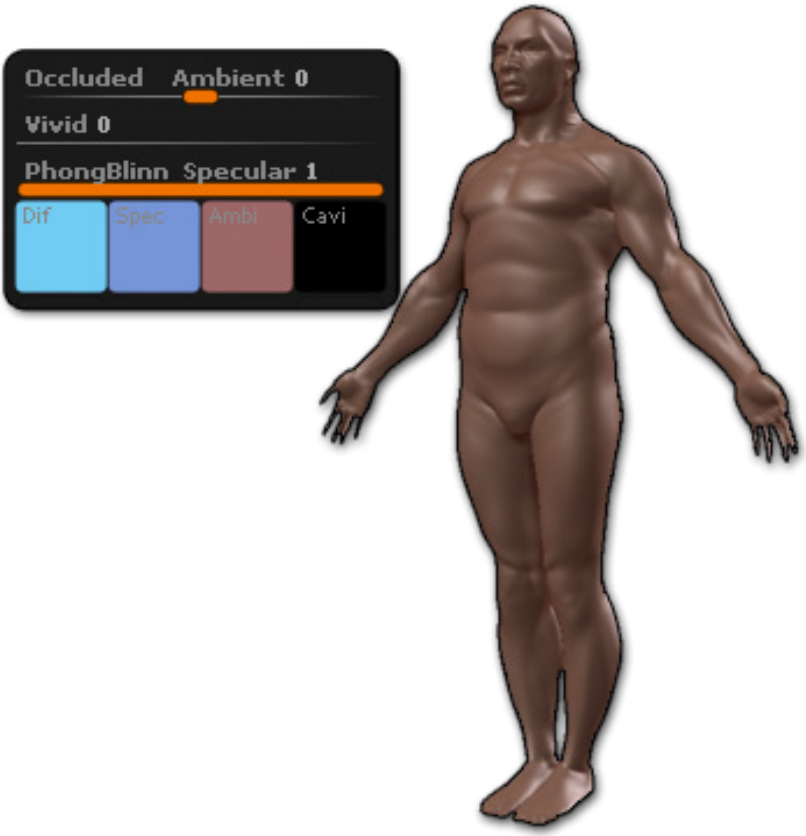
2. Light palette

Best Preview Rendering of shadows and subsurface scattering can be turned on or off for any light by pressing the Shadow or SSS buttons. Note that these options will only work for Sun-type lights.

3. Phong to Blinn specular

The default shaders now include a Phong to Blinn specular slider, which lets you change the type of specularity. At 0 you have full Phong specularity and at 100 you have full Blinn specularity.

Blinn specularity provides a more realistic specular effect for skin materials.



4. MatCap Blur and Overwrite color

Overwrite Color is new to all MatCap materials. The slider will overwrite any color change when a material has not been filled with any color. At 0, when the Main Color in the color picker is changed that color will be adjusted on all SubTools that do not have a fill color. When the slider is set to 1, no color will be changed when selecting any color in the Main Color picker.

The Blur slider will apply an overall blur to the whole MatCap.

5. Fast Overlay and Fresnel Overlay shaders

Two new materials have been added, mainly to be mixed with other materials to create complex shaders:

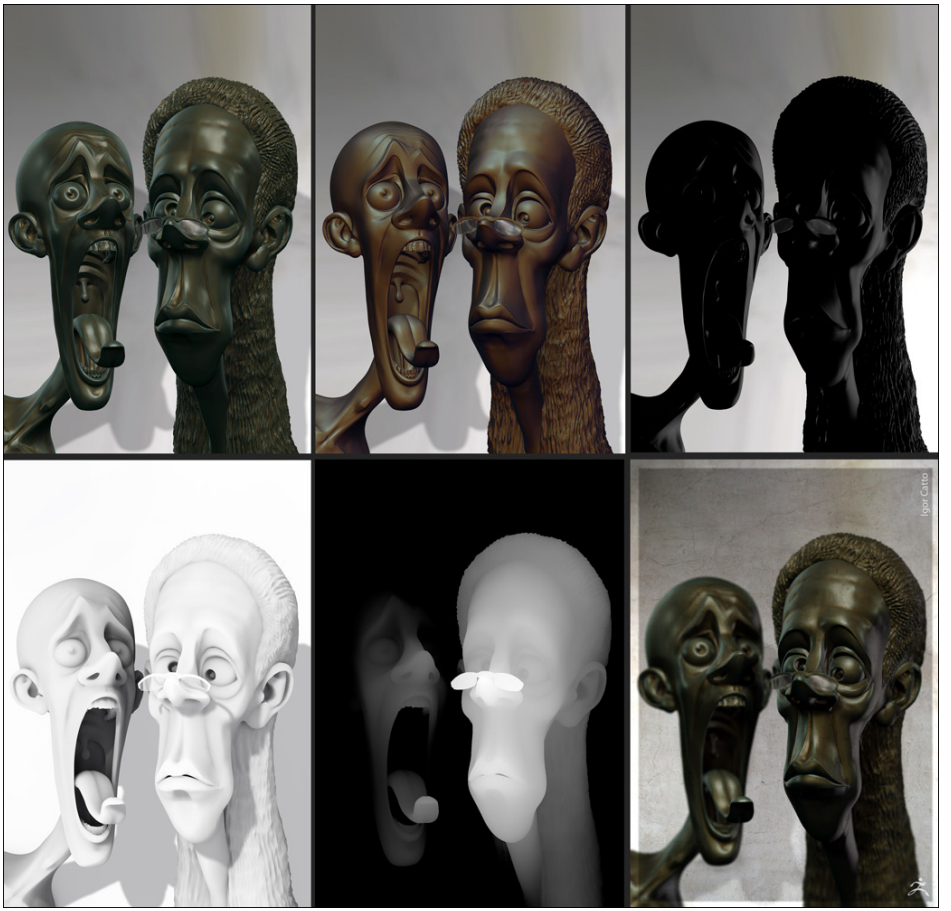
• **Fast Overlay**: This shader creates a simple overlay of color when mixed with other materials.

• **Fresnel Overlay**: This shader creates a radial gradient by using different colors and settings, resulting in a Fresnel effect.

XV BEST PREVIEW RENDER

The new Best Preview Render (or BPR) will render your model using high quality anti-aliasing at the full document size. Use of the AAHalf button is not necessary when using this rendering mode. BPR will render all SubTools, with polyframes displayed if that is activated and also provides several new render options including subsurface scattering and fibers effects.

The main BPR controls, including the BPR button, are at the top of the Render palette. The BPR button and SPix slider are also at the top right of the default UI.



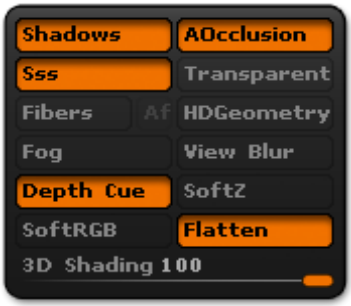
An example of multi-pass rendering using several MatCaps, ambient occlusion, shadows and depth. By Igor Catto.

1. Render Main options

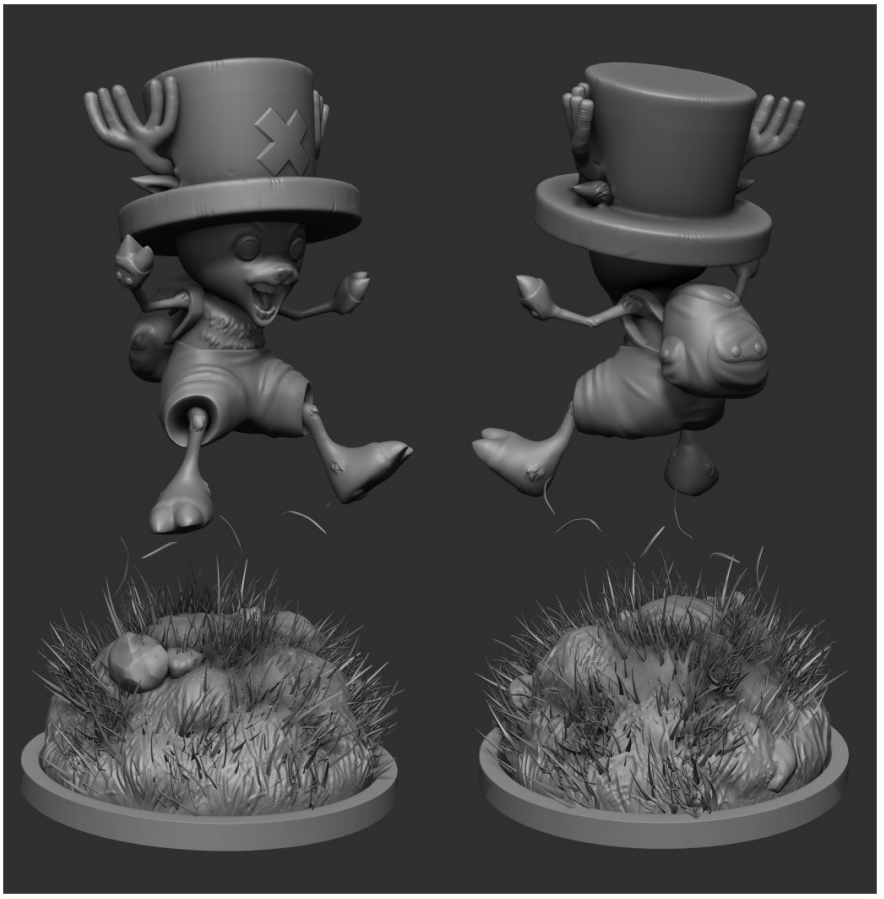
- **BPR button** (hotkey Shift+R) executes the render. The BPR only works for a model in Edit mode and no 2.5D effects are rendered. During the render BPR will clear any background pixols but these will reappear as soon as you click the canvas.
- **SPix** controls the quality of the anti-aliasing: The higher the value the better the quality but the longer it will take to render the image. Set the slider to 0 for no anti-aliasing and quickest render time - this is useful when trying out other effects.
- **VBlur** Radius controls the amount of View Blur: This is a temporary effect unrelated to BPR and does not show in exported images.
- **Create Maps**: Turn on this button to create various maps for compositing in an image editor such as Photoshop. After the BPR has finished, click an icon to export that map. For the Shadow and Ambient Occlusion maps the relevant option must be turned on lower down in the Render palette.
- **MGray**: This option instructs ZBrush to produce Shadow and AO maps at maximum grayscale range.

2. Render options panel

Activate a switch to include that option in the render. Not all options are available in BPR; for example, the Glow materials will only work correctly with the original Best Render. BPR will take account of Shadows, AOcclusion, Sss, Transparent, Fibers, HDGeometry and Depth Cue.



Below the render options panel are separate submenus for adjusting different BPR options. A submenu only becomes active when the relevant option is switched on.



A simple render with Ambient Occlusion, Shadows and Fibers enabled. Image by Satoshi Arakawa.

3. BPR Transparency

The BPR transparency menu includes all settings related to using transparency with the BPR. With BPR it is possible for a model to be seen through some of its SubTools. (In other words, for a model to be self-transparent.) For example, eyeglass lenses can be made transparent so that the character's face can be viewed through them. To specify which SubTools you wish to be transparent you must select the third icon (in the Tool >> SubTool list) for them.

- **Strength**: controls the Transparency effect by surface normals. A higher value will give greater transparency.
- **NFactor**: surface normals factor. This controls the falloff between transparent and opaque parts of the mesh due to normal direction. A setting of 0 means that all parts of the mesh will be transparent; a setting of 1 means that only normals directly facing the viewer will be transparent.
- **ByColor**: controls Transparency effect through color intensity. A higher value will give greater transparency.
- **CFactor** - color intensity factor: Higher values give greater distinction between colors. A setting of 0 gives no distinction between colors and with a ByColor setting of 1 the mesh will be completely transparent. A setting of 4 will give greatest variation with black areas fully transparent and white areas fully opaque.
- **Refract** - the amount of refraction: A setting of 0 gives no refraction effect, while a setting of 1 gives the greatest refraction.
- **RFactor** - refraction factor: Higher values give a more exaggerated refraction, effectively multiplying the setting of the Refract slider. Set to a high value for a magnifying lens effect.

4. BPR Shadow

The BPR shadow menu includes all settings related to rendering shadows when using the BPR. Shadows can be activated for individual lights - see the Lights section of the online documentation for more details.

- **Strength**: sets the shadow strength; higher values give a stronger shadow.
- **S Color**: sets the shadow color. Click on the button and select the desired color from the color chooser. Color is not included in the shadow map created when the Create Maps option is on.

- **Rays**: the number of rays used in the shadows calculation. A higher number will give softer shadows, depending on the Angle setting. Increasing the number of rays will increase render time.
- **Angle** - the maximum angle through which the rays are generated: Higher values give softer, less focused shadows. A setting of 360 with a high number of rays will give an effect close to ambient occlusion.
- **Res** - the shadow resolution in pixels: This figure is effectively the image size (independent of document size) that ZBrush uses internally to calculate the shadows. Lower settings will render more quickly while higher settings will give greater accuracy. Sometimes a lower value can give the desired result with less processing overhead - for example, when soft shadows are required.
- **Blur** - shadow blur radius in pixels: Higher values give softer, more blurred shadows. This is related to the Res slider and should be adjusted in tandem for the same effect. For example, if the Res slider value is changed from 500 to 1000, a Blur value of 4 should also be doubled to 8.
- **VDepth** - view depth offset in pixels: The shadow calculation is offset towards (with negative values) or away from (with positive values) the viewer. Negative settings can increase the intensity of the light and the shadows; positive values create more overall shadow.
- **LDepth** - light depth offset in pixels: The shadow calculation is offset towards (with negative values) or away from (with positive values) the light source. Negative settings can increase the intensity of the light and the shadows; positive values create more over all shadow.
- **Spd** - sub-pixel depth calculations: Gives greater shadow accuracy. Normally left on but turning off will speed up render times when experimenting.

5. BPR Ambient Occlusion (AO)

The BPR Ambient Occlusion (BPR Ao) menu includes all settings related to rendering ambient occlusion when using the BPR. Combined with the default shadows, it will give more depth to your model.

- **Strength**: Sets the strength of the ambient occlusion effect; higher values give a stronger effect.
- **Color** - Click to set the color of the ambient occlusion: Color is not included in the

AO map created when the Create Maps option is on.

- **Rays** - the number of rays used in the ambient occlusion calculation: A higher number will give softer AO, depending on the Angle setting. Increasing ray number will increase render time.
- **Angle**: Normally this should be left at 360 but reducing the value will narrow the AO effect in relation to light direction. A setting of 1 will only use the single light as the AO source.
- **Res** - the AO resolution in pixels: This figure is effectively the image size (independent of document size) that ZBrush uses internally to calculate the ambient occlusion. Lower settings will render more quickly while higher settings will give greater accuracy. Sometimes a lower value can give the desired result with less processing overhead - for example, when a weak AO effect is required.
- **Blur** - AO blur radius in pixels: Higher values give softer, more blurred ambient occlusion. This is related to the Res slider and should be adjusted in tandem for the same effect. For example, if the Res slider value is changed from 500 to 1000, a Blur value of 4 should also be doubled to 8.
- **VDepth** - view depth offset in pixels: The AO calculation is offset towards (with negative values) or away from (with positive values) the viewer.
- **LDepth** - lights depth offset in pixels: The AO calculation is offset towards (with negative values) or away from (with positive values) the light sources.
- **Spd** - sub-pixel depth calculations: Gives greater AO accuracy. Normally left on but turning off will speed up render times when experimenting.
- **Gamma** - ambient occlusion gamma: Gamma is similar to the brightness of the AO effect. Lower values will give a darker over all ambient occlusion, higher values will be lighter. A setting of 5 should work for most situations.

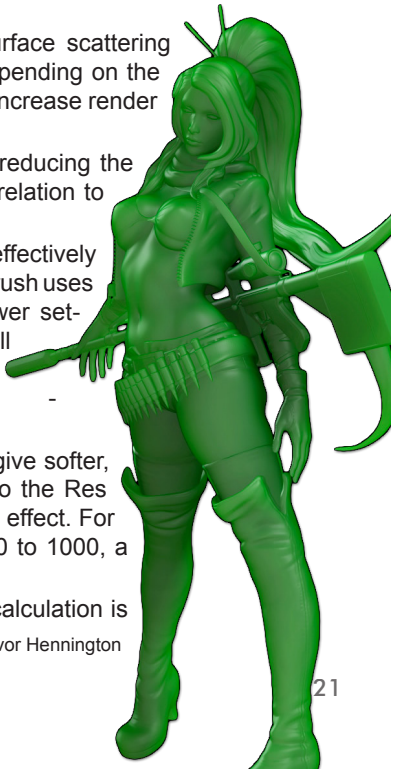
ZBrush Artist - Steve Warner

6. BPR Subsurface Scattering (SSS)

The BPR Subsurface Scattering (BPR Sss) menu includes all settings related to rendering Subsurface Scattering when using the BPR. This effect will simulate the light absorption visible in some material types: skin, milk, marble, special plastics and more.

Subsurface scattering (or SSS) can be activated for individual lights - see the Lights section for more details in the online documentation. SSS is also controlled through the material modifiers which provide color selection and adjustment of blend effects. See the Materials section for further details.

- **SSS Across Subtools**: all subtools are taken into consideration when calculating subsurface scattering. If this button is off, SSS is calculated as if each subtool is lit individually.
- **Rays** - the number of rays used in the subsurface scattering calculation: A higher number will give softer SSS, depending on the Angle setting. Increasing the number of rays will also increase render time.
- **Angle**: Normally this should be left at 360 but reducing the value will narrow the subsurface scattering effect in relation to light direction.
- **Res** - the SSS resolution in pixels: This figure is effectively the image size (independent of document size) that ZBrush uses internally to calculate the subsurface scattering. Lower settings will render more quickly while higher settings will give greater accuracy. Sometimes a lower value can give the desired result with less processing overhead - for example, when a weak SSS effect is required.
- **Blur** - SSS blur radius in pixels: Higher values give softer, more blurred subsurface scattering. This is related to the Res slider and should be adjusted in tandem for the same effect. For example, if the Res slider value is changed from 500 to 1000, a Blur value of 4 should also be doubled to 8.
- **VDepth** - view depth offset in pixels: The SSS calculation is



ZBrush Artist - Trevor Hennington

offset towards (with negative values) or away from (with positive values) the viewer.

- **LDepth** - lights depth offset in pixels: The SSS calculation is offset towards (with negative values) or away from (with positive values) the light sources. Settings towards the light source tend to create greater SSS, settings away from the light result in less SSS.
- **Spd** - sub-pixel depth calculations: Gives greater SSS accuracy. Normally left on but turning off will speed up render times when experimenting.

7. Depth cue

The BPR can include Depth Cue. Depth cue causes the image to be rendered with different blur levels at different depths. This can be used to simulate the effect of a lens that focuses sharply at only one depth, or atmospheric haze that causes distant objects to appear less distinct.

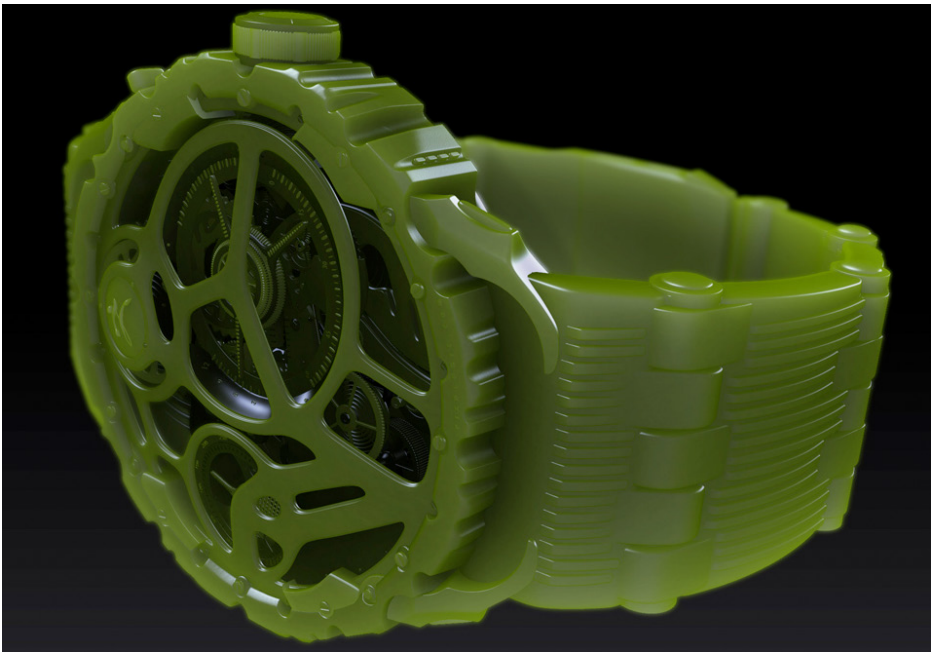
- **Depth Cue Alpha**: A texture can be selected to modify the depth cue effect. Click the Depth Cue Alpha patch to access the texture sub-palette and choose a texture. It will be converted to grayscale and stretched to fill the entire canvas area. The luminance of the alpha will determine the intensity of the depth cue at that location. White areas give the strongest depth cue effect, black areas give no effect. Useful for restricting the depth cue effect to a selected area of the canvas.
- **Intensity**: Sets the intensity of the blur at its farthest point.
- Softness: The number of pixels averaged to produce the blur. Higher numbers produce more blur.
- **Depth1**: Depth1 is the near point of the depth cue effect. There is no blurring at this distance. The blurring begins as depth increases. Type in the Z depth directly or click and drag from the slider to the canvas to set the value; pick an object at the depth where you want the depth cue to begin and release the mouse button.
- **Depth2**: Depth 2 is the far point of the depth cue effect. There is full blurring at this distance. Type in the Z depth directly or click and drag from the slider to the canvas to pick a depth.
- **Depth Cue Curve**: Adjust the curve to change the intensity of the depth cue between the near point (Depth1) and far point (Depth2).

Notes:

By setting a high depth cue intensity at each end of the curve and a low intensity at an intermediate point, you can achieve a "lens effect", where depths both in front of and behind the focal

plane of the virtual camera's lens are blurred.

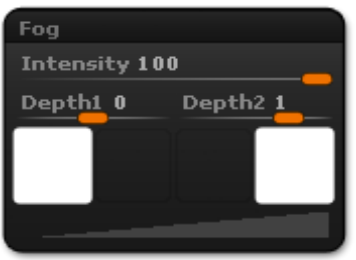
To preview the depth cue and find the best settings for the Depth1 and Depth2, activate the Fog and change its settings. When the fog looks like the depth cue you are looking for, copy its settings to the equivalent locations in the Depth cue menu.



An example of a SubSurface Scattering render, combined with Depth Cue

8. Fog

The BPR can include Fog. Fog allows the render to have a cloud fog effect over the entire image. The start and end points of the fog are controlled by the Depth1 and Depth2 sliders.



- **Intensity**: determines the overall strength of the fog effect.
- **Depth1**: determines the nearest distance along the Z-axis at which objects are displayed without fog. Between the Depth1 value and the Depth2 value, items are rendered with increasing fog applied. You can specify values in this slider or you can click on it and drag to the canvas to pick a depth value.
- **Depth2**: determines the furthest distance along the Z-axis beyond which all items are displayed with maximum fog applied. From the Depth1 value to the Depth2 value, items are rendered with increasing fog applied. You can specify values in this slider or you can click here and drag to the canvas to pick a depth value.
- **Fog Color 1**: selects the color of the fog at the Depth1 point and nearer. If a texture is chosen in the Fog Texture picker, this color is ignored.
- **Fog Color 2**: selects the color of the fog at the Depth2 point and beyond. If a texture is chosen in the Fog Texture picker, this color is ignored.
- **Fog Texture**: clicking this selector gives a pop-up of the Texture palette to select the texture which will be used to color the fog. This setting overrides the selections in the Fog Color 1 and Fog Color 2 pickers. To clear it, select 'Texture Off'.
- **Fog Alpha**: clicking this selector gives a pop-up to select a texture which will be converted to grayscale based on the texture's color intensity values and used to map the fog effect. Lighter areas define the places where the effect is strongest.

Fog Curve: defines the way in which the fog effect is applied along the Z-axis. By default, from the Depth1 value to the Depth2 value items are rendered with increasing fog applied. This curve defines the amount of fog at each point between the Depth1 and the Depth2 values.

ZBrush Artist - Christopher Brandstrom

XVI OTHER ZBRUSH 4 ADDITIONS

This section lists various additions or changes done in ZBrush 4 and not mentioned elsewhere in this document.

1. FILE MENU

The new File menu centralizes opening and saving for all the main ZBrush file types, as well as the new Project file type. With the exception of projects, this menu serves as an alternative to what already exists. If you are more comfortable with the original inventory button locations you can of course continue to use those.

1.1 PROJECTS

Saving a project will save everything that is open in ZBrush at the time of the save. When you reopen the project you will be able to continue working exactly where you left

off.

Projects are not listed separately in the File menu - simply Save or Open a project from the buttons at the top of the menu. The Revert button will reload the project as it was when you last saved, removing everything you have done since.

1.2 Other file Types

- **Canvas**: Save or Open a ZBrush canvas (Document) file. This is a 2.5D picture.
- **Tool Mesh**: Save or Load a 3D mesh.
- **SpotLight**: Save or Load a SpotLight image collection.
- **Texture**: Import or Export a full color image file.
- **Alpha**: Import or Export a grayscale image file.

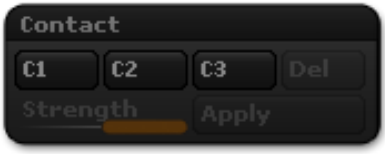
1.3 Fail-safe saving

Fail-safe saving means that a previous file is now only overwritten when ZBrush has successfully saved the file, thus avoiding file corruption through power outage, domestic accidents, out of memory errors and so on.

2. Tool palette

2.1 Contact

The new Contact feature lets you define contact points between two SubTools, so that if you pose one SubTool the second SubTool will follow along. This deformation is meant for static SubTools like the googles on the Demosoldier, a watch on a characters arm, or a baseball cap on the head of a character. For non-static SubTools such as conforming clothing you should use SubTool Master instead.



For best results, store three contact points between the SubTools. To do this:

1. Select Move mode so that the Transpose Action Line becomes available
2. Click and drag a line from the selected SubTool to the second SubTool
3. Click C1 in the Contact menu to store this first Contact
4. Draw a new line for the next Contact point and click C2 to store
5. Draw a third line and click C3 to store

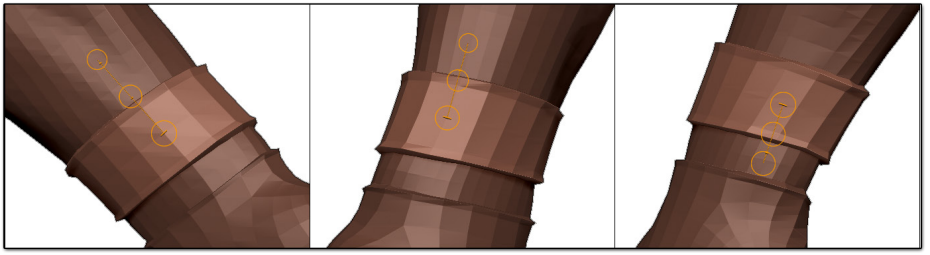
Try to place the three lines so that they are spaced equally around where the two SubTools meet. Think of the lines as forming the corners of an equilateral triangle.

- You can redraw a Contact if you want; simply store the point again.
- All Contacts can be removed by pressing **Delete**.

When you have set up the three points you can pose the selected SubTool. To apply the change:

- Select the second SubTool and click Apply - the SubTool will move to the new position relative to the posed SubTool.
- The Strength slider affects how much the second SubTool conforms. Normally leave this slider at 100%

Subtools will only Contact with children Subtools. Any Selected Subtool will only allow Contact points with all the Subtools above the Selected Subtool.



The Contact points defined on three different locations.

2.2 Contact and Timeline

When using Contact with the timeline and its dedicated Track, the conforming of the "contacted" SubTool will be animated and deformed corresponding to the animation of the main SubTool.

You don't need to apply contacts for each key frame. Just set the Contacts on your first key frame and the animation will take them into consideration for subsequent key frames.

3. UV Map palette

3.1 Morph UVs

Morph UV can be used with Shadow Box to lay out the Shadowbox so that you can mask on the flat surface. When Morph UV is clicked again your masking will generate a mesh where the masking on the three planes intersects within the box's volume.

Even though this will Flatten your mesh based on the UVs you cannot paint or sculpt on the mesh to create a texture or displacement map.

4. Deformation

The deformation are now updated in realtime, while changing the slider values.

4.1 Relax

This slider will relax the geometry of a mesh to its original state but maintain sculptural detail. The options are:

- Open Circle will apply a polish that will maintain the overall form of the tool.
- Closed Circle will apply a polish that will smooth out the tool without maintaining the volume.

4.2 Polish by polygroups

This slider will polish the surface based on the polygroups. All polygroup edges will be smoothed.

4.3 Inflat Balloon

This slider inflates the mesh as if it is being filled with air. The topology is respected so that the extremities are preserved as far as possible. (Imagine blowing up a surgical glove.)

Notes:

The Inflat Balloon, used with negative values create sharp edges on your object.

Try to use low values as it can create crossing polygons if high values are input.

5. Alpha palette

5.1 Non-square Alphas

The aspect ratio of rectangular alphas is now maintained.

5.2 Alpha repeat

Two new sliders provide alpha tiling within the alpha palette. Different values can be set for horizontal tiling and vertical tiling.

- H Tiles - sets the horizontal tiling
- V Tiles - sets the vertical tiling

Note:

When tiling alphas the original aspect ratio of the single alpha is maintained, so with unmatched horizontal and vertical settings the tiles will be stretched.

6. Other improvements:

- Improved Transpose masking to auto-align the depths of your start and end points. This helps with rotation actions.
- Partial subdivide will now auto-merge triangles to quads when the mesh does not have subdivision levels.
- ZSpheres bones: Move mode now uses forward kinematics (length-preserving-mode) by default when moving linking spheres. Hold Alt to disable fk and allow link stretching.
- Use of a Deformation slider on a ZSphere mesh now forces recalculation of the ZSpheres relative orientations and performs detection/validation of overlapping ZSpheres.
- ZSphere projection now uses a non-shrink algorithm.
- When entering ZSphere Topology Edit mode, ZBrush will automatically turn off Ghost transparency and perspective.
- To change a HotKey you must now hold CTRL+ALT.

XVII WHAT'S NEW IN ZBRUSH 3.5?

ZBrush 3.5 version served as an introduction to ZBrush 4, including the first steps of what has become ZBrush 4. Version 3.5 was also not available to Mac users, so they are not yet familiar with its features. For these reasons, the features added to ZBrush with version 3.5 are listed below:

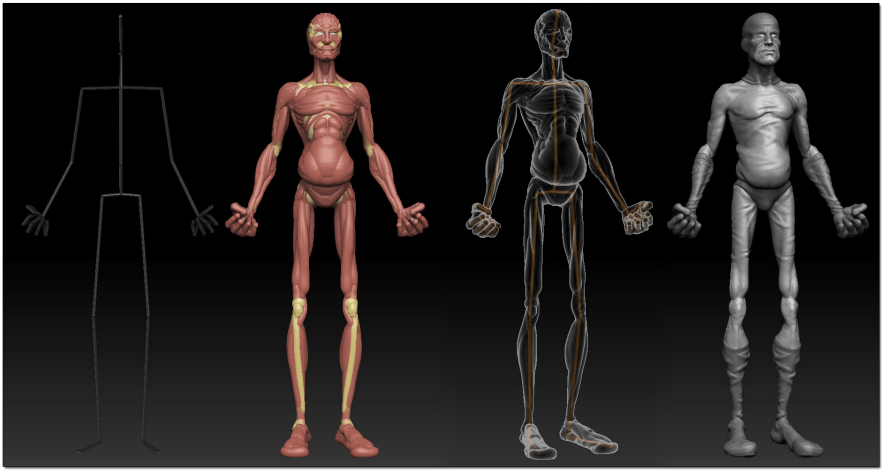
1. MAIN IMPROVEMENTS

ZBrush is continuously pushing the limits of what is possible in digital art. Version 3.5 continues this trend through key workflow enhancements. These enhancements allow you to work faster and have a seamless workflow more than ever before.

- New UI organization for some palettes (Example: Brush palette with a new organization of all brush modifiers under one palette).
- Increased Polygon count.
- Improved zoom into a single Point.
- Improved perspective with added visual grid.
- Enhanced Polypainting accuracy.
- 16 bits Masks and Polypainting from previously 8 Bits.
- Improved Project All functionality with Scan-Distance Control.
- More Vibrant "Deep Shadow" for real-time Preview.
- New Ghost transparency.
- Faster and more intelligent algorithms, resulting in a smoother sculpting feel.
- Displacement Mapping Enhancements, including support for 32-bit map creation.
- Normal Mapping Enhancements, including color flip options and other compatibility settings for use with other applications.
- Textures can be generated up to 8192x8192 pixels – over 67 million points of data.
- Posing a model using ZSphere rigging now supports ZSphere twisting/rotating.
- Several new ways to use pen pressure have been added to the Brush palette.
- Brushes accessible through "ABC" shortcuts.
- New licensing system, including support for RAID drives.
- Improved pen tablet sensitivity.

Additional improvements throughout many of ZBrush functions in order to accommodate the upcoming features of ZBrush 4.

2. Main new features



The power of ZSketch combined with the power of ZBrush brushes. Model by Ty. Shelton.

ZBrush 3.5 introduces several new key features to facilitate sculpting while still keeping the technical stuff out of sight. Like its predecessors, ZBrush 3.5 frees you to create.

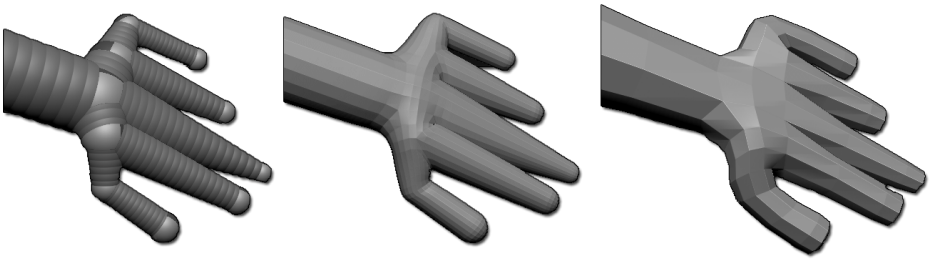
- ZSpheres II and ZSketch.
- Unified Skin now has subdivision levels.
- Surfaces Noise, Brush Noise, and Alpha Noise.
- Various new brush settings for all the brushes, including ZSketch: tilting, secondary brush curves, Depth Masking, Path correction, Direction sampling, and more, resulting of hundred of new brushes!
- QuickSketch to draw your ideas immediately.
- New Smoothing algorithm
- Remeshing ability to create a new skin over an existing model, including boolean operations (add, subtract, intersection), based on the improved Unified Skin.
- LightBox for browsing through your files. Short-cuts can be added into LightBox.
- Depth Masking to your brush.
- Cavity Blur and Cavity Curve to play with cavity masking like you could in ZMapper.
- New Polish, Trim and Planar brushes and improved Lazy Mouse with Backtrack and Snap to track modes.
- Increased Polygon count.
- Texture per SubTool.
- Displacement Map per SubTool.
- Geometry HD export as Displacement, Normal and/or Diffuse map.
- Creation of 32-bit Displacement Maps.

- PUVTiles, an enhanced version of GUVTiles/AUVTiles UV mapping.
- Masking by Ambient Occlusion (which can be saved as an Ambient Occlusion Map).
- Streamlined navigation with right mouse navigation, SubTool framing and one click SubTool selection process.
- ZSpheres editing in perspective mode.
- Several new Brushes: Noise, Move, Spherical, Slide, Form, Flakes, Crumple, etc.
- Equalize Surface Area.
- Polypainting gradient.
- Merge Visible SubTools.
- New MatCaps for ZSketch.
- New Groups Loops to create loops of polygons, based on the existing polygroups or based on the ZSketch strokes.
- Various Polygroups enhancements: autogroup based on UV islands, Polygroup from Polypainting.
- “Mirror And Weld” function to Geometry subpalette allow for X,Y,Z symmetry to create new complex models in fast way.
- Grow and Shrink visible polygons and outer ring visibility. Ideal for inflate deformation of rings.
- Alpha aperture to modify the Alphas stretching with your brushes.
- One click merging of SubTools with capabilities to weld points.
- Improved Project All functionality with Scan-Distance Control.
- New Polypaint from Polygroups.
- New Polypaint modes: Standard, Colorize, Multiply, Lighten and Darken.
- Import with detail reprojection: change your topology and keep your details.
- Maya Ascii file format, GoZ Binary files and Web3D file format added.
- Import with detail reprojection: change your topology and keep your details.
- Model checking after importing it with the new Mesh Integrity feature which will detect non supported topologies.
- Export Scale and Offset options.
- New Edge Looping Features

ZBrush Artist: Joel Mongeon

XVIII ZSPHERES II

With the new ZSpheres II, you will be able to create any form and shape with just a few ZSpheres. The new intersection computing will let you create multiple chains starting from a single ZSphere and the new Adaptive Skin algorithm will generate a polygonal skin over your ZSpheres with extreme accuracy.



On the left, the original ZSpheres. On the center, the new Adaptive Skin, on the right, the old one.

Several new options have been added to the ZSphere parameters, located in the Tool >> Adaptive Skin menu:

- Use Classic Skinning: This deactivates the new skinning algorithm and uses the original ZSphere skinning method.
- Use Classic Skinning: This is deactivate the new skinning algorithm and use the original ZSphere skinning method.
- G Radial: Define the number of edge loop between two ZSpheres
- Max Twist: Define the twist of the selected ZSphere, based on its parents.
- Proximity: Adjust the geometry where several ZSpheres intersect to create a more topology-friendly mesh.

Note:

G Radial is not like the Density slider. G Radial will increase just the number of edge loops while the Density slider will multiply by 4 the number of polygons of the Adaptive Skin. Increasing the G Radial slider will make the Adaptive Skin surface closer to the ZSphere shapes.

1. Changes between ZSpheres I and ZSpheres II

If you choose to use the new ZSpheres II skinning keep in mind that there are a few legacy features from earlier versions that will only work in the Classic Mode, such as:

- Create unconnected hierarchy of ZSpheres (ALT + Click in Draw mode on a link between two chains of ZSpheres).
- Create negative ZSpheres (Pushing a ZSphere inside another one).
- Create ZSpheres Magnets (ALT + Click in Draw mode on a link between a parent and the last ZSphere).

If you need to have these features back, please use the ZSpheres I skinning by clicking on Use Classic Skinning, located in Tool >> Adaptive Skin.

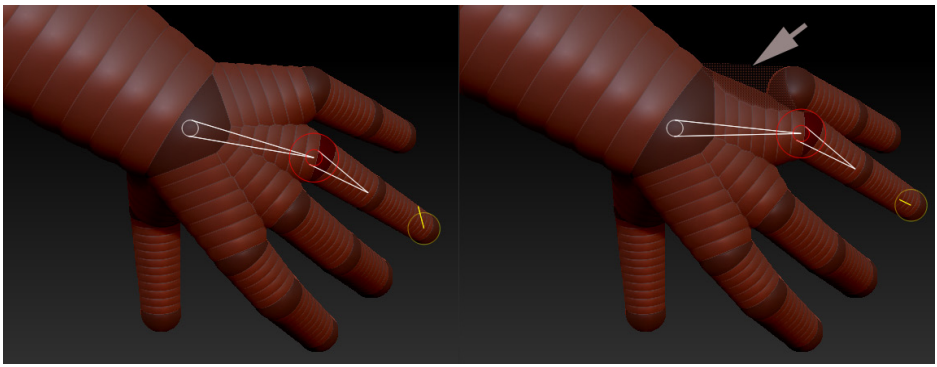
2. Preview of inconsistent structure

To prevent incoherence in your ZSpheres creation, ZBrush will display the link between the parent ZSphere and the new child ZSphere as transparent. If you leave your structure with this behavior, you may generate an Adaptive Skin with a topological error.

To correct this topology issue, please slightly move your ZSpheres until the link between two ZSpheres is correctly displayed.

With this new preview, you won't have any kind of surprises when generating your Adaptive Skin.

If you have created a ZSphere sculpt that can not be registered by the new ZSpheres II algorithm then ZBrush will always default to Classic Skin Mode. This would be on very rare occasions.



On the right, the original shape. On the right, the top ZSphere has been moved and the link is transparency, indicating the error.

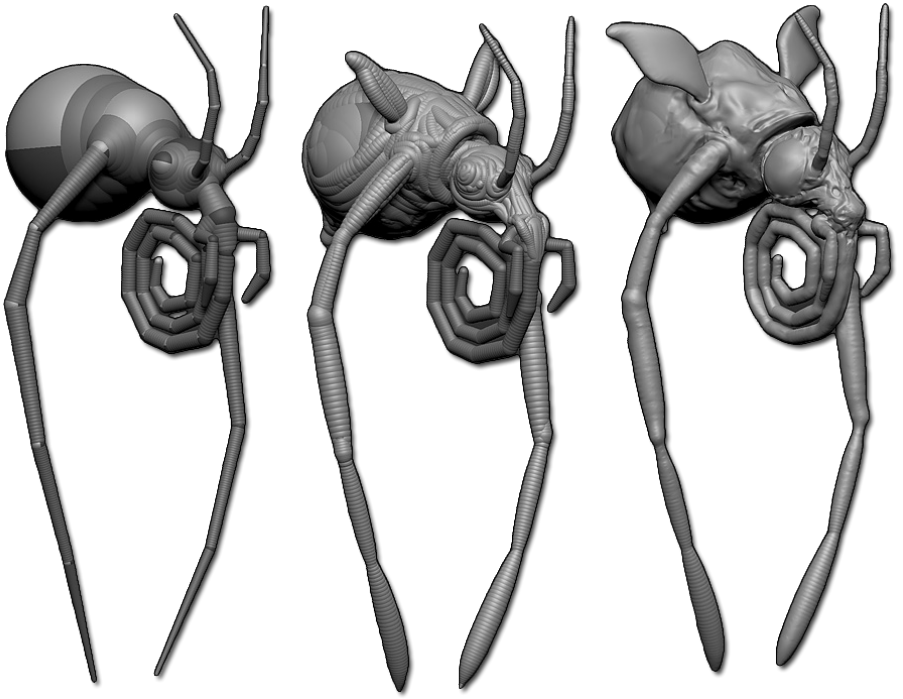
3. Improved Rigging and Skinning

Rigging has been improved in ZBrush 3.5 and will provide more expected results. To bind a polymesh:

1. Create a ZSphere skeleton that fits the model to be rigged.
2. In the Tool >> Rigging menu, click on the Select mesh button, and in the floating window, select the mesh to Rig.
3. Click on the Bind Mesh button to create the Skinning.
4. Your mesh is ready to be deformed.

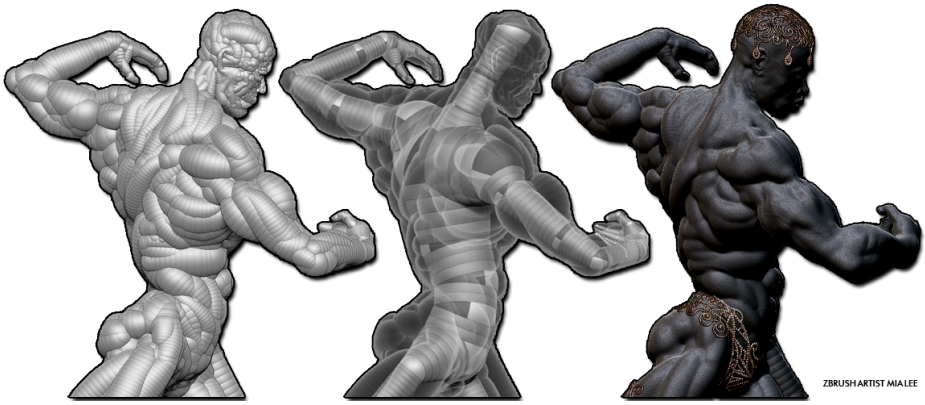
Note:

A good trick is to create the ZSpheres as a SubTool of the mesh to bind, and when the skeleton is done, clone it and use it to bind your polymesh model.



The ZSpheres II are a great support for the ZSketch. Image by Joseph Drust

XIX ZSKETCH



ZBrush Artist: Mia Lee

1. About ZSketch

ZSketch is a new technology based on the ZSphere which will let you freely create your models without restrictions. ZSketch can be used in three different ways:

- By using a ZSphere skeleton which will become an armature for the ZSketch ZSpheres
- By using just a single ZSphere and then, create your model in the 3D space.
- By adding a ZSphere as a SubTool to any mesh, put in sketch mode and draw directly onto the other SubTool.

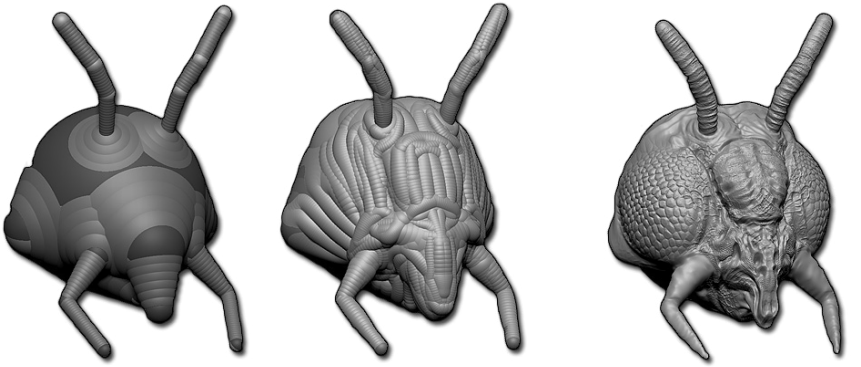
Each technique has its own usefulness and choosing one or the other will depend on your needs or simply, the way you prefer building your mesh.

Please keep in mind that ZSketch is based on ZSpheres and even if the way you will use the created ZSphere is not hierarchy-based, it's important to create strips of ZSpheres like you would apply strips of clay on a real model. Avoid going forward and backward on the same stroke.

Creation of these strips of ZSpheres can also be combined with smoothing. ZBrush provides several different Smooth brushes for sketching that will have a different affect to your mesh.

In the new ZBrush your Default Smooth brush will be defined by holding down the shift key and clicking on any of the smooth brushes. For example, if you hold down shift and click on Smooth1 then this brush will always be used for smoothing when shift is held. If you wish to change your default smooth brush from Smooth1 to Smooth2, hold

down the Shift key and select the Smooth2 brush. Now Smooth2 will be your default Smooth brush from here on out. The properties (such as Z Intensity or the Smoothing Curve) of the currently selected Smooth brush can now be changed on the fly. Simply hold down Shift to activate the Smooth brush and adjust the desired settings.



ZBrush Artist: Joseph Drust

2. ZSketch with a ZSphere structure

This method is based on a ZSphere skeleton. The first step will be to create a traditional ZSphere model. When this structure is finished, the strip of ZSpheres through ZSketch will be ready to be applied.

ZBrush Artist: Ryan Kinglsien

1. Create your ZSphere Skeleton.
2. In the Tool palette, open the ZSketch menu and click on the Edit Sketch button (Shift+A): your ZSphere will change color.
3. Be sure to have Edit>Draw mode on.

4. In the brush palette, the traditional sculpting brushes are replaced by the ZSketch tools. Pick the tool of your choice and start sculpting. The description of the brushes is available below.

5. By pressing the “A” key, or clicking in the Tool >> Unified Skin palette >> Preview button, you will see a mesh that is in preview mode. By default, ZBrush is using a Unified Skin to generate the model.

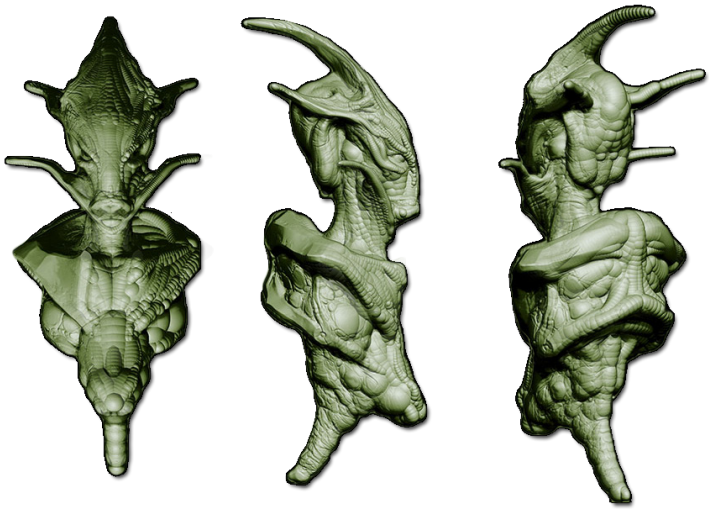
6. Press the “A” Key again to go back to the Edit Sketch mode and continue your 3D sketch.

7. If needed, press the Tool >> ZSketch >> Optimize button: it will remove the unnecessary ZSpheres, like the ones inside the model.

8. Repeat all these steps until your model is done. When you are finished sketch click on the “A” key to preview your mesh and then click on the “Make Unified Skin” to create a new mesh that will be put into the Tool Palette.

3. Free 3D Sketching with ZSketch

This method will give you the traditional feeling of building with clay. , When you are starting with nothing you will build up a surface by adding strips of clay on top of each other. The process of sketching is the same in ZBrush with a ZSphere structure except that with this method, you will create freely in 3D Space.



ZBrush Artist: Damien Canderle

1. Create a single ZSphere

2. In the Tool palette, open the ZSketch menu and click on the Edit Sketch button (Shift+A): your ZSphere will change of color.

3. Be sure to have Edit>Draw mode on.

4. In the brush palette, the traditional sculpting brushes are replaced by the ZSketch tools. Pick the tool of your choice and start sculpting. The description of the brushes is available below.

5. By pressing the “A” key, or clicking in the Tool >> Unified Skin palette >> Preview button, you will see a mesh that is in preview mode. By default, ZBrush is using a Unified Skin to generate the model.

6. Press the “A” Key again to go back to the Edit Sketch mode and continue your 3D sketch.

7. If needed, press the Tool >> ZSketch >> Optimize button: it will remove the unnecessary ZSpheres, like the ones inside the model.

8. Repeat all these steps until your model is done. When you are finished sketch click on the “A” key to preview your mesh and then click on the “Make Unified Skin” to create a new mesh that will be put into the Tool Palette.

A hand sculpture, using only ZSketch. Model by Meats Meier.

4. 3D Sketching on a SubTool

This method will sculpt onto any SubTool that is appended with the ZSphere. This is a great workflow for adding form and shape to SubTools. This process will use the SubTool surface to align the ZSketch strokes. It is best to first scale down the ZSphere to be inside the other SubTools.

1. Append a single ZSphere to any SubTool.

2. Scale the ZSphere down to be inside the SubTools so that you can not see the appended ZSphere.

3. In the Tool palette, open the ZSketch menu and click on the Edit Sketch button (Shift+A): your ZSphere will change color.

4. Be sure to have Edit>Draw mode on.

5. In the brush palette, the traditional sculpting brushes are replaced by the ZSketch tools. Pick the tool of your choice and start sculpting. The description of the brushes is available below.

6. By pressing the “A” key, or clicking in the Tool >> Unified Skin palette >> Preview button, you will see a mesh that is in preview mode By default, ZBrush is using a Unified Skin to generate the model.

7. Press the “A” Key again to go back to the Edit Sketch mode and continue your 3D sketch.

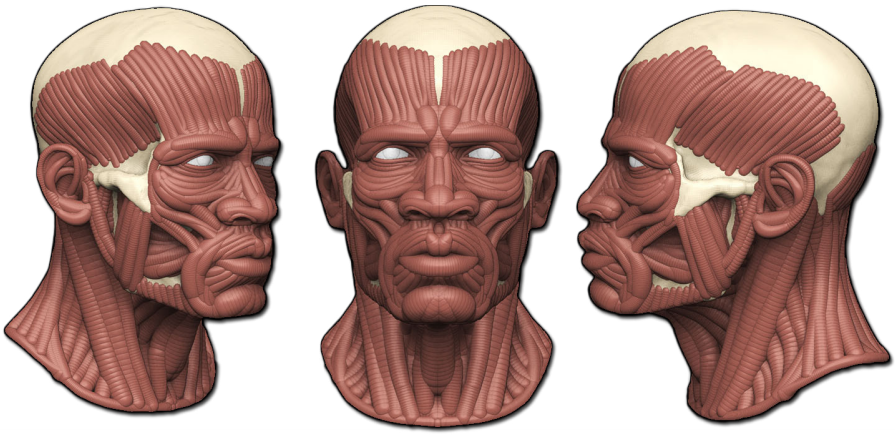
8. If needed, press the Tool >> ZSketch >> Optimize button: it will remove the unnecessary ZSpheres.

9. Repeat all these steps until your model is done.

10. When complete click on Make Unified Skin.

11. A new Tool will be added to the Tool Palette.

12. Append that new tool to your previous selected Tool that was used to sketch on. The new Unified Skin will be positioned where the sketch was applied.



Muscle flow sketched as a SubTool over a skull.

5. Create a 3D model from a ZSketch

When your ZSketch model is done, you can generate the final mesh, which will become fully sculptable with all the ZBrush sculpting tools. This model is based on the Unified Skin, this is using the Voxel technology or the Adaptive Skin technology to create the 3D model.

Unified Skin method

The ZSketch Unified Skin options. These are differentfrom the Polymesh 3D Unified Skin options.

1. In the Tool palette, open the Unified Skin menu.
2. Set the Resolution of the final model. Increasing the value (128 by default) will increase the resolution of the final model, but will also increase the processing time. (Higher resolution settings are usually only needed if your model has very small ZSpheres that are not being included correctly in the skinning calculation. If your preview skin simply doesn't have enough polygons for the detail that you've created, use a higher SDiv setting instead.)
3. You can add up to 4 Subdivision levels to the Unified Skin Mesh via the SDiv slider. This setting must be set before clicking on the preview button in the Tool>Unified Skin menu. If the setting is at 4 then there will be 5 levels to your Unified Skin when created. Important: SDiv is ONLY used to set the number of levels that the model will have. While the preview is active you then use the Tool>Geometry menu to move between levels.)
4. Change the Smooth slider to give a cube effect to the Unified Skin (0 value) or a smoothing on the resulting voxels.
5. Change the Polish slider to polish the resulting model. This option will remove fine details made on your Sketch model, but will create a cleaner topology. This option provides good results for the large base mesh which doesn't have very thin ZSketch strokes.

Note

Both Smooth and Polish sliders have two options, represented by a square or a rounded corner. The square will maintain the edges / volume of the mesh while the round square will give a round smoothness to the edges.

6. Change the Sphere density slider (Sdns) to increase the density of the ZSphere strokes on the Unified skin generation and then, reduce the ring effect. In essence this will add ZSpheres between two ZSpheres when the mesh is previewed. For example, if you change this setting to 50 then when the mesh is created there will be 50 ZSpheres added between each ZSphere to create a smoother mesh but maintain the silhouette of your sketch.
7. Change the Border slider to add loops of polygons around the polygroups generated by the Unified Skin. This option is available only when the Polish Surface slider is at a different value than 0. Use the Allow Triangle option if you don't mind having triangles on the border of the loops generated by the Border option.

Note:

You can change the polygroups of your ZSketch easily by using Polypainting and the From

Polypaint option located in the Tool >> Polygroups menu or by using the default polygroups tools.

8. Click on the Make Unified Skin button to create a new ZTool, which will be added in the Tool palette.

When previewing a Unified Skin, like with the Adaptive Skin, you can sculpt with all the default ZBrush sculpting brushes and tools. But in opposition to the Adaptive skin, if you un-preview your model and preview it again, all your sculpting will be lost.

Adaptive Skin method

If you have created a ZSphere armature tool with the intent to sketch on top of this ZSphere mesh then an Adaptive Skin can be used. The projection of the sketch into the Adaptive Skin is done locally per ZSphere radius. The quality of the Adaptive Skin will depend on each underlying armature ZSphere.

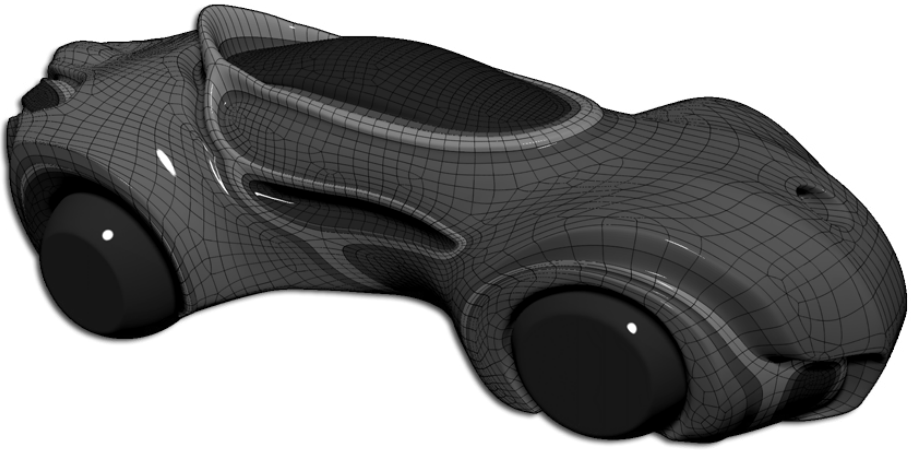
1. First, draw a ZSphere out on the canvas in edit mode. Draw out a ZSphere model such as a human or animal.
2. Open the Tool>ZSketch click on the Edit Sketch.
3. Sketch on the underlying ZSphere armature (Shift+A).
4. Click on the Edit Sketch button to leave sketch mode.
5. Click on the Show Sketch button or click Bind. This will display the sketch ZSpheres in the new Ghost Transparency.
6. When you see the sketch in the Ghost Transparency and can see the underlying ZSphere armature you can press 'A' to project the sketch into the Adaptive Skin.
7. The projection quality is set by the radius of each individual ZSphere of the armature. If you get unsatisfactory results in parts of your mesh then the underlying ZSpheres' radius should be enlarged to better capture the sketch.

6. New Unified Skin

The Unified Skin has been improved greatly to give the capability to create smooth polygroups with edge looping around designated parts of your mesh. The new features and settings will improve the result of your ZSketch models. With the new Polish and Border features you can sketch out anything imaginable and have a smooth polygrouped mesh after.

The new Polish Surface, Border, and Allow Tri will only be available when using ZSpheres or in ZSketch mode.

- Polish Surface: This will apply an over-all smooth polish to the entire surface.
- Border: This will add border edges around each polygroup. If the setting is set to 6 then there will be 6 rings of border around each polygroup.
- Allow Tri: When using Border and this slider you will be allowing triangles in your mesh when the Unified Skin is created.



Concept car with its base mesh generated by a new Unified Skin and refined with the new sculpting brushes. Image by Ofer Alon.

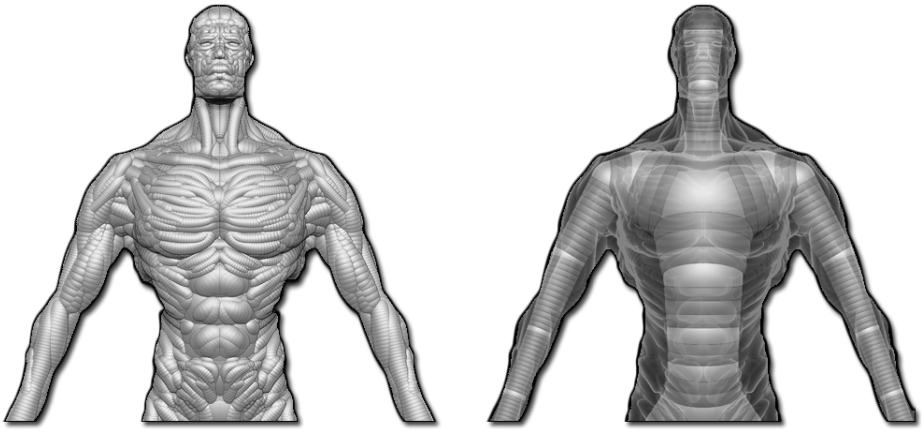
7. Deformation of a ZSketch

ZSketches can be freely deformed, and in three different ways:

- By using the deformation brushes like Flush, Bulge, etc.
- By using the Move, Scale, or Rotate mode.
- By using the ZSphere Skeleton if it exists.

For the first two ways, only use the tools or the Move mode, to do local deformations, depending on the tool you are using.

For the third way, this process will let you use your skeleton to change the pose of your ZSketch and create global deformations: Quit the Edit Sketch mode (Shift+A)and then, click on the Bind button, located in the same menu. Your ZSketch will appear in Ghost transparency and it will be deformed when you move, scale or rotate your skeleton ZSpheres.



A ZSketch and its internal ZSphere skeleton with the Ghost transparency display. Manipulate the ZSpheres to apply a deformation to the ZSketch.

8. ZSketch Brushes

ZBrush offers several brushes which will produce a different result for your ZSketch. Some of them are basically the same but have different settings such as the Sketch 1, 2 and 3 which give the same result with different embed depths.

8.1 Armature

This brush allows you to create ZSphere strips freely in space. This is the best way to create floating strips to create major parts like the arms, legs, etc.

This brush won't snap to existing ZSpheres when doing a stroke and will be created in the screen working plane.

8.2 Sketch 1, 2 and 3

These three brushes allow you to create ZSphere strips like the Armature one, but the ZSpheres will snap to the underneath ZSpheres.

The difference between these three brushes is the embed depth of the stroke: Sketch1 will create a strip which will be almost inside the underlining surface while Sketch 3 will be almost out of the surface.

The Sketch 1, 2 and 3 Brushes

8.3 Sketch A, B and C

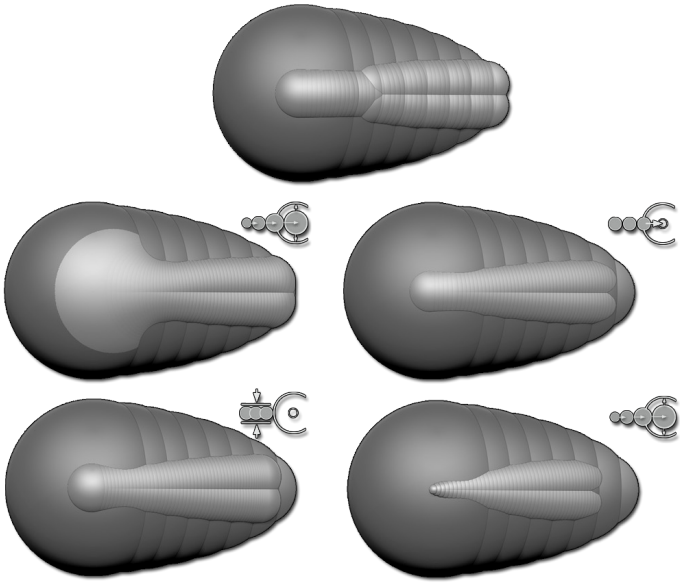
These three brushes are based on the Sketch 1, 2 and 3, but are using the picker Once orientation and not the Continuous orientation.

8.4 Smooth 1, 2, 3 and 4

The Smooth brushes operate on the ZSketch ZSpheres in the same way as the default Smooth brush in traditional sculpting, by smoothing the ZSphere strip, and with different behaviors on the beginning and end of the strip:

The Smooth 1, 2, 3 and 4 Brushes

- Smooth 1 will move and enlarge the end of the strip on the underneath ZSphere or strip of ZSpheres.
- Smooth 2 will move the end of the strip inside of the underneath ZSphere or strip of ZSpheres.
- Smooth 3 will only smooth all the strip and won't affect the end of the strip of ZSpheres.
- Smooth 4. will move and shrink the end of the strip inside of the underneath ZSphere or strip of ZSpheres.



On the top, the original ZSketch. Below, the result of the Smooth 1, 2, 3 and 4.

There are three smoothing controls in the Brush Palette> Smooth Brush Modifiers that will change the effect of each ZSketch Smoothing result.

- Coverage Position will change how far the sketch stroke will embed into the underlying ZSpheres when smoothing is applied. If this setting is set to 100 then the sketch will be eventually be embedded completely into the underlying mesh/sketch.
- Converge Radius will change the radius of the end strip to match intersecting mesh/sketch. If this is set to 50 then the radius will be adjusted to 50% of the size to the connected mesh/sketch.
- Converge Color will adjust the color of the end strip to gradually smooth into the color of the connected sketch.

When choosing a Smooth brush, it becomes the default Smooth brush which will be used when using the Shift key, until another Smooth brush is selected.

Note:

When smoothing a ZSphere strip, unpress the Shift key without releasing the tip of your pen / mouse click to fuse the stroke with the existing ones. Please, read the Fuse brush section below.

8.5 Flush

The Flush brush changes the radius and the position of the strip of ZSpheres, aligning the strip of ZSphere on the screen working plane. Com-

bined with the ALT key, the brush will push inside the model.

8.6 FlushDynamic

The FlushDynamic brush has the same effect as the Flush brush, except that the strip of ZSpheres will be flatten and aligned to the pen tablet stroke, and not on the screen working plane.

8.7 FlushResize

The FlushResize brush has the same effect as the Flush brush, except that all the strips of ZSpheres will be resize at the same size.

Note:

The effect of this brush may be more visible if you apply first a Flush stroke and then, apply the Bulge&Flush brush.

8.8 Bulge

The Bulge brush changes the radius of a strip, giving an inflate effect on the strip of ZSpheres. Combined with the ALT key, the brush will give a shrink effect to your strip.

8.9 Bulge&Flush

The Bulge&Flush brush is a mix of the Bulge brush and the Flush brush: The strip of ZSpheres will be flattened and resized at the same time.

Note:

The effect of this brush may be more visible if you apply first a Flush stroke and then, apply the Bulge&Flush brush.

8.10 Float

The Float brush moves the ZSphere strip fully outside of the underlying ZSpheres.

8.11 PushPull

The PushPull brush moves the ZSphere strips partially outside of the underlying ZSpheres. Holding the ALT key will push the ZSpheres into underlying sketch/mesh.

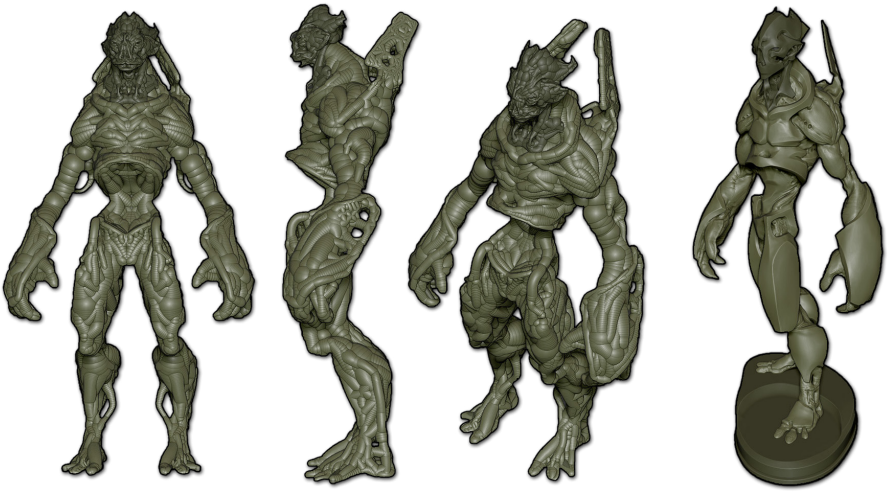
8.12 Fuse

The Fuse brush will merge the clicked ZSphere with the closest strip of existing ZSpheres. It will allow you to have a better continuation of existing strokes.

9. ZSketch Tips and Tricks

This is a list of tips and tricks which may be useful when doing a ZSketch:

- Using the ALT key while in Edit mode will delete the clicked ZSpheres. The number of deleted ZSpheres will depend on the size of the brush radius. ZBrush will also remember the order of your strokes. If you click on the highest stroke first while holding down the ALT key it will only delete that stroke as you move up and down.
- While smoothing, press the ALT key to smooth a straight line from the first clicked point. It can be in the middle of a ZSphere strip or at the root of a ZSphere strip.
- To create a floating and rounded strip of ZSpheres in the 3D space, create a single ZSphere with ZSketch, scale it if needed and then create a rounded strip around this single ZSphere. Smooth it, modify it and when your rounded strip is done, delete the support ZSphere by clicking on it in Edit mode with the Alt Key
- • Like in traditional sculpting, try to put the main mass first and then refine with thin strips of ZSpheres. But this is not a tip to always keep in mind since ZSketch is powerful enough to let you create your model as you wish!
- • When doing a polymesh preview by pressing the “A” key, ZBrush will create a Unified Skin. Like an Adaptive Skin, you can sculpt on this preview mesh with all the traditional sculpting tools. But note that unlike an Adaptive Skin, toggling the preview (press “A” again) will make your sculpting disappear.



From concept to final sculpting, with the help of ZSpheres II, ZSketch and a mix of organic and mechanical sculpting brushes and tools. Image by Jeff Feligno.

XX QUICK SKETCH

Similar to drawing your ideas on a paper block, ZBrush includes Quick Sketch. You simply open a blank document and draw your ideas using a small, streamlined set of brushes. Quick Sketch uses symmetry by default to accelerate your drawing and let you imagine your best art.

ZBrush Artist: Martin Krol

To launch Quick Sketch, click on the Quick Sketch button located on the right of the Projection Master button, under the Draw / Edit Palettes, or in the Zplugin >> QuickSketch menu and:

- Start painting directly.
- If needed, in the Stroke palette, disable symmetry or change its settings.
- Choose one of the different Sketching brushes in the 3D brush palette: Pen Shadow, Pen Sketch, Pen Fur, etc. (All Quick Sketch brushes start with “Pen” for easy identification.)

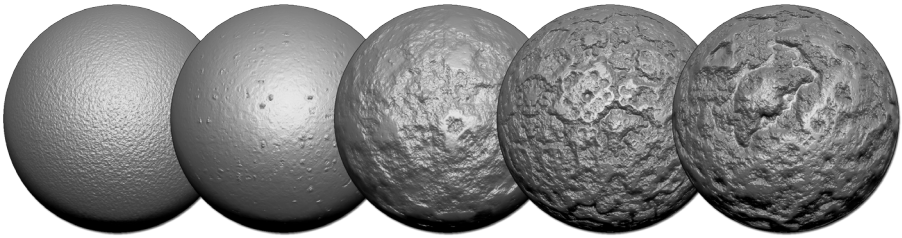
The Quick Sketch button, located on the right of the Projection Master and Light Box buttons.

Quick Sketch is based on the idea of Polypainting over a 3D plane. If you need to save your sketching, you can save it as a ZTool or create a new texture and do a New from Polypaint, located in the Tool >> Texture Map menu.

When you want to finish with Quick Sketch and switch to traditional sculpting or painting, ZBrush keep several settings from Quick Sketch. To revert ZBrush to its default configuration, you can do a Preferences >> Init ZBrush (which is like a restart; please save your files first), or change the following settings:

- Switch to Preview render, in Render >> Preview
- In the color palette, change the color to a pure white if your model doesn't have a loaded texture or Polypainting.
- Change the Matcap to the one of your choice
- Click on the Frame view button, located in Transform >> Frame or in the vertical sidebar on the right of the document in the default UI.

XXI SURFACES NOISE



With the new Surface noise feature, you can apply a procedural noise to your creations, driven by simple parameters and curves for easy customization. By default, the noise is applied globally to your object in a non-destructive way, allowing you to change it at any time or even remove it. Or with a single click you can apply it to your model as geometry that can be sculpted. It can even be a mix of different noises, blended together with the help of the powerful ZBrush masks.

Noise is also available as a brush setting, which means that you will be able to add this noise to any of your ZBrush sculpting brushes!

1. Apply Surface Noise globally to your 3D model

In the Tool palette, open the Surface menu and click on the Noise button: a noise will be displayed on your model. At this first step, the noise is parametric and can be removed or change at anytime, by deactivating the Noise feature or changing the different parameters.

- Noise Scale: This slider changes the scale of the noise. High value will create a large noise while small values create a thin noise. A larger size will also deform the mesh at an extreme displacement.
- Strength: This slider will change the intensity of the noise, without changing its scale. At 0, the noise won't be visible and at 1, the bump strength will be at its maximum. It is recommended to keep this setting at a lower level.
- Noise Curve: By changing the aspect of the curve, you will drastically change the aspect of the noise. The Curve editor is working like all the others ZBrush Curves editors.
- ColorBlend: This slider associates with the two colors. The cavity of the noise will take on either of the colors.
- Apply to Mesh: Will convert the procedural noise to a real deformation on the model, like if you have sculpted it with default ZBrush Brushes.
- SNormal: This will smooth the normals of the mesh before the noise is applied when you click the Apply to Mesh. When using higher scale and strength values it is advised to have this setting at 100.

the Surface Noise curves and settings.

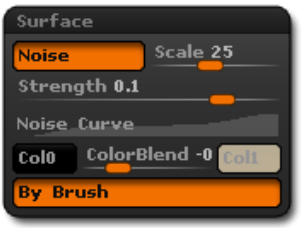
Notes:

The quality of the noise generated but the Apply to Mesh function will depends of the resolution of your Polymesh. If your resolution is to low, you won't have a high quality noise. If needed, increase the Subdivision levels.

The Surface noise is a visual effect applied on the top of the mesh and no real deformation is applied. It means that if you set a high value for the strength and after, do the Apply to Mesh action, you may have unexpected results with very high elevations. Remember that the view of the Noise is like viewing a bump map but when the Apply to Mesh is clicked it is like applying a displacement map to a mesh. If you have an extremely high scale and strength then your mesh will be pushed to extreme points.

2. Noise settings for the Brushes

You will find in the Brush palette, a new section dedicated to the new noise functions. It will allow you to add a noise parameter to all brushes.



The Surface noise parameters for the brushes.

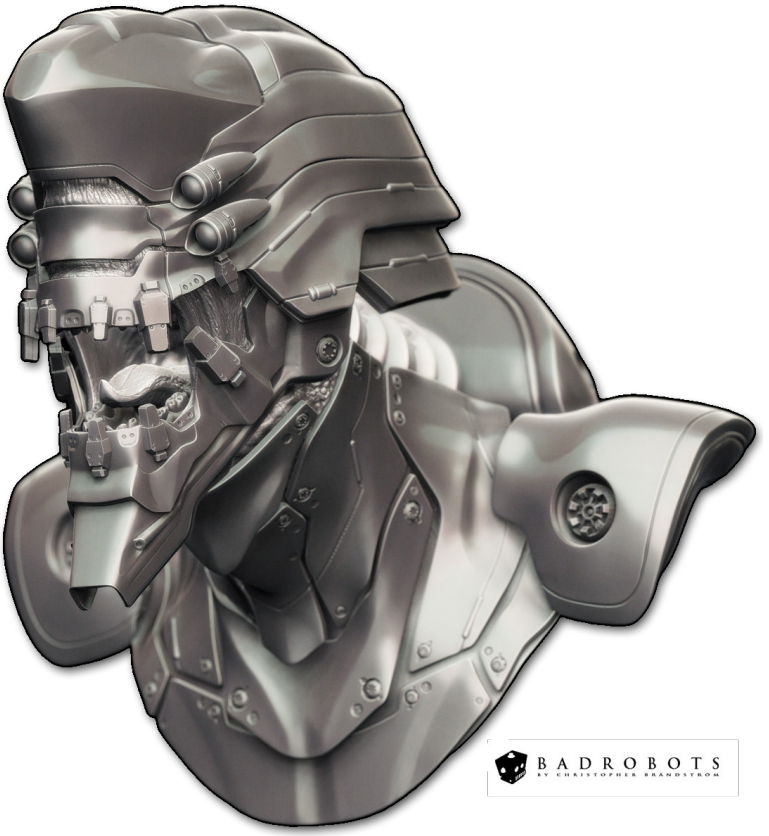
- Noise: Activate the noise brush option.
- Strength: This slider will change the intensity of the noise, without changing its

scale. At 0, the noise won't be visible and at 1, the bump strength will be at its maximum.

- Noise Curve: By changing the aspect of the curve, you will drastically change the aspect of the noise. The Curve editor works like all other ZBrush Curve editors.
- Scale: This slider changes the scale of the noise. High value will create a large noise while small values create a thin noise.
- By Brush: Controls the noise size in proportion to the Brush size.
- ColorBlend: This slider associates with the two colors; the cavity of the noise will take on either of the colors.

ZBrush Artist: Joel Mongeon

XXII MECHANICAL / HARD SCULPTING



ZBrush Artist: Christopher Brändström

Already popular for its organic capabilities, ZBrush is now opening the door to mechanical sculpting with the new Planar, Trim, Polish and Trim brushes. Combined with the improved Lazy Mouse and the new Backtrack feature, you will be able to make accurate planar surfaces on your models. It's the perfect set of features to build armor, props, or simply sculpt robots and all kinds of mechanical shapes.

The combination of these new features lets you build a near infinite array of new brushes which will perfectly suit all your sculpting needs. To help you get going even faster in your new mechanical world, ZBrush provides you with an array of new dedicated hard-surface brushes!

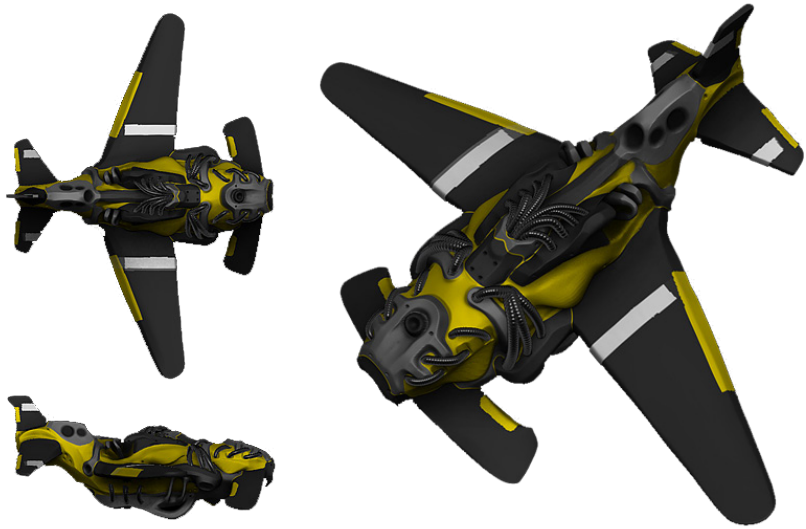
Mechanical sculpting is mainly based on the Planar, Trim and Polish Brushes. Along with Lazy Mouse and with the new Brush Imbed and Depth parameters, only your imagination will slow you down.

1. Planar Brushes

The new Planar Brushes add the ability to flatten parts of your model, without creating overlapping in your geometry. By default, these brushes will flatten everything which is at the clicking level and aligned with the brush angle, by doing a click drag.

This means that if you click inside a cavity, everything which is above the click depth will be flattened. If your click is on the top of a peak, nothing will be flattened as your cursor is already on the top of the model. The Imbed slider in the Brush >> Depth menu will control the depth of the stroke when using the planar brush.

All the other Planar brushes available are just a set of presets based on the features explained in the next two chapters.



ZBrush Artist: Joseph Drust

2. Trim Brushes

The new Trim Brushes are based on the Planar brushes but provide a different behavior based on the normal of the surface or the screen working plane. Compared to the Planar brushes, which are restricted to a clicked point on the surface or a defined path, the Trim brushes do not have these restrictions by default.

These brushes will allow you to sculpt hard surfaces in a freehand way.

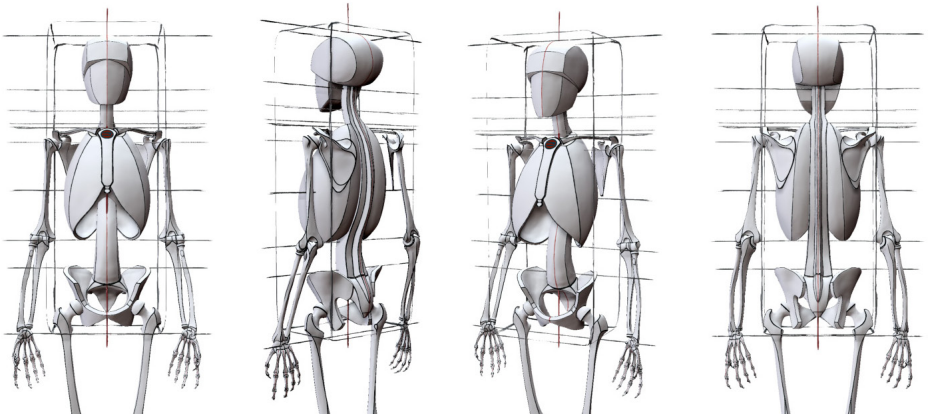
Most of the Trim brushes available are just a set of presets based on the features explained in the next two chapters.

3. Finish and Polish

In addition to the Planar and Trim brushes, extra brushes have been introduced to create the overall shape or global modifications like the Clay Finish which is designed to create rough mechanical shapes very easily, or the Form Brush which can modify the shape without affecting the small details of your model.

With the help of the Clay Polish and Form Polish, you will be able to refine your model and do some fine tuning, all in freehand sculpting.

We highly recommend sPolish (Soft Polish), mPolish (Medium Polish) and (hPolish (High Polish) to build your shape and create polished surfaces with hard edges in a freehand way.



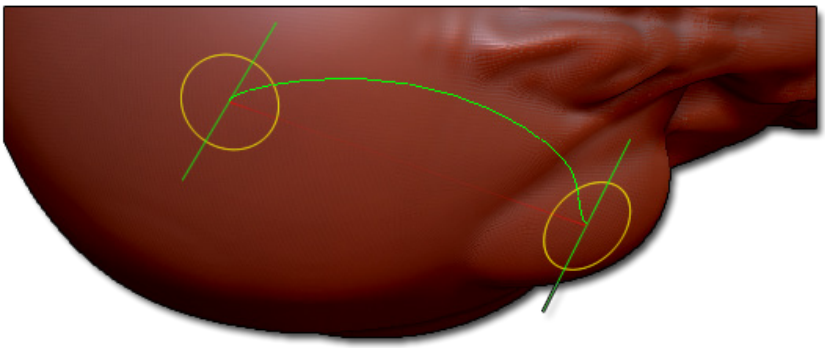
ZBrush Artist: Geert Melis “Etcher”

4. New Lazy Mouse options

The Lazy Mouse has several new options which provide some new strokes, especially for the planar Brush.

The new Lazy Mouse options with Backtrack.

- With the help of the Clay Polish and Form Polish, you will be able to refine your model and do some fine tuning, all in freehand sculpting.
- We highly recommend sPolish (Soft Polish), mPolish (Medium Polish) and (hPolish (High Polish) to build your shape and create polished surfaces with hard edges in a freehand way.
- Plane: this option will constrain the stroke on a virtual plane defined by the cursor position.
- Line: this option will constrain the stroke on the line plane defined by the beginning and the end of the forward stroke.
- Spline: this option is the same as the Line, except that the plan will be blended between the first and last point of the forward stroke and the curvature by the angle of the brush at the first and last point.
- Path: this option is the same as the Spline, except that the stroke follows the path defined by the forward stroke.
- Snap to track : this option will constrain the stroke on the strokes drawn out path along the surface define by the plane, line Spline or Path option.
- Track curvature: this slider increase or decrease the curvature of the line and spline options.



The Path mode enabled during a stroke with the PlanarPathCut brush.

5. New geometry and topology features

in addition to the brushes, several new enhancements and additions has been made to ZBrush to add to its toolset all the elements you will need to create hard Sculpting. These include the new Group Loops to create loops of polygons, Polygroup masking to easily work on the polygroups without affecting the polygons outside this group, the Remesh tool which combines with SubTools to create complex base meshes and all the dozens of new brush options.

Please discover all these new additions in the next chapters.

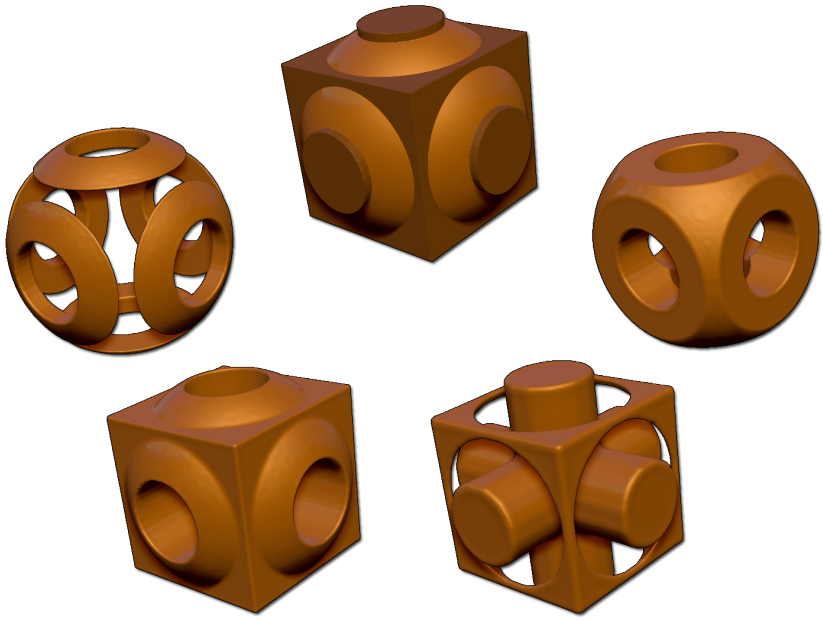
A model using mechanical features and tools new in ZBrush 3.5.

XXIII REMESHING

To create a base mesh for your sculpting in ZBrush, you can use ZSpheres, ZSketch, the built-in primitives or importing a model from another 3D package. Another solution is to do a remeshing of a model or a set of different objects. The Remeshing method creates new geometry with a new topology, but which is based off an existing one.

ZBrush uses its Unified Skin technology (based on voxels) to create the model. The purpose of these tools is to create a new base mesh rather than a high resolution mesh, based on the combination of different high resolution models. We recommend you use this only for the purpose of creating base meshes.

The Remesh function can use a symmetry option, associated with the Remesh All option. It will create a symmetrical result based on the selected SubTool when clicking on the Remesh all button. If you have a SubTool which is located on the right of the selected SubTool, when remeshing the model, the final mesh will have the shape of this SubTool on the right -and- left of the selected SubTool, the three of them combined in one and unique mesh.



On the top, the original SubTools, below, the result of different Remeshes.

Note:

You can use remesh to combine different high resolution models and then use the Project All function in the SubTool menu to reproject the details. Please keep in mind that some artifacts can appear on the junction of certain models.

6. Remeshing One or More SubTools

To remesh one or more SubTools, go to the Tool >> SubTool menu and make visible all SubTools which need to be remeshed. Invisible/hidden SubTools won't be used for this operation.

The Remesh All button and its options.

In the Remesh All section, change the options according to your needs and press the Remesh All button to generate a new SubTool. This new SubTool will be appended to your existing model.

1. Remesh All options

Remesh All offers different options which affect the quality or the shape of the resulting model. Change these options before pressing the Remesh All button.

- Resolution slider: Increase or decrease the slider value to modify the resolution of the remesh model. Increasing the value can create high resolution meshes, making final sculpting more complex.
- Remesh Polish slider: Makes the resulting surface smooth or close to the original Tools or SubTools. This function is combined with two options, represented by a square or a rounded corner. The square will maintain the edges/volume of the mesh while the round square will give a round smoothness to the edges.
- Polygroup: Creates automatic polygroups based on the combination of the SubTools.
- Choose a symmetry axis: In the Remesh All button, click on the axis of your choice to create a symmetrical result for your combination of SubTools. The symmetry axis of the selected SubTool will be applied on all results. You don't need to specify the Symmetry axis on non-selected SubTools.

2. Combining different SubTools with operators

To create a large amount of variation for your remeshing of models and create the base mesh that you need, you will by default combine all SubTools to create the new mesh. You can also subtract the Subtools of your choice, or request the computing of an intersection.

ZBrush include these three Boolean operators for use when generating a remesh. The generated model will be computed from the top SubTool to the bottom one, as listed in the SubTool menu. To activate or change an operator, click on one of the three operators icons in the SubTool selector: Add (default), Subtract or Intersection.

These operators can be mixed with the symmetry option of the activated SubTool before launching the Remeshing function.

The new SubTool operators for the Remesh All tool.

XXIV BRUSH MODIFICATIONS

Some brushes have a new behavior or several new behaviors and some existing brushes have been updated.

This is the list of the main additions and modifications.

Note:

To revert to the original behavior of the ZBrush 3.1 brushes, Go in the Brush >> Depth menu and deactivate the Fast Sample mode

1. DIRECT KEYBOARD ACCESS TO THE BRUSHES

Because of the large number of new brushes, a new system using the alphabet and associated shortcuts has been added.

At the top of the floating brush palette, click on the letter of your choice to display only the brushes starting with this letter, such as “C” to display all the Clay brushes and the Crumple brush.

At the top, the full brush list. At the bottom, the “P” key has been pressed and ZBrush only display the brushes’ names which start by “P”.

You can also use the keyboard shortcuts to access to these brushes in half a second:

1. Press “B” to open the brush window
2. Then, press the first letter of your choice, like “C”. All the brushes started by “C” will be displayed. If you hit the wrong key, press the space bar to go back to the default

brush window.

3. Notice at the top left of each brush icon, an orange letter: press it to choose this brush, like “T” for Clay Tubes.
4. The Clay Tubes brush is now selected.

Then, by pressing keystrokes like B,C,T, you will be able to pick the brush that you want in an efficient way.

2. Smooth Brushes

In version 3.5, when clicking on a Smooth brush you define the new Smoothing brush that will be used when pressing the Shift key. It is no longer possible to select a Smooth brush separately as with the other brushes.

If you need to change the kind of Smooth brush, just pick a new one. Your selection will then become active every time you hold down the Shift key, until you select a different Smooth brush.

To change the modifiers for the currently-selected Smooth brush, hold down the Shift key and make your changes. (For example, hold Shift and adjust the Z Intensity slider.) These changes will only affect the Smooth brush. The Slider Volume Smooth in the Brush Palette>Smooth Brush Modifiers will control the alternate smooth brushes strength. A higher number will take longer to smooth out the mesh, but keep in mind this will have a slow reaction on a model with high poly counts.

Several new Smooth brushes have been added with new behaviors. The brushes like Smooth Peaks and Smooth Valleys are using cavity masking to smooth only the inside of a cavity or the top of the peaks of the geometry, while the Smooth Valance, Smooth Subdivision or Smooth Groups (and others) will do a smooth depending of the topology of your model.

The Smooth Brush Modifiers menu with the new Weighted Smooth mode.

Smooth Brush Modes:

- 0 - Standard: This will keep the smooth brush set at default
- 1 - Stronger: This will increase the strength of the smooth brush to interact with the surface quicker
- 2 - Valance: Will give more weight where the mesh has more polygons meeting at one point. For example, if there is a point that has 5 faces sharing that point it will receive more smoothing weight then a point that is sharing 3 faces.
- 3 - Subdiv: Will smooth the mesh with same algorithm that is run when you subdivide a mesh in ZBrush.
- 4 - Stroke Direction: This will smooth the mesh along the stroke direction only. This is a great way to smooth out your last stroke but not loose a lot of the surface detail.
- 5 - Perpendicular To Stroke Direction: This will smooth the surface detail perpendicular to your brush stroke.
- 6 - Groups Border: This will smooth the mesh but respect the borders of the groups to maintain that line along the border.
- 7 - Creased Edges: This will maintain the creased edge when smoothed out.

Weight Strength: Will control how strong the smooth algorithm will react to the surface for each mode. At lower numbers, the smooth stroke will have less effect on the surface. This slider only works with the Groups Borders and Creased Edges mode.

Several new Smooth brushes have been added with new behaviors. The brushes like Smooth Peaks and Smooth Valleys are using cavity masking to smooth only the inside of a cavity or the top of the peaks of the geometry, while the Smooth Valance, Smooth Subdivision or Smooth Groups (and others) will do a smooth depending of the topology of your model.

Note:

If you don't remember which Smooth brush is bound to your Shift key, just press this key and you will see the Smooth Brush icon and name in the Brush palette.

3. Move brushes

In addition to several new Move brushes, ZBrush offers new behaviors while dragging polygons with the Move brush:

- Press the SHIFT key to slide the stretched polygons along the surface. As an example, you can easily pick the corner of a head's lips and slide it along the cheeks.
- Press the ALT key to do the deformation along the average normal of the surface corresponding to the brush size like in ZBrush 3.1.

The MoveRing Brush with the ALT key pressed while sculpting.

Note:

You can use the Brush Imbed and Depth to affect the form of the Move brush while using these shortcuts.

4. Brush Stroke length

The stroke length of your brush has been increased by a significant factor over ZBrush 3.1 and earlier versions. In fact, your strokes can now last a full 16 times longer! Now your strokes can be continued for a very long period before stopping on your mesh.

5. New brushes settings

This section covers the main brush settings which have been added in ZBrush 3.5. Other minor settings are described in the List of Changes section of this documentation.

5.1 Brush Imbed and Depth

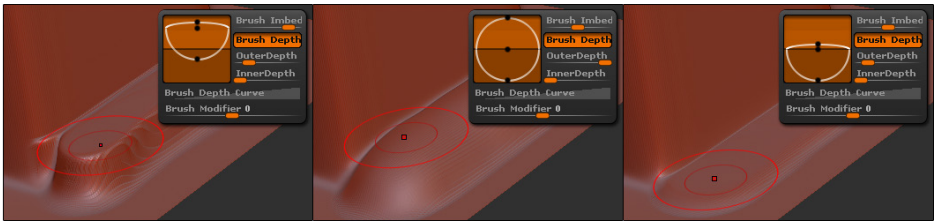
To offer a new way to create the perfect brush to fit your needs, ZBrush now gives better control of the shape of the brush itself. By default, the brushes are shaped like a sphere, with the dividing line between hemispheres being oriented to the surface.

The new Depth and Imbed brush settings.

With the new Brush Imbed and Brush Depth parameters located in the Brush palette, you can now change the shape of this sphere to flatten the top, bottom, sides and even move its center up or down.

By flattening the top of the brush, only the parts which are on the same level of the hemisphere or below are affected by the stroke. If the brush is intersecting a surface which is in the upper hemisphere, nothing will happen.

Edit the various settings, located in the Brush >> Depth menu to change your brush behavior. You can use the graphical widget to interactively change the Depth settings, or use the sliders.



Three different settings with three different results.

5.2 Samples

The Sample menu, located in the Brush palette, groups all the brush internal settings which will affect the result of your brush. These settings are related to the algorithm behind the brush itself.

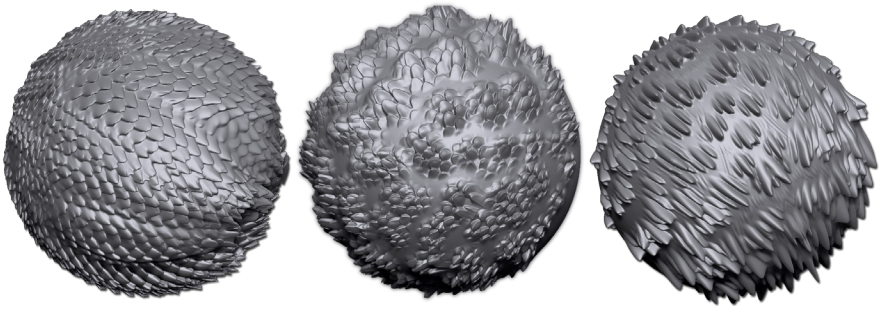
Changing these advanced settings can significantly alter the behavior of the brush:

- Buildup: When applying brushstrokes, information is constantly picked from the canvas and used to update the stroke.
    - If Buildup is turned off, the current brushstroke is ignored while picking the information, until the mouse/pen button is released.
    - If it's turned on, the information is picked both from the canvas and from changes made by the current brushstroke.
- Samples Radius: ZBrush will sample the Normals and Position of the mesh under the cursor when being applied. If the settings are set at .75 then ZBrush is evaluating 75% of the mesh that is under the cursor.
- ConstSamples: Will keep the samples of the normals and position at a constant number based on the default brush size of ZBrush.
- OnSurface: This will keep the brush flat to surface when evaluating the curvature of a mesh. For example, if you apply the clay brush from the center to the outside of the polysphere with the OnSurface on and off you will see a smoother stroke around the sphere with OnSurface turned on.
- Preserve Edge: Will keep the edge of a mesh preserved when a brush comes into contact with an edge. This is a key setting when hard surface modeling.
- Stabilize Orientation: averages stroke normals. This will add stabilization to rough surfaces.
- Stabilize Direction: Will keep the surface normals stabile to the direction of the stroke. If you take the Clay Tubes brush along the Sphere with the setting at 100 you will see how the surface normal is following the stroke. This will also cause a slower reaction to the surface.
- Other descriptions are listed in the List of Changes chapter.

5.3 Modifiers

The Modifiers menu, located in the Brush palette, provides fine control over the brush itself and its shape.

With the Tilt slider, set an angle to rotate your brush and create new sculpting effects. With this option, you will be able to sculpt the scales of a lizard easier than before.



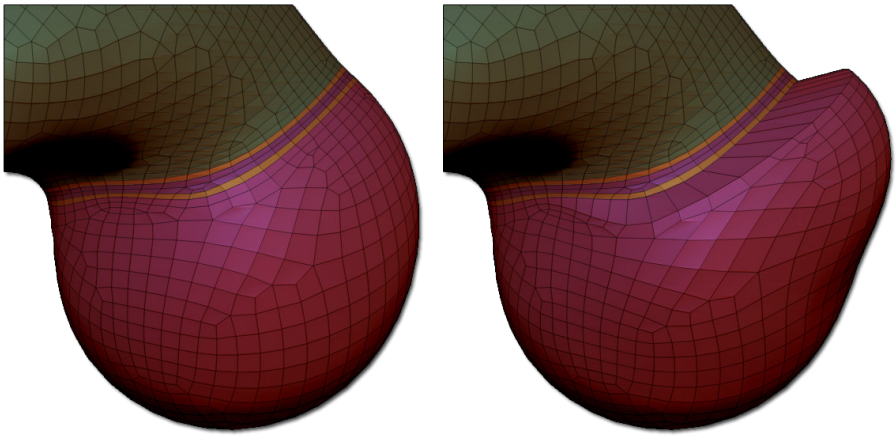
Different results of the Tilt setting applied to various brushes.

The trail option, used by QuickSketch makes a connection between the beginning and the end of your stroke, by continuing it, depending of the option value.

- Tilt Brush: This will apply a tilt to the brush. If the slider is set to 35 then the tilt of the brush will be 35 degrees.
- ConstantTilt: This button will keep the tilt constant to the setting in the Tilt Brush slider.
- Trails: This slider will apply the selected brush bush multiple times depending on the setting. If the setting was at 50 then the brush will be applied 50x along the stroke. As you move along the stroke the current brush will be applied 50 more times from the point of the brush cursor. If you set this setting relatively high you will see the stroke continue to grow even though your cursor is well past the point.
- Intensity: This will control the intensity of the trails.
- Other descriptions are listed in the List of Changes chapter.

5.4 Mask by Polygroups

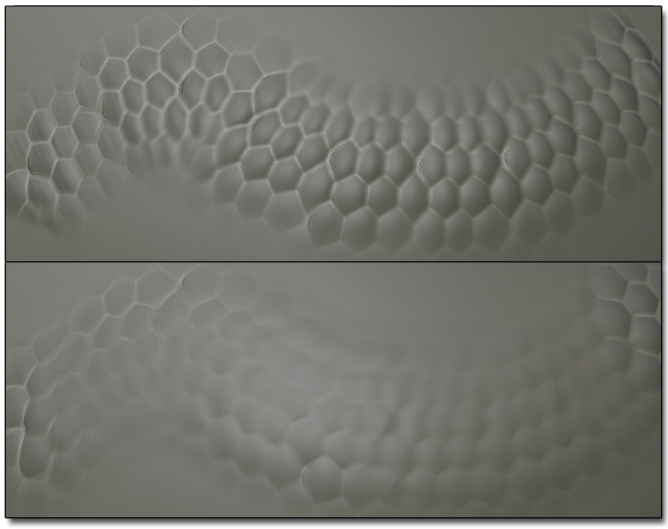
Mask By Polygroup, located in the Brush >> Automasking menu, will apply virtual masking based upon the polygroups of the tool. If you have the setting at 100 then the first selected polygroup will be the only part of the mesh that can be edited by the selected brush. If you have the slider any lower then that it will allow multiple polygroups to be edited on a given stroke but with less intensity than the first selected polygroup.



The Mask by Polygroup in action: on the left, the original model with several polygroups, on the right, only the bottom polygroup has been deformed by the brush, without affecting the other polygroups.

5.5 Directional

The Directional mode and its associated curve, located in the Brush >> Automasking menu makes the stroke and its associated alpha follow the path of your stroke while having a consistent draw to the mesh: if you choose a long and rectangle alpha, when doing a rounded stroke the created shape will be smooth and not rotated.



At the top, with the Directional masking. At the bottom, the same stroke without the option.

5.6 Tablet Pressure: use Global Settings

This mode, located in the Brush >> Tablet pressure menu lets you define the same tablet pressure settings for all your brushes, based on the setting in the Preferences >> Tablet menu.

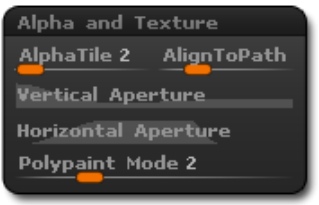
The Use Global settings option, in the Tablet Pressure menu.

5.7 Alphas and Textures

All the brushes can use an Alpha and a texture, from sculpting to texturing. Now, with ZBrush 3.5 it is possible to edit, in conjunction with Alpha tiling, the Vertical and Horizontal Aperture: by editing both curves, you will be able to use only a part of the image. This will be stretched to the entire brush surface, creating new effects.

A curve at its maximum means 100% of aperture. The right of the curve is the center and the left represents the borders of the Alpha or Texture.

Several QuickSketch brushes are provided which use these new Apertures options.



The Alpha and Texture options, including the Polypaint mode.

- Vertical Aperture: This curve will control the vertical roll off of selected alpha. The selected alpha will be stretched to fit the selected brush size. This is a great way to create your own Radial Fade (Rf) that you find in the Alpha Palette.
- Horizontal Aperture: This curve will control the horizontal roll off of selected alpha. The selected alpha will be stretched to fit the selected brush size. This is a great way to create your own Radial Fade (Rf) that you fide in the Alpha Palette.
- Polypainting modes: there are multiple Polypaint modes available now when ap-

plying color to your tool. There are 5 modes which include Standard, Colorize, Multiply, Lighten, and Darken

XXV NEW BRUSHES

ZBrush 3.5 introduces a new set of brushes which will boost your creativity and productivity. Some of these brushes use brand new technology while others are a mix of existing brushes with the addition of new features and options.

Because ZBrush 3.5 adds a huge amount of new brushes, many of them have been moved into the Brush category of LightBox. The most important ones are still available in the Brush palette. At any time, you can reorganize which brushes are in the Brush palette in LightBox by manually moving the brushes from one location to another through the ZBrush folders located on your hard drive as follows:

- Directory: ZBrush3.5/ZStartUp/BrushPresets will control brushes at startup being added to the pop-up menu from the main brush icon.
- Directory: ZBrush3.5/ZBrushes will control which brushes will be in LightBox.
- Directory: ZBrush3.5/ZData/BrushPresets are the default startup brushes that will launch at startup.

Move these brushes between directories as you wish to have complete control. However, we recommend not deleting any of these brushes because the only way to get them back is to do a completely new install. If you don't want to have a brush available at all, it is better to move it to a holding folder that you create for that purpose, so that they can easily be restored should you change your mind.

The new brushes add several exciting possibilities for your sculpting: some are dedicated to hard surface sculpting, some for the addition of noise, some for building your main shape, some for finalization. Describing all the brushes and what they will add to your sculpting is impossible -- the possibilities are infinite!

We invite you to read about the new brush features in the previous chapter to understand how they are built, then experiment for yourself to see what they can bring to your art!

XXVI NEW TEXTURE AND UVS MANAGEMENT

Various enhancements have been made to texture management for ZTools and SubTools. Previously, it was only possible to have one texture for the current tool which applied to all SubTools. Now textures can be saved separately per ZTool or SubTool.

Now, each ZTool and/or SubTool has its own texture management; color and displacement textures are saved directly in the ZTool. They can be displayed or turned off, by clicking on the Texture On or Disp On buttons.

The UV's management has also been improved in the same way as the Texture maps.

The basic workflow is as follows:

- Use the Tool >> UV Map menu to set your desired map size. This setting will be used for all future maps created for the selected model.
- Set a UV Map Border, if the default value of 4 pixels is not sufficient.
- If the model does not already have UV mapping, select one of the mapping options. PUVTiles is recommended for most uses.
- Create your texture, displacement and/or normal maps. For texture and displacement maps, these maps will immediately be applied to your SubTool after creation. They will therefore be found in the appropriate Tool sub-palette (Tool >> Texture Map or Tool >> Displacement Map).
- To export your texture or displacement map, browse to its sub-palette and click the Clone button found next to the map's thumbnail. This will copy the map into either the Texture or Alpha palette, where you can then export it for use in another application.

Please note that this change is a fundamental difference in how ZBrush manages and saves the ZTL format. This means that ZTools saved in version 3.5 will not open in any earlier version of ZBrush including version 3.1.

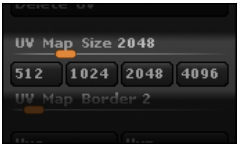
1. UV Mapping

The UV functions have been moved to their own dedicated menu in the Tool palette. Most of the previous features are now located in this new menu, and some features have been added.

Now, before creating a texture for the current ZTool or one of its SubTools, you can change the default size of the maps created by ZBrush for the Color map or the Displacement Map: four presets buttons have been added for the most common sizes: 512, 1024,

2048, 4096. You can also set a custom value up to 8192 by entering a numerical value or moving the UV Map Size slider.

ZBrush is optimized for map sizes which are a power of 2. You will get the best results by using one of the four preset sizes.



The UV size presets buttons.

2. New UV Unwrap: PUVTiles

In addition to Adaptive UV Tiles (AUVtiles) and Group UV Tiles (GUVTiles), a new automatic UV unwrap has been added: Packed UV Tiles (PUVTiles).

This new UV creation feature is a mix of both AUVTiles and PUVTiles, which creates a UV unwrap which will try to as much as possible to fill 100% of the UV space (like AUVTiles) with packed UV groups (like GUVTiles). This is the most distortion-free UV unwrap that maximizes the UV space.

The PUVTiles button on the left.

Generate a PUVTiles unwrap:

- Go to the lowest level of subdivision for the ZTool which needs UVs.
- Click on the PUVTiles button located in the Tool >> UVMap menu.
- If needed, go to the Tools >> Texture Map menu >> New from UV Check to check your created UVs

Note:

Tiles mapping does not make sense to the human eye, but the computer has no such difficulties. When combined with Polypaint or Projection Master, these mapping methods provide the most accurate and distortion-free mapping available. You will be able to paint what you want to see, rather than trying to paint on a flat map and manually compensate for stretching or seams.

3. Texture Map menu

Tiles mapping does not make sense to the human eye, but the computer has no such

difficulties. When combined with Polypaint or Projection Master, these mapping methods provide the most accurate and distortion-free mapping available. You will be able to paint what you want to see, rather than trying to paint on a flat map and manually compensate for stretching or seams.

The new Texture Map menu in the Tool palette.

Four new features have been added:

- Clone Texture, which will make a copy of the current texture and add it to the Texture palette. This lets you export your texture or perform other operations from the Texture palette.
- New Texture, which creates a blank texture of the size specified in the UV Map menu.
- Transparent button, which transforms the pure black color of the current loaded texture to a transparency. This button is only clickable when a texture is loaded and Texture On is pressed. Black must be absolutely pure to be rendered as transparent. That means an RGB value of 0,0,0. If you use Photoshop in your texture-creation pipeline, it is recommended to turn off its antialiasing functions as they cause edges to be blended away from pure black.
- Antialiased button, which gives a more accurate look and less pixelized aspect to the loaded and displayed texture. This button is only clickable when a texture is loaded and Texture On is pressed.

To load a texture and display it on the current ZTool (or SubTool):

- Before applying a texture, check if your ZTool has UVs, by clicking on Tool >> Texture Map >> New from UV Check button.
- In the Texture palette, click Import and choose the texture to load from disk.
- In Tool >> Texture Map menu, click on the empty texture map thumbnail to display the texture popup window. It will display all the default textures, and at the top of this window, in the User Textures field the previously loaded texture. Choose the desired texture.
- Now you should have your texture displayed on your model or SubTool.

Create a texture from ZTool information:

- Before creating a texture from the ZTool information, check if your ZTool has UVs, by clicking on the Tool >> Texture Map >> New from UV Check button.
- Click the button you want:
  - New from Polypainting: applies painting from your Tool to create a texture.
  - New from masking: applies masking from your Tool to generate a grey scale texture.
  - New from UV Map: Allows you to check the integrity of the Tool's UVs by creating an RGB map. Any discontinuity of colors indicates a seam in the UVs.
  - New from UV Check: generates a grey scale fill of your UVs. Red will indicate an overlap of UVs. This will cause issues when texturing and generating displacement maps. It is recommend to fix these areas before beginning to Polypaint or generate a difference map.
  - New from Vertex order: Assigns a color to each vertex. Use this map to verify that there has been no vertex movement after re-importing from an external application. Note: Generate a Vertex Order map before exporting to layout UVs. When the tool is re-imported generate a new Vertex Map. If there is no difference between the maps then there has been no vertex movement.
  - New from Poly order: Assigns a color to each polygon. This map is used the same way as the Vertex Order map except that it shows the polygons which have been affected. It is recommended to generate this map before exporting to verify the polygons when re-importing.
- A new map is generated and displayed on the current ZTool.
- If needed, click on the Tool > Texture Map > Clone Texture button to duplicate this image in the Texture palette, which will allow you to export this map.

Convert Polypainting from a texture color map:

- Before applying a texture, check if your ZTool has UVs by clicking Tool >> Texture Map >> New from UV Check button.
- In the Texture palette, click on Import and choose the texture to load from your computer.
- In Tool >> Texture Map menu, click on the empty texture map thumbnail to display the texture popup window. It will display all the default textures, and on the top of this window, in the User Textures field where the previously loaded texture will be seen. Choose the desired texture.
- In Tool >> Geometry menu, make sure to divide your Tool up to enough polys to capture the painting information.
- Click on the Tool >> Polypaint >> Polypaint from Texture button to convert your texture to a Polypainting.
- Click on Tool >> Texture Map >> Texture On button to display only the Polypainting, turning off the previously loaded texture.

3.1 Creating a Texture Map which includes HD Polypaint

The creation of a Texture map which includes HD Polypaint is the same as traditional texture maps, except that the HD Geometry slider must be at the maximum value and the Geometry Subdivision slider most also be at the highest level. When the map is created ZBrush will capture all HD Polypaint to be applied to the Texture Map.

Note:

Before extracting the Polypainting from a texture map, ensure that your ZTool or SubTool has a polygon density which is close to the number of pixels in your texture. For example, a 1024x1024 texture has approximately 1 million pixels. This means that a model would require at least that many points in order retain the same image quality. A 2048x2048 map is equal to about 3-4 million polygons, and a 4096x4096 map is about equal to 10-12 million polygons.

4. Displacement Map menu

The Displacement Map menu has been enhanced to have a behavior close to the new Texture Map menu.

The functions are the same as ZBrush 3.1 except that the Displacement map texture is generated and saved per ZTool or SubTool.

New features have been added:

- Clone Displacement, which will copy the current displacement map to the Alpha palette. This action lets you save your map or do other operations from the Alpha palette.
- Texture Thumbnail, which displays the currently-selected displacement map or can be used to select a new one. To select a different displacement map, it must first be loaded into the Alpha palette. Then click the texture thumbnail found in the Tool >> Displacement Map menu and select the desired map from the popup window.
- Adaptive and DPSubPix may now be used together. Adaptive is a special calculation mode that in most cases enhances the quality of displacement maps; especially when the model has been sculpted with brushes that have the effect of moving points across the surface of the mesh. DPSubPix virtually subdivides the model to increase the number of points that are being calculated in creating the displacement map. For example, if you have a 1 million polygon model and wish to create a map sized 4096x4096 (which has up to 16 million points of data) you would use a DPSubPix setting of 2. This virtually subdivides the model twice during displacement calculation, resulting in 16 million points being calculated – a value that matches the resolution of the texture map. Higher values would add to the displacement calculation time without improving the map quality, because they would cause more points to be calculated than the texture could even hold. In short, only use DPSubPix when your mesh has fewer points than the desired map, and even then only use the minimum value that will match your texture resolution.
- Mid specifies the value that will be used as the 0 point for displacements. By

default, this value is set to 0.5 which allows the map to depict both positive and negative displacements. You can adjust this slider to modify the map for positive-only or negative-only displacements.

The following settings apply to 32-bit map creation:

- Flip V tells ZBrush to flip the map vertically. This only works with the Create and Export Map button.
- Scale factor defines the baked-in map intensity.
- 3 Channels is required by some rendering engines, and instructs ZBrush to export three identical TIFF channels. This only works with the Create and Export Map button.
- 32Bit activates 32-bit displacement calculation mode. This will only work with the Create and Export Map button.

When creating a 32-bit displacement map, clicking the Create And Export Map button will provide you with a new dialogue that lets you specify where to save the map. These maps are exported directly from ZBrush, rather than appearing in the Displacement Map menu after creation.

The improved Displacement Map menu in the Tool palette.

4.1 Creating a Displacement map which includes HD Geometry

The creation of a Displacement map which includes the HD Geometry is the same as a traditional displacement map, except that the HD Geometry slider must be at the maximum value, while the Subdivision slider must be at the lowest value. When the map is created ZBrush will capture all HD sculpt to be applied to the displacement map.

5. Normal Map Menu

The Normal Map menu has been enhanced to provide more control over the created maps.

Several options have been added or enhanced:

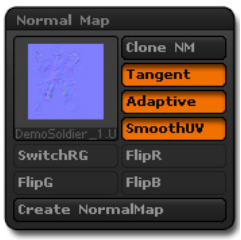
- FlipV to flip the map vertically
- FlipR, FlipG and/or FlipB to flip specific color channels in order to accommodate the needs of a specific renderer.
- SwitchRG will switch the Red channel with the Green channel in your normal map.

Note: These settings are in addition to the NormalMapFlip settings that are found in the Preferences >> Importexport menu.

- Texture Thumbnail, which displays the currently-selected normal map or can be used to select a new one. To select a different normal map, it must first be loaded into the Texture palette. Then click the texture thumbnail found in the Tool >> Normal Map menu and select the desired map from the popup window.
- Clone NormalMap, which will copy the current Normal Map to the Texture palette. This action lets you save your map or do other operations from the Texture palette.

For all intents and purposes, ZBrush 3.5 renders ZMapper obsolete. Aside from providing new map calculation algorithms which have now been incorporated directly into ZBrush so that they no longer need to be manually selected, the two main purposes of ZMapper were to let you use bump maps in the creation of normal maps or to project details from one mesh to another that doesn't share the same subdivision history. Both of these features are now obsolete in ZBrush 3.5:

Bump maps are now useless in calculating normal maps because 3.5 can easily handle models in the 10 to 16 million polygon range. A 4K map has no more than 16 million pixels of data. That means the most detail it can possibly hold is equivalent to a 16 million polygon model. Most maps actually waste about 25% of the available texture space, which means that a model of 12 million polys holds the same detail that a texture of 4096x4096 can hold. So a bump map can't add any more detail than what the model can already support. Additionally, ZBrush 3.5 can use HD data to create a normal map. (See below.)



The enhanced Normal Map menu in the Tool palette.

As for projecting details between meshes, you can now do that through the SubTool menu thanks to the Tool >> SubTool >> Project All feature and the ZProject sculpting brush. In fact, 3.5 has improved the projection routines and also added new features such as PA Blur and PA Distance. This is a significant improvement over ZMapper, which provided no control for projections. You can also use the sculpting brushes to clean up

a projection before creating the map from it – something else that wasn't possible with ZMapper.

5.1 Creating a Normal map which includes HD Geometry

The creation of a Normal map which includes the HD Geometry is the same as a traditional Normal map, except that the HD Geometry slider must be at the maximum value, while the Subdivision slider must be at the lowest value.

6. Ambient Occlusion Masking

A new Masking creation function has been added: Mask Ambient Occlusion, which generates a new Mask, based on an ambient occlusion algorithm. Like all kinds of Masks, it is possible to save this mask as a Texture Map. Ambient Occlusion will use the Main and Secondary colors for the map. Play with these colors to get several different maps.

Ambient Occlusion Masking. From left to right: the default model with a Matcap, Masking with a Flat color Material and the first Matcap with the Ambient Occlusion Masking.

Three parameters are available to change the result of the Ambient Occlusion masking:

- Occlusion Intensity, this will increase the intensity of the black in your AO map.
- AO Scan Distance, which defines how far apart points can be to affect the masking.
- AO Aperture, which defines the angle at the vertex for the Ambient Occlusion computing. High values generate a sharp Mask while low values generate a soft and diffuse Mask.

This Mask function and its three sliders are located in the Tool >> Masking menu.

The new Mask Ambient Occlusion function.

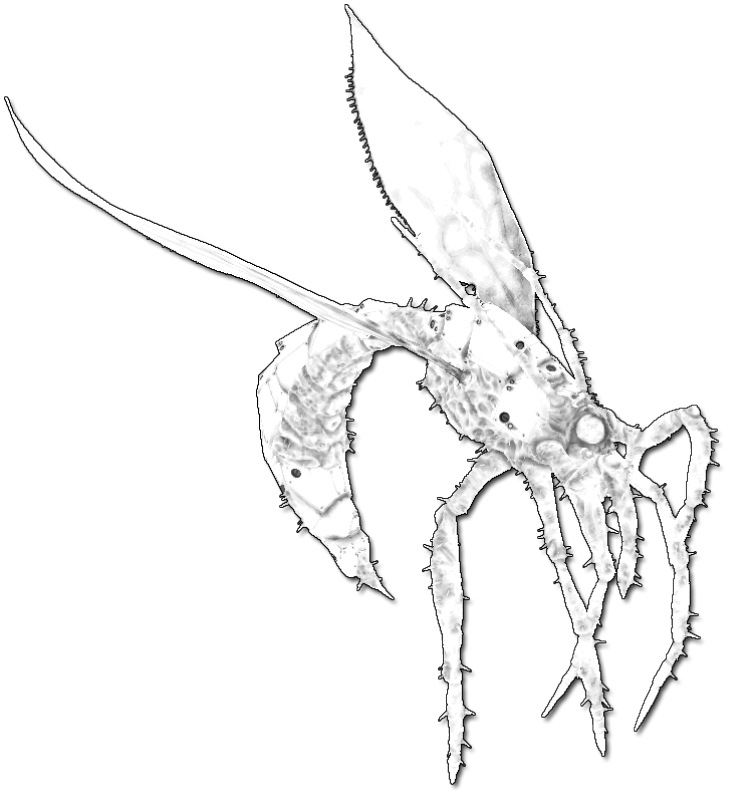
Notes:

High values of AO Scan Distance combined with a high resolution 3D model can take a long time to compute.

To increase the Ambient Occlusion masking intensity, increate the Masking Object Dimming slider, located in the Preferences >> Edit menu.

Create and save an Ambient Occlusion Map:

- Load a ZTool that you wish to have an Ambient Occlusion on.
- Check if your ZTool has UVs by clicking on Tool >> Texture Map >> New from UV Check button.
- In the Tool >> Masking menu, click on the Mask Ambient Occlusion button.
- If needed, tweak the three Ambient Occlusion sliders to refine the Ambient Occlusion results and then redo the previous step.
- To have a better visual feedback of the Ambient Occlusion Masking, go to the Render palette and switch from Preview render to Flat render, or choose the Flat Color in the Material palette.
- In the Tool >> Texture Map menu, click on New From Masking button to create a new texture from the masking.
- A new map is generated and displayed on the current ZTool.
- Clear the Masking by clicking on the Tool >> Masking menu >> Clear button.
- Click on the Tool >> Texture Map >> Clone Texture button to duplicate this image in the Texture palette, which will allow you to export this map.



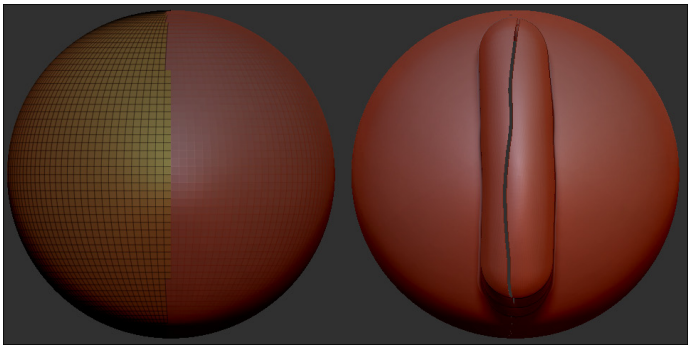
Model by Joel Mongeon

XXVII OTHER AND ADDITIONS

1. MERGE SUBTOOLS AND WELD OPTION

A new function has been added to the SubTools menu: Merge Visible SubTools. It allows you to combine several SubTools to create a new ZTool which will retain all the current polygroups and as much as possible, the Subdivision levels from previous SubTools.

The associated Weld option will weld all overlapping vertices which are at the border of two SubTools. This allows you to sculpt over multiple SubTools without any seam spread. Tool >> SubTool >> GrpSplit will split the current merged tool back to the various SubTools after you have sculpted your changes. Your vertex points must match in order for a true weld to take place.



On the left, two SubTools after a Group Split operation. On the right, several edits have been applied to the result of a Merge SubTool operation. Without the Weld option, a gap can appear.

Merging several SubTools into one new ZTool:

The Merge visible option, under the SubTool list.

- Load a ZTool with several SubTools.
- Hide the unwanted SubTools.
- Check the Subdivision level of all the SubTools.
- Select the main SubTool. If other SubTools have a higher subdivision level, those levels won't be kept. For example one tool has 4 levels but the other SubTool has 5 levels. You will lose the fifth level when merged.
- Click on the Tool >> SubTool >> Merge Visible button to create a new SubTool.
- In the Tool palette, choose the new ZTool to replace the previous ZTool with all its SubTools.

Notes :

If all the visible SubTools have the same Subdivision level count before the operation, the created new ZTool will keep these subdivision levels.

If all the visible SubTools have different Subdivision levels before the operation, the created new ZTool will keep the maximum Subdivision level possible, but may delete lower or highest levels, depending on which SubTool was selected before the operation.

Welding only affects points that share identical positions. This feature cannot be used to perform Boolean operations.

2. Group Loops

The Group Loops feature inserts edge loops around the existing polygroups. The Tool cannot have subdivision levels, so before doing this operation you will need to remove the higher and/or lower Subdivision levels.

These are options that can be adjusted prior the operation:

- GL Count: the slider sets the number of loops to insert.
- GL Smooth: the slider sets the amount of smoothing allowed during the operation.
- GL Triangle: set on for allowing triangles

This model uses the new GroupsLoops feature intensively, combined with the Polygroup Automasking option. Model by G.A.Priest.

3. Mirror and Weld

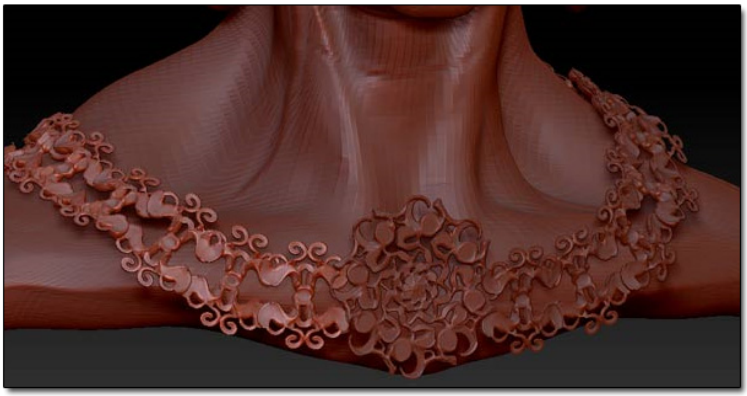
This function allows you to mirror geometry across an axis or axes. Select the axis by clicking on the little x, y or z on the right side of the button.

Points that intersect will be welded and overlapping geometry will be removed.

Like with Group Loops, the objects cannot have subdivision levels. Also, because the resulting mesh may contain triangles it may not be possible to reconstruct subdivision levels.

The Mirror And Weld with the symetry axis option in the button.

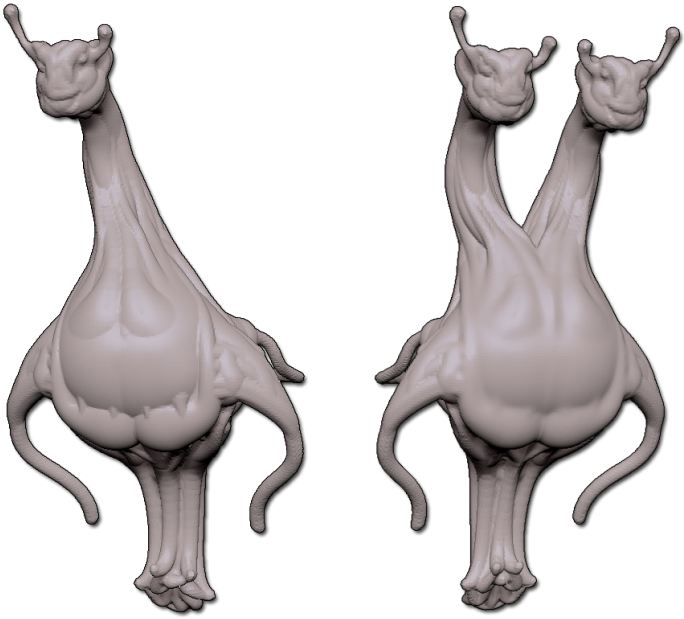
The position relative to the axis affects how the overlapping geometry is removed. The floor grid axes (see the Draw palette) give a good indication of how this works. For example, when mirroring along the X axis, all geometry on the left (where the red X axis is shown) will be mirrored whereas any geometry on the right will be removed. If all geometry is on the right then everything will disappear!



The Mirror And Weld used intensively for the neckless creation. Model by Eric Keller.

Note:

Like all the symmetry and mirror functions, this tool can use the Tool >> Preview function to move on the 3D space the pivot point. Then, it become easy to create complex shapes with this tool.

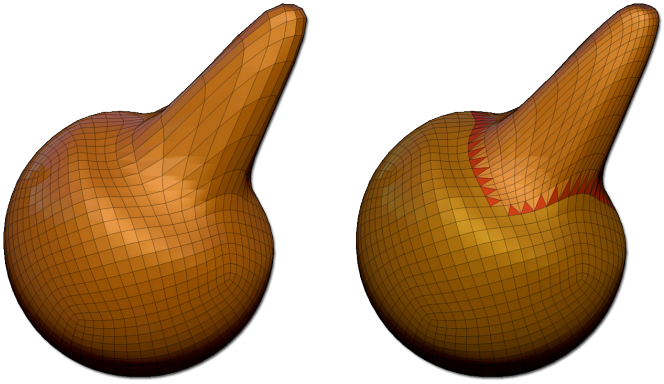


Miror and Weld function has been used to create this new creature.

4. Equalize surface Area

This automatic function will automatically do a local subdivision on stretched surfaces, to minimize important distortions.

Depending on the topology, this tool can create triangles or break the polygon flow.



On the left, the original model, stretched. On the right, the result of the Equalize Surface Area tool, with the local subdivision automatically created on the stretched part.

5. Gradient Polypaint

ZBrush Artist: Joseph Drust

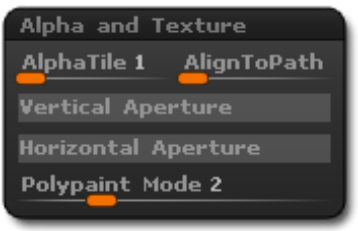
It is now possible to use a gradient color when Polypainting a model. This gradient is a mix of two colors: The main color is the default color available in the color picker, blended with the secondary color, enabled when the gradient button is pressed.

The Gradient button, under the sidebar color picker.

The Gradient color is available in the Color Palette or below the color picker in the standard ZBrush User Interface.

6. Polypainting Modes

To create more complex Polypainting, ZBrush now add several new operator modes, located in the Brush >> Alpha and Texture menus. Change the slider values to change the mode:



Polypaint Mode, at the bottom the Alpha and Texture submenu.

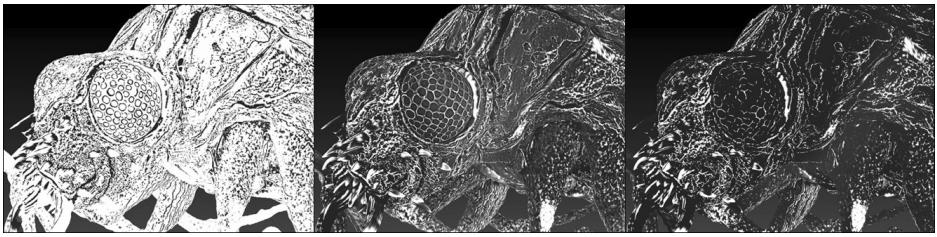
- Standard: The default painting mode. The painting will replace the underlying painting, mixed by the RGB Intensity.
- Colorize: this mode will replace the underlying color by the selected one, but it will keep the contrast of the underlying color.
- Multiply: this mode will multiply the color values of the new color or texture by the one on the model.
- Lighten: this mode will make color appear lighter on the darkened parts of the underlying color. The colors which are lighter won't be affected.
- Darken: This mode will make color appear darker on the color on the lighter parts

of the underlying color. The colors which are darker won't be affected.

With the new polypainting mode combined with gradiant Polypaint and Polish Brushes, it's become easier to create a nice painting effect like the glowing blue color of this car. Model by Ofer Alon.

7. Cavity Masking with Curves

The new cavity Masking lets you create masks based on the cavity of your model and can be combined with ZBrush's powerful curve system to create the mask which suits your needs.



Various results of the Cavity Mask adjustments. Model by Joel Mongeon.

Various results of the Cavity Mask adjustments. Model by Damien Canderle.

Note:

Cavity Masking can be saved as a texture by doing a New from Masking operation in the Tool >> Texture map menu.

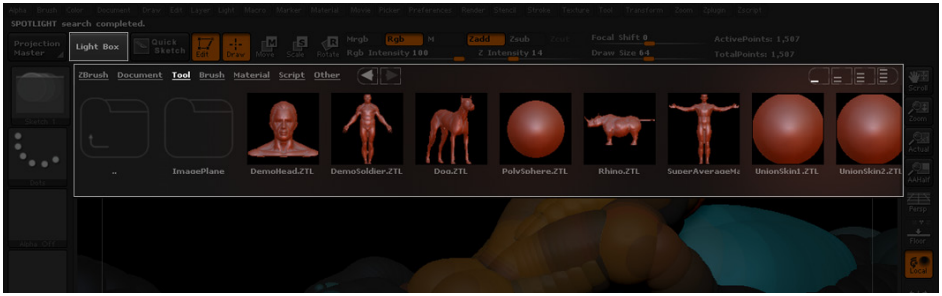
8. Auto Groups with UVs

A new option has been added in the Polygroups menu: Auto Groups With UV. It creates a polygroup based on the UV shells of the model. This function is different from the UV groups which create polygroups based on the different UV spaces. (between 0 and 1, 1 and 2, etc.)

- Create polygroups based on a multi UVs model:
- Load or import a model which has different UV shells.
- Optionally, switch in Frame view (Shift+F).
- In the Tool >> Polygroups menu, click on the Auto Groups with UV button: ZBrush automatically create different Polygroups, visible when the Frame is enable.

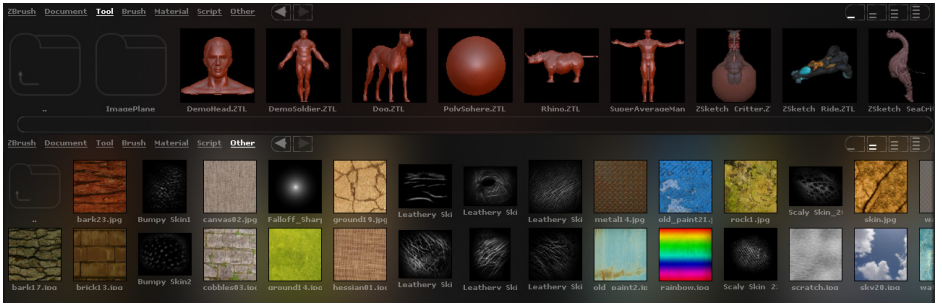
9. LightBox

LightBox for ZBrush 3.5 is a light version of what will be LightBox for ZBrush 4. Currently, it's a browser which can display the content of folders located on your hard drive.



The LightBox window and its button, located on the top of the Canvas.

LightBox will display the content of the folders located in the root folder of ZBrush, by categories: Documents, Tool, Brushes, Material, Script and Other.



On the top, a single row of Tool, on the bottom, two rows of Textures and Alphas

At any time, save your own content by using the default ZBrush Save/Export buttons for each item: Brush >> Save as, Texture >> Export, etc. You can save your content in your own folders and browse them with LightBox.

You are able to save shortcuts in LightBox. If you have an external hard drive you can put a shortcut in the ZBrush3.5>ZTools folder so that will always be there when you load LightBox.

If you would like to access your own folders in the Other tab just save all of your Texture, Alphas, and etc in the ZBrush>ZExportImport folder. How when you click on the Other tab all of your folders will be there.

To open an element, simply double click on it. If it's a 3D model / ZTool, it will be automatically loaded. If it's a texture, it will be loaded in the Texture palette, if it's a material, it will be loaded and selected, etc.

Shortcut: Shift+Z

9.1 LightBox navigation

LightBox offers several ways to navigate and display its content:

- On the top, click on one of the category names to display and browse its content: ZBrush, Documents, Tool, Brush, Material, Script and Other. These hyperlinks refer to ZBrush default folders.
- On the right of these default folders, click on the left or right arrow to switch from one category to another.
- Click on the left folder with the up arrow to go up in the hard disk hierarchy.
- Click on the other folder icons to enter in these folders.
- On the top right, choose to display on, two, three or four lines of icons.
- Click and drag on the bottom of the LightBox window to scale it up or down: it will change the size of the content preview.
- Click and drag in the content, including on a preview icon to move on the left or right the LightBox content.

9.2 LightBox preferences

In the Preferences palette, several LightBox settings have been added, including the function it takes to open at ZBrush startup. Uncheck the Open At Launch option to make LightBox close when launching ZBrush.

Several options allow you to change the look and feel of LightBox and also the number of threads used to create the previews of the displayed content. More threads will mean a faster display of the thumbnails.

10. Quick Pick

Quick Pick is a floating panel located at the top of all Tool, Texture, Stroke, Materials and Alpha palettes, which displays the last selected item for that palette.

The quick pick floating window on the top of the Tool floating window.

To reset the content of the Quick Pick panel, press the Reset (R) button of the corresponding palette.

11. Perspective

Perspective management has been improved in ZBrush 3.5 and is now more consistent when switching from one SubTool to another.

You can define the Focal Length by modifying the slider and activating the Align to Object option, which makes ZBrush align the Scale / 3D Zoom operation to the current tool.

This button and these parameters are located in the Draw palette and a copy of the button is also on the right Shelf, located at the border of the document.

Shortcut: P

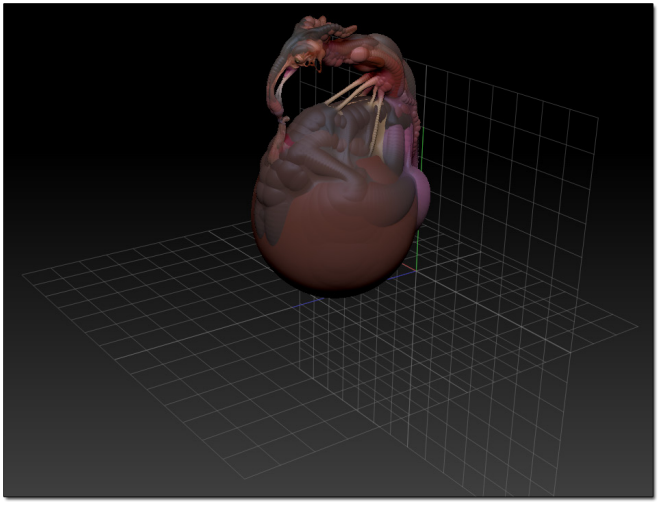
12. Floor Grid

A floor, represented by a 3D grid has been added to improve your orientation in 3D space for ZTools and their SubTools.

You can define the Floor Grid color, Floor Grid opacity, the number of Tiles, the Floor Grid Size and the Elevation.

By clicking in the X, Y or Z in the Floor Grid button, you can display the grid of the desired axis, or a combination of different grids.

An axis slider will let you display and change the length of a red, green and blue axis in the center of each grid, to help you visualize each axis. The three axes will be displayed even if only one grid is displayed. These axes won't be displayed if no grid is on.



The new Floor grid with the three axes

This button and these parameters are located in the Draw palette and a copy of the button is also on the right Shelf, located at the border of the document.

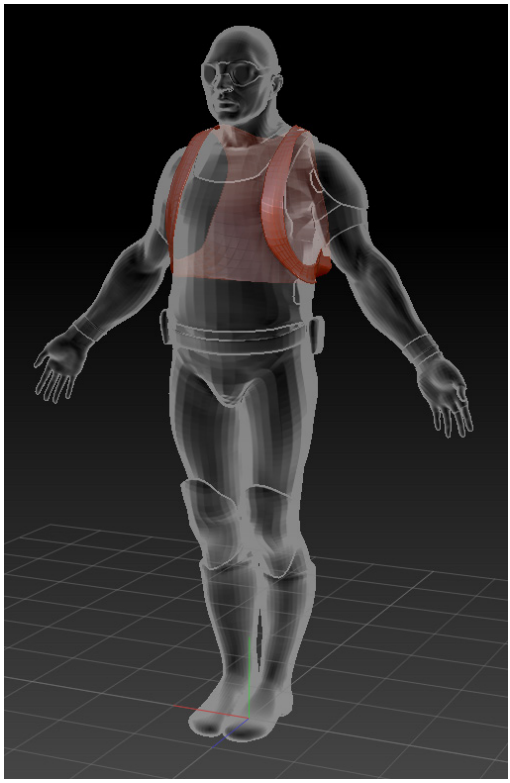
Shortcut: Shift+P

13. Ghost Transparency

The new Ghost transparency feature in ZBrush 3.5 allows inactive SubTools to be displayed with an appearance similar to frosted glass. This does a better job of showing the relative volume of SubTools, making it easier to see how your model's components relate to each other.

To activate this transparency, click on the Transparent button located in the vertical Shelf to the right of the Canvas or in the Transform palette.

This new transparency is now the default version. If you need to use the original transparency – for example, when working with image planes -- you can switch between modes by clicking on the Preferences >> Draw >> Ghost. For convenience, this switch is also located below the Transparent button to the right of the Canvas.



The new Ghost Transparency.

Note:

Several options are available in the Preferences >> Draw menu to fine tune the look of Ghost Transaprency.

XXVIII 3D NAVIGATION

3D navigation has been improved in ZBrush 3.5, providing several new ways to move your model in front of the camera or pan the camera across the canvas. This is the list of all the navigation capabilities of ZBrush.

1. Rotate

- Left click & drag in an empty space of the canvas or outside of the Edit rectangle. This action is only available when the cursor is not over a ZTool or a painted part of the canvas.
- New: Right-click & drag in an empty space of the canvas or over a ZTool or painted part of the canvas.
- Click & drag on the Rotate button available on the right Shelf in the interface or in the Transform palette.

2. Move (Pan)

- Press ALT key and do a Left click & drag in an empty space of the canvas or outside of the Edit rectangle. This action is not available when the cursor is over a ZTool or a painted part of the canvas.
- New: Press ALT key and do a Right-click & drag in an empty space of the canvas or over a ZTool or painted part of the canvas.
- Click & drag on the Move button available on the right Shelf in the interface or in the Transform palette.

3. Scale (Zoom 3D)

- Press ALT key and do a Left click & drag in an empty space of the canvas or outside of the Edit rectangle. While doing this action, release the ALT key without releasing the click. This action is not available when the cursor is over a ZTool or a painted part of the canvas.
- New: Press the CTRL key and do a Right-click & drag in an empty space of the canvas or over a ZTool or painted part of the canvas.
- Click & drag on the Move button available on the right Shelf in the interface or in the Transform palette.

4. Frame to the current ZTool

- ALT+Click in an empty space of the canvas.

- Click on the Frame button available on the right Shelf in the interface or in the Transform palette.

Note:

After selecting Subtool, clicking "Frame" once will frame selected Subtool. Click "Frame" again to frame the whole ZTool.

5. Frame to the current SubTool

- ALT+Click on the selected SubTool.
- Click on the Frame button available on the right Shelf in the interface or in the Transform palette.

6. Select a SubTool

- ALT+Click on an unselected SubTool to select it.

7. Frame View

An icon has been added to perform the Frame operation, which consists of a zoom to make the current ZTool or SubTool fit within the document space.

This button is located in the Transform palette and a copy of the button is on the right Shelf, located at the border of the document.

Shortcut: F or ALT+Click in an empty space of the canvas.

Note:

This function was available in the previous version of ZBrush, but only via the keyboard shortcut.

XXIX LIST OF CHANGES

Going palette by palette, we will identify all the new additions and changes between ZBrush 3.1 and version 3.5. Some of these functions and improvements are explained in the New Features and Improvments or Other and Additions chapters.

1. Alpha Palette

- New Alpha Antialiasing option to improve the Alpha quality.
- Alpha Noise: will apply a noise to the selected alpha.
- Noise Radius: controls the size of the noise. A higher number will create a stronger noise.

2. Brushes Palette

2.1 New options and parameters

Curve menu:

- Accu Curve:
- Curve By Pen: When the Curve By Pen button is activated ZBrush will use the Zero Curve as the modifier for the brush when the pressure is low and when the pressure is high ZBrush will transition into the Edit Curve to modify the brushs overall curve.
- Zero Curve: The Zero Curve will be applied to a brush when the Curve By Pen button is on and low pressure is being applied to the surface. When pressure is increased the curve that modifies the brush will be transfered to the Edit Curve
- Pen Curve: The Pen Curve is the curve that sets the transition between the Edit Curve and Zero Curve when the Curve By Pen is active."

Brush Depth menu:

- Imbed: this slider change the center of the Brush sphere by moving it up or down, the center is by default located on the top of the surface.
- Depth masking: activate this option to enable the change of the outer and inner depth settings.
- OuterDepth: this slider lets you flatten the top of the brush sphere.
- InnerDepth: this slider lets you flatten bottom of the brush sphere.
- Brush Depth Curve: this curve will let you define the profile of the brush depth.
- Gravity Strength slider: a different value than 0 will affect your brush with a gravity.

Change the cursor orientation to define the direction of the gravity.

Sample menu:

- Buildup: When applying brushstrokes, information is constantly picked from the canvas and used to update the stroke.
    - If Buildup is turned off, the current brushstroke is ignored while picking the information, until the mouse/pen button is released.
    - If it's turned on, the information is picked both from the canvas and from changes made by the current brushstroke.
- Fast Sample: deactivate this function to bring back the behavior of some brushes available in ZBrush 3.1.
- Constant Samples:
- On Surface: keeps the applied stroke on the along the surface consistently.
- Samples Radius slider: ZBrush will sample the Normals and Position of the mesh under the cursor when being applied. If the settings are set at .75 then ZBrush is evaluating 75% of the mesh that is under the cursor.
- Normal slider:
- Position slider:
- Preserve edge slider: by increasing this value, the brush will preserve the edges near the stroke and will avoid its deformation. This setting is use in the s, m and hPolish brushes to create the hard edge effects on the border and make them avoid affecting the surface which create an angle with this troke.
- Stabilize orientation slider: it averages stroke normals. This will add stabilization to rough surfaces.
- Stabilize Direction slider: when on, the brush doesn't compute the backface of the surface, then the average result will be better.
- Orthogonize Slider: this option aligns the direction of the brush to be perpendicular.

Modifier menu:

- Smooth: The Smooth slider will apply a smooth that will follow the tail of a stroke
- Pressure: The Pressure slider will apply an auto pressure that adjusts by stroke speed.
- Tilt brush: modify this value to apply an angle in degrees to your brush, to create non perpendicular deformations.
- Constant Tilt: enable this option to have a constant tilt when doing your stroke. When disabled, the tilt angle will vary depending of the stroke speed: slow stroke means low angle, fast stroke mean high angle
- Mesh Insert preview has been moved to this menu.
- Trails: makes a connection between the beginning and the end of your stroke, by continuing it, depending of the option value.
- Intensity: apply a Fallof to the trail.

- V Aperture: The V Aperture slider control the Vertical Aperture of an alpha in the Alpha Palette when Trails slider is set higher then 1
- H Aperture: The Aperture slider control the Horizontal Aperture of an alpha in the Alpha Palette when Trails slider is set higher then 1.

Auto Masking menu:

- All the masking features has been organize in this menu.
- Directional masking has been added. It limit redraw issues of an alpha when applied to the mesh. This is especially evident when the Roll feature is on in the Stroke Palette.
- By Pressure: The Pressure slider controls the Directional Masking by pen pressure. If the slider is set to 0 then the pen pressure will have no affect to the Directional Masking. If the By Pressure slider is set to 100 then when 100% pen pressure is applied the Directional Masking will be disabled.

Others:

- Smooth options now have a Strong Smooth Mode button which implements ZBrush 3.0 smooth behavior.
- The Smooth Min connected Points slider let you define the minimum number of vertices to be affected by the Smooth Brush, to solve the Smoothing limitation on boundaries of surfaces.
- ZSub respects backface masking, if active.
- Tablet Pressure menu has options for using pressure sensitivity of a graphics tablet to dynamically adjust brush size, Z intensity, RGB Intensity and/or the BrushMod slider.
- Sketch Smooth brush sliders let you change the behavior of the ZSketch Smooth 1, 2 3 and 4 brushes.
- Reset All Brush has been added to initialize the brushes to their initial values without initialize ZBrush.
- Use Global Setting has been added to the Tablet curves menu.
- Directional has been added to the Auto Masking that will limit redraw issues of an alpha when applied to the mesh. This is especially evident when the Roll feature is on in the Stroke Palette.

2.2 UI ORGANIZATION

- Auto smooth slider, Auto pressure slider and Brush Mode have been moved to the same location in the Brush palette.
- Mesh insert is now a stand-alone button, for a better preview of the loaded ZTool.
- AccuCurve button, Wrap mode slider and Edit Curve have been merged to create the Curve menu.

3. Document Palette

- The maximum document size is now 8192x8192 (power of 2) rather than 8000x8000.
- WSize option has been added next to the New Document button. When turned on, new documents will be created to exactly fill the available screen space.
- Save As StartupDoc to save the current document (size, background gradient) as your starting document

4. Draw Palette

4.1 New options and parameters

- The Perspective Mode has been improved.
- The Align to object perspective mode let you have an alignment from the camera to the ZTool while Scaling/Zooming your ZTool.
- The Floor Grid has been added.
- Floor Grid (Shift+P): Switches the floor grid on or off.
- Elv: the slider changes the elevation of the floor grid.
- Grid Col: change the color of the floor grid. As with other pickers, you can click and drag from this button to any point on the canvas or interface to select the color at that point.
- Opacity: the slider changes opacity of the floor grid.
- Grid Size: the slider changes the size of the floor grid
- Tiles: the slider adjusts the number of tiles the grid will have.
- Axis: the slider adjusts the length of the axes. The axes are displayed as Red for the X axis, Green for the Y axis and Blue for the Z axis. When your model is facing forwards (towards the camera or you, the viewer) with a rotation of 0,0,0, the X axis will be to the left, the Y will be up and the Z axis towards you. Set the slider to 0 to disable the axes display.

4.2 UI organization

- The Z intensity, Rgb intensity sliders as well as Mrgb, Rgb, M, Zadd, Zsub and Zcut buttons have been re-ordered.

5. Movie Palette

Several parameters have been added:

- Quality slider: the compression of the video.
- Intensity slider: Controls the intensity quality of the movie. Recommend only adjust the Quality slider.
- Color Intensity slider: Controls the color range of the movie. When slider is lower the movie will be generated with a lower color range. Example: The movie will be 16BIT instead of a 32BIT when slider is lowered.

6. Picker Palette

- The picker direction affects the brush cursor/circle orientation for a better visualization of the picker function.

7. Preferences Palette

7.1 Interface menu

- Texture and Alpha saved in tool button added (default is on).
- Click time Slider indicates the time before ZBrush understands a click to be a stroke and not just a transform.
- Click distance Slider indicates how many pixols ZBrush understands to be a stroke. Example: If slider is set to 10, then ZBrush understands that you must move more than 10 pixols before ZBrush applies as a stroke.
- Rotate Speed and Scale Speed Slider added to improve the ZTool manipulation.
- Smart Transform Rate Slider controls the rotation of ZTools. Smaller ZTools will rotate faster than larger ZTools.
- Recenter Rate Slider calculates rotation of a Tool based on the center of the canvas. Example: Set the slider to 200. Select the default dog ZTool. Click on the nose of the dog. When you rotate now you will notice that the dog will rotate to the center of the canvas, using the nose as the central point of rotation.
- Document Fade slider removed.
- RightClick Navigation added to turn off/on the new right click navigation.

7.2 Draw menu

- VBlur switch and ViewBlur Radius slider added, to help you better understand the shape of the ZTool without focusing on its details.
- Adots slider, Grpc button, Maxdepth Slider, Active Opc slider and Inactive Opc slider removed.

- Ghost Clear Transparency added, to control if the transparency of the ZTool will have a fog glass look. If off ZBrush will not apply new transparency feature.
- Ghost Transparency button will turn of the Ghost Transparency and set the transparency to be based on the textures, Polypaint, or material setting. This will set the transparency how it was in ZBrush 3.1.
- Ghost Button was added to turn the Ghost Transparency on/off.
- Transparency Depth added, to control the opacity of the glass. If turned up then the transparency will decrease. If turned down then transparency will have an outline to the ZTool. Turning this down is a great way to see form in your sculpt.
- Front Opacity, to control how transparent a SubTool will be that is in front of selected tool.
- Back Opacity to control how transparent a SubTool will be that is behind the selected tool.
- Transparency Color added, to effects the color of the glass.

7.3 Performance menu

- Multirender button removed.
- H and N priority buttons removed.

7.4 Edit menu

- Align Cursor to Surface toggle has been added. When active, the cursor will rotate to align to the surface normal while editing an object. When turned off, the cursor will always lay flat on the canvas. This option is cosmetic only, for personal preference. It has no actual effect on sculpting.
- Auto Select SubTool button added to gives you the capability to ALT+Click SubTools on the canvas.
- Masked Object dimming slider added to change the intensity of the Masks.
- Inactive SubTool dimming slider added to change the visibility quality inactive SubTools to match active SubTool.

8. Stroke Palette

- Brush intensities have been equalized when LazyMouse is on or off.
- New LazyMouse Backtrack features, Plane, Line, Spline, and Path added.
- Snap to track featured added to keep the stroke along the drawn Line, Spline, or Path.
- Track Curvature was added to give an averaging of the smoothing of an edge when in Spline mode.
- Align Cursor to surface was added to turn off/on if the brush cursor will follow

surface detail.

- Auto Select Subtool will turn off/on the ALT+click select any subtool in the canvas. This will also turn off the ALT+click in the canvas to frame the model.

9. Render Palette

- Deep Shadow button added, to improve the quality of the real time shadows by producing more vibrant shadows.
- Back Shadow slider removed.

10. Texture Palette

- Maximum texture size is now 8192x8192 (power of 2) rather than 8000x8000.
- JPG file format may now be imported.

11. Tool Palette

The Tool palette is one of the most important palette in ZBrush. In ZBrush 3.5, several modifications have been made in the features and UI. Most important features and changes have been described in the New and Improved Features chapter.

11.1 SubTool

- Enable or disable Polypainting display icon have been added.
- Icons switch between Add, Remove and Intersection for the Remesh tool have been added.
- Merge Visible button added with Weld Option. See the New Features and Improvement chapter for more information.
- Project All Distance Slider added to improve the quality of the 3D projection by controlling the raycast distance.
- Project All Blur Amount slider added: Before the projection is calculated, ZBrush will apply a blur to the normals. This will create a smooth effect on the normals.
- Extract Thickness slider may now be given a negative value. Positive values extract the mesh out from the surface while negative values extract the mesh back behind the surface.

11.2 Geometry

- Equalize Surface Area function added: it will automatically do a local subdivision on stretched surfaces.
- GroupsLoops function added: Inserts edge loops around the polygroups.
- Mirror and Weld function has been added.

11.3 Masking

- New Mask Ambient Occlusion button. See the New Features and Improvement chapter for more information.
- New Ambient Occlusion Intensity, Scan Distance and Aperture Sliders added.
- Buttons are now active or not, depending on the current ZTool and information: example, if no colors are painted on a ZTool, the Mask by Saturation button won't be active.
- Mask Alpha button adds the masking to the selected Alpha in the Alpha Palette.
- Mask Texture button adds the masking from the mesh to the texture in the Texture map.
- Mask Intensity Slider added. Will control the intensity of the mask on the selected mesh that will be applied to a Texture or Alpha. If you apply a mask to a mesh at 100% RGB intensity and keep the default 50 in this slider then a grey value will be added to selected texture or alpha. If this setting is set to 100 then 100% of the masked value you will be added. If you masked at a RGB 100 setting and have the slider at 100 then pure black will be added to the Texture or Alpha map.
- HidePt and Showpt has been moved in the Visibility menu.
- Mask Alpha: When an alpha is selected in the Alpha Palette this button will apply any masking on selected tool to the alpha. The Mask Intensity will control the value of the masking to be added to the alpha.
- Mask Texture: When an Texture is selected in the Texture Map Sub-Palette this button will apply any masking on selected tool to the texture. The Mask Intensity will control the value of the masking to be added to the texture.
- Mask Intensity This will control the intensity being added to the alpha or texture. This works just like the RGB Intensity when drawing out a mask.

11.4 Visibility

- New Visibility menu
- Grow: increase the visible polygons by unhiding the border polygons, one loop by one loop. This function doesn't add polygons, it just reveal previously hidden polygons.
- Shrink: decrease the visible polygons by hiding the border polygons, one loop by one loop. This function doesn't remove polygons, it just reveal previously hidden polygons.

- Outer Ring: hide everything except the outer ring of the visible polygons.

Note:

These option can be easily combine with Tool>> Deformation >> inflate to create plateau or joint borders.

11.5 Polygroups

- New Auto Groups With Uvs, to create polygroups based on the UVs shells of the ZTool.
- From Polypaint and tolerance will create polygroups from a Polypainting. Change the slider tolerance to increase or decrease the different polygroups detections.
- From Mask and tolerance will create polygroups from a mask. Change the slider tolerance to increase or decrease the degree different polygroups are detected.

11.6 Polypaint

- Colorized moved to this sub-palette
- Polypaint from Texture will apply selected Texture in the Texture Palette or Texture Map as Polypaint to selected tool.
- Polypaint from Polygroup will convert the exisiting polygourp to a Polypainting.

11.7 UVMap

- New UVMap size slider and preset map size buttons (512, 1024, 2048, 4096).
- New PUVTile UV unwrap.

11.8 Texture Map

- Texture On button added.
- Texture selector added.
- Clone Texture button added.
- Transparent button added.
- Antialiased button added.

11.9 Displacement Map

- Displacement selector added.
- Displacement On button added.
- Clone Displacement button added.
- New button and slider order in the menu.
- DPres Slider removed. DPres is now defined by the UV Map size.
- Adaptive and DPSubPix can now be used together.
- Mid displacement value slider added.
- Flip V added for 32-bit map creation.
- Scale Factor slider added for 32-bit map creation.
- 3 Channels TIFF export added for 32-bit map creation.
- 32Bit option added. Exports map immediately upon creation.

11.10 Normal Map

- Normal Map selector added.
- Clone Normal Map button added.
- NMres Slider removed. NMres is now defined by the UV Map size.
- SwitchRG button added.
- FlipV switch added.
- FlipR, FlipG and FlipB switches added.

11.11 Export

- New Scale and offset sliders added.
- DXF and OBJ removed.

11.12 UI organization

- New Polypaint menu.
- New UVMap menu.
- Texture Map: Buttons previously from the Texture menu in version 3.1 have been moved and their behavior slightly changed: New from Polypainting/Masking/UVMap/UV Check/Vertex Order/Poly Order.
- New Texture Map menu: merges several features in a dedicated menu for texture map creation.
- Texture menu has been removed and content mixed with other menus.
- “Displacement” menu has been renamed to “Displacement Map”.

12. Transform Palette

• Frame button added. Was previously the ALT + Click in an empty space of the canvas action. See the 3D Navigation section for more information.

12.1 UI organization

• Frame button has been renamed to Polyframe and has a new icon.
• L.Sym button has been slightly changed.

13. Zplugin Palette

• New deactivation plugin. See Activation chapter.

XXX THANKS!

Pixologic would like to thank everyone who has participated as a beta tester for version 4.

Your feedback has been invaluable as we've worked to provide you and all ZBrush artists with the best and most stable feature set possible.

We hope that you will continue to share at ZBrushCentral as everyone is introduced to this new version that you are already so familiar with.

Happy ZBrushing, and thank you again!

The Pixologic Team

ZBrush Artist - Magdalena Dadela

XXXI NOTES