forger User Manual

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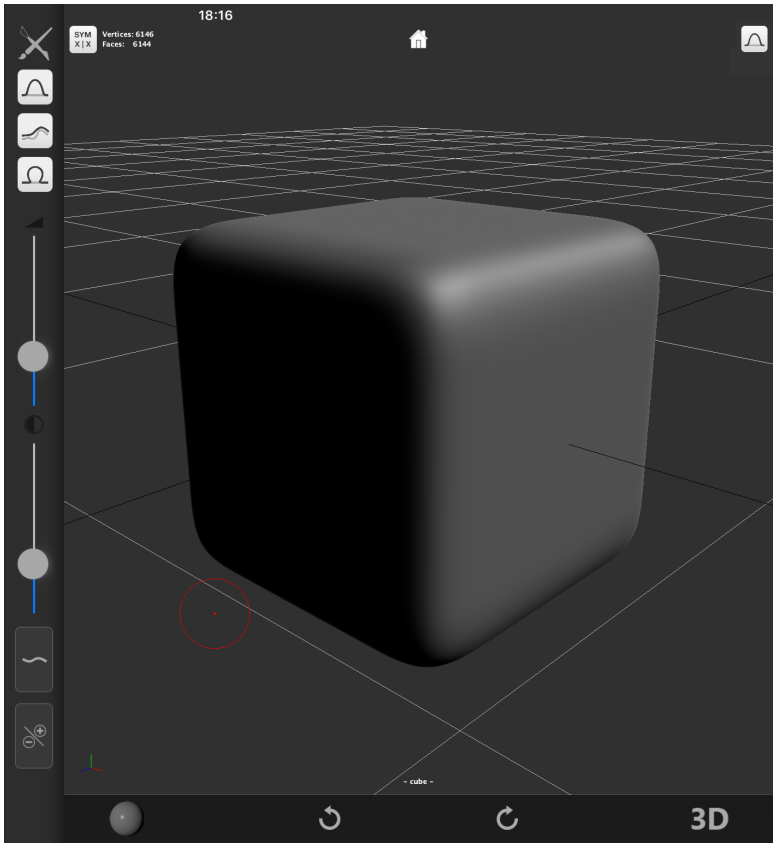
v. 1.6

Contents

1. Interface

forger for iOS is an universal sculpting and painting app that works on all iOS devices *(iPhone/iPod Touch/iPad/iPad Pro)* although it really benefits of the extra screen size found in the larger devices and makes great use of the performance benefits that the iPad Pro(s) can bring to the table and supports various pressure sensitive stylus.

1.1 Overview



The forger interface is divided into two main sections, the viewport, and the menu panel.

forger(s) interface is exactly the same one on all devices (since v1.4+).

forger gives access to most functions through the side panel, this panel can be set on the left or right depending on the user's preference (adjustable from the Preferences menu)

This panel can be opened or closed by dragging in/out the SideBar.

1.2 Start Menu

This menu shows up every time that forger starts up.

It allows users to open the latest scene the user was working on, or use of the five built-in base meshes (plane, cube, sphere, bust, human), users can also choose the "New" option to start from a fresh scene.

1.3 Viewport

The viewport is where all of the action happens, users can navigate in 3d and sculpt meshes and paint by interacting with it.

The viewport shows the active tool in the top right corner of the view

The current selection is displayed at the bottom center of the view.

A "Home" button is located on the top-center of the view that frames the user's current selection when pressed.

In the sculpting context, the top left of the view displays some information of the currently selected mesh. (polycount & symmetry settings)

1.4 Sidebar

The SideBar gives handy access to some of the current tool(s) settings as well as having shortcuts to the user's preferred tools.

The SideBar can be split into three sections:

- **Tool Picker:** Gives quick access to all tools available for the current user context.
- **Tool Shortcuts:** Give quick access to user-chosen preferred tools.
- **Context settings:** A set of elements that varies depending on the context.

1.4.1 Sculpting Context Settings

The sculpting context settings expose the most commonly adjustable settings or shortcuts that users might need to access during sculpting, they consist of the following:

- **Tool Size Slider:** Use this to adjust the active tools size.
- **Tool Strength Slider:** Use this to adjust the active tool's strength.
- **Smooth "shortcut" Button:** Press this while sculpting to temporarily switch the active tool to the "Smooth Brush". Double tap it to keep it pressed until is double tapped again. (Experienced desktop users might recognize this as the "Shift" keyboard key modifier in some Desktop sculpting applications.)
- **Alternate "shortcut" Button:** Press this button while sculpting to run the "alternate" function of the active brush. Alternate generally means opposite (ie: push/pull, in/out, etc...) although it may vary from brush to brush, please read each Sculpting Tools documentation page for details on how the alternate mode affects their behavior. (Experienced desktop users might recognize this as the Alt/Ctrl keyboard modifier in Desktop sculpting applications.)
- **Light "shortcut" Button:** Press this button while touching the viewport to adjust the default lights placement and thus see your sculpts under different lighting conditions. (Experienced desktop users might recognize this as the "L" keyboard shortcut in Desktop sculpting applications.)

1.4.2 Painting Context Settings

The painting context settings expose the most common settings or shortcuts that users might need to access during sculpting, they consist of the following:

- **Tool Color:** Use this to adjust the "color" that the tool will use when applying paint, note that its use may vary depending on the active Painting Tool.
- **Tool Stamp:** This represents the active stamp that the active tool will use, users, can change it by tapping on it and choosing one from the Stamps popover that will show up.
- **Tool Size Slider:** Use this to adjust the active tools size.

- **Tool Flow Slider:** Use this to adjust the active tools flow.
- **Eyedropper "shortcut" Button:** Press this button to temporarily change the eyedropper tool to select existing colors from the "paint canvas".

1.4.3 Defining Tool Shortcuts

Users can define their own tool shortcuts by doing tap-hold on the shortcuts themselves and selecting a tool, these shortcuts are stored in the forger preferences and restored on launch.

> *Note that the number of shortcuts available can vary from device to device based on how much room there is for them. (in terms of screen resolution)*

1.5 Toolbar

- **Display Mode:** Allows users to adjust the viewports display mode.
- **Undo:** undo the last action
- **Redo:** redo the last action
- **Viewport Toggle:** Press this button to change the viewport mode between 3D and UV.

2. User Interaction

2.1 Viewport Navigation

2.1.1 Orbit

Single finger drag in the canvas will make the camera orbit around the selection.

2.1.2 Zoom

Moving two fingers in opposite directions doing a spread/pinch gesture will move the camera closer/further away from the selection.

2.1.3 Pan

Moving two fingers in the same direction will offset the camera from the focused object.

2.1.4 Sculpt/Paint/Interact

If a mesh is selected in the outliner (if selected, its name will be displayed in the bottom center of the screen) users will be able to deform/paint/transform it by touching and dragging it with a single finger.

2.1.5 Frame

Press the home button in the viewport to frame selected object.

2.1.6 Snap

While orbiting, press the smooth brush shortcut to snap the rotation to the closest 90-degree angle in all axis.

2.2 Stylus

forger supports three pressure sensitive stylus. In order to enable their pressure sensitivity and custom button actions, users must go to the Preferences menu and tap on the one they want to be enabled. A pressure sensitivity widget will appear on the viewport and the stylus will be listed with a checkmark next to it if pressure sensitivity is enabled.

2.2.1 None / Apple Pencil

This option should be used if there is no available stylus or the user wants to use the Apple Pencil.

2.2.2 Wacom Creative Stylus

In order to link to this stylus, make sure you have Bluetooth enabled and press any of its buttons to start the Bluetooth discovery process, then press on "Wacom Stylus" under the preferences menu and it should list all Bluetooth devices available, select your stylus from this list (commonly named "Wacom Creative Stylus") if it doesn't have already a checkmark next to it.

- **Button 0** on this stylus can be used to orbit.
- **Button 1** on this stylus can be used to pan.

2.2.3 Pogo Connect

In order to link to this stylus, make sure you have Bluetooth enabled and press any of its buttons to start the Bluetooth discovery process, then press on "Pogo Connect" under the preferences menu.

- **Button 0** on this stylus can be used to orbit.

3. iOS Integration

3.1 iOS Files App Interaction

forger exposes its "Documents" folder to the Apple "Files" app so users can interact with elements generated by forger or make new contents accessible to it via this app.

This app also allows users to exchange files with iCloud drive or the different cloud vendors.

The forger Documents folder recognizes and encourages users to fill the following subdirectories to have their contents accessible from the app:

- ***Documents/stamps/*** Can contain square, black & white images to use as brush tips during painting.
- ***Documents/ibls/*** Can contain lat-long, HDR images, if possible in the *.exr and* .hdr formats to light scenes with (Preferably of a maximum of 2000 pixels wide)
- ***Documents/images/*** Can contain any images that users may want to use to project paint with the "ProjectBrush".

3.2 iOS Drag & Drop

forger has partial support for iOS Drag & Drop due to the current limitations of the system.

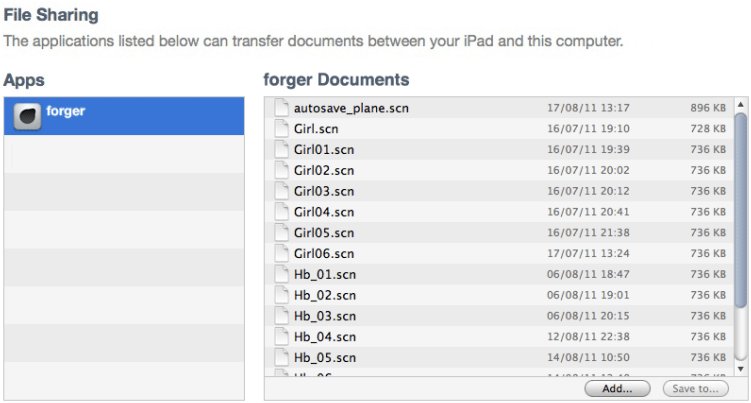
Only images can be dropped to the "Resources" and the "Stamps" panels, when dropped these will be saved automatically to their corresponding subdirectories in the forger Documents directory.

IBL dropping is not supported since iOS would clamp HDR image values to the range 0-255, so it is recommended the users add IBLs via the Apple "Files" app.

Geometry or scene files can't be opened in forger since the current iOS implementation is rather primitive and would require an entire file to be loaded in memory before it can be used, whilst that may seem reasonable for some simpler text files it simply isn't acceptable for the kind of Preferably files that forger can work with. Once Drag & Drop is a bit more mature Apple might expose some sort of direct access to files so developers can access to a file in parts this will be implemented.

> *Note however that tapping on any Geometry or scene file within the Apple "Files" app will instantly launch forger and load it so there is no need to do the actual drag action.*

3.3 iTunes File Sharing



Users can use iTunes file sharing for moving files in/out of forger, this feature can be used any time via wifi if iTunes synchronization is enabled for the device or via cable if it is not.

In the "Applications" tab in the device sync preferences, there are two sections, in the lower section, iTunes lets users move files from/to connected devices.

After adding files through the iTunes file sharing interface, models will appear in the "File" menu ready to import.

3.4 Open In...

forger allows users to import scenes or models directly from other apps via iOS's "Open In..." functionality.

This can be done from Apple's "Mail" or "Files" apps, Safari, or any other app that may generate or contain any editable file type supported by the app.

4. File I/O

forger allows full interoperability with other platforms and 3D packages by allowing users to import/export models from/to it at any given time.

In addition to working from the base meshes supplied with forge, users can export other meshes from any traditional desktop 3D package, forger lets users import polygonal geometry files in the very common Wavefront OBJ format and the industry standard geometry format Alembic.

The "File" menu is the main file interaction menu in forger, it allows users to save and open forger scenes, as well as importing and exporting geometry files.

The contents listed in this menu correspond to the contents of the "Documents" folder of the app, these contents can be browsed and edited via the Apple "Files" app.

> *Note that forger filters out any non-geometry files from this list to avoid user confusion.*

forger scene files can store many multi-resolution meshes per file, along with materials and tool preferences. (they have the *.fpk extension)

Tap on any file listed here to open/import it.

4.1 Opening vs Importing

If a scene file is selected, forger will try to "Open" it, whereas other supported (geometry) formats will be imported.

In practice "opening a scene" means clearing the contents of the current scene (if any) and opening the old one, whereas "importing into a scene" means leaving the existing contents of the scene intact (if any) and adding the contents of the chosen "import" file into it.

4.2 +

- **New...:** Clears the current scene of all contents and sets up the default (empty) forger scene.
- **Plane:** Opens the default "Plane" sculptable scene.
- **Cube:** Opens the default "Cube" sculptable scene.
- **Sphere:** Opens the default "Sphere" sculptable scene.
- **Bust:** Opens the default "Bust" sculptable scene.
- **Body:** Opens the default "Body" sculptable scene.

4.3 Save

Allows saving the current scene to open later as it is, with all its contents, including selection, masks and tool preferences.

- **Save:** stores the current scene with the last scene name it was given or if there isn't a scene name with the current selections scene name.
- **Save Incremental:** Increments the "name" a previously saved scene, ie for mySceneName.fpk it would save as mySceneName1.fpk and so on.
- **Save As...:** Gives users the ability to save the scene with an adequate name so it's easier to remember what the contents are. It is recommended using this first and then using the other two in successive saves to avoid users from typing a similar or identical scene name all the time. ;)

4.4 Export

Allows exporting the selected geometry to an OBJ file.

- **Export:** stores the currently selected geometry into a geometry file with the same name as the selected geometry has in the scene.
- **Export As...:** Gives users the ability to export the selected geometry with an adequate name so it's easier to remember what the contents are.

- **Email. . . :** Exports the current selection to a geometry file and adds it to an email form that users can finish editing before sending. (Only available if the device forger is running on has an email account configured)

4.5 Autosave

By default forger will automatically save scenes when the app is moved to the background (users press the home button or some other app takes over) unless it detects that the scene is "too heavy" to autosave, if forger detects that this is the case, it will show a message informing the user. This is because there is a restriction in iOS that limits the amount of time that an app can spend having background activity after moving to the background, heavier scenes will take longer to save so forger may decide to disable autosave on them. *(Note that users will always be notified of this option being disabled)*

> *Note that all of this depends on the "Autosave Scene" setting, found in the Preferences menu that defines whether scenes are auto saved or not.*

5. Tool

This menu shows tweakable parameters for the active tool, users can change the active tool from their SideBar shortcut buttons or the tool picker, also found in the SideBar.

Every tool in forger has a different set of parameters and each parameter within a tool will change the way this tool behaves when applied to the target mesh (or canvas).

5.1 Sculpting Tools:

Note that in forger the size of the brush works in screen units, meaning that the same brush size can affect different amounts of vertices, with varying strengths depending on how close the camera is to the selected model. This is actually simpler in practice than it may seem in writing and it will feel natural to users.

forger comes with various different brushes, each brush has two different modes, a normal and an "alternate" mode, the "alternate" mode can be triggered by pressing the "Alternate Shortcut Button" found in the sidebar in sculpting context.

A tools behavior will change depending on whether it is running in "regular" or "alternate" mode.

5.1.1 Parameters:

Most sculpting brushes share the same parameters so they are only listed once here.

- **Size:** Size of the brush in screen units, it will affect any areas of the meshes under it.
- **Strength:** Strength of the brush (relative to screen units)

- **Falloff:** Curve that represents the decay of the strength as vertices get further away from the center of the brush.
- **Buildup:** When disabled, there will be a limit of how much an area can be sculpted in successive stroke-overlapping interactions within the same stroke.
- **Smooth Stroke:** Makes brush strokes smoother avoiding unwanted jittery behaviors.

Standard

Regular: Pushes vertices in the direction of the average normal.
Alternate: Pushes vertices in the opposite direction of the area normal.

Clay

Regular: Moves vertices with a nice clay-like effect, filling holes and building up in the direction of the average normal.
Alternate: Works in the opposite direction of the area normal.

Flatten

Regular: Pushes vertices over the average plane defined by the average point position of the affected vertices and the area normal.
Alternate: Same effect.

Move

Regular: Moves vertices in screen coordinates.
Alternate: Pushes vertices along the area normal.

Layer

Regular: Pushes vertices up to a per stroke limit in the direction of the area normal.
Alternate: Works in the opposite direction of the area normal.

Inflate

Regular: Pushes vertices in the direction of their own normal.
Alternate: Works in the opposite direction.

Pinch

Regular: Pushes affected vertices closer to the center of the stroke.
Alternate: Pushes vertices away from the center of the stroke.

Scrape

Regular: Pushes vertices onto the average plane defined by the positions of the affected vertices and the area normal.
Alternate: Same effect.

Smooth

Regular: Averages the position of the affected vertices with their adjacent ones.
Alternate: Same effect.

Mask

Regular: Marks affected vertices as masked, all brushes will have less or no effect on masked areas.
Alternate: unmasks affected areas.

PaintSelection

Regular: Selects faces.
Alternate: Deselects faces.

5.2 Painting Tools:

5.2.1 Paint Brush

The Paint Brush is the main painting tool of forger, it is also the most basic one, all of the other painting tools build on top of this tool.

The Paint Brush will paint on the selected canvas.

Parameters

Base

- **Size:** Size of the brush

- **Size Modifier:** Determines how the size of the brush can be modified (None/Pressure)
- **Flow:** Strength of the brush (in screen space units)
- **Flow Modifier:** Determines how the flow of the brush will vary (None: constant/ Pressure: pressure-dependent)
- **Color:** Color that the paintbrush will use to paint

Tip Shape

- **Tip File:** the file to be used as the brush tip, set through the Stamps panel.
- **Tip Angle:** the initial angle of the tip image to use.
- **Tip Flip U:** flips the tip image on the X-axis.
- **Tip Flip V:** flips the tip image on the Y-axis.
- **Tip Orient Stroke:** Aligns the tip image to the stroke, making it follow it.
- **Tip Filter:** Filtering applied to the tip image (Bilinear/Nearest)
- **Stroke Type:**
  - Dabbing: Each sample of the brush stroke will be evaluated as a dab (dot) at the input coordinates.
  - Line: Between each sample of the brush stroke, forger will fill in with as many dabs as necessary (considering the brushes spacing) making strokes look as continuous lines.
- **Hardness:** Simulates the hardness of brushes, smaller values make softer edged brush tips whilst higher values make harder-edged ones.
- **Spacing:** defines the minimum distance between two consecutive dabs of the brush in the same stroke. (in brush size units 1.0 = brush size).

Shape Dynamics:

- **Smooth Stroke Distance:** Distance in screen space units at which the brush stroke will take effect, any distance smaller than this will be ignored, this parameter is used to make smooth lines and curves removing unwanted jitters. *(only available when "Stroke Type" is set to line)*
- **Size Jitter:** Adds a certain randomness to the brush size.
- **Flow Jitter:** Adds a certain randomness to the brush flow.
- **Angle Jitter:** Adds a certain randomness to the brush tip angle.
- **Position Jitter:** Adds a certain randomness to the brush placement from where the user put it.

5.2.2 Paint Eraser Brush

The Eraser brush will erase paint from the selected canvas.

Parameters

It's parameters do the same as the Paint Brush.

5.2.3 Project Brush

The Project Brush can do a screen space projection of images onto the selected canvas.

Parameters

The Project brushes parameters act the same way as the Paint Brush ones with the following additions/exceptions:

- **Color:** Acts as a color multiplier which allows adding a "tint" to the projected image as it's being projected, set to white to project with the same color or tweak it for artistic purposes.
- **Projection File:** The image to use when projecting paint, can be set via drag & drop from the Resources panel.
- **Projection Filter:** The texture filtering to use when projecting the given image.

- **Nearest:** Use the closest projection image texel to the projected coordinates.
- **Bilinear:** Use a texture filtered sample of the projection image texels at the projection coordinates.

5.2.4 Eye Dropper Tool

This tool allows picking colors from the selected canvas.

5.3 Misc Tools:

5.3.1 TranslateTool

Allows applying translation transforms to the selection.

5.3.2 RotateTool

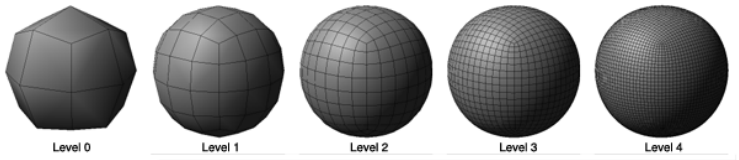
Allows applying rotation transforms to the selection.

5.3.3 ScaleTool

Allows applying uniform scales to the selection.

> *Note that nonuniform scaling is **not** supported currently, this is planned to be supported in the future, nonuniform scaling requires computationally expensive operations which are better avoided on these devices, a solution is being worked on at the moment.*

6. Mesh



The mesh properties menu allows users to apply different operations on the selected mesh. This menu can be accessed via the "Mesh" cell in the "Main Menu" or from the small button on the left of a "MultiresMesh" node in the Objects menu.

> *Note that this menu will not open if there is no mesh selected, to select a mesh, go to the "Objects" menu and tap on its name.*

6.1 Geometry

This section controls the amount of detail that can be sculpted onto a mesh, the higher the number of faces/vertices of a model, the more detail can that can be sculpted.

Pressing Subdivide will increase the resolution of the model by multiplying the number of faces by four, whilst keeping the previous (coarser) version of the mesh as another sublevel, note that it is possible to step up/down existing levels at any time.

> *Note that before subdividing forger will check if there is enough memory available and will bail out if it finds that there is not enough if this happens and the mesh resolution is still at a moderate level, closing background apps might help.*

When working with multiple resolution models users will find it easier to step down to coarser levels to do big form changes and step up to higher ones to do finer detail edits. forger will automatically propagate any changes *(positions, masks, visibility)* done to each level to other levels.

- **Sublevel:** If a model has multiple resolutions, users will be able to step up/down one level at a time by using this slider.
- **Delete Highest:** Deletes the highest sub-level. *(active only when the current sublevel isn't the highest)*
- **Delete Lowest:** Deletes the lowest sub-level. *(active only when the current sublevel isn't the lowest) Deleting unnecessary levels can help out freeing memory.*
- **Rebuild Sublevel:** If a mesh was previously subdivided in another software and imported into forger their sublevels can be rebuilt by pressing this button. This button rebuilds one sublevel at a time and it's safe to press until there are no more levels left to rebuild.

6.2 Masking

As noted before, masks define how much tools can affect certain areas. From this submenu, the user can clear or invert the masked areas on the selected model.

- **Clear:** Removes the mask.
- **Invert:** Inverts the mask.

6.3 Other

- **Bake Transform:** Applies any transforms made to the model. Note that this action will flush the undo history.

6.4 Remeshing

This feature allows users to sculpt freely allowing them to re-create their model's topology on the fly as they work, it's meant to be used mainly for concept sculpting as the generated meshes aren't topologically ideal due to their triangle only nature.

- **Resolution:** This slider defines the resolution of the intermediate volume used for remeshing, the higher the value the more accurate it will be and the slower the process will be.
- **Remesh:** Starts the remeshing process.

6.5 Selection

Controls the selection of the mesh, selections can be used in conjunction with features such as topological symmetry scanning and partial visibility.

- **Clear:** Clears the selection of the model.
- **Invert:** Inverts the selection of the model.
- **Grow:** Increments the selection, adding adjacent, unselected faces to it.
- **Shrink:** Decrements the selection, removing selected faces from the border of the selection.

6.6 Symmetry

This section controls the way that forger deals with symmetry on the selected model.

In order to sculpt a model symmetrically, users must choose an axis and any edits that are done on one side of the mesh will be replicated on the other side of the mesh along that axis, this assumes that the originating mesh is somewhat symmetrical. If the original mesh was symmetrical but has been "posed", read on for symmetrical topology support.

There is support for posable symmetry, when working with meshes that have been "posed" in external software, users can still work on them symmetrically provided that these meshes are topologically symmetrical, in order to enable this, users must to the lowest sublevel, select (with the SelectBrush) only two contiguous adjacent faces along their topological axis and press Scan Topological if this is successful, users now should be able to set the mirror axis to T(tangent) and sculpt symmetrically even if the model is posed.

- **Mirror Axis:** Axis to use for symmetry, choice between (X, Y, Z, and Tangent)
- **Scan Topological:** Scans the model for topological symmetry. (Only active whilst the lowest level of a mesh is active)

6.7 Visibility

There is also support for partial mesh visibility, this can help users when trying to work on areas hard to reach, it can also give them a quicker/smoother response on denser meshes, or simply concentrating in certain areas.

- **Hide Unselected:** When pressed with an active face selection, this will hide any faces that were not selected.
- **Invert Visibility:** Inverts the visibility of the mesh.
- **Reset Visibility:** Shows the entire model.

7. Layers

7.1 Sculpt Layers

Sculpt layers allow working in a non-destructive manner by saving everything done in them as offsets from the main mesh.

Layers are locked to a certain mesh sublevel when created, this means that layers are only editable whilst their matching mesh sublevel is active and deleting a sublevel will delete its associated layers.

7.1.1 Add Layer

Creates a new sculpt layer and locks it to the currently active subdivision level.

7.1.2 Flatten Layers

Clears all layers and applies them to the model.

7.1.3 Layer Operations:

- **Select Layer:** Tap on a layer to make it the active one.
- **Toggle Visibility:** (eye icon) Makes them affect or not affect the mesh they are attached to.
- **Lock/Unlock:** (padlock icon) Locking a layer will stop any actions from affecting the mesh and thus the layer if is the active one. Layers can be locked or unlocked by pressing on the lock icon that appears on each layer.
- **Intensity:** Can be used to great benefit to adjust how much of this layer will affect the mesh after it has been sculpted. The slider appears only in the active layer.

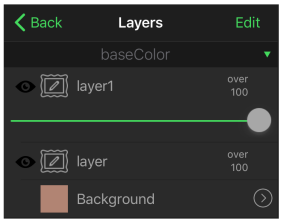
- **Rename Layer:** Double tapping the name of the active layer will allow users to change its name.
- **Delete Layer:** Users can swipe to the left and choose "Delete" from the options that appear to delete a layer.

7.2 Paint Layers

forger allows painting multiple texture channels (baseColor, metalness, roughness) in a layered manner.

Paint layers allow users to texture in a non-destructive way by separating different texture elements in layers.

Layers can then be enabled/disabled, rearranged and partially mixed with different operations to define a final look for a texture channel.



7.2.1 Channel chooser

If multiple texture channels are active for the currently selected paintable mesh, this top chooser will allow users to change between them.

7.2.2 +

Creates a new layer that users can Paint on.

7.2.3 Add Texture Channel

Shows a list of texturable channels left untextured in the current shader of the selected paintable mesh and creates a new paintable texture for the chosen texture channel.

7.2.4 Layer Operations

- **Select Layer:** Tap on a layer to make it the active one.

- **Visibility Toggle:** Allows users to toggle the visibility of the layer.
- **Layer Blend Mode:** Users can adjust the blending mode of the layer by tapping on the name of the blending mode and choosing one of from the list that appears. forger uses the famous "Porter-Duff" compositing operators. All blending is done in linear space in forger.
- **Intensity Slider:** Defines how much of the layer should be mixed with the bottom layers. The slider appears only in the active layer.
- **Adjust Layer Parameters:** Some special layers may have a small circled arrow that allows users to access their parameters for further tweaking.
- **Rearrange Layer:**
- **Rename Layer:** Users can swipe to the left and choose "Rename" from the options that appear to rename a layer.
- **Delete Layer:** Users can swipe to the left and choose "Delete" from the options that appear to delete a layer.

7.2.5 Exporting Textures

All textures are exported in the TIFF format.

- **Export All:** Exports all channels of the selected paintable mesh with a naming scheme following: "meshName_channelName".
- **Export:** Exports the current channel with a naming scheme following: "meshName_channelName".
- **Export As...:** Allows users to enter any name (without extension) to use as the exported texture name.

8. Objects

8.1 Scene Contents

All scene nodes are listed in the Objects menu, they can be selected by tapping on them, renamed by swiping left and choosing from the menu and deleted.

- **Visibility Toggle:** Each object with a visible representation can have its visibility value toggled from here.
- **Scene Node Icon:** Each scene node type is represented by an icon to allow users to differentiate between them.
- **Scene Node Name:** Shows the name of the node.
- **Scene Node Parameters:** Allows users to tweak parameters of the node.
- **Rename Node:** Users can swipe to the left and choose "Rename" from the options that appear to rename nodes.
- **Delete Node:** Users can swipe to the left and choose "Delete" from the options to that appear to delete nodes.

8.2 IBLs

forger allows users to use "Image Based Lighting" to light their scenes, doing so will give a more realistic look to scenes.

This should be used preferably whilst painting since gamma correct materials have harsher

Please note that this panel does not allow drag & drop since iOS clamps images to 8bit when they are dragged, users are encouraged to copy any latlong images they may have to the apps "Documents/ibls/" subdirectory of the app via Apple's "Files" app.

forger supports panorama (lat-long) HDR images in common industry formats such as *.exr and* .hdr.

Selecting an image in this panel will create an "EnvironmentLight" node with the selected image if there isn't one in the scene or change the IBL image of the first "EnvironmentLight" node it finds.

> *Note that IBLs can't be accumulated or translated in the scene, only the first one found is used in scenes.*

For more information on IBL please visit https://en.wikipedia.org/wiki/Image-based_lighting

9. Materials

Materials define the way objects look in forger. The material editor allows users to create new materials, modify existing ones and assign materials to objects.

9.1 Creating Materials

New materials can be created by pressing the add (+) button in the top right corner. The interface will pop up an input alert asking the user for a material name, after accepting the name, the view will move into editing mode.

When in editing mode, the user can delete materials by pressing the trash button. The default material cannot be deleted.

9.2 Material Parameters

Material behaviors in forger are controlled by their parameters, each material type has different parameters that can be one of the following:

- **Constant:** A color, decimal or boolean number. Its value does not vary across the surfaces it is applied to.
- **Texturable - Color:** A color image, that can vary across the surfaces that it is applied to based on the UVs and the values located near the texels of those coordinates.
- **Texturable - Scalar:** A scalar image (in linear space, black and white), that can vary across the surfaces that it is applied to based on the UVs and the values located near the texels of those coordinates.

9.3 Material Types

9.3.1 Blinn

This is the legacy material type, it has been kept in forger because it's useful for sculpting as gamma correct materials present harsher light-to-shadow transitions. That although more correct, can be hard to sculpt with given that it may hide forms.

- **Diffuse:** Defines the object's color when a light is emitted onto its surface.
- **Specular:** Defines the effect the material has on the reflected light.
- **Shininess:** Controls the size and brightness of the specular reflection.

9.3.2 Standard

This material type is used for all painting and is the regular type of material. It's a physically-based, gamma-correct material that can represent many kinds of surfaces. It also has texturable parameters that users can use to have further control over the shading of the surfaces using it.

This material factors in Environment Lighting if users have set any from the "Objects Menu".

- **Base Color:** (texturable - color) The diffuse base color of the surface.
- **Metalness:** (texturable - scalar) Represents how "metallic" the material is, with a value of 1.0 it will be fully metallic, values closer to 0.0 will make the material appear non-metallic. Note that although the metallic model has no diffuse component, it has a tinted incident specular.
- **Specular:** Incident (maximum) specular amount. This is in lieu of an explicit index of refraction.
- **Specular Tint:** A concession for artistic control, this parameter tints incident specular toward the base color. Note: grazing specular is still achromatic *(i.e. in the specularTint parameter doesn't tint incoming light at grazing angles).*

- **Roughness:** (texturable - scalar) Controls the glossiness of specular reflections, the lower the value, the sharper the reflection. A value of 0.0 will result in a mirror-like reflection while a value of 1.0 will create reflections closer to a rubber-like diffuse reflection, any value in-between will result in blurred reflections.

- **Emit Color:** Emission energy, non-black values give the appearance that the material is emitting incandescence.

9.4 Applying Materials

Materials can be applied to selected objects by pressing the "Apply to Selection" button that can be seen whilst editing them.

Any forger scene, new or old will contain a material named "default_material", this material cannot be deleted, but can be modified.

10. Preferences

forger allows adjusting user settings in the preferences menu, these user choices are saved and restored across different forger sessions.

The preferences can be edited through the “Preferences” menu.

10.1 Controls

- **Free Orbit Style:** Controls the orbiting style, when disabled, the orbiting style will be turntable (the classic navigation for all 3d software) when enabled the orbiting style will be a ”Rolling Ball” freestyle orbiting. (this navigation style might feel more natural to some users for sculpting as it has no restrictions in the way it handles orbiting)

- **Action Pivot:** Enable this option to use the last active point as the center for all navigation actions, note that this center will still stay in place in screen coordinates.

- **Left Handed:** Changes the layout of the app to display the SideBar and menus on the right, having this disabled will mean that the app is in Right Handed mode and thus the sidebar and menus will be on the left. (This may seem counter-intuitive but is actually done on purpose so the hand that users don’t use as much is the one they will use to change brushes and the other hand can stay on top of the model)

- **Hide Touches:** Hides the touch display that appears when there are multiple touches. (This option is only to keep the viewport cleaner and less distracting when users feel more confident with the app.)

- **Pressure Curve:** This curve is applied to the input pressure of the various devices before setting the final pressure in the active tool, allowing users to adjust pressure handling to their preference.

10.2 Colors

- **Background Color:** Controls the background color (clear color) of the viewport.
- **Cursor Default:** Controls the usual color of the cursor, when there is no shortcut pressed.
- **Cursor Smooth:** Controls the color of the cursor, when the smooth shortcut button is pressed.
- **Cursor Alternate:** Controls the color of the cursor, when the alternate shortcut button is pressed.

10.3 Others

- **Display Pressure Widget:** This option will add a little widget to the viewport that will display stylus pressure if a pressure-sensitive stylus is being used. Please note that the operating system needs some memory left to work so it is recommended that there is some memory left to the OS to work with. It is recommended that you close all background apps that you can.
- **Display Memory Chart:** Shows a viewport widget in the form of a pie chart that represents the memory taken up by forger (blue), all the other apps (red) and the available memory (green).
- **Show Memory Warnings:** By default, forger shows memory warnings whenever it receives one, but users can disable this from the menu although doing so is not recommended.
- **Copy Autosave To Documents:** forger keeps up to three autosave files, users can copy these files to the "Documents" folder by tapping this button.
- **Reset All Settings:** Resets all settings to factory settings, including all tool preferences.

11. Others

11.1 Resources

This panel shows any images or directories found in the "images/" folder of the app.

Users can place any images they want to use to project with to this folder via Apple's "Files" app or by dropping images onto the panel from any other application. (ie: Safari)

Any images contained in this panel can be dragged to the viewport to use in conjunction with the Project Paint Brush.

> *Camera and Photo Library pictures can be used, but when used they are copied and shrunk when stored inside forger for projection, to avoid users from attempting to project unnecessarily large files and to minimize scene file storage.*

11.1.1 Camera

Users can take pictures and have those images added to this panel to use for projection.

11.2 Photo Library

Images from the photo library can be added to this panel to use for projection.

This panel is only visible whilst the app is in the "painting" context mode.

11.2.1 Turntable

forger allows users to make turntable videos of their creations to share with friends and colleagues.

After generation, turntable videos are stored in the devices "Photo Library"

Note that in order to store in the "Photo Library" access permission is required by iOS. If access isn't granted, turntables will be left in the app's "Documents" folder.

Users can choose the length (in frames) of the turntable videos.
Nodes MultiresMesh

11.3 Share...

Users can share their creations via email or tweets or tweet screenshots be at this menu once pressed choose your selected destination

11.4 Help

- **User Manual:** Shows the user manual of the app.
- **Twitter:** Shows the twitter account of @forgerapp. Check here often to know the latest about forger!
- **About:** Has some useful info about the app and contains a list of acknowledgments.

11.5 Feedback

Opens an email form that users can fill in to send an email to forger support to give feedback about the app.

Requires at least an email account to be configured on the device that the app is running on, otherwise, emails can't be sent.

11.6 Extras

forger allows buying some extra functionality or assets from this section via In-App Purchases (IAP).

In order to buy In-App Purchases, users will need a valid AppStore account and internet connection at the time of the purchase.

Occasional internet connection may be needed for further validation in successive runs as forger may occasionally check AppStore purchase receipts.

12. Appendix

12.1 Format notes

12.1.1 Scene

forger Package Scene (*.fpk)

This is the default forger format, it supports saving all scenes contents and states, including selections and tool preferences.

It is recommended that users remain in this format for as long as they can and use the more general export/import formats to interact with other mobile or desktop apps.

12.1.2 Geometry

OBJ (.obj)

- Import:
  - UVs (if found)
  - Geometry
- Export:
  - UVs (if any)
  - Geometry

Alembic (*.abc)

forger has "basic" support of Alembic files, allowing the import of single frame meshes.

Only Ogawa Alembic files are supported

- Import:
  - **Sculpting:** forger will import any sub-meshes as individual MultiresMesh nodes.
  - **Painting:** forger will merge all sub-meshes into one for painting purposes.