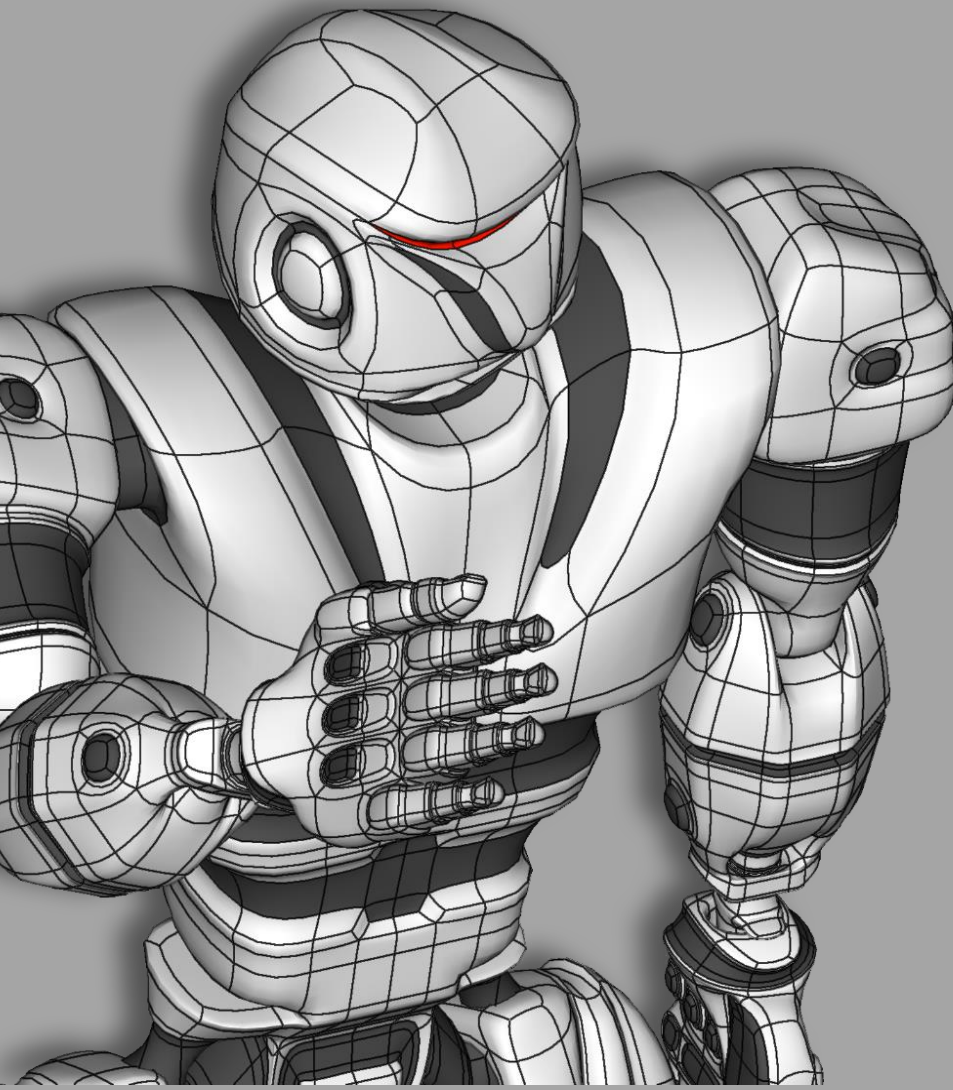




SDF3D

User Manual

V0.9B/08.01.18



With tutorials and
practical tips from the
Show-real Design team.

This is a BETA Copy of the User Manual.
We will provide further updates soon.



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Preface

Welcome to the world of Softedge© modelling!

The Softedge Approach

On a mobile Device you cannot have everything, but what could be the right toolset for designing things on the go? We needed to find the right compromise in between usability, memory, broad support of devices and functionality. Unfortunately many people write negative recensions just because they miss functions like Animation, inverse kinematics or Boolean operations. These functions need a lot of Memory, and that will slow down your mobile, and reduce stability of the app and operating system. So we decided to build a suite of apps, starting with SDF3D as the editor and offering further functions in separate apps of the SDF3D Suite later.

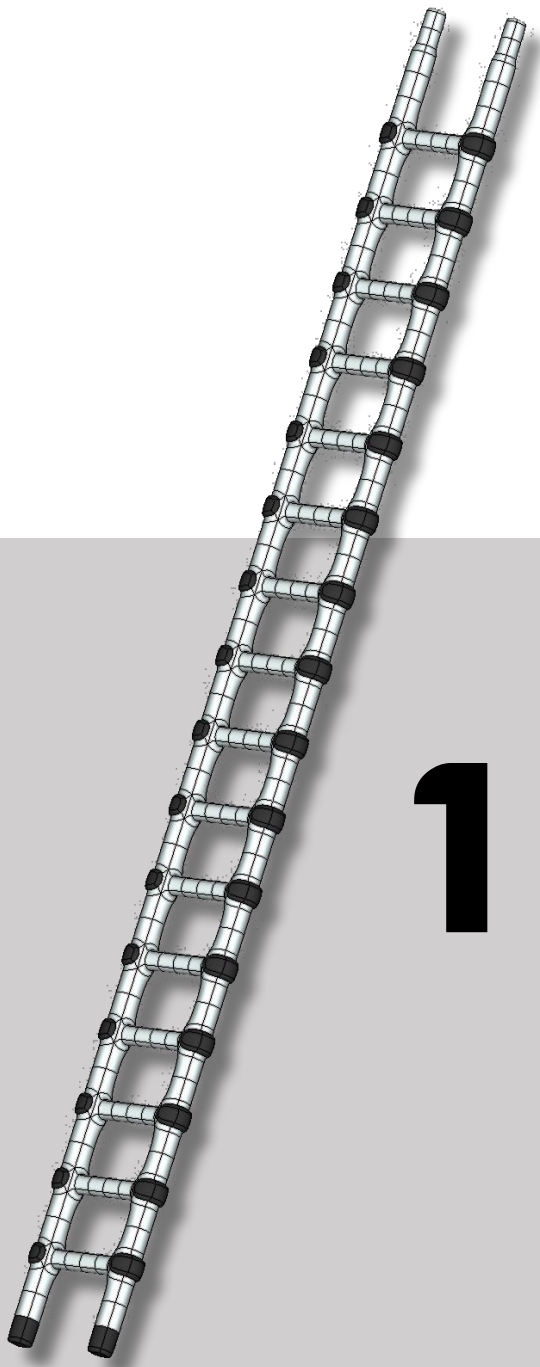
Given the limitations we came to a different approach, we took the softedge modelling way. Our aim was not to be a fully featured 3D app such as Blender on a Desktop, we wanted to make 3D editing simple and usable on touch screens. On small touch screens you edit faces rather than vertices, because they are easier to touch and modify. So we designed SDF3D in a way that a user on a touch screen can work on complex models by the touch interface of most mobiles. Nevertheless Users of Stylus enabled devices have a precision advantage and we recommend for larger projects to use a capacitive stylus, which are available for cheap money nearly everywhere.

What is Softedge modelling? Opposite to hard Edge Modelling or just draw / Extrude SDF3D uses a tension model. Tension can be understood like you have a piece of Wire and hold it with 2 hands, by pushing the hands close together the wire bows itself under the tension. If you add additional geometry in the middle of the wire the tension has relief and the bow is getting straighter. 80% of today's 3D tasks need soft edges, and if you look on items you use in daily life they have fine rounded edges, if it comes to ergonomic things like tools or household items, than they get even more refined and smoothed in order to fit well in the hands and to not hurt you. Therefore we decided to go an abstract way on modelling and starting with a ball rather than a cube. Soon you learn how many Objects you can design if you just think the other way around. And with some simple examples we show you how to use SDF3D in the right way. You will be surprised how useful and straight forward our approach is and that it is well suited for mobile devices. SDF3D is ment to be a mobile tool for designs on the go that are later being refined and edited on a workstation. Nevertheless thanks to surface colouring and the STL Export feature you can immediately print the objects on a 3D Printer or use them in game design environments such as Unity or with the Unreal Engine.

We hope you are going to have a lot of fun with SDF3D and that you are going to create a lot of interesting 3D Models.

Regards

Your SDF3D Team



1

Introduction

1. Introduction

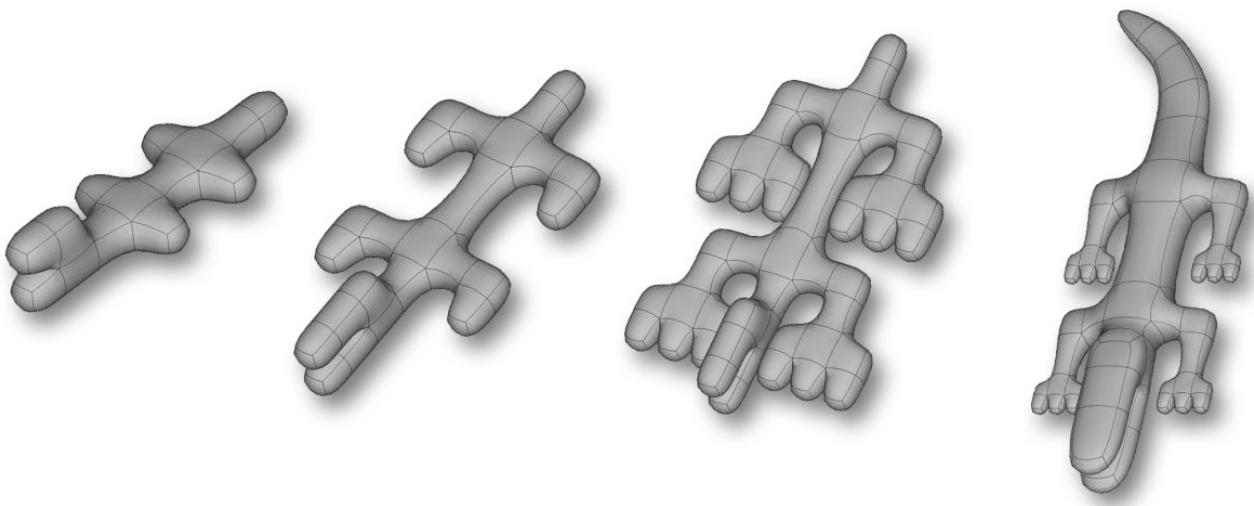
Softedge™ modelling & subdivisions

The SDF Suite of products is especially designed for rapid 3D modelling on mobile devices. Mobile devices have advantages and disadvantages compared to desktop workstations.

Their biggest advantages are their touch and pen interfaces, the disadvantages are small screens, less memory and slower CPUs.

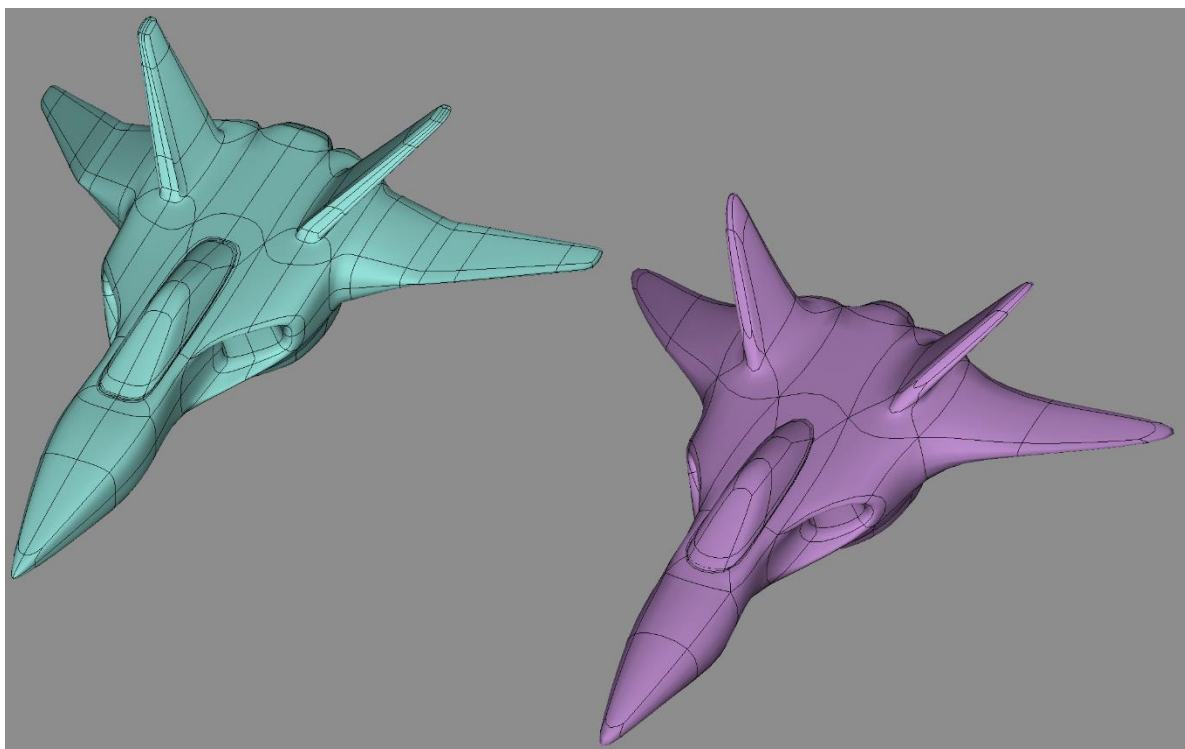
The SDF Team was on a quest to decide which modelling method would suit mobile users best, while still be acceptable in terms of functionality and usability even on a smartphone to provide quick and convincing results.

SDF uses Subdivide Forming as the core design approach and has a high sophisticated 3D Engine supporting this method. Mobile enables people like quick results and simplicity. If we look at creative entertainment we can see that Minecraft was successful even it was only build on cubic blocks. People expressed their creativity with it and there have been artists, virtually building whole cities out of digital blocks, as the Lego Artists did this over the time.



In the Subdivision model, these blocks are extruded subdivisions, which can be more and more refined, with the advantage of always-smooth edges, easy expandability and structure. SDF uses the control grid method, to describe the 3DModel. The Design focuses on the control grid where you can just touch and select faces, add faces or even mirror the whole object against the selected face in order to create new structure. SDF does that in such a simple way, that it is very suitable for 3D Design on the go.

Subdivision needs another thinking in its methodology. You split the design that you have in mind into sections and you create for every junction and split an extrusion step:



Above example illustrates how the softedge tension model of SDF3D works. The purple Object has been simplified, the round edges being automatically calculated based on instances in between. Additional subdivisions have been applied to the left plane. Adding additional splits and subdivisions straighten the object out. You actually start with a soft edge model and in a later stage of the design process, you can decide where you want to straighten out edges. Using this methodology allows you to work with a less complex model that can be much easier shaped rather than using complexity where you need to select a lot of geometry instances. This is why we have chosen the softedge approach for mobile devices.

To make this simple, SDF uses a special formula to create each extrusion step in proportion to its originating faces. From there you just bring the next section into shape by scaling, rotating and moving its control faces. Compared to other design approaches using nurbs or geometric faces, SDF allows free, predictable absolute position of faces and recalculates the so-called tension between the surfaces during the alteration process. It needs some practice to understand how this works in order to get the right results, as the subdivision model behaves differently if faces are modified in a non-proportional way. In order to create more complex designs, SDF allows splitting of faces. By using splits with ring connected faces (using the strip select function), tension can be removed from the model and edges become more and more edged (still maintaining smooth edges which are perfect for 3D Printing).

We are about to put up a bunch of tutorials which show how you can create nearly anything complex in SDF.

Nevertheless, do not forget you are on a mobile device, SDF therefore is good for quick results, but the memory intensive postproduction like texturing or Boolean operations should be done on the desktop. SDF offers different export filters and plugins for that purpose.

Quick Colouring Function

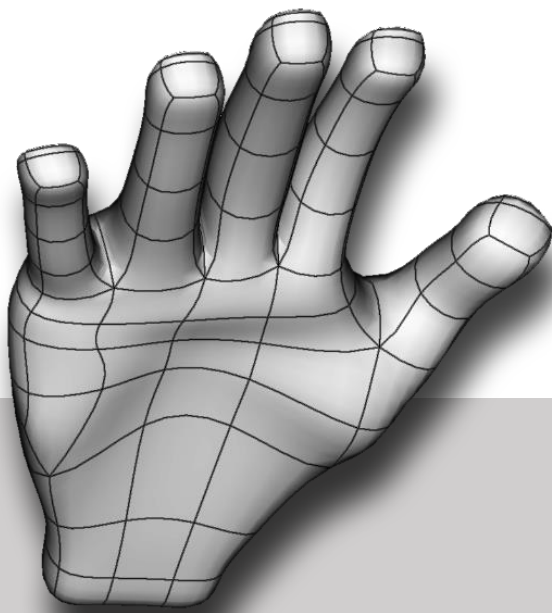
Using Coloured Faces SDF is very suitable for illustrations and design studies. Colouring faces on mobile devices is not as powerful as texturing, but help to get a first impression of a Design and allow vibrant illustrations as part of a workflow in between the designers desktop.

Smart Mirror

With Smart Mirror and Rotate, designers can create stunning structures and repeating parts quickly. These set off Functions is very suitable if it comes to design interesting forms and structures for 3D Printing, as you can see in our Illustrations. There is also a Symmetry function that mirrors the object in real time for symmetric projects.

Who uses SDF?

- SDF is made for Speed-Modelling. It is suitable for Product Design and rapid prototyping tasks. It allows in-experienced users to quickly create simple forms and print them on 3D Printers.
- Architects love extruding buildings out of a ground face to quickly get an idea of a project, while game designers love the typical smooth edge concept, helping to create unique SciFi Objects quickly.
- The SDF face colouring model can give a quick impression of colouring of an object on the go, making it also easier to apply texturing in postproduction process on the workstation.
- A Goldsmith or a Fashion Jewellery Designer takes advantage of the smooth edge model creating 3D Printable mock-ups for chains and rings.
- Hobby enthusiasts enjoy a real 3D Tool in the hand that makes creating 3D Objects as easy as playing Minecraft.
- Engineers can rapidly understand a design and work on it from all sites with a finger-tip, so SDF can serve as a kind of sketchbook for future designs and concepts.
- As all Modellers and Sculptors, SDF is not designed for precise CAD Work, but serves well if it comes to designing and understanding a certain matter. It is also perfect for concept art and gives Artists a realistic impression of a model wherever they are.
- Game Designers like the .OBJ and .3DS Export, which also allows to set the amount of polygons prior export in order to optimize a design for 3D Game Engines.



2

User Interface

2. The SDF3D user-interface

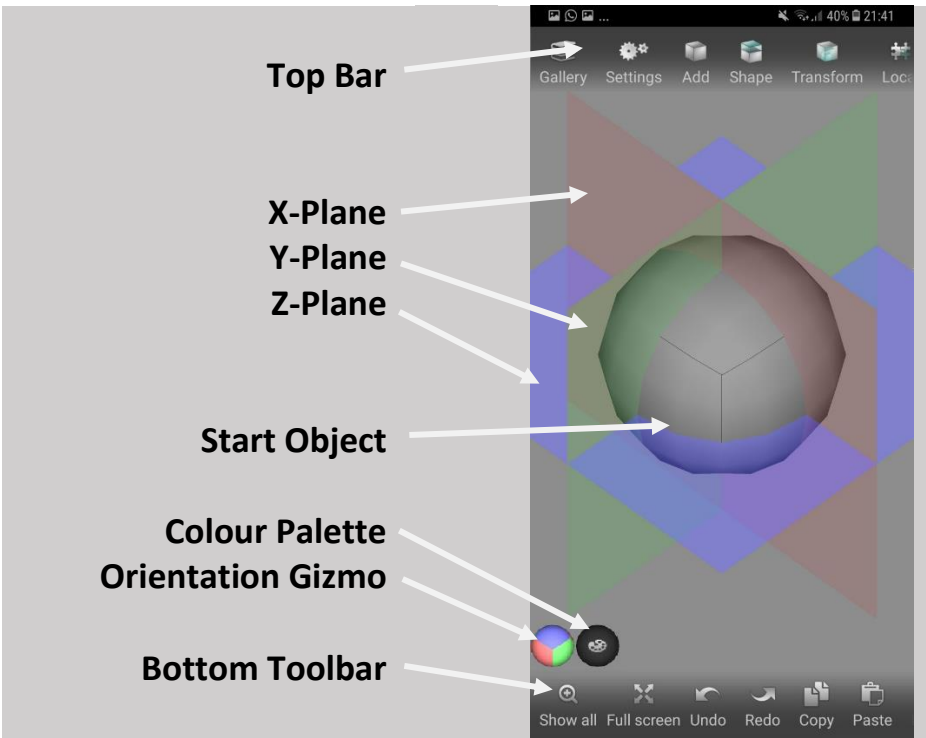
Portrait and Landscape modes

The User interface has been built to support many platforms but also take advantage of larger displays whenever possible. Therefore the icons are in horizontal rows and if the screen is too small to show all functions of a function group you can touch and scroll the toolbars to see all further icons.

In the top row you see the manipulative functions, in the bottom row you see all selection and colouring functions as well as some common manipulation tools such as Mirror.

In the Middle of the Screen you see the workspace where you see a Start object. The Red, Green and Blue transparent Panes in the centre of your start object are to help you orienting yourself and to see in that direction your Object points and which direction to choose if it comes to moving geometry. Experienced users can disable this in the options dialogue.

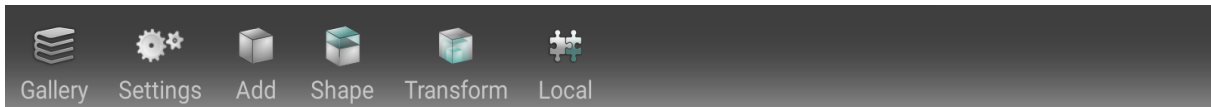
In the lower left corner you see a colour selection ball and an orientation ball. This shows you with its colours where the object is pointing to. You can set the view to a side, top and isometric view by just tapping on the orientation ball and select one of the views that show up represented by icons. For example, to properly move geometry on one axis select a side view.



Colours in SDF3D have 2 uses and are considered also a part of the User Interface if it comes to selections and texturing. In an early stage of modelling you use colours to store selections, so you can select faces with colour selection allowing you to reuse selections for further manipulations. In a later stage you use Face colouring for getting a first impression of the colour and texture of an object but also to use the given colour information in exported objects to easier apply texturing in a desktop app like Blender or 3D Studio Max. You can preview and render an Object in one of the many 3D Viewer Apps for that purpose SDF supports also the earlier .3DS Format allowing to render Objects in Colours. You select Colours by tapping on the Colour Ball next to the Orientation Ball in the lower left corner of the Workplace.

The SDF3D Toolbars

The upper (or in Landscape mode left) Icon Bar

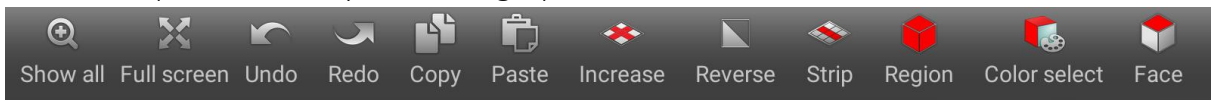


Here you can see the main functions and function groups starting with the gallery followed by settings, add (geometry) manipulation functions such as Shape (to extrude, intrude etc.), Transform (to move, rotate and align geometry) and Local (to edit and delete geometry). These icons represent function groups, if you tap them, the function group opens and you can select the respective function by tapping the icons, to return to the upper menu level, just tap on the arrow icon to the left.



If your display resolution does not allow to show all icons, just keep the finger touched on the toolbar and slide the toolbars to the left or right to see further icons.

The lower (or in Landscape mode right) Icon bar



This bar represent functions that you need during the whole workflow. Therefore there are no sublevels or groups in this toolbar. In the Lower Toolbar you find Functions like Show All, Full Screen Mode, Undo, the Edit Mode, and the selection tools as well as the toggle for the Mirror Mode.

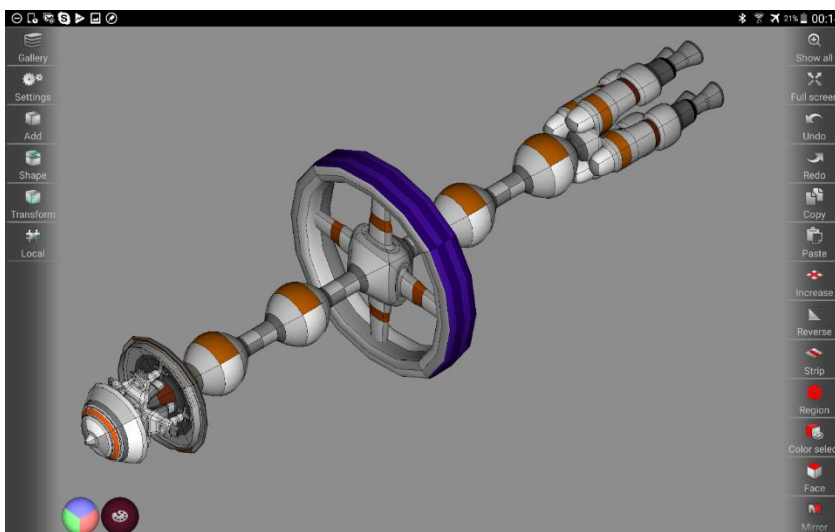
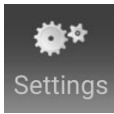
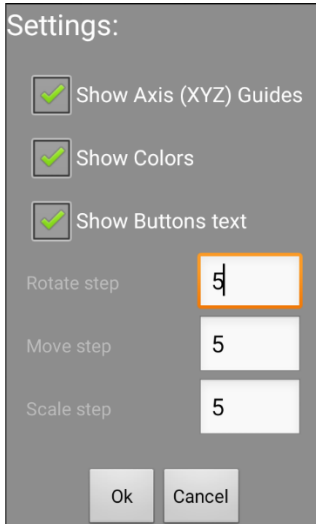


Image above shows the SDF3D User Interface in Landscape mode (recommended for tablets) – SDF3D supports automated screen rotation, just rotate your device into landscape and SDF changes the Interface automatically.

Settings



In the settings dialogue you can enable / disable the axis guides, colours and the menu text. In addition you can set the rotate angle in degrees, as well as move and scale steps for the precision functions.



Use the settings for precision work: If you rotate items you can set the angle of rotation with the rotate step, for example try 45°, 90° or 180°.

Move steps are based on internal units and allow you to adjust extrusions, moving geometry or scaling it.

In future versions we are planning to implement measurement with metric units for precise 3D printing.

Settings are affecting the steps for the precision buttons:



These arrows automatically appear when a transform function and editable geometry are selected. Tap them to rotate / move scale with the entered parameters.

Gestures for adjusting the View



You can rotate the view with one fingertip moving around the workspace. The 3 Planes X Y Z allow You to orient yourself



Zoom in and out using Pinch (spreading thumb and index finger tips) on the screen.



You move the Screen with 2 Fingertips in constant distance on the workspace. In some Versions of SDF3D if you be in an edit Function such as Move or Rotate, you cannot move the screen because the gesture is than assigned to editing. In this case just deselect the operation icon you are using and adjust the screen, than reselect the operation icon (such as move, rotate etc.).

View Functions:



Use the Full Screen Icon to hide the toolbars for better viewing and to take Screenshots.

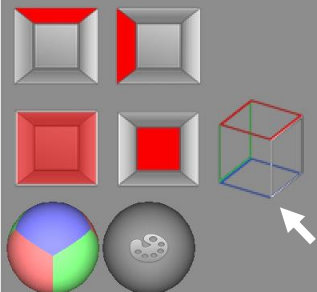
Double tap on the display to return to the normal view.



Use the Zoom Icon to zoom out, showing the whole project.

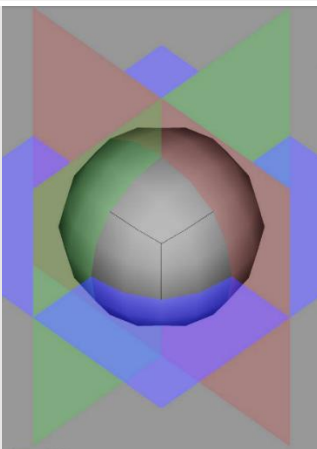


In the lower left corner you can see the “Orientation Gizmo” this icon follows the rotation angle of the workspace and helps you to determine in what direction your object is pointing, blue indicates the Y Axis and points upwards, Red the Z and Green the X Axis.



If you tap on the orientation Gizmo, 5 view Icons appear and allow you to set the Side, top, front, back and isometric view. In many cases it is better to only look from one side on an object, for example to properly adjust distances and sizes of an object or to see geometry that is hidden behind another object.

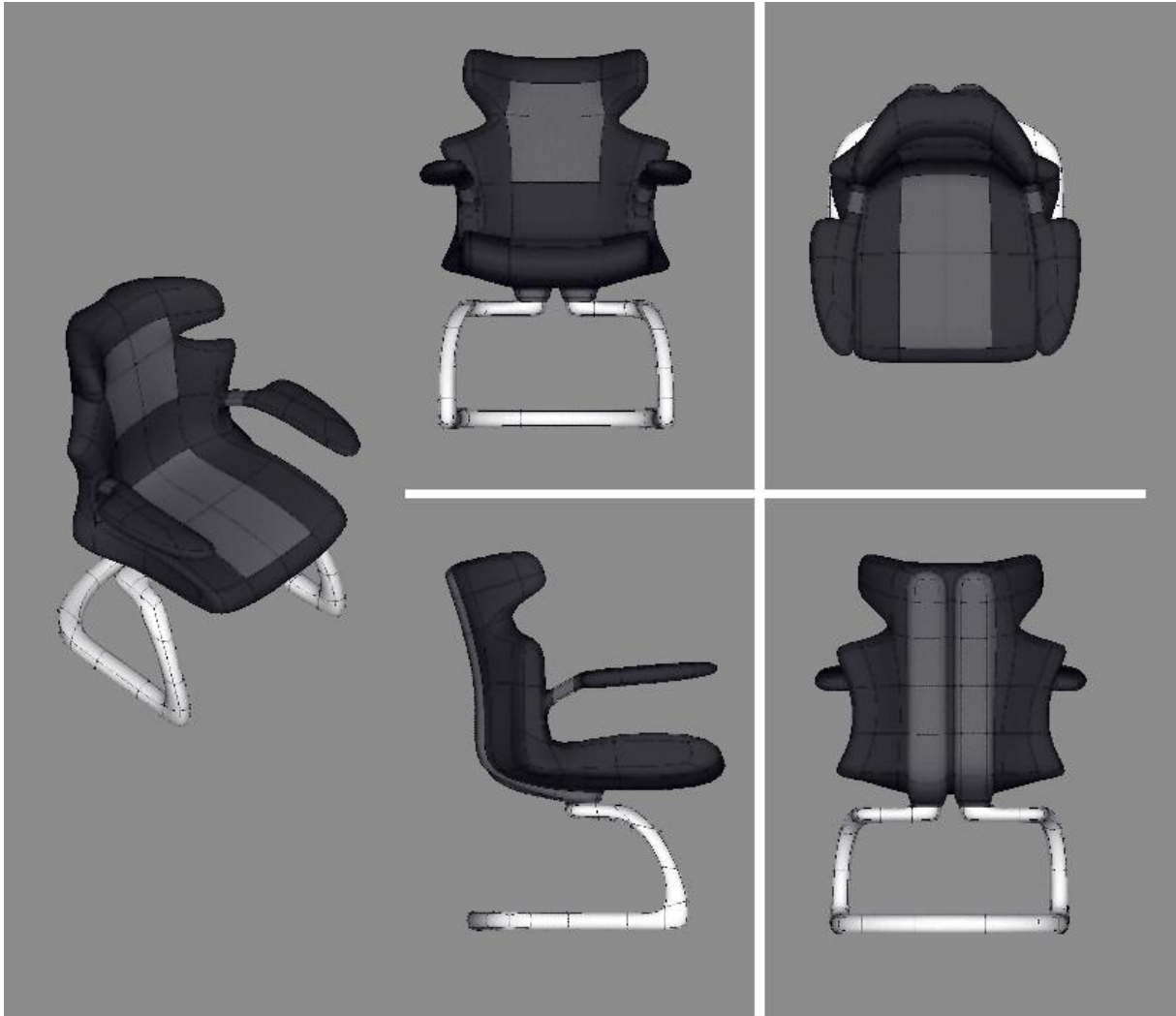
If you set one of the 4 views, the screen is locked to this view, to rotate the workspace again, just tap on the isometric cube icon.



XYZ planes, the 3 planes are rotating with the workspace and indicate the center of the object and help you with orienting yourself. Advanced users may disable these planes settings dialog.

Viewports:

By switching the view, you can see an object from all sides and work on the corresponding axis:



Above illustration shows the model of a chair from the normal (isometric) view, the front view (Z axis), top view (Y axis), side view (X axis) and the back view (also Z axis).



The SDF3D Gallery General Functions

3. The SDF3D Gallery

Managing your objects, sharing, import and export

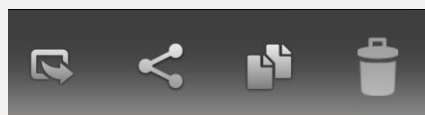
The Gallery is your cockpit to start a new project, to open a previous one, to load a file from another place and to share and export files. Some functions only appear when you long touch one object in gallery.



If you touch one of the thumbnails, the touched file will open in the editor.



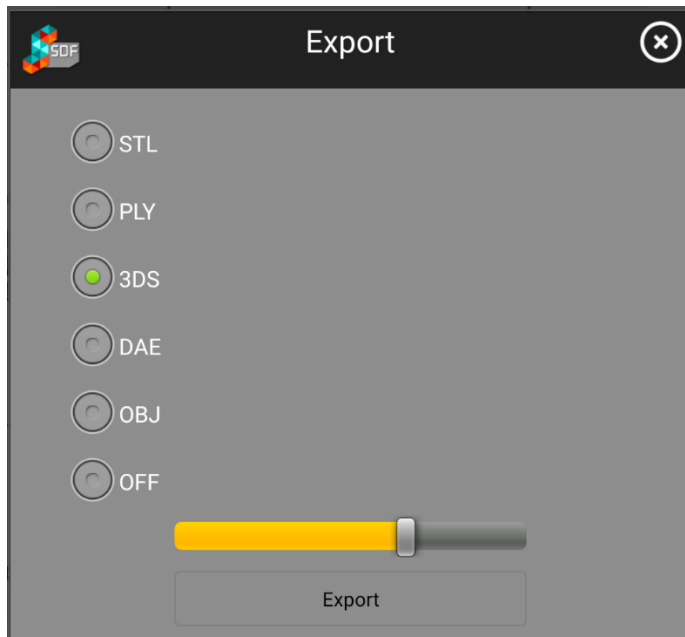
Tap about 3 Seconds on one of the entries to activate further options:



Export



Export: with the export Icon you can export your design into other formats that allow for example 3D Printing or use in other 3D Modelling applications. The standard allows an unrestricted STL Export, a format also readable in other applications including 3D Studio MAX but without colour information's. Use the STL Format to print your object on a 3D Printer.



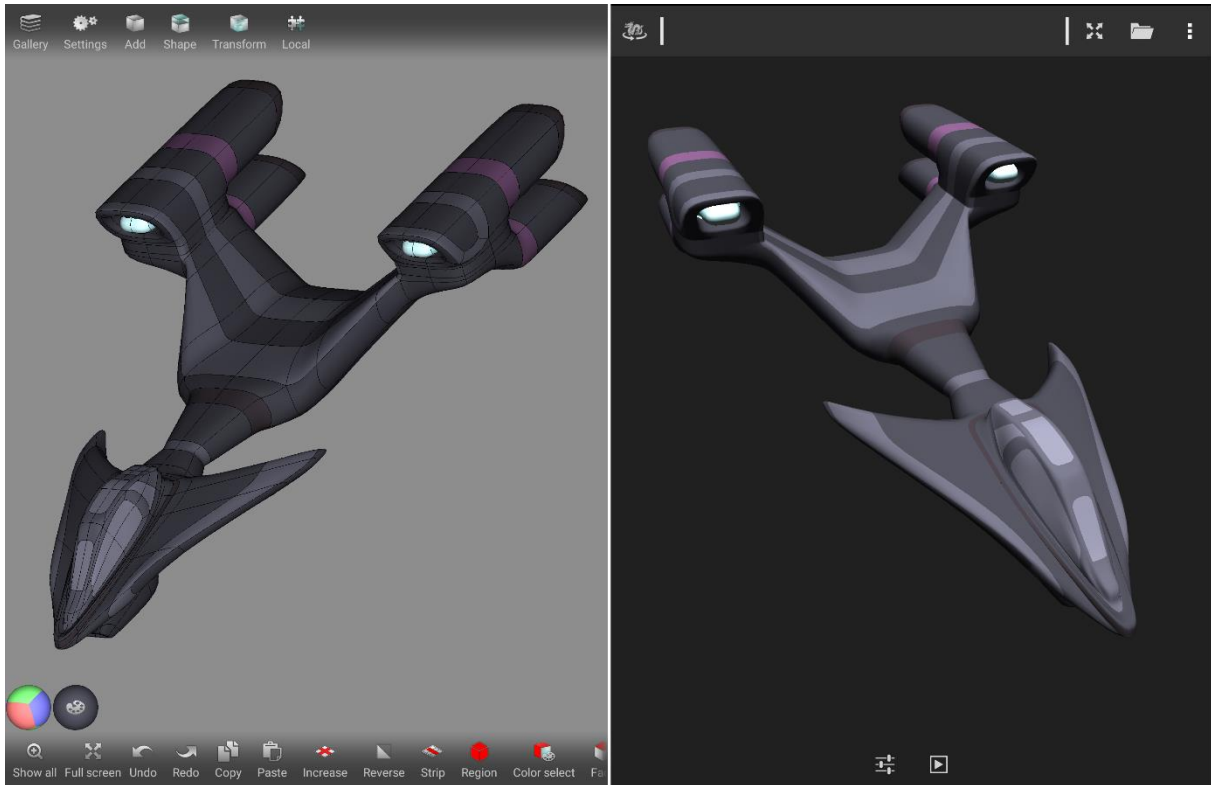
If you tap the export Icon, the Export dialog opens. You can select the desired format and set the export resolution (The amount of polygons). Low poly models go for 3D Games, choose higher resolution for 3D Printing. You should check the result with a 3D Viewer after you exported the file in order to check if the resolution is sufficient enough for the requested purpose.

The Export 3D Formats:

.STL: (an abbreviation of "stereolithography") is a file format native to the stereolithography CAD software created by 3D Systems.[1][2][3] STL has several after-the-fact backronyms such as "Standard Triangle Language" and "Standard Tessellation Language".[4] This file format is supported by many other software packages; it is widely used for rapid prototyping, 3D printing and computer-aided manufacturing.

.PLY: **PLY** is a computer file format known as the **Polygon File Format** or the **Stanford Triangle Format**. It was principally designed to store three-dimensional data from 3D scanners.

.3DS: is one of the file formats used by the Autodesk 3ds Max 3D modelling, animation and rendering software. It was the native file format of the old Autodesk 3D Studio DOS (releases 1 to 4), which was popular until its successor (3D Studio MAX 1.0) replaced it in April 1996. Having been around since 1990 (when the first version of 3D Studio DOS was launched), it has grown to become a de facto industry standard for transferring models between 3D programs, or for storing models for 3D resource catalogues (along with OBJ, which is more frequently used as a model archiving file format). 3DS allows also the export of Coloured faces. Use 3DS Format if you want to get a quick preview of your models including colour information and open it in external viewer Apps, such as HD Viewer PRO.



Isometric view of an object in the SDF Editor, vs exported file in 3DS Format shown in a 3D Modell viewer (for example HD Modell Viewer)

.DAE: Also known as COLLADA File Format, (COLLABorative Design Activity) is an interchange file format for interactive 3D applications. It is managed by the non-profit technology consortium, the Khronos Group, and has been adopted by ISO as a publicly available specification, ISO/PAS 17506.[1] COLLADA defines an open standard XML schema for exchanging digital assets among various graphics software applications that might otherwise store their assets in incompatible file formats. COLLADA documents that describe digital assets are XML files, usually identified with a .dae (digital asset exchange) filename extension. DAE is very accurate and allows an unlimited resolution file export. We recommend using DAE if you want to export files to desktop 3D Design Software for further editing.

.OBJ: (or .OBJ) is a geometry definition file format first developed by Wavefront Technologies for its Advanced Visualizer animation package. The file format is open and has been adopted by other 3D graphics application vendors. The OBJ file format is a simple data-format that represents 3D geometry alone — namely, the position of each vertex, the UV position of each texture coordinate vertex, vertex normals, and the faces that make each polygon defined as a list of vertices, and texture vertices. Vertices are stored in a counter-clockwise order by default, making explicit declaration of face normals unnecessary. OBJ coordinates have no units, but OBJ files can contain scale information in a human readable comment line.

.OFF: OFF (Object File Format) is a geometry definition file format containing the description of the composing polygons of the 3D object. This file format allows editing coordinates manually as in an ASCII File.

Share:



This opens the standard system sharing dialogue, allowing to export a file for example to google drive, or as an attachment to an Email or even send it over social media and messaging apps. Share sends files in the SDF3D Format, so other users can open it on their devices and edit it with SDF3D.

Copy



If you need to work with different versions or modifications of your 3D Modell, you can use Copy to duplicate a model within the gallery. This allows you to modify an object without overwriting it, use this to make sure you are not working with the only copy of an object.

Delete



This function deletes a file out of the gallery

Rename:



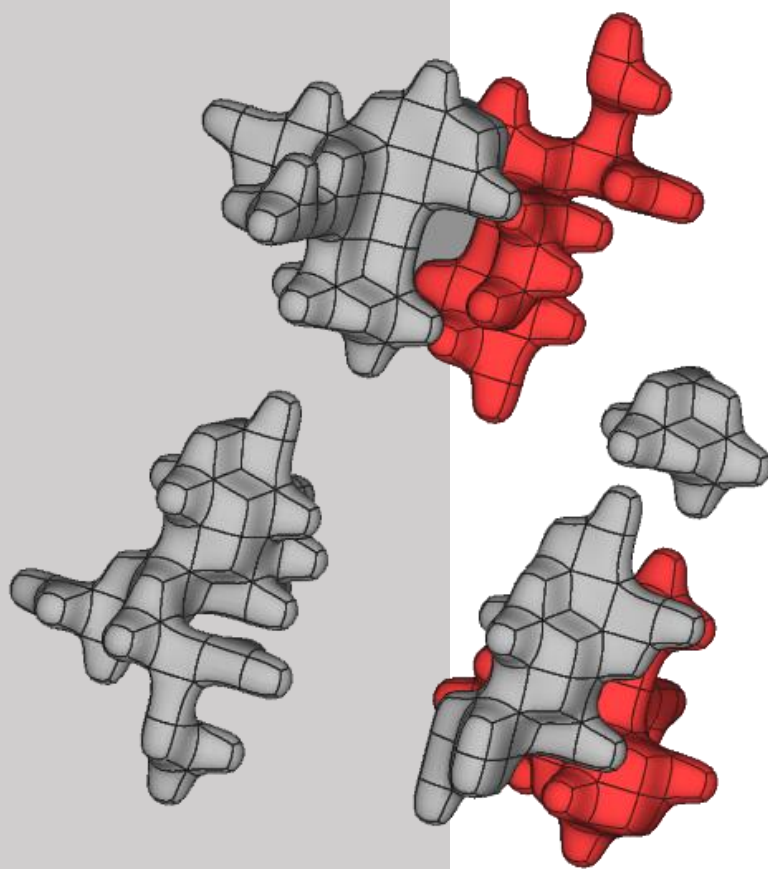
With the rename function you finally give a name to an object. By default SDF3D creates a generic name to not hinder the workflow. We recommend to rename an object after editing in order to recognize it and making it easier to handle exported files hence the exporter uses the given filename.



After you have changed the filename, touch the "Aa" icon to rename the file.



If the text including the path is too long to be shown in the file name box, like touch and move within the pathbox to scroll towards the filename and edit it.



4

Elements and selections

4. Elements & Selections

Selecting Geometry:

Selection mode

In the bottom toolbar you can use the element mode icon (Face, Edge, and Vertex) to set the selection mode. The default setting is “Face” mode, the caption and appearance changes if you tap the icon and the edit mode can be switched from face to edge mode and from edge to vertex mode.



Touch a face (edge or vertex) 1 time to select
Tap a second time to deselect.

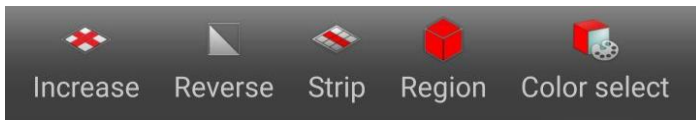


Tap about 3 Seconds anywhere in the workspace
to deselect all.

Selections

SDF3D is optimized for touchscreen use. Conventional selection methods like bounding box, or lasso as we know them from desktop apps, are not suitable for a mobile design tool. SDF3D can be used with one hand and selecting in 3D is not always that easy. SDF3D uses a smart face selection technique. Select just one or 2 faces on the object and use the increase command. SDF3D expands the selection with every time you tap the “increase” icon by 1 instance of surrounding neighbouring faces. The better you master selection techniques in SDF3D the more productive you become.

SDF3D offers multiple selection tools:

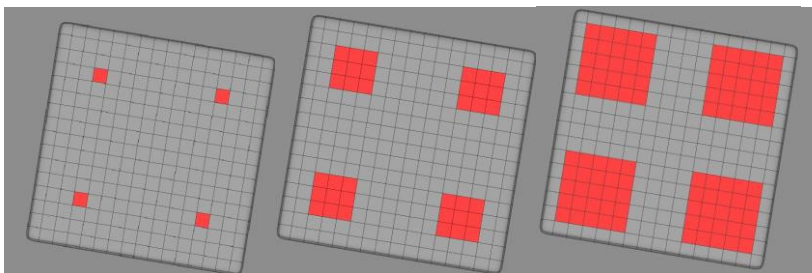


Select is used by simply touching any element on the 3D Object to toggle its selection state. If you touch the same element a second time, it will be deselected (toggle). If a face is selected, it will be shown in red colour.

Increase

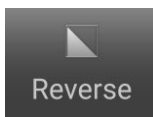


Use increase to expand your selection by to the surrounding faces, the more you tab increase the large the selection becomes. On complex models select multiple parts of the model from different sides in order to increase selection speed with “increase”



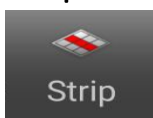
Illustrations above show 4 faces have been selected and by touching the increase icon, the selection grows from all 4 selected faces to the surrounding faces selecting more and more geometry.

Reverse

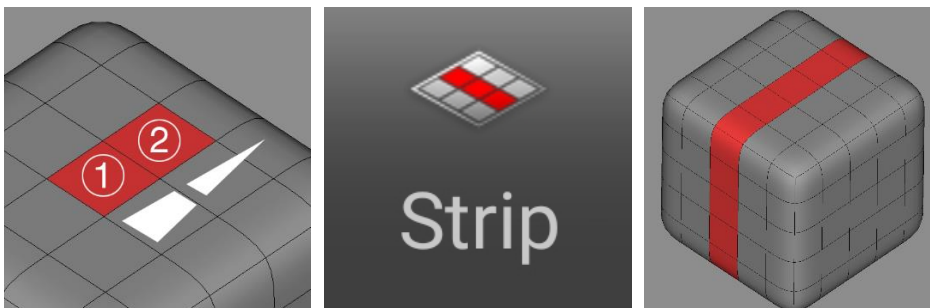


Use Reverse to invert the selection. This is usefull if you have a lot of difficult to select or hidden geometry. Just select the elements you don't want to modify, that tab the “Reverse” icon and SDF3D selects everything that has not been selected, while the selected part will be deselected.

Strip



Strip Selection is a very efficient way to rapidly select consistent loops of geometry in order to apply split operations. For the Strip command you need to select 2 bordering faces. The first one indicate the origin of the selection strip, the second one indicates in which direction the strip select shall be performed.

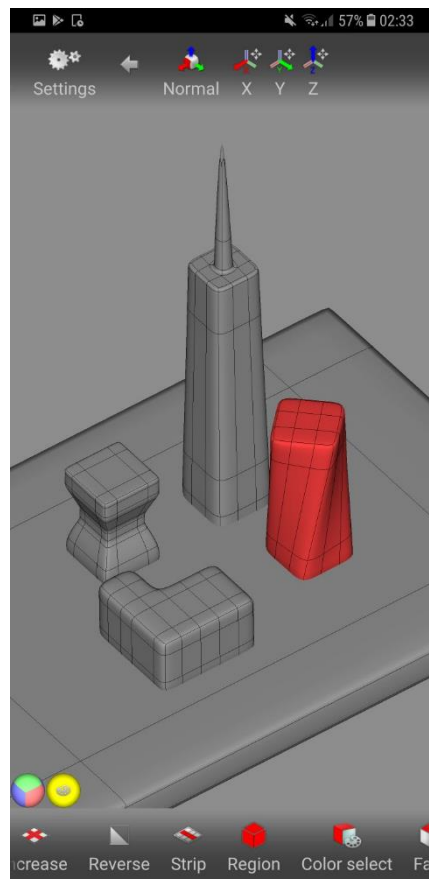
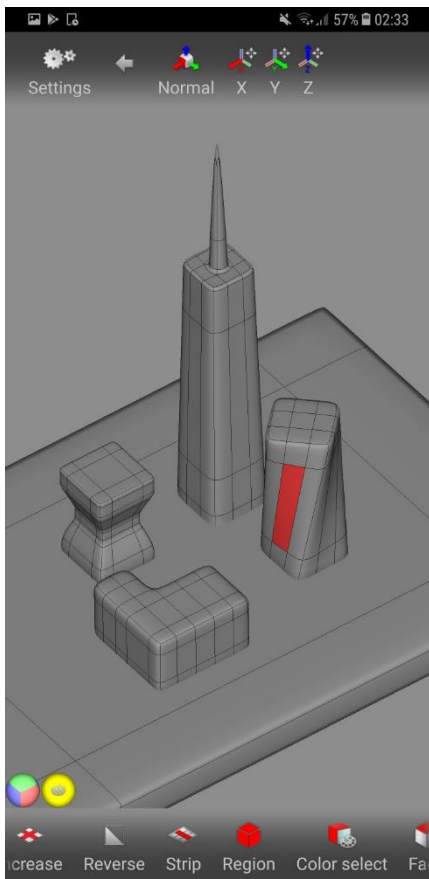


Select two bordering faces to initiate a strip select. By selecting the second face, you show SDF3D in which direction you want the strip select to perform and then select the strip select icon.

Region

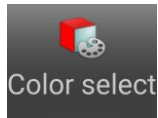


To keep SDF3D compact and agile, SDF3D does not consider individual objects as memory units. SDF3D distinguishes between connected and not connected geometry. Not connected geometry is considered a “Region” in order to select a complete individual Object in SDF3D you need to select them by the “Region” command. Please make sure that you have completely deselected other faces and objects before you perform a Region select. Now select just one face of the respected object and touch the Region icon. Now the whole connected faces of that particular object are selected. Region can only select one object at a time. If you need to select an additional not connected object, use conventional selection methods such as the “increase” command.



Just touch one face of the object you want to select, SDF will then find all connected edges and selects the object automatically.

Colour Select



Colours in SDF are not only for the proper visualisation of objects in SDF3D, Colours can be used to store selections of a model. Just select one coloured face of model and Colour select will automatically select all faces with this particular colour. You can also select different colours at once and Colour select will highlight all faces that have one of the selected colours.

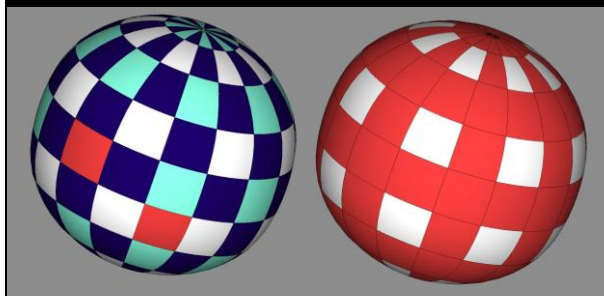


Just select one coloured face of the model...

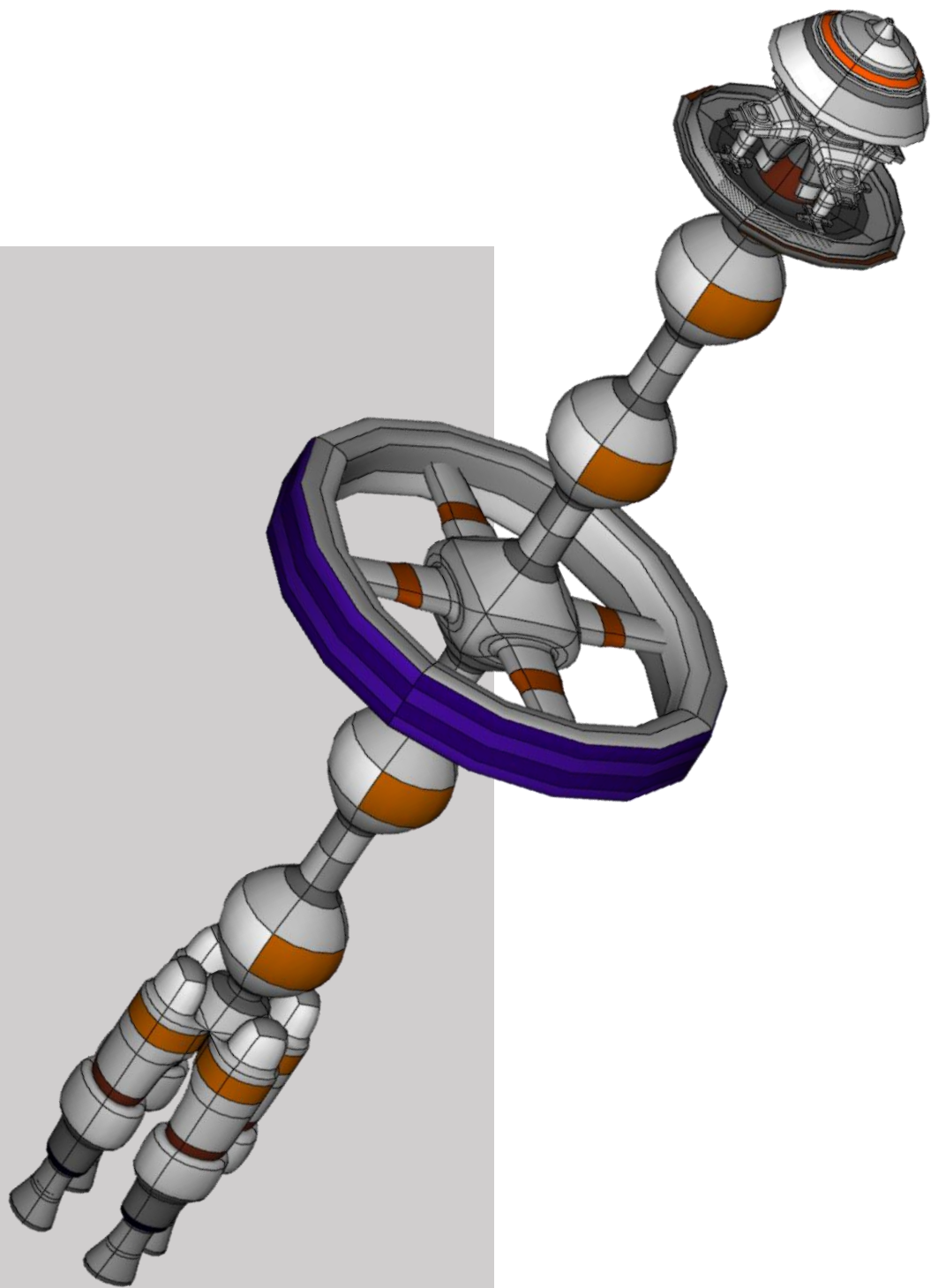


To select all faces of the same colour.

TIP



In an early stage of modelling use the colours as layers in order to store your selections so you don't need to select all faces of an area you are working on over and over again.

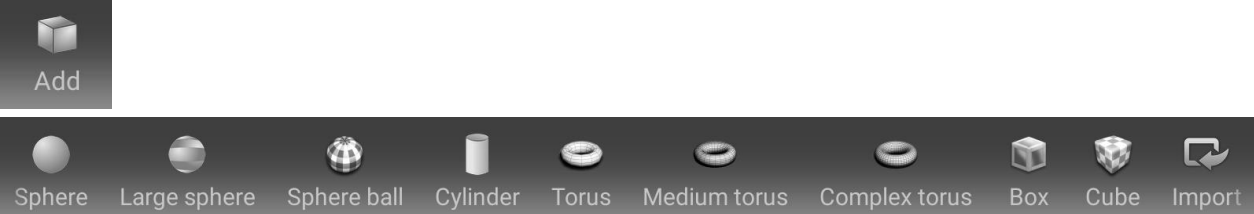


5

**Adding geometry
objects and import**

5. Adding geometry objects and import

Add (new objects and import)



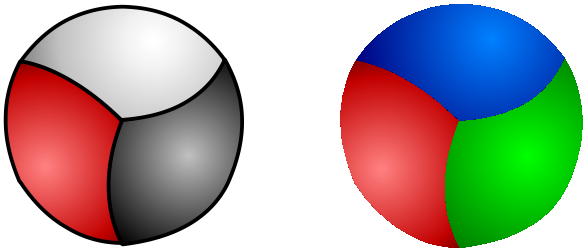
With the add icon, you can add additional Geometry to your Scene allowing you to create advanced shapes with less work. (You need the premium feature advanced toolset to get the additional start objects).

The advanced toolset contains the following start Objects:

Sphere

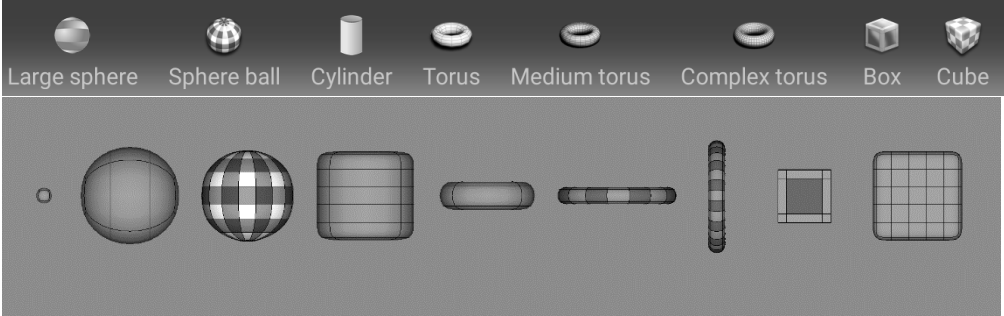


The simple sphere is the standard object in SDF3D. You can create quickly a wide variety of forms out of this. With some practise you are capable of forming even some advanced forms out of it and store them as your own start objects for later use (See import).



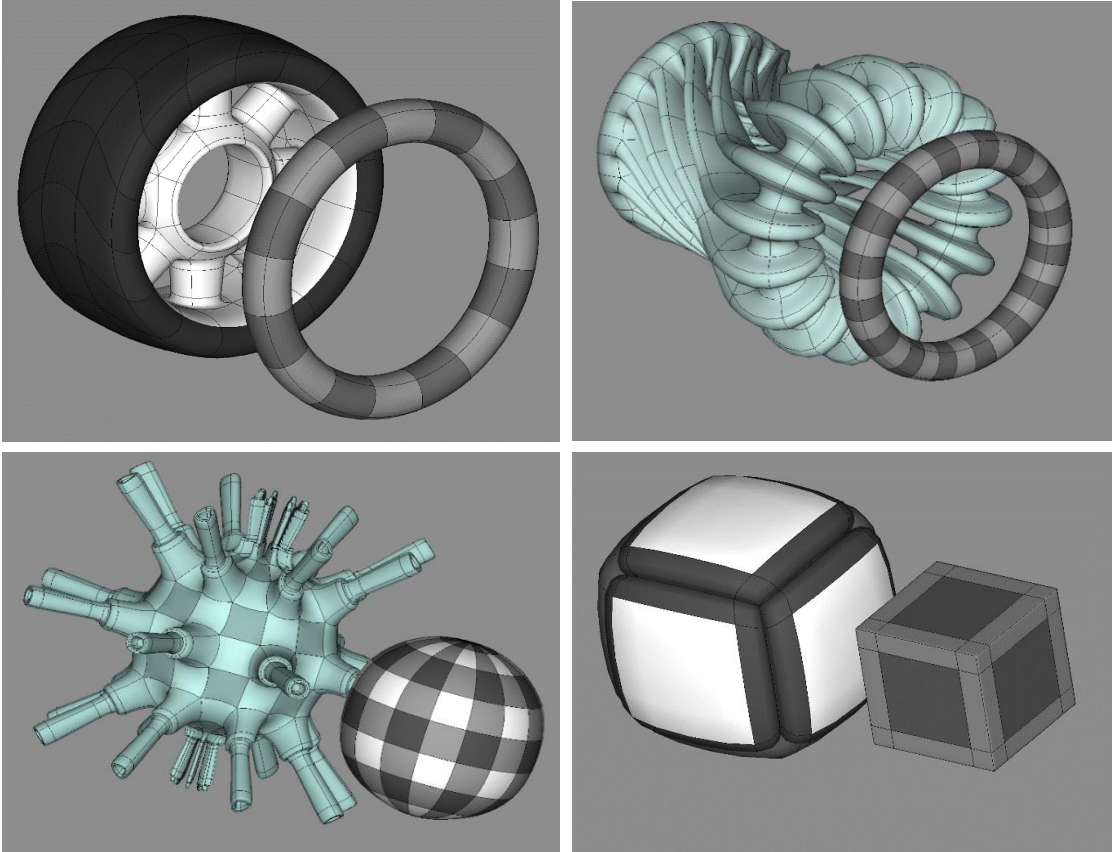
The basic sphere is also the smallest extrude step in SDF3D. Its faces are aligned on all 3 axes, X-Y-Z. A small icon in the lower left corner, called the orientation ball helps you to understand from which side you are looking on your geometry. Therefore it is represented by a Sphere object where its faces have been coloured Red Green and blue, where Red represents Z, Blue the Y and Green the Y Axes. Whenever you start the editor, SDF3D will need at least one of such objects to start with and will therefore generate every new scene with one of these.

Sphere Ball, Cylinder, Torus, Medium Torus, Complex Torus, Box and Cube:

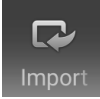


These Primitives are helping to create more complex geometry. In this manual you find some hints on how to integrate them properly in your projects.

Start Objects can be transformed into different advanced shapes, here are examples for the medium and complex torus as well as “sphere ball” and “Cube”



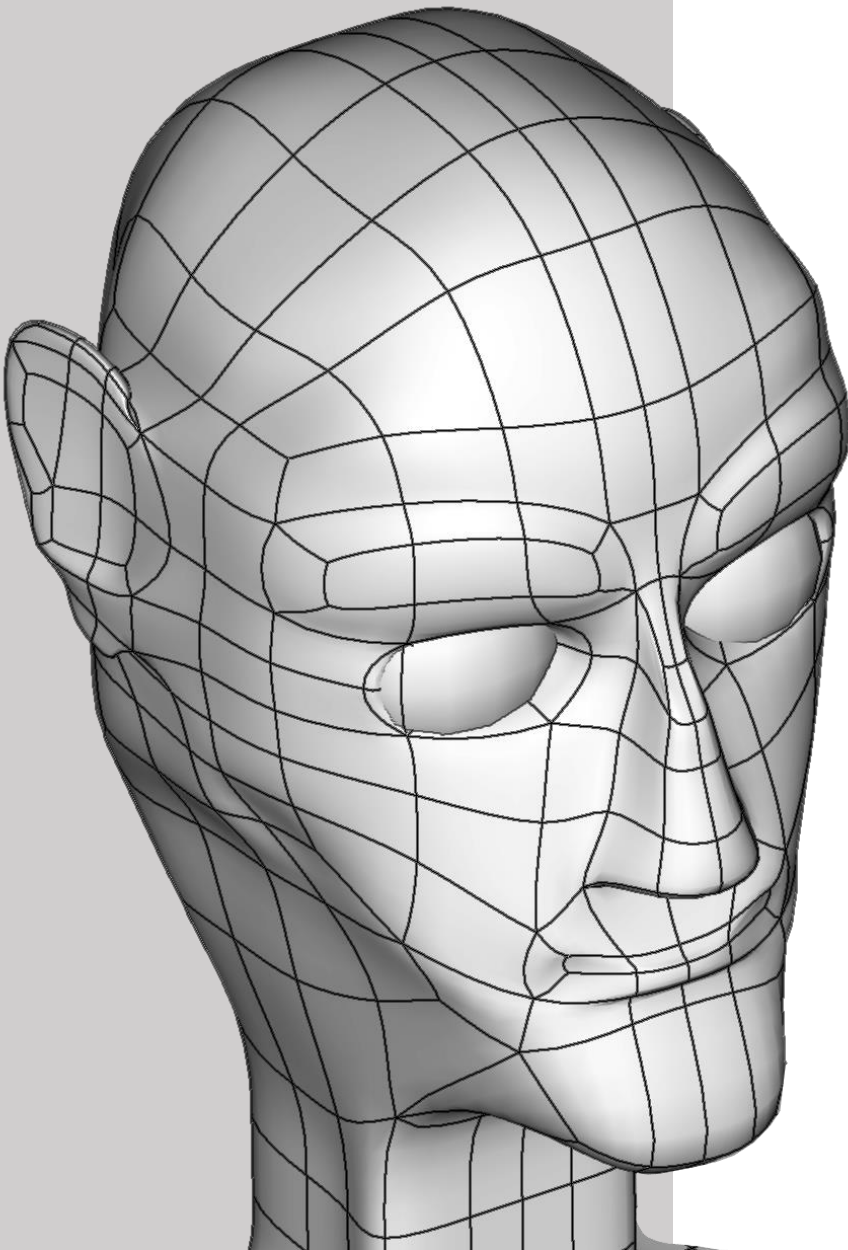
Import



With Import you will be directed to the Gallery Screen where you can select one of the objects to be inserted into your scene. If you need to load the object from an external source, tap the import Icon in the gallery to insert it. Refer to Chapter 3 for information how to use the Gallery Screen in SDF3D.



Shaping Functions



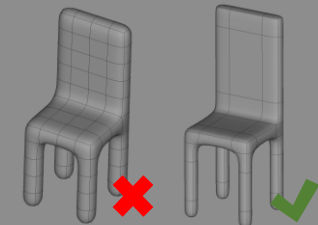
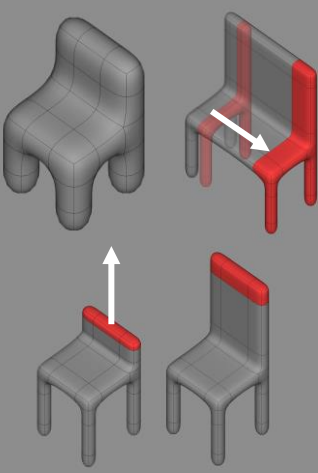
6. Shaping Functions

Extrude

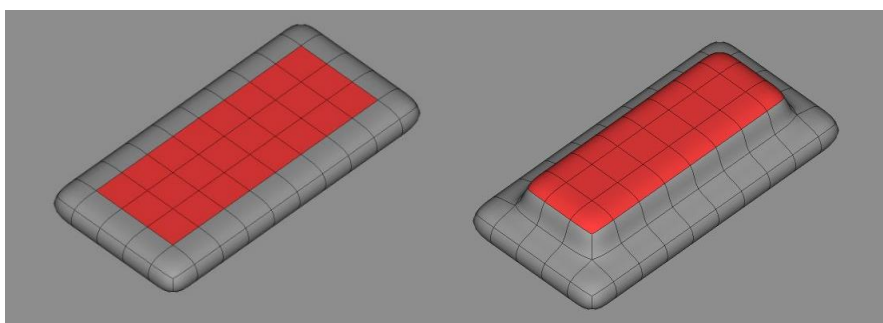


Extrude is one of the most important features, it extrudes all selected edges and adds new geometry. SDF understands connected faces and extrudes them accordingly. Select multiple faces and extrude them at once to create interesting effects.

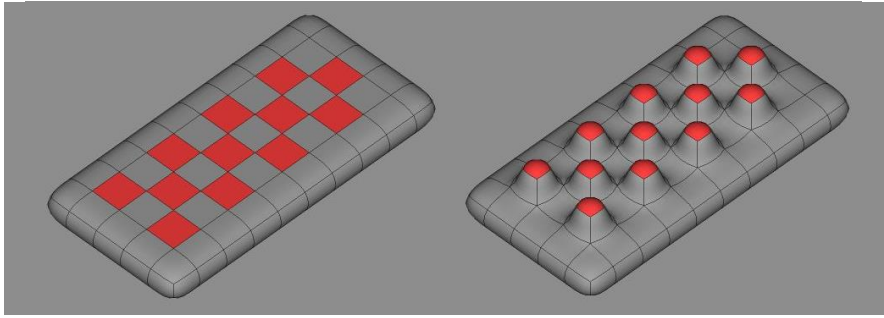
Beginners use Extrude to build a geometry using many instances, this is no longer necessary, once the move and scale functions are understood.

TIP	
	Try saving extrusions by adjusting available geometry with move and scale!
	Instead of shaping an object only out of extrudes, select on every side one extrude step of geometry and use the move function to adjust its distance rather than adding more geometry. A less complex object can be easier moved in shape.

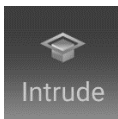
When selecting direct neighbouring faces, SDF3D will extrude them as one connected surface:



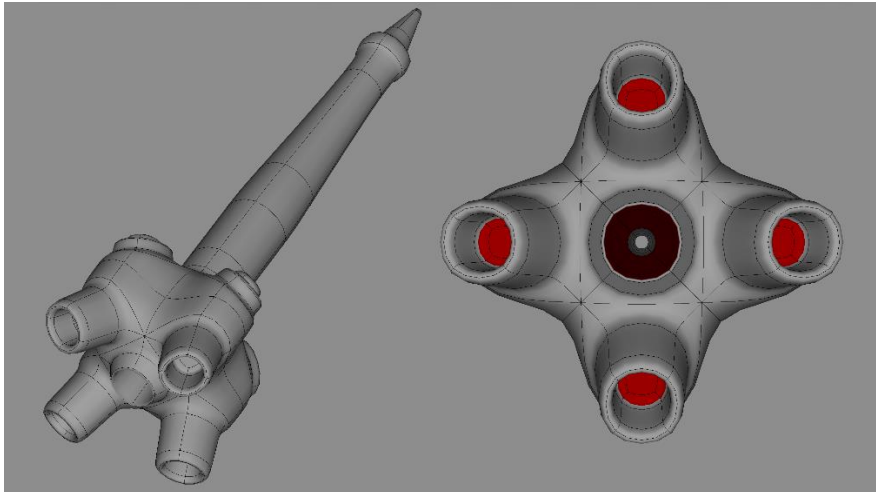
When selecting independent faces, SDF3D extrudes them each at once but not connected. This Function can be used to create interesting effects such as thorns, bumps or bristles:



Intrude

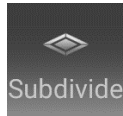


Allows creating “holes” and works like Extrude but in the opposite direction. With Intrude you can create pinches, notches and slots etc.



In the above shown example, the intrude command has been used to create the rocket thrusters exhaust holes.

Subdivide



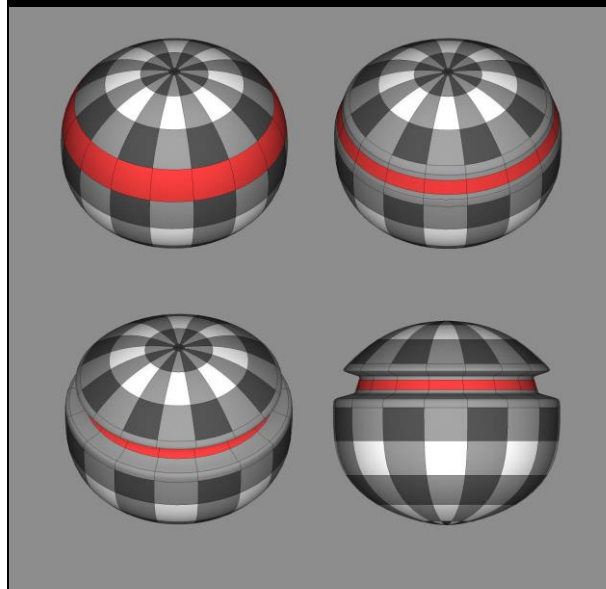
This is a key function in SDF; subdivide faces to create new geometry and more complexity. Subdivide is very intelligent and automatically adjusts the orientation of selected faces for further accurate extrusion or intrusion steps.

Use Subdivisions wise, as the more complex the mesh gets the more you have to adjust. The recommended workflow in SDF is to create a simple skeleton of the future object and then use subdivide and split to increase resolution and add geometry.

Subdivide also straightens out edges, it has an impact to the shape of the object hence to a reorientation of the faces. Use Split instead, if you just want to add more geometry.

With Subdivide you create a complete new face or set of faces within the selected region. This new faces displace others and that may change the structure of the object. With some practise, you will soon understand how this affects your geometry and you than use Subdivide to straighten out edges, add instances to a structure in order to have additional modifiable faces.

TIP



Combine multiple subdivide and scale operations to create stunning carving effect:

Step 1:

Use Strip Select to select a closed row of faces.

Step 2:

Use subdivide to add an instance.

Step 3:

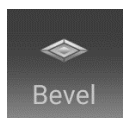
Do additional Subdivide to separate the outer row and add an additional instance to be scaled inwards with the scale all command.

Step 4:

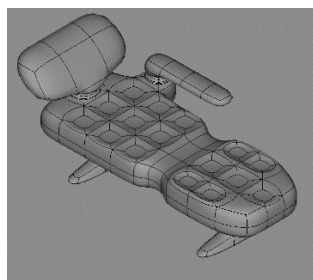
Use a last subdivide to straighten the geometry.

Hint: try to maintain the selection with every step, do not deselect, this saves time.

Bevel

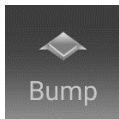


Is creating simple pits, use subdivide on a face to make bevel more accurate and prevent the function from affecting surrounding faces. Bevel and Bump are predestined for organic effects on a mesh. If you need larger bumps or holes, use extrude instead. Adjust the extruded surface with scale or move.

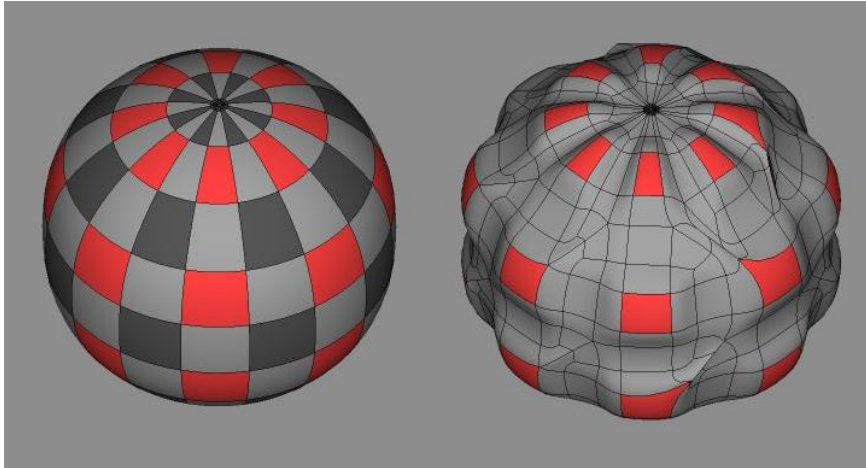


Above Example shows Bevel being applied to the surface of the canapé creating some surface effects.

Bump



Creating simple bumps and pits, use subdivide on a face to make bump more accurate and prevent the function from affecting surrounding faces. If you need larger bumps use extrude instead. Adjust the extruded surface with scale or move.

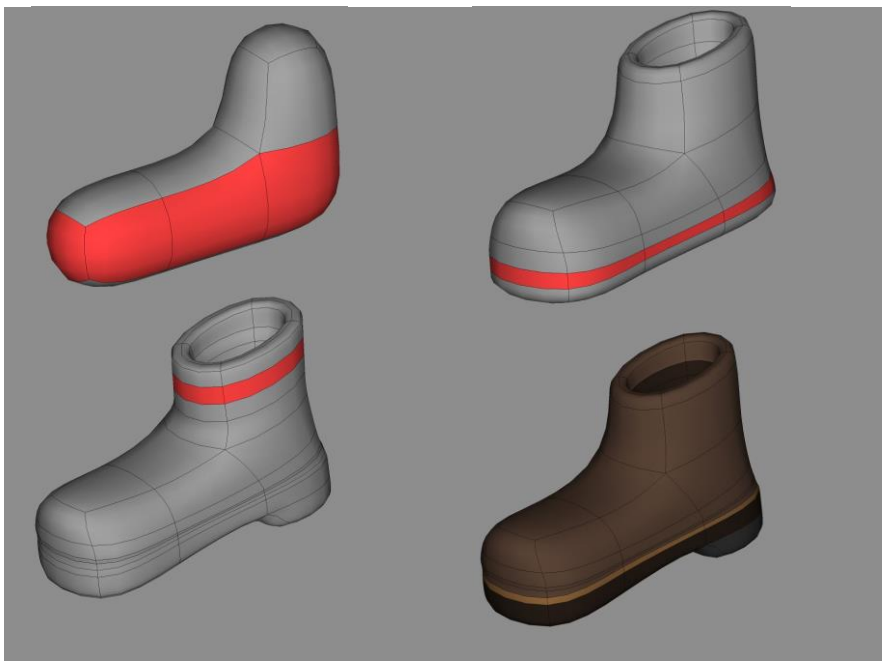


Multiple Bump's applied to a set of selected faces on a "sphere ball" object. Make sure to have at least one instance in between in order to separate the bumps.

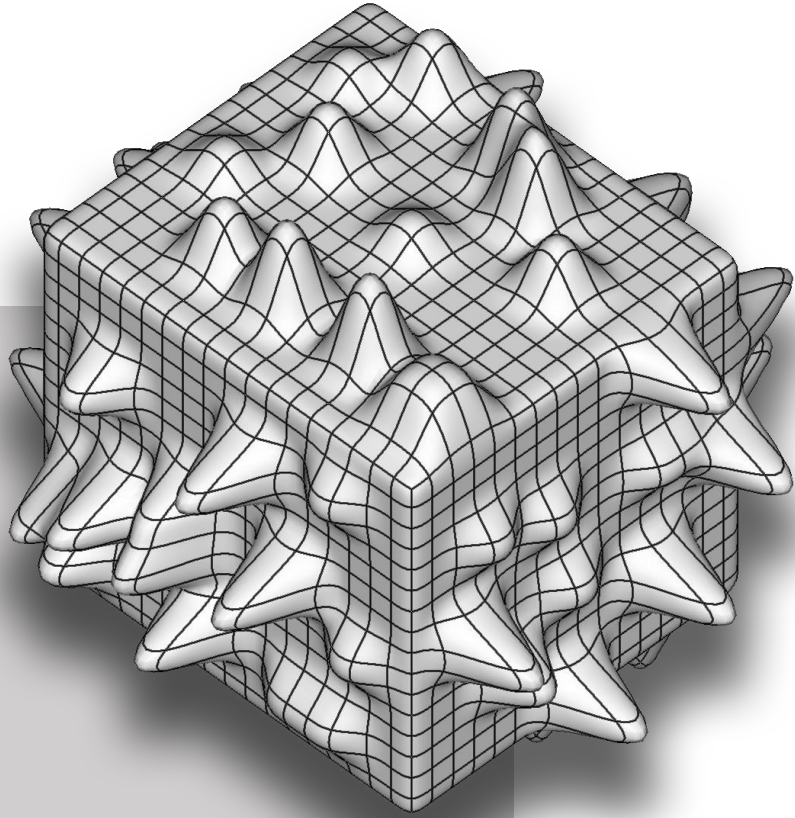
Split



The split function inserts a new strip of edges. This can only be applied to a closed loop of selected faces (strip select helps to select the respected geometry quickly). Split can be used to increase complexity in the object and is another tool for subdivision. It is also useful to bring additional modifiable faces into a model without too much of influence to the overall geometry (opposite to subdivide). The more you increase the complexity with Split, the harder edges will appear. Split needs a Strip Select, it can only be applied to a full selected connected slice or ring selection. Refer to strip select to see how to perform a proper strip selection.



Starting from a very basic model, using multiple strip select and split operations turn it into a shoe in due time. The Softedge™ technology helps to always maintain the right shape.



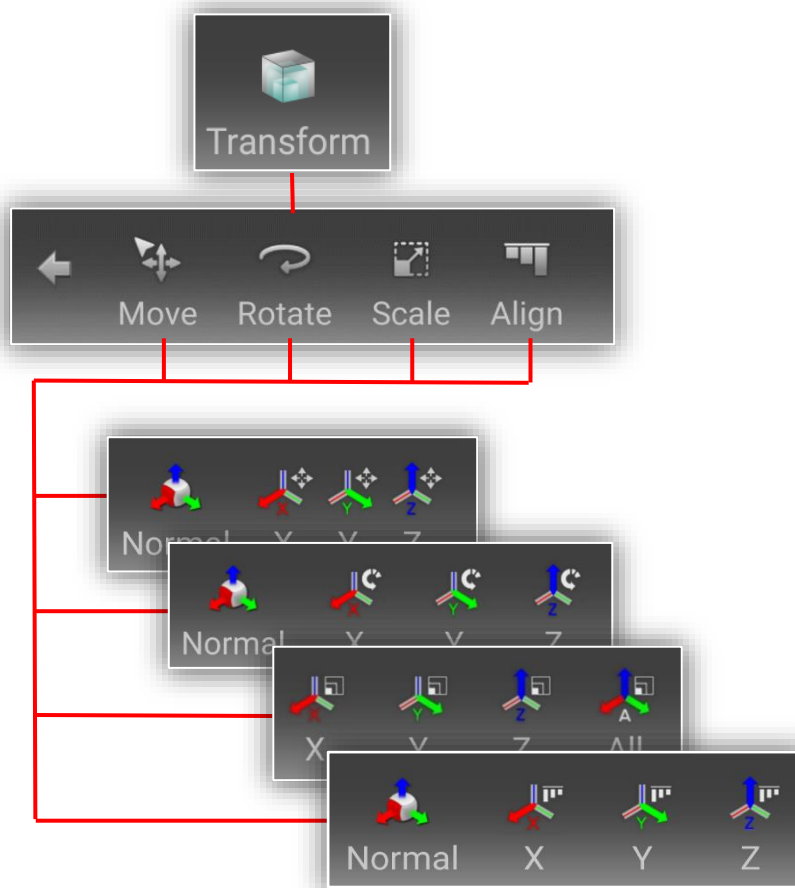
Transform

7. Transform

Bringing your faces, edges and vertex in form...

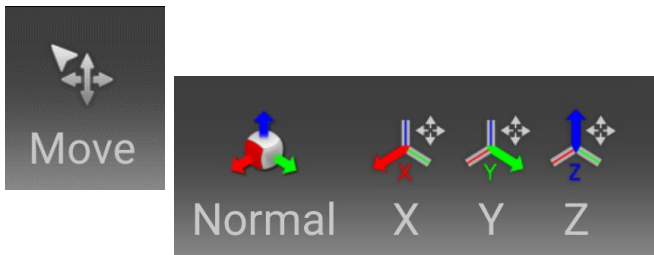
Transform offers a variety of functions that are suitable to form your project in the known ways, by moving / rotating or scaling geometry on one of the 3 axis. Some functions offer in addition the Normal button. This command lets SDF3D automatically identify the right axis of movement. This works as long as the object is still straight aligned on all 3 Axis. Normal would not work, when the object has been roated and the axis are not parallel to the 3 axis anymore.

The Transform menu tree:

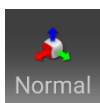


Use the “back” button to return to the previous menu level.

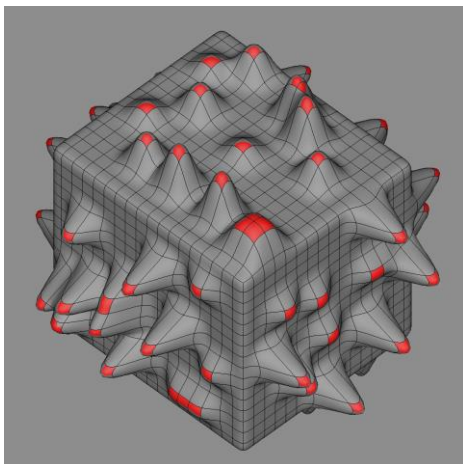
Move Commands



The Move command sounds simple but is a very powerful tool in SDF3D, this is because of the nature of Softedge modelling. Designed for touchscreens, with SDF3D you start with a concrete start object, you extrude surfaces in different directions to get a basic form and then you use move and scale to bring it in shape.



With the move/normal command you can even have multiple faces moved away from its centre on all 3 Axes as long as they are parallel to them. If not SDF3D cannot determine on which axis you want to move the object.

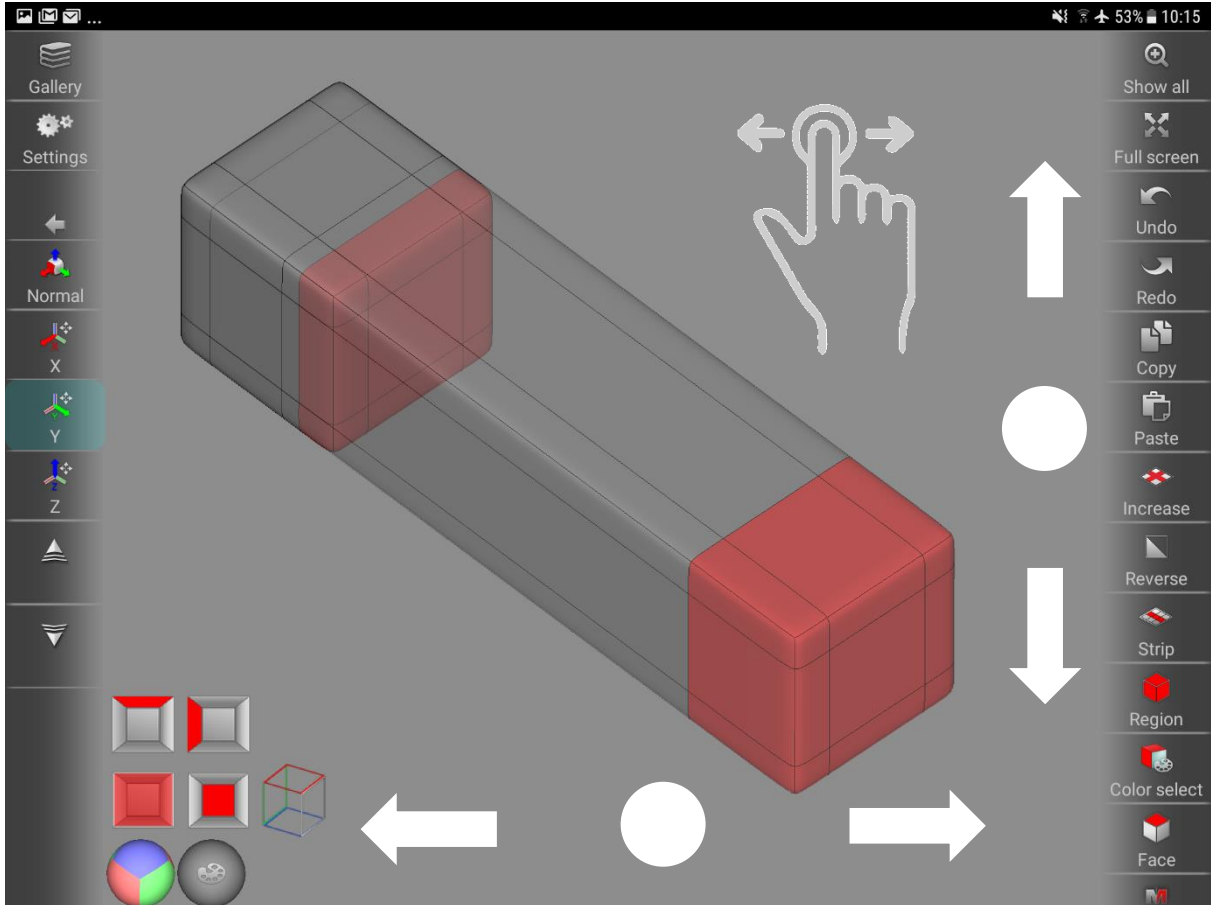


A good example for moving with the Normal command is pushing several faces out of a cube at once. Just select certain faces on a cube and use normal move, you see that all selected faces move on the 3 axis at once and a shape like this occurs. The Normal command automatically works on all 3 axis, as long as the faces are proper aligned. Once transformed and rotated (disaligned), normal may not respond unless the faces are reoriented. In this case use the align command to readjust geometry on the X-Y-Z axis to allow the Move-Normal command to work again.

Move X-Y-Z Commands

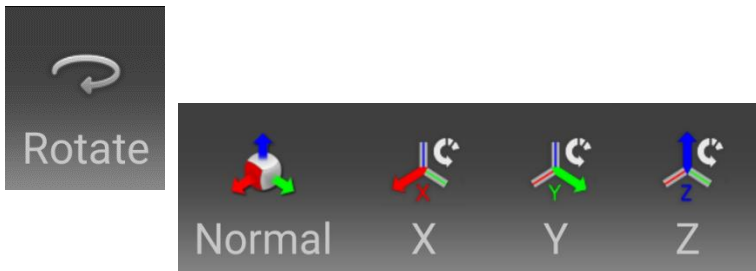


Move on X-Y or Z Axis lets you manually choose on what axis you are wanting to move the geometry.

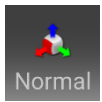


To use move on one of the 3 Axis, select first the geometry and then the Icon with the axis you want to move the selection on. As long as the move Icon is active, you cannot move the view, because the needed gesture is now in use for the editing process. Deselect the selected move Icon to release the viewport. You move the geometry by touching and sliding your finger carefully on the work screen. With complex projects use the precision arrows in the toolbar to carefully move elements around. Use these function also to do precision work. The precision arrows move the geometry always in an amount of steps that have been set in the settings dialogue.

Rotate Commands

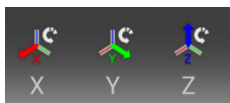


Normal

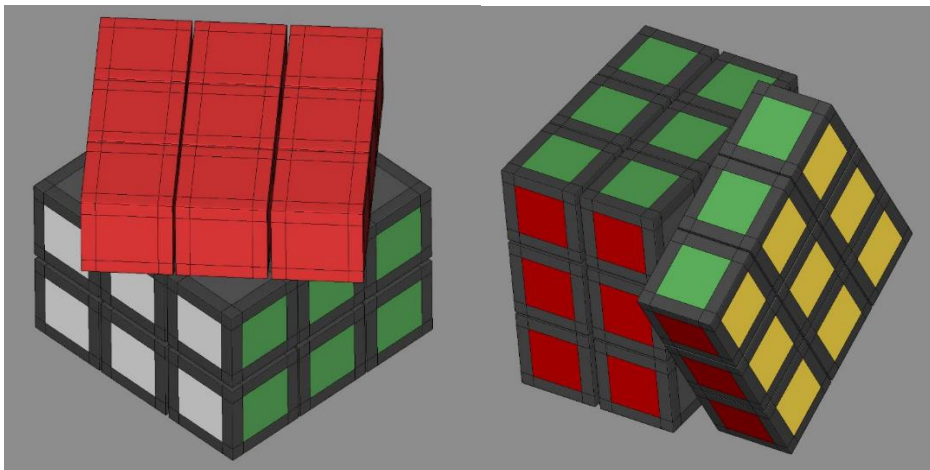


The Normal rotate command allows you to rotate selected geometry on its specific axis you don't need to select any axis icon as long as the geometry you want to rotate is aligned straight to the X-Y-Z axis.

Rotate X-Y-Z

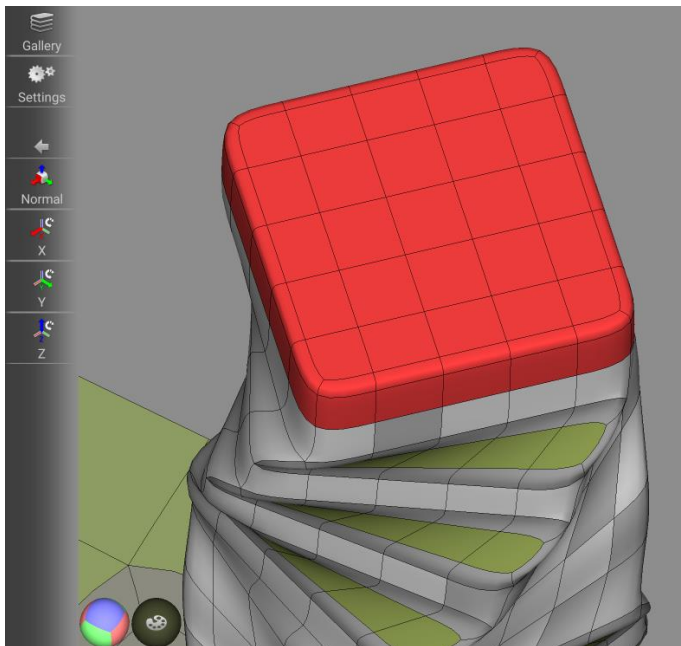


Select the geometry you want to rotate and use one of these commands to rotate the selected objects around its specific axis. Rotate automatically calculates the centre of all selected geometry and uses this centre to rotate the selected geometry around it. This is very helpful if it comes to the creation of rotation objects out of several independent objects or regions.



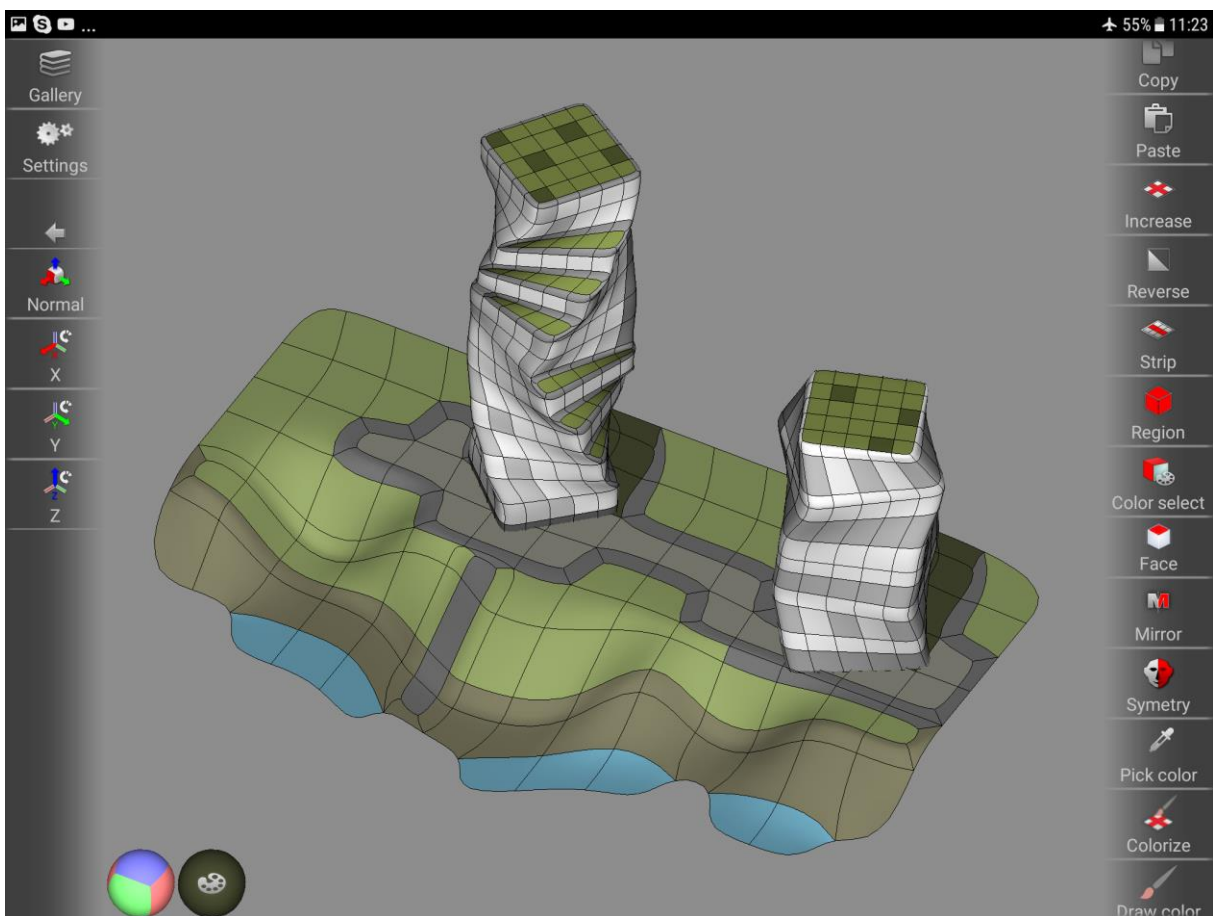
If multiple objects or faces are selected, rotate rotates around the centre of the selection.

Rotating Faces, vertices and edges has different interesting effects:

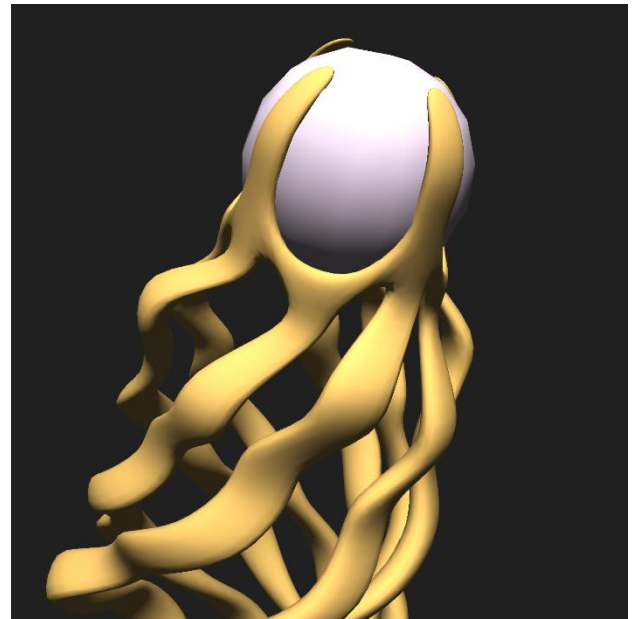
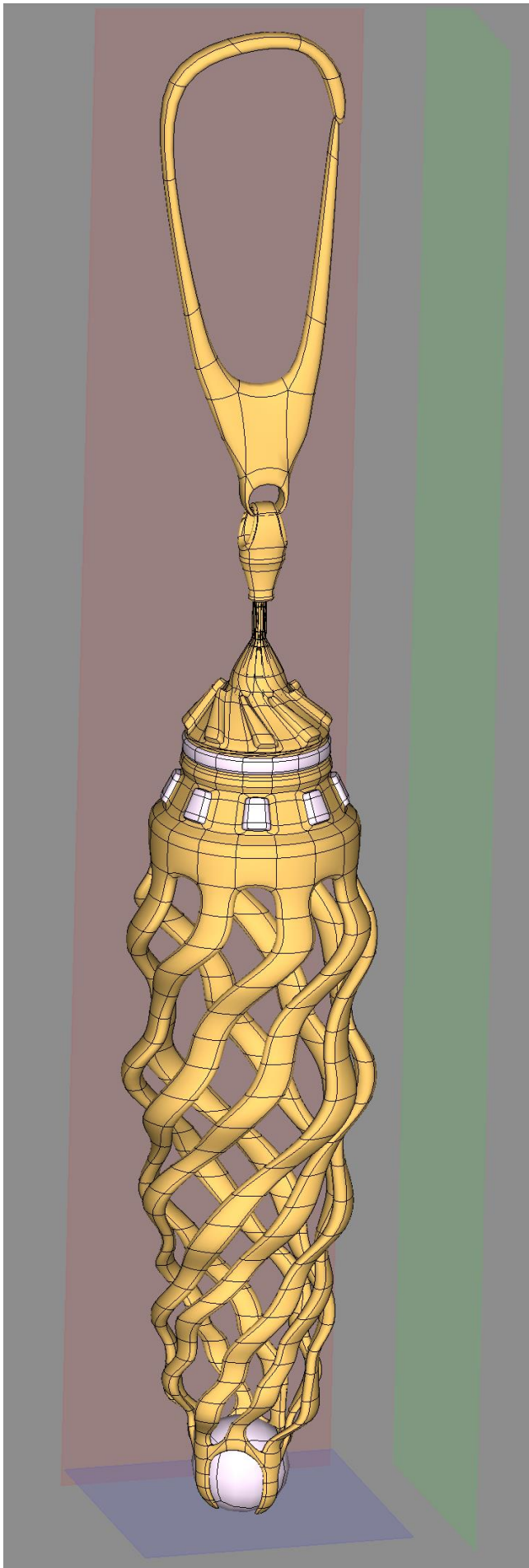


Combined extrude and rotate operations allow you to get interesting twisted helix forms, these are interesting for architecture, ceramics, decorations or in technical work for example a drill or turbine.

Rotate in SDF3D is not only rotating geometry, it is in combination with the interconnected faces a design tool that offers a lot more than just turning things around.



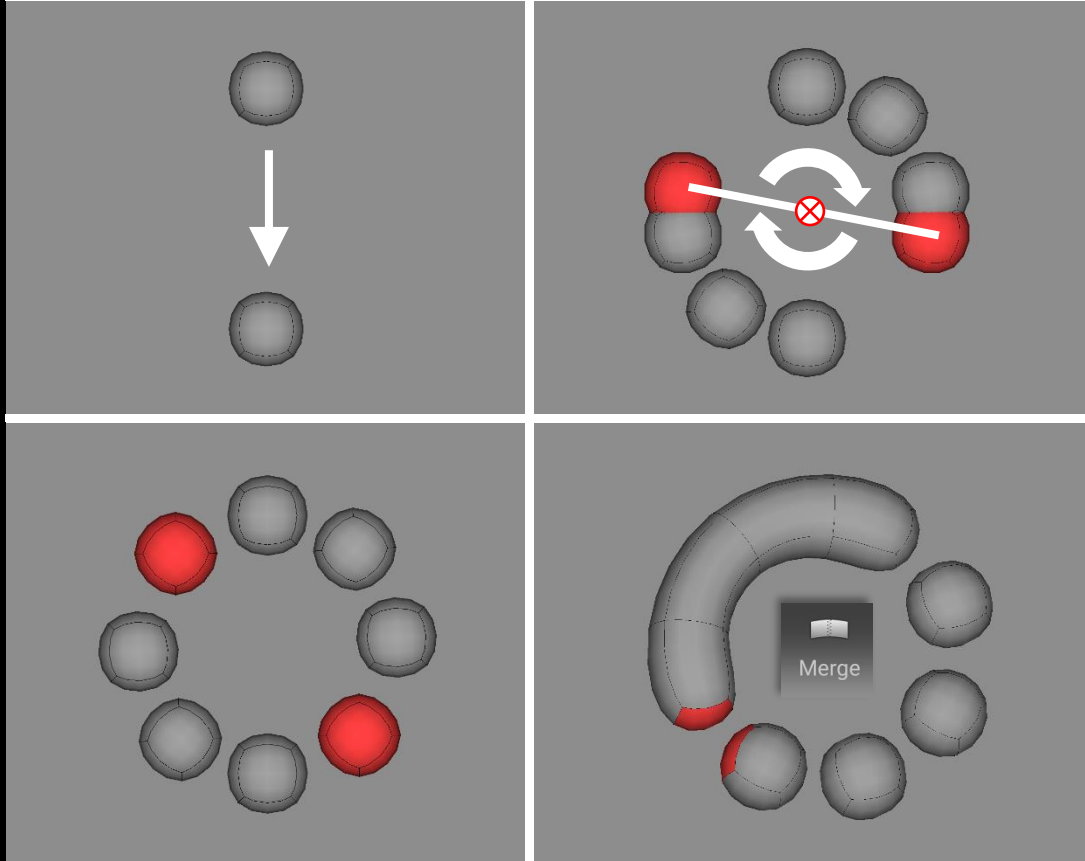
Architectural concept of green helix towers



Another example for rotate in conjunction with extrude. In this case an object has been created out of a ring, where every second unit was selected and all of them extruded together while rotated with every extrude step. With some practise, rotating individual faces of an object at once can cause interesting effects. The following tip illustrates how to build a ring as a base for such objects without the advanced toolset which offers a wider variety of readymade start objects.

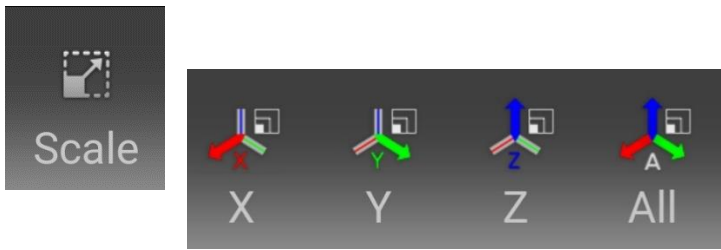
TIP: Combine Copy & Paste with Rotate

Have two objects created and moved apart from each other, than select both of them and use the copy and paste command, keep the selection and rotate the copied objects, repeat this step several times. Hence SDF3D automatically rotates around the centre of both selected objects, you can arrange the objects in a way that they form a circle.



Now use the merge or bridge command to join the objects and you can create a constant rotation object, that you later can extrude to create for example wheels, pottery or tubes.

Scale Commands



With the scale command set you can size up and down geometry but also use it to scale individual faces within a certain object in order to straighten out edges or form multiple faces by scaling them around their centre.

Scale X-Y-Z



Use scale X-Y-Z on one of these axis to size the object only along the direction you have chosen if you want to scale an object only on one of the 3 axis. Use scale all for a uniform scale of the selected geometry.

Scale All



With "Scale All" you scale an object symmetrically (uniform scale) in all directions. Use this command if you want to change the actual size of an object while maintaining its aspect ratio.

Tip: Scaling out inner faces to straighten edges:

Initiate a strip select on the center faces of the cube...

Use Scale X to scale the center edges ...

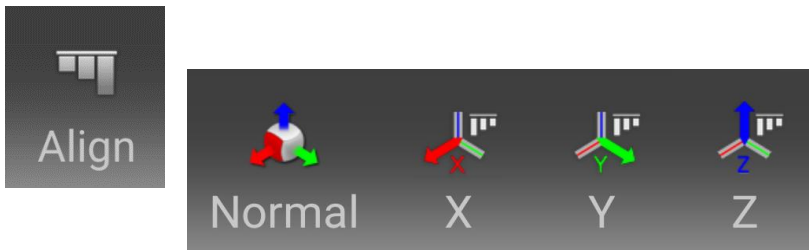
The more you scale the center faces, the sharper the cube gets,

repeat these steps on all 3 axis

Until the cube is

straightened out on all sides

Align Commands



With align you can straighten out edges once they are deformed allowing you to properly apply other commands to them on one of the 3 corresponding axis.

Align Normal



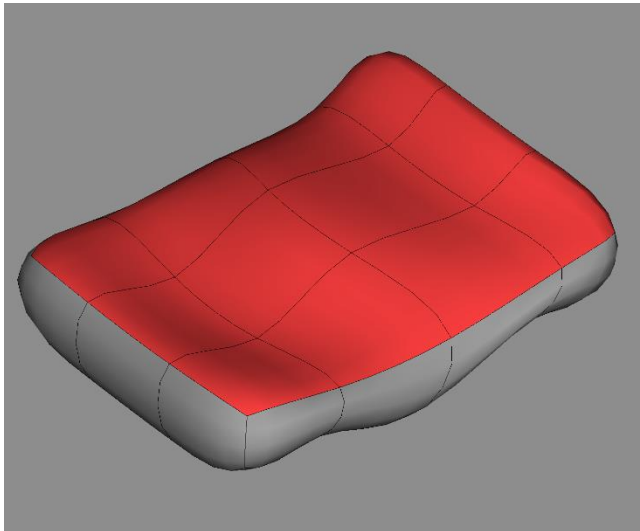
With the “Align Normal command”, align straightens edges by identifying the selected axis automatically. Use this to straighten out objects from all sides at once.

Align X-Y-Z

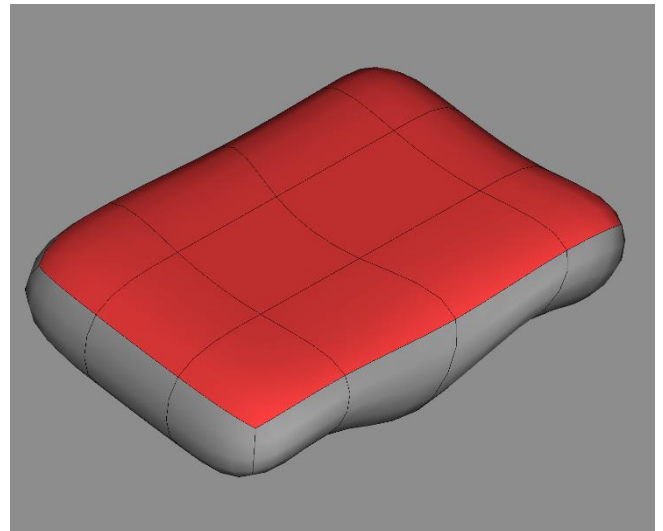


Here you select the axis on which align should align edges. Align calculates the average centre of all objects and sets their coordinates on a way that they are all on the same level, also the orientation of the faces will be aligned along the selected axis. This allows you to readjust garbled geometry and make extrude / move / rotate work again in a straight way to get your models maintaining straight orientation. You can apply Align to all types of elements such as faces, vertex and edges.

Before:

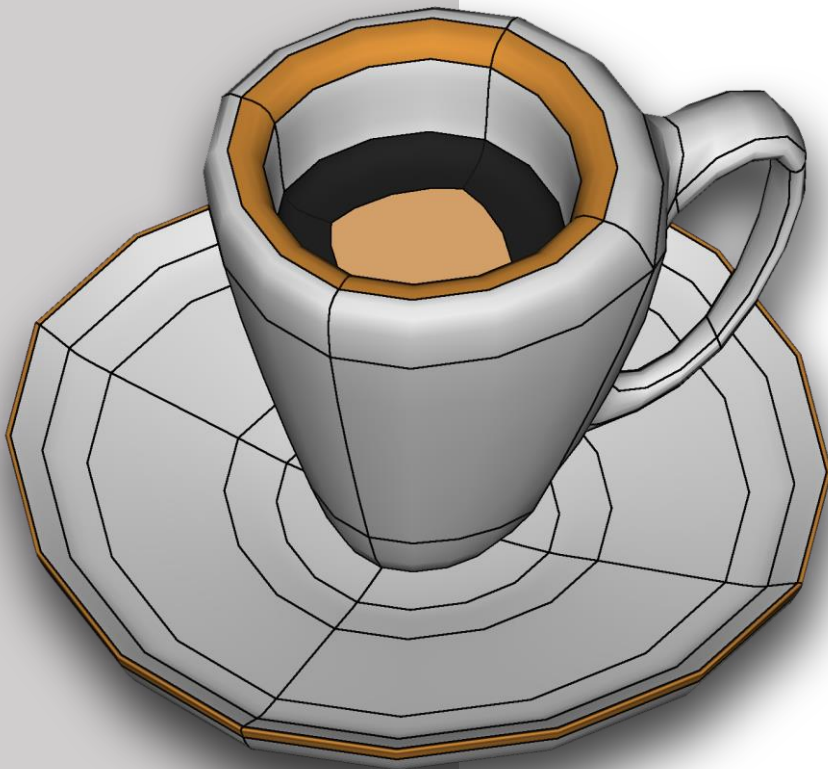


After:



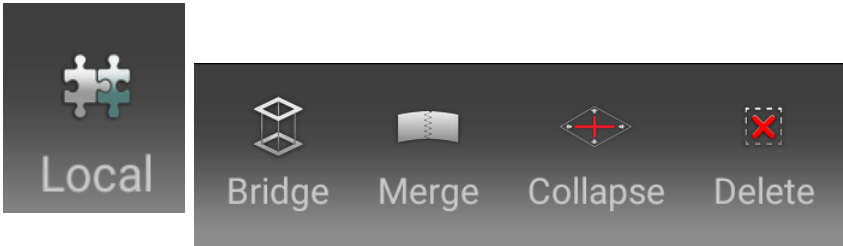


Local Functions



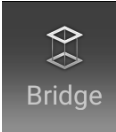
8. Local Functions:

The Local Command set:



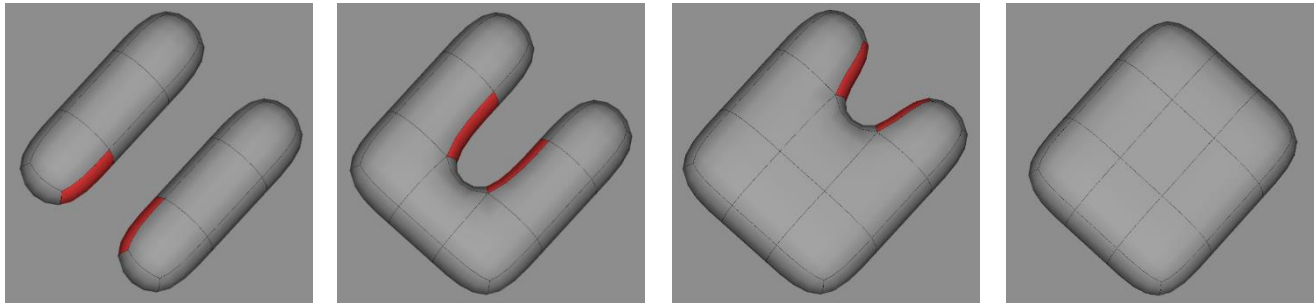
The Local Function set of SDF is used to directly alter the objects, insert holes, delete and join geometry. With local functions you connect faces and use the merge tool to re-join open surfaces. This functions are powerful tools if it comes to advanced modelling techniques.

Bridge



The bridge tool is used to join to faces by creating another instance in between. Bridge is also used to tunnel through objects, if you select to corresponding faces and execute bridge. The following Illustrations will show you where and when to use the bridge command. If you just want to join geometry without creating another instance in between, use "Join".

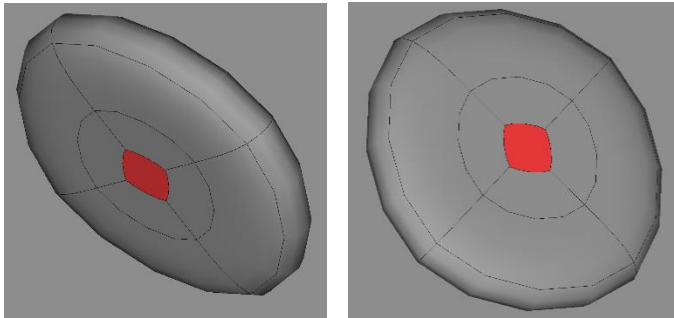
With Bridge you can connect 2 facing surfaces or edges and join them by creating new geometry in between:



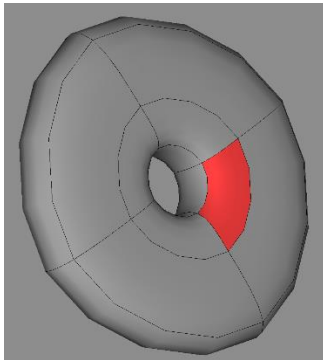
You can continue of joining faces and merge the 2 opposing objects together....

Using Bridge to pierce geometry, build tunnels or to remove parts of an object:

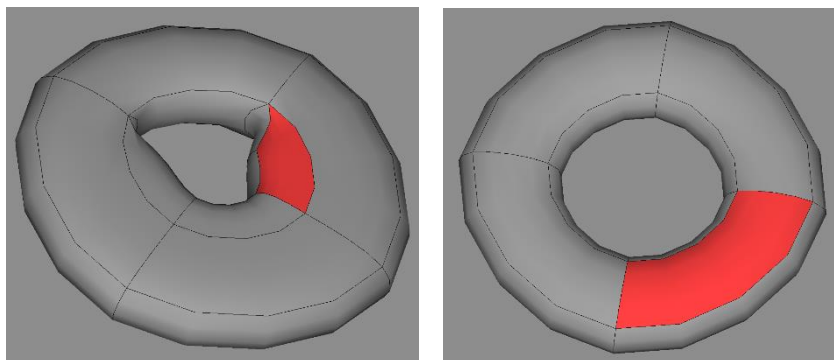
Select front and backside of an object, make sure that both faces are aligned to each other, if a face is turned too far away, and is not adjusted near enough for SDF3D to compute a tunnel, the function will warn you with the error message "Operation cannot be run":



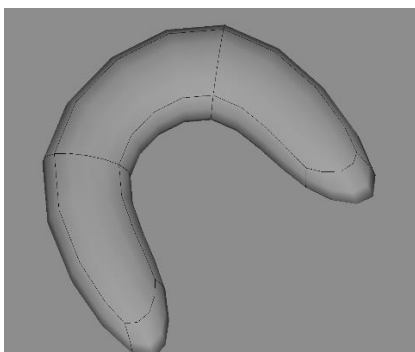
Once you select 2 corresponding faces like in our example on the top and the bottom of the object, tap the "Bridge" icon, you should see a result like this:



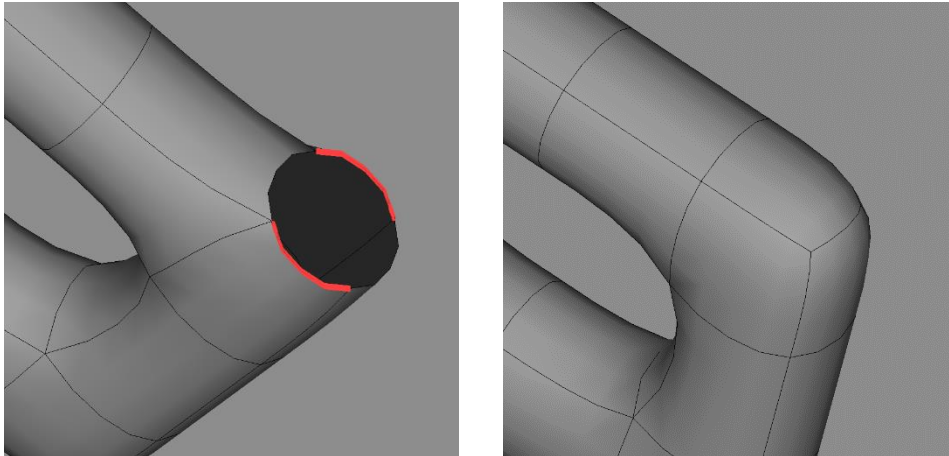
You can also repeat this step with bordering faces which would result in the following:



And a step further you get a result like this:

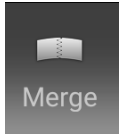


You can also use the bridge command to join edges instead of faces, just carefully select 2 facing edges and run the “Bridge” command:



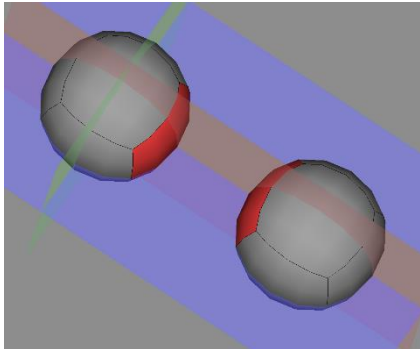
This allows you to seal open geometry after delete operations. Merge and Bridge operations can be memory intensive, it may be an advantage to save your work before you run more complex local operations.

Merge

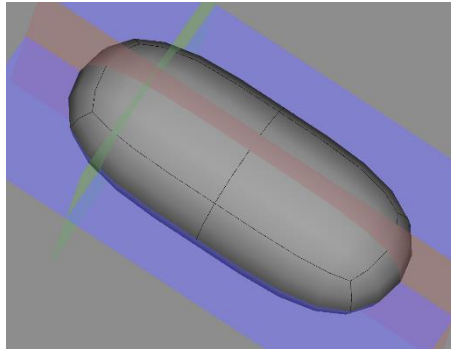


Merge works in the same way as the bridge command, but does not create an additional instance in between. Instead it directly attaches 2 selected faces or edges together. Merge can be used to build complex objects out of smaller instances.

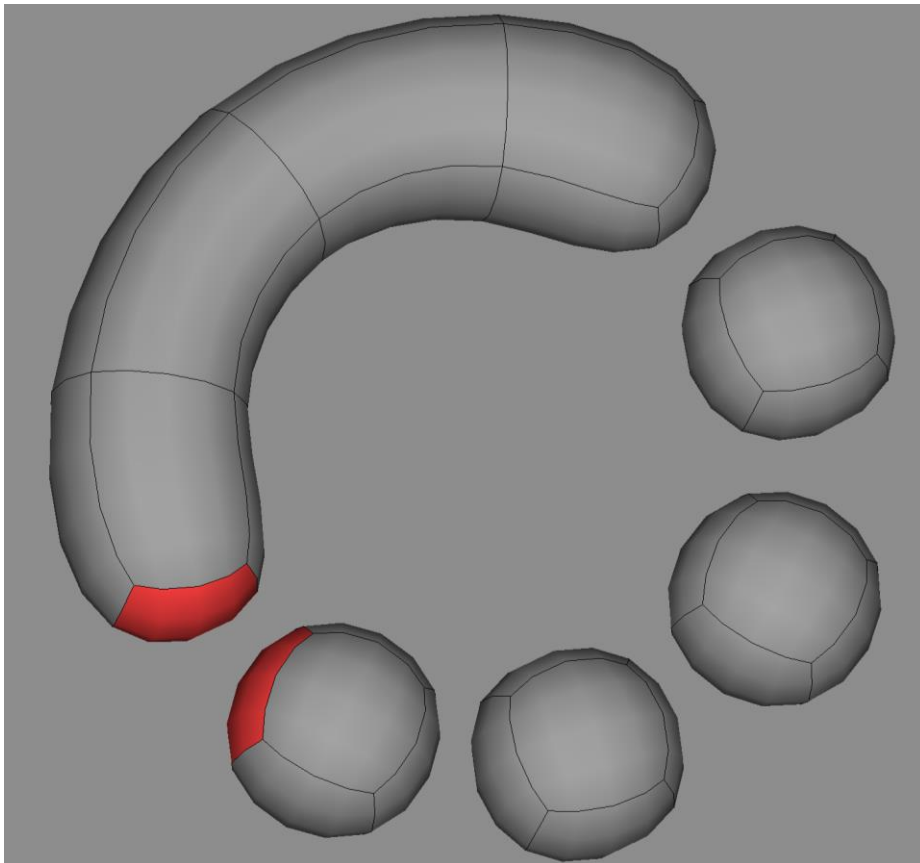
Select 2 opposing faces or edges....



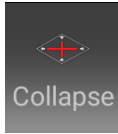
tap the merge icon to join the 2 objects:



Also Use merge to connect elements:

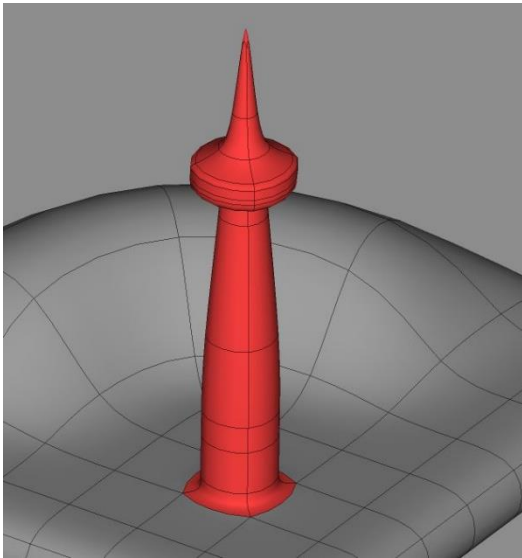


Collapse

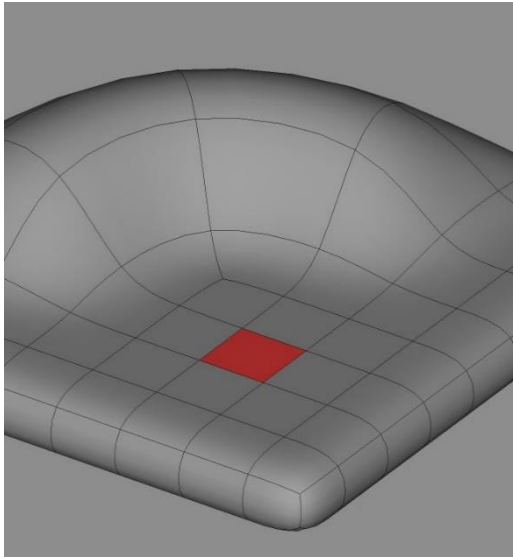


This function helps to remove simple geometry as long as it is connected by one single instance. With more complex geometry use the delete command and seal the open surface with the bridge and merge commands.

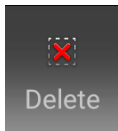
Select the mesh to be collapsed:



Collapse removes and seals the geometry:

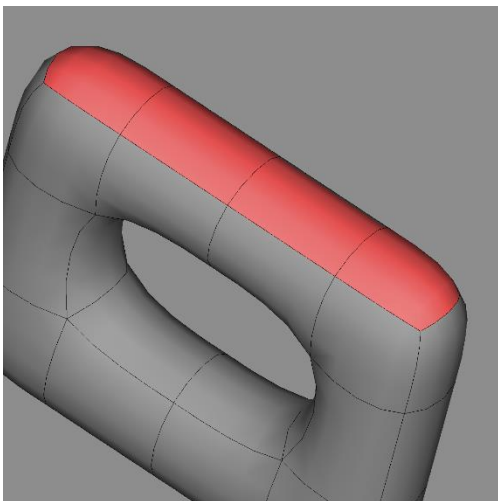


Delete

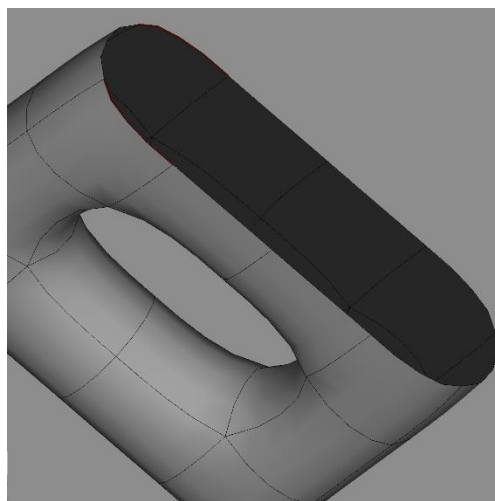


The "Delete" command removes everything selected without sealing the geometry, use delete to delete objects, faces, vertex and faces as well as so called regions. If you need to seal broken geometry use bridge to close the holes.

Select the geometry you want to delete:

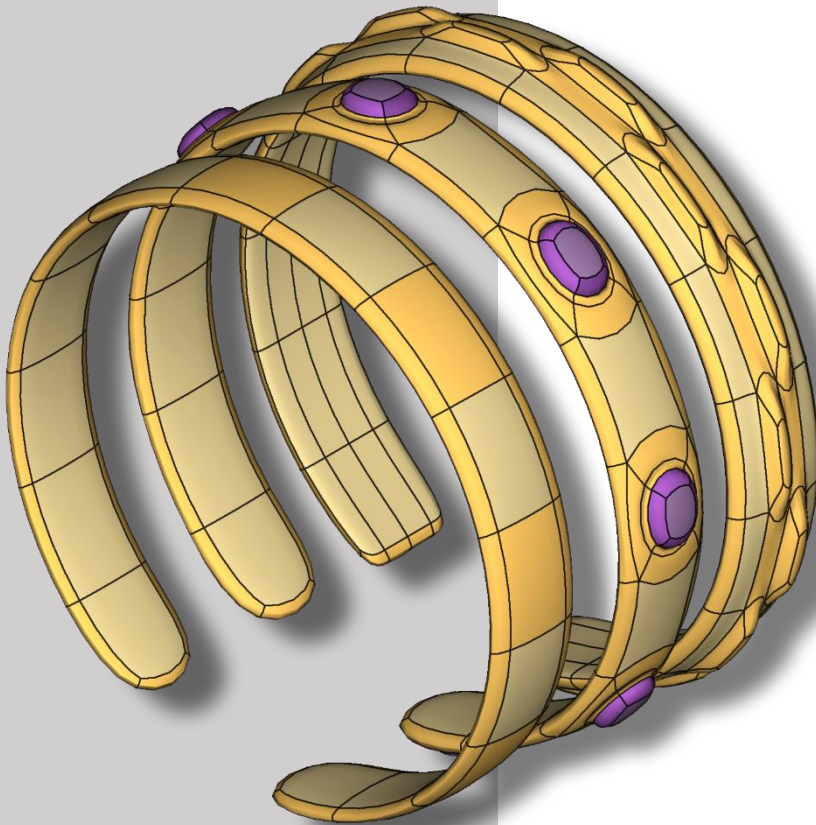


The geometry is deleted and the object opened:

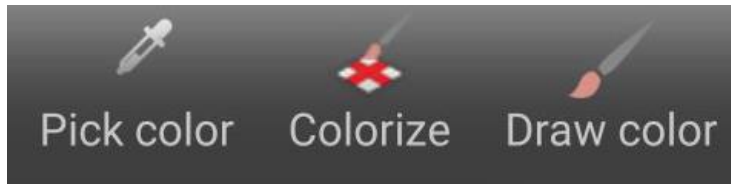
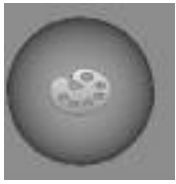


9

Colours



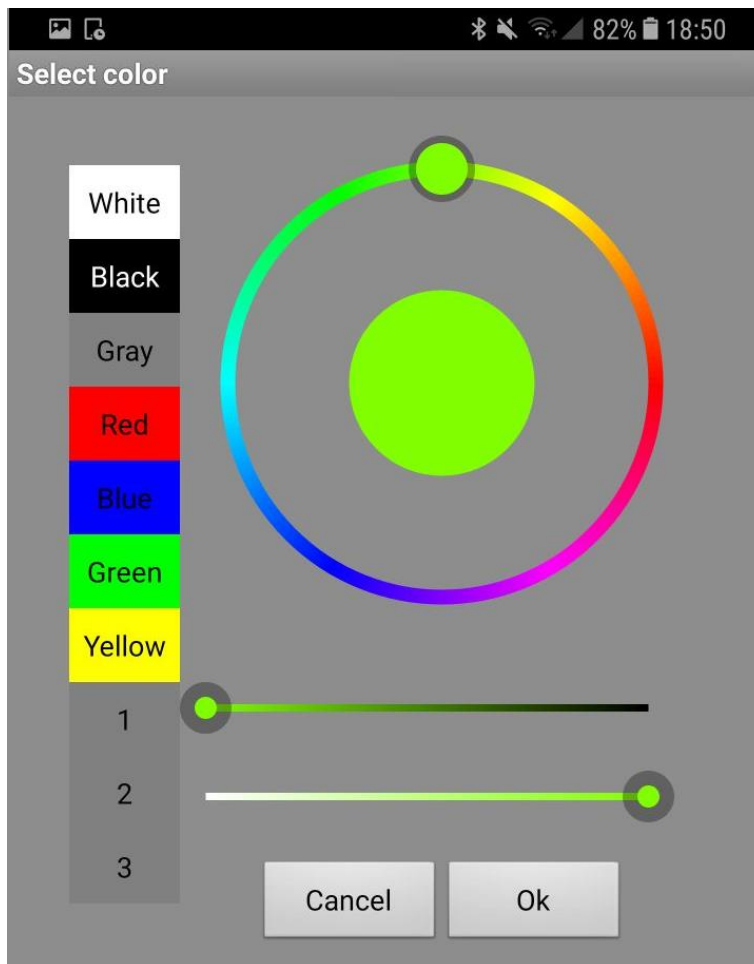
9. Colour



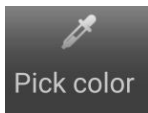
Colourselect



Tap on the Colour indicator icon to show the colour selection dialogue and select a colour to be assigned to your geometry. The Colour select dialogue remembers the last 3 colours you have used. It has a colour brightness and a saturation bar allowing you to select any colour.

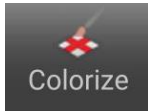


The Colour picker



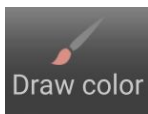
This icon helps you to retrieve colour information from the geometry so you can reassign the exact colour to other faces.

Colorize



Use Colorize to assign the selected colour to the selected geometry

Draw Colour



With Colordraw enabled you can touch any geometry and change its colour.



BETA

**This is a Beta Version of this User Manual.
It will be updated and corrected on a regulary base.**

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