Subject: Complex shape questions from Noob
Posted by kmceject on Thu, 20 Oct 2011 18:10:19 GMT
View Forum Message <> Reply to Message

Hello, first post here. I have been playing with Blender for the past few weeks (and NetFab to 'fix' my problems.) I am working on my first design, and it is kind of complex. I'm like that, never do the easy stuff first, as I want to learn certain issues and do something worth doing.

My shape is an ejection seat, and I am trying to do it as a single piece less the parachute pack and survival kit, to be added as separate pieces later. The main issue I am having is Blender 2.59 does not seem to be able to join mesh sections. See the pic I am posting here. The second issue is that I don't see covered in the tutorials I have glanced at is how far the material can be stretched unsupported across empty space. For example the base of the seat is like a shelf. I plan on adding gussets (triangles) to support the material from below and to be built up from there, but how far apart should they be?

With the joining meshes I have been selecting vertexes and merging them. then making faces. Ctrl-J does not seem to function at all. I even went thru the keyboard shortcut menu and could not find Join as an option. Am I missing anything???

If I don't join meshes, but overlap them will they print o.k.?

As to the unsupported area issue I think the tutorials could do with a more easily found description of how much you can span.

BTW my seat is 1/12 scale and is about 96mm high. There are several sections I have not joined yet, for example the seat bucket sides. There are indeed holes in the area below the headrest that belong there, as well as the grip areas in the handles. I have been thickening my meshes with a script I glommed from a tutorial on statistical maps and it has been quite a mess. I think I have to do that, then add certain shapes into certain places and join them to make it work...

Kevin


```
File Attachments
1) sr1seat3d.png, downloaded 501 times
```

Subject: Re: Complex shape questions from Noob
Posted by Youknowwho4eva on Thu, 20 Oct 2011 18:53:14 GMT
View Forum Message <> Reply to Message

I'm terrible at Blender, but I can answer your non-blender questions. What is the intended material? Depending on the material and the thickness of the seat, support may or may not be needed. I think thin FUD could need some support, but everything else, as long as it is the required thickness, should be ok. And for joining, as long as the solids overlap, not just but up face to face, the software automatically joins them so your not being charged 2 for overlapping geometry.

Subject: Re: Complex shape questions from Noob
Posted by christopherlowe on Fri, 21 Oct 2011 04:37:47 GMT
View Forum Message <> Reply to Message

what you are looking for in blender isn't join- but weld...

control-W

select 2 points in the same object and hit control-w and it will pop up a dialogue asking first, last middle, and some others...

pick witch one you want and continue modeling...

something else you might be looking for is the fill tool. selecting 2 or more edges or 2 or more points will fill in that area... that is just plain F...

what kind of aircraft are you making this for? the "walls" look a little thin to be printed... that is something that you have to watch out for as well...

Subject: Re: Complex shape questions from Noob
Posted by kmceject on Fri, 21 Oct 2011 04:58:29 GMT
View Forum Message <> Reply to Message

Thanks to both of you for the info. I haven't expanded the walls in that image, i do that just before I export to STL and test in netfabb. The seat is SR-1, SR-71 version. I run The Ejection Site web site, and am an avid modeller. A few years back ESCI came out with 1/12 scale F-104 and F-16 cockpit models. I want to make an upgrade for the F-104 to the older C-2 seat, and a few others for my displays. The real things take up way too much to move and display. I have a C-2 from the -104, and a ACES II from F-16 along with some six others, tons of parts, and tens of thousands of documents and photos of seats.

I would love to have a real SR-1 but they are among the hardest to get, I only know of one owned

by non-military. I might make a Shuttle version of the seat, and a U-2R version later, but the main frame and many of the parts will work for C-2 as well. I might even make a C-1 downward version, and some others if these become popular.

I am currenlty using .75mm as the min thickness. Here is a quick and dirty image I did for this post. I am at the point of adding a lot of the detail pieces, including the inertia reel lock and the battery box on the near side.

Kevin

```
File Attachments
1) sr1seatnetfabb.png, downloaded 473 times
```

Subject: Re: Complex shape questions from Noob
Posted by christopherlowe on Fri, 21 Oct 2011 05:08:44 GMT
View Forum Message <> Reply to Message

had to model several seats for work... but they weren't exactly ejection seats...

can't exactly do that on a helicopter.

thought that i could help though if the need arises.

Subject: Re: Complex shape questions from Noob
Posted by kmceject on Fri, 21 Oct 2011 05:13:47 GMT
View Forum Message <> Reply to Message

The Russian Havok has the K-37 extraction system, similar to the USAF/Stanley YANKEE system. Fires a rocket out and yanks the crew free by their harnesses. The YANKEE was also tested for helos, and the Space Shuttle after the Challenger disaster.

Kevin

Subject: Re: Complex shape questions from Noob
Posted by christopherlowe on Fri, 21 Oct 2011 05:16:42 GMT

i see-

i work on marines helicopters so i guess they don't need them...

i joke!

Subject: Re: Complex shape questions from Noob
Posted by kmceject on Fri, 21 Oct 2011 23:09:07 GMT

Marines are tough men and women, but I do wish that the military would put out a requirement to have egress systems on helos. My contacts in the industry are certain it is possible to do.

I tried Weld, but it did't seem to work. I tried several different ways and finally gave up. Every time I tried Ctrl-W I get a popup that says "Save Over" and the file path.

Today I stopped at a bookstore and looked thru a couple of Blender books that all mentioned using Ctrl-J in Object mode. I tried that, but I couldn't select the two objects together unless I select all the items in my scene and that isn't what I want at the moment. I still have parts I want to fix before I join them. I guess I have to do it by joining the vertexes the hard way.

This pic shows the bottom of the seat before thickening. Note in particular the rectangular piece in the center front- That is to connect the torque tube to the rear end which is thru the side panels of the frame, and to support the traverse cylinders under the seat firing handle. I plan on adding a grid of similar pieces to strengthen the base of the seat, especially on the sides between the foot area to the front (with the cylinders longitudinally aft- the foot retract storage) and the reel boxes to the rear (a thin cable should connect them but I don't think I could print it, it would be about 0.25mm in thickness at best.)

Kevin
GRRR ARRRRGGGGHHH apparently my attempt to use the Ctrl-J corrupted my file in some way. Now if I create a STL from the image it is essentially empty with no error message. I have to fall back to my previous rev (12) which is missing several additions and tweaks that I did overnight.

File Attachments

Subject: Re: Complex shape questions from Noob
Posted by stannum on Sat, 22 Oct 2011 01:49:10 GMT
View Forum Message <> Reply to Message

For merging vertices, use Alt-M. Then click the menu that appears to select the merge location; or press 1, 2 or 3 to select one of the menu entries if you prefer to use keys (Alt-1 etc if you want to select 11th entry, which is not the case for this small menu, but needed for longer ones, up to 20 items).

Newer versions also let you press letters, look for the underscored letters. The numbers was the original Blender style (like view layers, you get 20 shortcuts, 1, 2... Alt-1, Alt-2...), which was rather fast until menus started to juggle contents at random and any muscle memory was destroyed every 6 months. Never gettting easy-to-visualize hints is another reason for them been obscure shortcuts hard to (re)learn.

If Ctrl-W does two things (in which version does it Weld?), do not use Ctrl-W, you're only testing your luck. Avoid as much as posible those keycombos that do different things depending on other factors, specially if one of the thing can be really nasty, like overwriting your file with bad work you want to discard (you should have multiple backups enabled in Blender, but even so, you would just waste one slot). Ctrl-S is Save in Object mode and Shear in Edit Mesh, but Save is F2 (too), so you can use it for Shear only. Maybe someday Blender developers will put some sense into keybindings and eliminate all the reuse and duplicity the configuration keeps piling on with time. Maybe... as the nonsense has lasted enough to lose hope.

You can Join two or three meshes, keeping others separate, just make sure one of them is Active, which will become the destination of all the triangles (important for name and other things). It should have a different shade of selection color (that or your color theme is useless ^_^). To be sure, no matter if you use box select or select all commands, you have to select one item last, with Shift and click (eer... whatever the button it's today, originally select was on right button). That was a common problem with newbies, some select operations don't set any Active object.

But the best: do not Join mesh objects if you don't need to. Nor use booleans, if you can avoid them. Shapeways' upload will do all that for you. Just make sure all your meshes are closed, with the right normals and no vertex overlaps with others. At worst, do a "join everything" then Remove Doubles and use Select Manifold to discover problematic zones, before saving the file you will upload (if all goes OK, undo and save the non joined meshes, the merging is just a test). Another advice about uploading to SW: try .obj format instead of .stl. And remember you can zip files for faster upload.

Subject: Re: Complex shape questions from Noob
Posted by kmceject on Sat, 22 Oct 2011 03:25:06 GMT
View Forum Message <> Reply to Message

Stannum,

Thank you for the info, that is fantastic! Huge help! I suspected some of that, but being new at this I am thrilled to have the info. What I really am looking for is how to make some componants that I can reuse in other models.

Kevin

Subject: Re: Complex shape questions from Noob
Posted by christopherlowe on Sat, 22 Oct 2011 03:27:46 GMT
View Forum Message <> Reply to Message

this is my fault...

i got confused between MAX and Blender... damn it all...

everything that stannum said is totally correct and well said.

sorry for the confusion...

chris

Subject: Re: Complex shape questions from Noob
Posted by stannum on Sat, 22 Oct 2011 04:14:41 GMT
View Forum Message <> Reply to Message

kmceject: then you have to learn about Blender linked duplicates inside the same file (many objects using the same mesh data, or nurbs obj using nurbs data, etc), group duplicators (instead of meshes, you link full groups of objects), and libraries (other .blend files as source of data).

christopher: heh, MAX, no worries, the ("new" Blender's) huge side bar maybe confused you. ^_^

Subject: Re: Complex shape questions from Noob

Posted by kmceject on Sun, 23 Oct 2011 17:17:55 GMT
View Forum Message <> Reply to Message

New problem here. I have some problems with overlapping parts. many of them are probably due to my use of the following script-

import bpy

#Iterate over all members inside the Object struct
for ob in bpy.data.objects:
    #Check if object is a Mesh
    if ob.type == 'MESH':

        ob.modifiers.new('Solidifystates', 'SOLIDIFY')
        ob.modifiers['Solidifystates'].thickness = .75

but many of them are due to the direction of Normals. I figured out that if I have two joined faces with opposite normals I get a shape that has a narrow edge. I solve this by either reversing the normals if it make sense to me, or separating the parts and having them in proximity.

The latest problem comes from an unusual feature on the SR-1 seat. Behind the shoulder of the seat pan certain parts are covered. These covers follow the same outline as the front view and extend back then cover the back area. To me the simple way to make this was to extend back my edges of the seat pan but first I get an overlap that doesn't make sense, and second when thickened by the above script I get a gap along the joint. The overlap can only be removed by extending the side out way too far. I tried several different directions of normals on the different faces but can't solve the problem. Here is a pic of my current setup without running the script-

Kevin

File Attachments
1) seatflip.png, downloaded 355 times

Subject: Re: Complex shape questions from Noob
Posted by kmceject on Sun, 23 Oct 2011 17:21:35 GMT
View Forum Message <> Reply to Message

And this is a typical thickened result I get in Netfabb-

I have tried using loop slide and cut to sever the connection and then let the pieces join by their thickening but I am not satisfied with the result. Is there any better way???

Thanks again for all your help!
Kevin

File Attachments
1) seatgap.png, downloaded 348 times

Subject: Re: Complex shape questions UPDATE
Posted by kmceject on Fri, 28 Oct 2011 06:09:51 GMT
View Forum Message <> Reply to Message

Hi again. With much experimentation I got results I am happy with, and much understanding of Normals and their actions. I am now at the 95% complete stage (after a MAJOR rework of parts of the seat, I had to change the seat bucket angle!) and have one last question. Seats have LOTs of gas hoses on them that will have to be added if they can not be printed. The hoses will have to be less than the 0.7mm wall thickness for scale, so the question is can I print them, especially unsupported at points. In other words they will start at a thick componant and then move over to another thick spot.

Here is my latest image. The normals are shown as I get a kick out of the seat firing handle, normally marked DO NOT PULL in the warnings- the spikes of the normals would keep a pilots hand of!

File Attachments
1) sr1seatv1_22.png, downloaded 307 times

Subject: Re: Complex shape questions from Noob
Posted by Youknowwho4eva on Fri, 28 Oct 2011 12:50:00 GMT
View Forum Message <> Reply to Message

Do the hoses float? (unsupported) or would they rest on the surface of the seat? I would keep the model you have now, and if you can make one with the hoses embedded a little bit, and try

ordering that first. That way, if that one is rejected you can say oh well, and send in the hoseless one. But if you embed the hoses enough, it could work, I think.

Or you could order in FUD.

Subject: Re: Complex shape questions from Noob
Posted by kmceject on Fri, 28 Oct 2011 22:26:14 GMT
View Forum Message <> Reply to Message

Thanks. Some part of the hoses will float, other sections will be against the model, and will be attached there. I did a test to see how they will look and ran into a problem due to my proceedure. I use the aforementioned script to thicken the model anbd the hoses are thinner than the .7mm so they get too fat to use. *the normals are facing inside, but the faces expand from one side thru the other.

Somehow while I was testing I hit some random key that essentially expanded my model from 32,000 triangles to over 500,000 triangles and I don't know what I did. Since it now bogs down my machine I have to go back to a prior save and work forward again.

In the mean time I used NetFabb to fix it up and uploaded it. It passed the tests and I ordered a print of it to see how it comes out.

I'll keep working on it...

Subject: Re: Complex shape questions from Noob
Posted by kmceject on Sun, 06 Nov 2011 02:40:48 GMT
View Forum Message <> Reply to Message

I've progressed to the point where I tried to print it once, and although it passed the initial testing I got a reject email on it. The attachments showed four areas marked as 'shells', Near as I could figure the issue was that some of the parts were too thin, but double-sided so the solidify script caused the shapes to essentially invert and be fatter than the original edges of the shapes. By that point I was significantly past the initial design, so I fixed up the errors (I hope) and submitted an update.

The odd thing though is that two of the areas marked were the roller assemblies, and I had made one piece and duplicated it five additional times. I couldn't find any faults there so I hope it passes this time. Here is a pic showing the seat from above, the inertia reel handle on the far side (the lolly-pop like thing) and one of the rollers visible here along the back edge were flagged.

I started working on it after the solidify step, trying to add smaller parts that wouldn't be negative shells, but any new meshes added automatically solidify and become thick. When I add a cylinder for example to make a hose I get it to be the right size and shape, but when I go to use the loop cut and slide to add a point to bend it at it expands in the negative realm as it is narrower than the 0.7mm thickness.

I don't know how to fix this so I have to figure out some other way to deal with it. I'd like to be able to thicken/solidify the walls, then edit them to some degree. Is there a way to do this in Blender? Or should I try some other application? I have limited funds at the moment as I am out of work, so I am looking for free/very low cost apps. I have Netfabb, Meshlab, Blender, and Sketchup

Kevin

```
File Attachments
1) sr1seatlookdown.png, downloaded 230 times
```

Subject: Re: Complex shape questions from Noob
Posted by stannum on Sun, 06 Nov 2011 04:04:22 GMT
View Forum Message <> Reply to Message

How to get things printable? Build things so they are always closed and solid, and of the minimum thickness, by hand or if "auto", knowing what the auto is going to do even before it does. Solidify and many other modifiers can back fire too many times, so the least you use them, the better. Sounds hard... but it's just another limit, like when you have to build things low-poly for a game. In the end, it's all about knowing the limits and sticking to them.

Could you mark the problem zones in the picture?

Subject: Re: Complex shape questions from Noob
Posted by kmceject on Sun, 06 Nov 2011 04:25:45 GMT
View Forum Message <> Reply to Message

Thanks. The circled roller is one of the ones that was IDed as bad, but I couldn't identify any

issues. The arrowed parts I found inversions that I fixed, this is a fixed image.

Considering this is only about my fifth week at this I think I am doing o.k. I have learned a lot, and have had a lot of fun doing this, but I am antsy to get the first one in hand.

Kevin

File Attachments
1) sr1seatlookdown1.png, downloaded 236 times