Subject: Need help hollowing a mesh for 3D printing.
Posted by JonathanT on Fri, 27 Jan 2012 00:41:09 GMT
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I paid an artist to model this as a gift for my grandparents...they are very old, and not exactly in the best of health, but I had hinted at this for a while and really want to get it to them while I still have time.

At 6" tall, I was getting a price of over $150 in the WSF material. That is just way beyond my price range, even more so since I intend on printing two...one for them, one for me. We're going to paint them by hand and send the best looking one as the gift.

The artist I work with was able to make it look pretty much exactly how I envisioned it, but he's a low-poly modeler by nature and this really wasn't a good job for him, but I was desperate. He's also not familiar with 3D printing and the specific quirks of the technology...I only recently introduced him to it by printing a starship model I commissioned from him, which came out much better than I expected.

Aside from hollowing the mesh to use a minimal amount of material, the runes also seem to go in far too deep. The depth shouldn't be much greater than the thickest lines that make up the font, which will greatly help in hollowing the mesh (as-is they would require the front half of the runestone to be pretty much completely solid). We're going to antique the finished product, so the runes will show up very well without needing to be insanely deep.

The wall thickness should be as little as will still provide a relatively stable, free standing object. The bottom of the base can be completely open, though the walls of the base should probably be thicker than the rest of the mesh to provide more stability.

Considering the amount of solid material that the mesh can do without, I'm expecting some good fixes should be able to reduce the print cost dramatically. The mesh is in .obj format, and quite hefty (compressed size of almost 44 megs). Now, I can't afford much, which is obviously why I can't print it as-is. However, if someone here would be willing to fix the mesh up so that it can be printed for a reasonable amount of money, I can provide reasonable compensation.

Also, if anyone has any opinions on which material would be best to print the finished product with (as far as the processes go, I'm not sure which would be best for this sort of object), I would be glad to hear your opinions.

-Jonathan

File Attachments
1) runestone1.zip, downloaded 79 times

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by Fredd on Fri, 27 Jan 2012 02:12:40 GMT
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Jon, you need any help, you could try #Blender on Freenode irc channel. Blender has a thickness modifier that will come in handy.
The bunch there are always looking for something to model. especially for a nice cause. Just let them know that the wall thickness should be 3 blender units, to play it safe.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by stonysmith on Fri, 27 Jan 2012 06:41:39 GMT
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So very very close..

Your artist actually did make the thing hollow. The problem is that when they exported the file, it ended up as two shells instead of one single one. On top of that.. the bottom (flat part) of each shell is overlapping with the other shell. This should be curable without a lot of work.

If you could move the inner (negative) shell downward ever so slightly, it might be that MeshMedic would fix this for you.

One note: the inner shell does NOT need all the extra details that it currently has.. the inside shell could afford to have MUCH less detail to it, making the whole file size drop down.

Unfortunately, for the programs I have available, the file size is causing me difficulties. It is likely that one of the other members here may be able to handle it in some other program easier.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by JonathanT on Fri, 27 Jan 2012 07:35:13 GMT
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I figured it was somewhat hollow from looking at it in MeshLab, but it sure did look like a mess in there. I wish I could fix it myself, but the best I can do is rotate an object, resize it, and save it to whatever format I need. Beyond that there's pretty much nothing I can do in 3D.

If someone could reduce the depth of the runes (that's one of the key issues), I'm guessing it would be easy enough to just solidify the mesh and then create a low-poly 'core' that could be subtracted from the stone, without all the excess detail where it isn't needed.

I don't think my artist was familiar enough with ZBrush to pull off everything the way I needed it, but at least the exterior is nicely done.

Really hoping someone on here can pull it off.

-Jonathan

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by rich33584 on Sat, 28 Jan 2012 13:54:32 GMT
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It appears to have a double wall inside and I am working on punching a hole in the bottom as we speak. Its such a dense and messy mesh though and I have to leave in a few minutes. I dont have much doubt Ill get it done, but it may be a couple hrs before I can get it to you.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by rich33584 on Sat, 28 Jan 2012 15:51:28 GMT
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try this and see how it works. There isnt much I can do about the runes and also the interior wall.
All I managed to get done was punch a hole in teh bottom and make it manifold again.
If this doesnt work, I think youll be much better off starting from scratch again.
http://www.richardsphoto.com/images/rune3.zip

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by stonysmith on Sat, 28 Jan 2012 18:59:31 GMT
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Do you have the font that was used to create these letters?

Subject: Re: Need help hollowing a mesh for 3D printing.

Posted by JonathanT on Sat, 28 Jan 2012 19:28:18 GMT
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stonysmith wrote on Sat, 28 January 2012 18:59Do you have the font that was used to create these letters?

My artist actually had to use an image file I created...I didn't have a good looking font that had all the symbols I needed, so I had to modify/create from scratch a few of the symbols. But, I do still have the image.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by rich33584 on Sat, 28 Jan 2012 19:32:34 GMT
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Send me the image and Ill try to put something together for you.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by JonathanT on Sat, 28 Jan 2012 19:35:18 GMT
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rich33584 wrote on Sat, 28 January 2012 19:32Send me the image and Ill try to put something together for you.

This is the same image I provided my artist originally.

-Jonathan

File Attachments

1) Runestone Text.zip, downloaded 57 times

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by rich33584 on Sat, 28 Jan 2012 19:39:41 GMT
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JonathanT wrote on Sat, 28 January 2012 19:35rich33584 wrote on Sat, 28 January 2012 19:32Send me the image and Ill try to put something together for you.

This is the same image I provided my artist originally.

-Jonathan
Ok, ill work on it. Shouldnt be a problem. I have my son this weekend, so it will probably be late tonight.
Meanwhile, if someone else chimes in dont be shy about taking their offer. I wont be offended. This was going to be a freebie since it seems to be for a good cause.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by JonathanT on Sat, 28 Jan 2012 19:51:08 GMT
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rich33584 wrote on Sat, 28 January 2012 19:39
Ok, ill work on it. Shouldnt be a problem. I have my son this weekend, so it will probably be late tonight.
Meanwhile, if someone else chimes in dont be shy about taking their offer. I wont be offended. This was going to be a freebie since it seems to be for a good cause.

Thank you very much...it is very important to me, which is why I sunk money into having the mesh made in the first place. At least I learned I shouldn't take a fish out of water here...best to leave them with what they are familiar with...or bad things happen.

-Jonathan

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by rich33584 on Sun, 29 Jan 2012 01:06:54 GMT
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JonathanT wrote on Sat, 28 January 2012 19:51rich33584 wrote on Sat, 28 January 2012 19:39
Ok, ill work on it. Shouldnt be a problem. I have my son this weekend, so it will probably be late tonight.
Meanwhile, if someone else chimes in dont be shy about taking their offer. I wont be offended. This was going to be a freebie since it seems to be for a good cause.

Thank you very much...it is very important to me, which is why I sunk money into having the mesh made in the first place. At least I learned I shouldn't take a fish out of water here...best to leave them with what they are familiar with...or bad things happen.

-Jonathan
Well, my computer keeps crashing because the mesh is just too dense to get the text to look

good. Maybe someone with a much better rig can do this.
Mine will handle alot, but this is just too much for it.
Did you try the other one?

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by JonathanT on Sun, 29 Jan 2012 02:46:11 GMT
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rich33584 wrote on Sun, 29 January 2012 01:06
Did you try the other one?

I did...wouldn't even upload. Apparently I was already right at the edge of overloading their system, since the original mesh did upload (albeit barely).

I'm sorry everyone...seems the mesh was beyond saving from the start.

-Jonathan

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by Jackablade on Tue, 31 Jan 2012 12:27:12 GMT
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It's rare that a mesh is irreparable. Let me have a lookit.

EDIT: I can fix that. Zbrush isn't liking it much, but it shouldn't be to difficult.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by rich33584 on Tue, 31 Jan 2012 13:02:27 GMT
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I was able to "fix" it, but the file size was much too large to upload.
The mesh has to be too dense to get the text to have any detail at all.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by Jackablade on Tue, 31 Jan 2012 15:36:36 GMT

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Yeah, the mesh was a pretty big mess. I wound up using Dynamesh to rebuild it. I think the result is pretty decent - letters are nice and sharp.

What does the text say, out of interest?

EDIT: Oops, hold on, don't DL that yet. Need to fix something.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by stonysmith on Tue, 31 Jan 2012 15:37:59 GMT
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Hint: one line says "You shall not steal"

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by Jackablade on Tue, 31 Jan 2012 16:15:15 GMT
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Hm, I may have committed a faux pas here. I didn't notice that there was was compensation on offer for this job and just assumed that Jonothan was looking for a quick fix for his model. Given that everyone looked like they were giving up, I thought I'd do a charitable thing and touch up the model so he could get it sent off to his grandparents.

If there's money changing hands here that's obviously going to upset people and well it should. It was not my intention to sweep in and try to steal anyone's job away and I do apologise to Rich.

I'll move along now and find something else to work on.

S

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by stonysmith on Tue, 31 Jan 2012 16:42:51 GMT
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No hard feelings on my part.. I just wanted to see if I could fix it, but my tools were failing me.

>>> Not everything has to be done for a profit.

JohnathanT: It'd be really nice if you could offer this model for sale at some point. If they end up < $20, I'd like to buy at least three.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by JonathanT on Tue, 31 Jan 2012 20:17:25 GMT
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To clarify, I am out for a quick fix...the quicker the better. My great grandfather isn't doing well at all, and the chances he could live to see it now are very, very slim. But at least great grandmother can still get it.

I said I could offer some compensation to anyone who could get it down to a reasonable print cost, so to clarify I spent $50 on the base mesh, and couldn't afford to risk having my artist try to redo it. My goal is to get the printed mesh to cost $20 or less (or a bit more, not a hard limit), and that's about the amount of compensation I can provide in return.

Almost all of my money is currently tied up in an indie computer game project, and this side-project only came up because I discovered 3D printing and could finally try to make a physical copy of something I wrote out for them a long time ago.

The only other one who seems to have had some degree of success with at least altering the mesh somewhat it was Rich, but it sounds like the resulting mesh was unusable by Shapeways (it sounded like that, at least, correct me if I'm wrong). If that's the case, I really need to get ahold of Jackablade's mesh to see if it will work. Running out of time and options.

-Jonathan

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by rich33584 on Tue, 31 Jan 2012 21:00:54 GMT
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Jackablade wrote on Tue, 31 January 2012 16:15Hm, I may have committed a faux pas here. I didn't notice that there was was compensation on offer for this job and just assumed that Jonothan was looking for a quick fix for his model. Given that everyone looked like they were giving up, I thought I'd do a charitable thing and touch up the model so he could get it sent off to his grandparents.

If there's money changing hands here that's obviously going to upset people and well it should. It was not my intention to sweep in and try to steal anyone's job away and I do apologise to Rich.

I'll move along now and find something else to work on.

S
I was going to do it for free since it was a good cause. By all means, if you cab do this, go ahead.I dont think you will hurt anyones feelings. My pc, albeit a strong one, just cant get this done due to the dense mesh. At least with my program.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by Jackablade on Wed, 01 Feb 2012 04:11:19 GMT
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Alright then. If everyone's happy I'll upload.

File Attachments

1) runestoneFixed.zip, downloaded 37 times

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by stonysmith on Wed, 01 Feb 2012 04:37:26 GMT
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Jackablade: is that model above the million triangle limit? When I open it it in MeshLab, it seems that it is.

JonathanT: don't give up.. try uploading the OBJ file, and if that fails, there may still be a way around the 1m triangle limit.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by JonathanT on Wed, 01 Feb 2012 07:29:17 GMT
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Well, looks like you did everything I needed...the model looks great, the runes are a reasonable depth, and the hollow part is perfect. It uploaded fine as a zipped OBJ, and I was promptly notified that it was greater than their 1m polygon hard limit.

I didn't think this would be a problem, since when I initially uploaded the model from my artist, Shapeways allowed it...obviously since it treated the mesh as solid it ignored the interior as part of the polycount. This probably means that the exterior is *just* shy of the limit, so the new hollow interior is putting it over the cap, even though the actual file size is far lower.

I wonder if there is a way to decrease the polycount of the new hollow interior? For that matter, I wonder exactly how many polygons are left over from the existing exterior...

-Jonathan

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by Jackablade on Wed, 01 Feb 2012 08:16:31 GMT
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Ah right, I always forget that ZBrush displays verts and not polys. I can crank up the decimation a smidgen. It shouldn't have much of an effect on the overall appearance.

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by Jackablade on Wed, 01 Feb 2012 08:42:20 GMT
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Ok, 978k tris. Not much appreciable difference to the 1.5 million tri version.

File Attachments

1) runestoneFixed.zip, downloaded 43 times

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by JonathanT on Wed, 01 Feb 2012 12:19:10 GMT
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Alright, now we're getting somewhere. The initial file I received uploaded beautifully, but as it was 1 unit high (and I want to print it at six inches), I took it into MeshLab and made a resized copy.

The resulting model has the exact same polycount (under the 1 mil mark), yet now for some reason Shapeways keeps kicking the resized model out and sending me the "it's over 1 million blah blah blah" message, even though it's not.

The only difference I can see is that the model I got directly from Jackablade's download uploaded successfully, while the version I resized in MeshLab did not, so I'm wondering if there's anything MeshLab is doing that is messing with Shapeways. It's not increasing the polycount (I double checked the finished export), so there must be *something* going on behind the scenes that's messing things up.

Anyone have any ideas?

-Jonathan

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by stonysmith on Wed, 01 Feb 2012 15:12:15 GMT
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Try this copy. I used Meshlab to "Merge Close Vertices" at .001 world unit, and then I exported it as a STL, and used NetFabb to resize it to five inches.

At 5in tall, it is 44cm3 of material, or approx $45 in WSF.
At 6in tall, it is 77cm3 of material, or approx $80 in WSF.

File Attachments

1) runes.zip, downloaded 62 times

Subject: Re: Need help hollowing a mesh for 3D printing.
Posted by JonathanT on Fri, 03 Feb 2012 23:49:44 GMT
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Hey everyone, just an update...I *think* I finally have everything I need, just still working on getting it into Shapeways at a size that I can afford to print...the volume pricing scales more exponentially than I had expected for a mostly hollow mesh.

-Jonathan