
Subject: How to debug a model in Google Sketchup?
Posted by [elegos](#) on Wed, 06 Feb 2013 16:50:19 GMT
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Hello!

I've never done 3D before, and I've tried using Google Sketchup 8 (free). The model is not completed yet, but I just wanted to know how much it will cost to print (more or less).

So... I've exported the model to STL via the plugin (simply File -> Export to DXF or STL -> Millimeters -> stl) and sent to the website, but an email informs me there are some errors. How can I debug the model?

Attached is the 3D model (in skp, Google Sketchup format). I'd attach the STL too, if you require it.

Thanks!

P.S.

I've exported only the main building, not the bricks.

P.P.S.

I know I'll hollow the bricks once I've understood how to debug all the things.

EDIT: using netfabb's repair tool, I get these results after the process:

Edges: 95268
Triangles: 63512
Shells: 91
Border edges: 0
Invalid orientation: 13482
Holes: 0

In the tutorial it is written that Shells should be 1 for one object (mine is one made out of the "bricks"). Even though it's not necessary to be one, I think it shouldn't be 91 O.Ã²... and there are still 13482 invalid edges (about 30%, maybe more of the model is colored in red).

Should I adopt a totally new way of designing the 3D model? I just created the walls and rotated one to make the other 3.

File Attachments

1) [Cuboled.skp](#), downloaded 61 times

Subject: Re: How to debug a model in Google Sketchup?

Posted by [elegos](#) on Wed, 06 Feb 2013 17:46:53 GMT

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I think I've found the problem about the orientations. As I already wrote in the thread, I've used the bricks to fill the walls. The various bricks were made by 5 "parents" (the the bar, T, L, Z, the square). Tetris bricks (as they are) are made of these 5 plus the "inverted" Z and L, for a total of 7 bricks.

I've created the 5 parents as components, and the two flipped pieces as copies of the same components.

In the attachment (front view) you can see that all the inverted L and Z bricks have inverted normals, so I think I'll have to create from ground up those bricks. What a shame >.< - all the edits I do on one of those flipped copies are reproduced on the non-flipped ones, so I can't just edit only those.

About the shells: may it be linked to this problem?

Thanks

Subject: Re: How to debug a model in Google Sketchup?

Posted by [denali3ddesign](#) on Thu, 07 Feb 2013 12:46:12 GMT

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You don't have to redraw! Right click > Reverse faces flips the normals, then you can Right Click > Orient faces to change the rest all at once. The model needs to be "manifold" in order for "Orient faces" to work correctly.

Manifold just means that the model is watertight, which it needs to be for printing anyway. You can use this free tool to check for errors in your model: Solid Inspector. I only found one component that had an error, so you're on the right track.

Re the shells, you have each component separate - which is a very good way to model because you can easily edit the model if necessary. Just before you are ready to print, make a copy of the model, then use the Outer Shell (Tools > Outer Shell) command to join all the components (shells) into one. You may need to do that for each wall, rather than all of them at once.

BTW, nice model!

Subject: Re: How to debug a model in Google Sketchup?
Posted by [elegos](#) on Thu, 07 Feb 2013 12:49:57 GMT
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Well, I've redone the work in order to start with better and 100% valid STL bricks

Still I count 1520 shells... is that correct for a model which should be made of one body (the 4 walls without floor nor ceiling)?

Thanks

Subject: Re: How to debug a model in Google Sketchup?
Posted by [denali3ddesign](#) on Thu, 07 Feb 2013 12:51:59 GMT
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Yes, each component is counted as one shell. Not a big deal, just combine them with "Outer Shell" before exporting.

Cheers

Subject: Re: How to debug a model in Google Sketchup?
Posted by [elegos](#) on Thu, 07 Feb 2013 12:58:53 GMT
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May you please explain me how to do that? Also, how can I precisely hollow the bricks? I think it'd cost too much as of now (around 140\$:S)

Thanks

Subject: Re: How to debug a model in Google Sketchup?
Posted by [denali3ddesign](#) on Thu, 07 Feb 2013 13:09:30 GMT
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See my first post above for how to use Outer Shell...

For hollowing, there are lots of ways to do it and really depends on what your purpose for the

model is. Keep in mind the hollow needs to be connected to the outside of the model so the support material can be removed. Here is one way it could be done (your components make it easy!)...

You could also just push the back thru part way, leaving the front intact.

File Attachments

1) [Capture.JPG](#), downloaded 220 times

Subject: Re: How to debug a model in Google Sketchup?

Posted by [elegos](#) on Thu, 07 Feb 2013 14:26:52 GMT

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I've hollowed the bricks (still haven't outer-shelled it as I have to understand how to better use the tool - it actually deletes the bricks :S), price went down to \$93.70 (white strong & flexible). I'd like to use the semi-transparent material: Frosted Ultra Detail or Frosted Detail (what do you suggest me for this type of details?), and those cost even more (\$234.84 and \$162.40).

How can I drastically reduce the production price? I think I'm doing something wrong (in the end it's not even completed (the ceil is missing), but it's a 10cm x 10cm x 10cm hollowed cube with hollowed walls after all!

Thanks.

File Attachments

1) [Cuboled \(repaired\) 2.stl](#), downloaded 57 times

Subject: Re: How to debug a model in Google Sketchup?

Posted by [denali3ddesign](#) on Thu, 07 Feb 2013 14:40:05 GMT

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You're paying for low density, meaning a big(ish) model with air in the middle takes longer to print (therefore costs more) than a more dense model of the same volume.

Could you print each wall separately and assemble them yourself? That way you could place each wall side by side in the model and create a smaller bounding box.

The outer shell problem is likely because Sketchup doesn't like tiny faces. To get around that, scale up the model, run Outer Shell, then scale back down before exporting.

Subject: Re: How to debug a model in Google Sketchup?
Posted by [stonysmith](#) on Thu, 07 Feb 2013 14:47:51 GMT
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For a 10cm³ cube, it's going to be expensive.

From what I can see, the average of your wall thickness would work out to be equal to about 3mm thick, which would be \$600 in FUD

<http://stonysmith.com/wired/VolumeEstimator.asp?L=100&W=100&H=100&T=3>

For comparison, even if you could shrink the average of the walls to only 0.6mm thick, it would still be \$129 in FUD

<http://stonysmith.com/wired/VolumeEstimator.asp?L=100&W=100&H=100&T=.6>

Subject: Re: How to debug a model in Google Sketchup?
Posted by [elegos](#) on Thu, 07 Feb 2013 14:50:56 GMT
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Uhm... that doesn't help. I tried to upload the single wall and it costs the same (around \$60 for the FUD and \$44 for the FD each wall). Is there a way to trim all the inside faces with one big plane in sketchup? (I can explode the wall and the bricks of the wall to return them to single vertexes and faces) In that way I'd reduce the material used (even if I don't expect to get lower in price).

I'm starting thinking making bricks in epox one by one :S

EDIT: thanks stonysmith for the reply - I'm gonna manually make bricks in epox then!

Subject: Re: How to debug a model in Google Sketchup?
Posted by [denali3ddesign](#) on Thu, 07 Feb 2013 14:54:51 GMT
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elegos wrote on Thu, 07 February 2013 14:50... Is there a way to trim all the inside faces with one

big plane in sketchup?...

Just push/pull the back of the components in.
