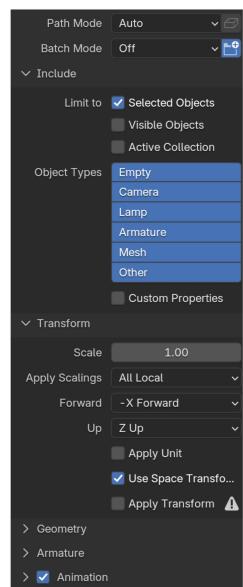
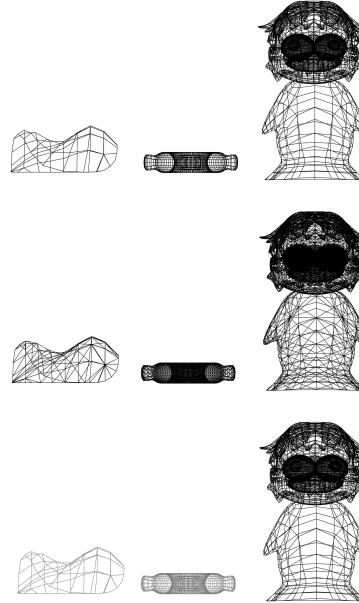


FIX INTEROPABILITY 02

OBJECT SIZE/SCALE



imported fbx mesh objects

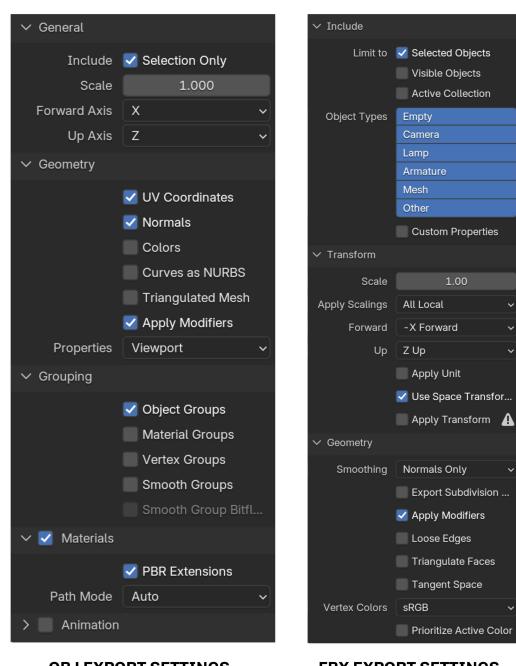


I wondered if I can get the blender exports to import into Rhino with correct, and the same scale. I had done so successfully by changing the units in Rhino to meters (using a new file).

That was the only change I had to make for the stl and obj files, but since on my first attempt the objects from the fbx file were especially humongous, I took a step beforehand by unchecking the "Apply Units" box under the Transform tab in Blender's export window (Refer to the picture on the left).

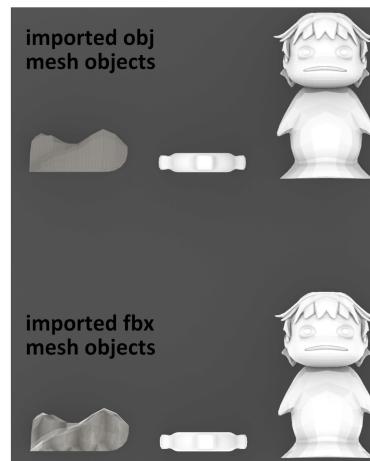
This time, the obj and fbx imports have no noticeable difference, aside from the pavilion and the torus having a different color in the obj import. Meanwhile, the stl import remained more defined than the other two.

MATERIAL TRANSFER



I explored the settings once again to see if there's something I can toggle on/off to make the material transfer successful for the obj file. There was no option for it for stl exports, so here I have the obj and fbx export settings. This time, I applied material to all three objects (Pavilion, Torus, and Character Model).

Previously, I had not checked the box for "PBR Extensions" for the obj export, so I wanted to see if material transfer will be successful in this attempt.



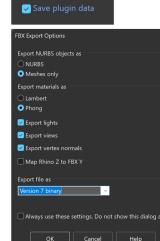
I found it weird that both are successful in containing the material only for one object, which is the pavilion.

Regardless, I can make a comparison seeing as how the obj export maintained the material similar to how it was applied in Blender. Instead of a zoomed in base image like that of the fbx's, it retained the original scale of the applied texture used for the material.

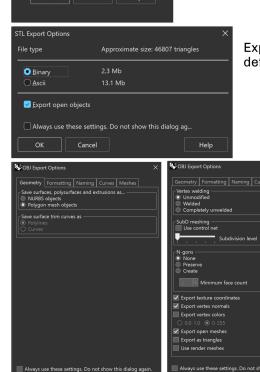
FILE SIZES

	EXPORTED IN BLENDER with material	EXPORTED IN BLENDER without material	EXPORTED IN RHINO with material	EXPORTED IN RHINO without material
fbx	1.12 MB	0.99 MB	3.69 MB	2.42 MB
stl	N/A	2.23 MB	2.23 MB	2.23 MB
obj	3.36 MB	3.35 MB	16.5 MB	15.7 MB

These settings were kept the same for all three file formats when exporting from Rhino. All three are exported as mesh.



Export Options were kept to default in exporting fbx files.



Export Options were kept to default in exporting stl files.

Export Options were also kept to default in exporting obj files, except for changing the geometry as Polygon mesh objects rather than NURBS (for close comparison). The subdivision level under SubD meshing was also kept at the lowest.

Findings

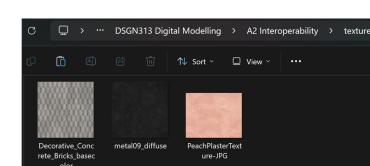
1) obj exports are flexible (Refer to OBJ Export Options images). Ranking of flexibility in exporting is as such:

MOST FLEXIBLE
obj
fbx
stl
LEAST FLEXIBLE

2) stl exports as triangles.
3) Material does not affect the size of stl exports. Judging from the export options, it only copies the geometry of the objects. This might be due to the fact that STL is mainly used for 3D printing purposes.
4) Material affects obj and fbx exports by a few megabytes.
5) Rhino exports are generally much larger than Blender's, especially for obj file format. I have made a short analysis below.

Mathematically computed = higher data stored = higher file size

Higher flexibility = higher file size



Because I was using blenderkit extension which is specific for that software, I thought it might be because I did not manually apply the material from an external source. So Rhino was not able to read the textures.

I proceeded by restarting the Rhino file and I was greeted with this window below.



Then, I bulk replaced by choosing the folder the textures were in.

Which gave me this. The materials had automatically been applied for the fbx file which I found convenient and efficient. I had to export from Blender and import to Rhino again to successfully transfer material for the obj file format.

imported obj mesh objects



In comparing the material transfer between the two file formats, fbx is capable in lighting (noticeable gloss on the surface), while obj is great in keeping the scale of the base texture in the material. One downside of obj imports regarding material transfer is that these fail to recognize elements the material was applied onto.