

InteriCAD T6 - Working with large scenes

When users run into huge house or building in InteriCAD, they may find the program reacting slow, render takes longer time. In some old computers, the program may even stop responding. The main cause is the scene contains too much data, too many surfaces, so the program does not have enough resource to handle the task.

To improve our speed with huge scene, decrease error occurrence, users need to know how to optimize the scene to decrease data volume.

Usually we recommend the scene to contain less than 1.5 million surfaces. Below are some common rules:

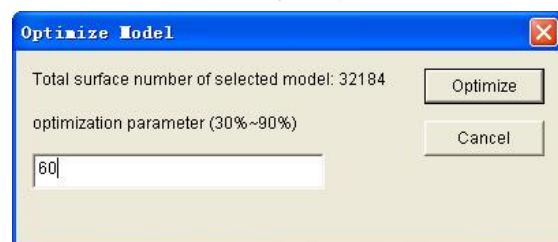
1. Simplify delicate models, use texture to present complicated structure. Thus we can lower the pressure on the CPU and Graphics card.
2. Delete surface that cannot be seen. In a huge scene, lots of surfaces are not seen from the render. If we can optimize it properly, the total surface number can decrease by about 30%.
3. Do not use high resolution texture. The bigger the texture, the more system resource is needed, so the computer will slow down. Try to control the texture resolution within 1000 x 1000.

Now let's see how to apply these rules in practice.

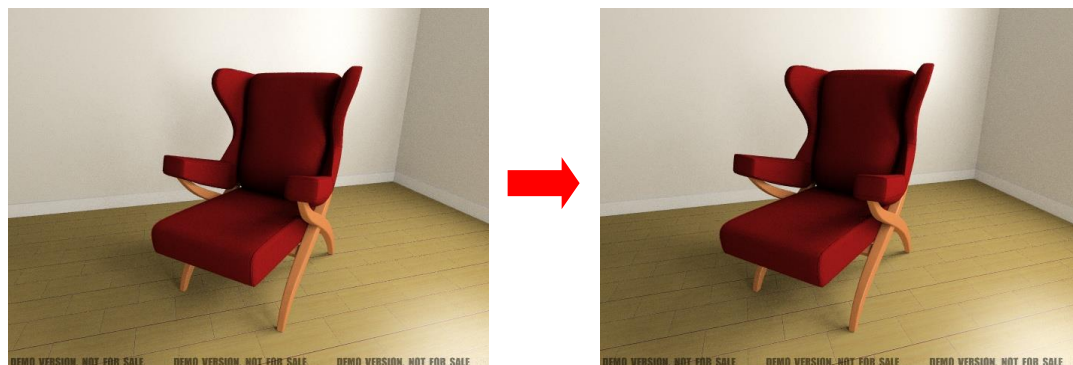
Simplify delicate models

This part is usually used on imported models, such as 3ds max models. Most models in InteriCAD system library are already optimized.

Take 3ds max models for example. The first solution is to edit in 3ds max, with MultiRes Modifier or ProOptimizer Modifier (Autodesk 3Ds Max 2010 new feature). Here we don't explain this solution in detail. The second solution is to edit in VR of InteriCAD 7000. Model optimize is a new feature to 7000. It greatly reduces model surfaces while maintaining its shape.



Total surface number: 32184 -> 19315,



use texture to present complicated structure

For those hardly noticed models, we recommend using texture to replace actual 3D model. The following case is very common to many users - use fully 3D modeled door or use a flat door panel with texture? Here are two pictures for you to compare.



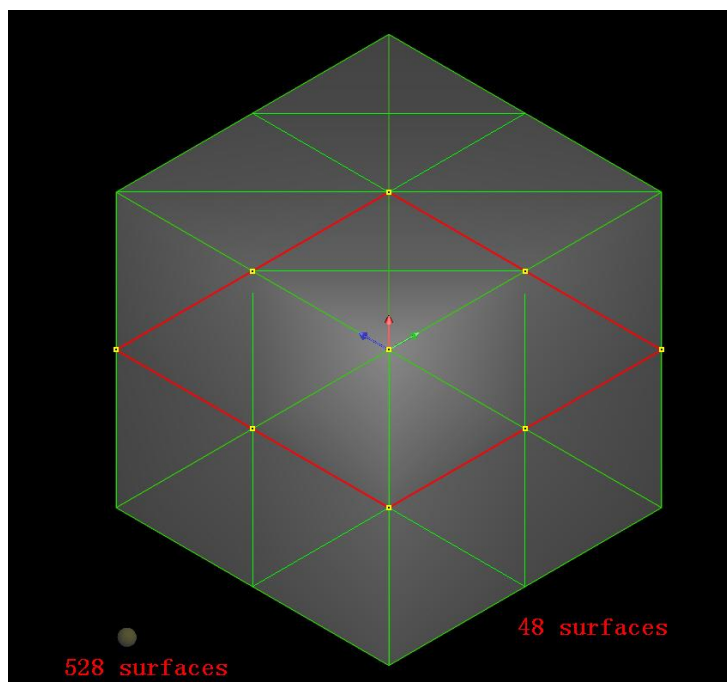
The first picture uses a fully 3D modeled door, while the second uses texture. Compared to the little difference in outcome effect, the surface number difference is huge. Total surface number of this scene is about 820 thousand, while the 3D modeled door uses 39 thousand surfaces, which is 4% of total. The texture realized door is only 12 surfaces, but the outcome is nearly the same. Let's look at another example. The telephone below has every button and number modeled in 3D. When you look at it from distance, the details can barely be seen. It suggests we do not need such detailed model.



Now let's look at a client's experience share:

To create interior design rendering, we care more about the whole effect and the combination of furniture, not the small decorations. When using computer programs to realize your design, remember the relation of superior and inferior objects. Take the picture above as an example, the chair, tea table and TV cabinet should use very fine models, while the telephone, bowl or vase do not need good models. Some users think that small models do not generate too much data. That is wrong. The complexity of models decides how much data will be generated.

The cubic below has very flat surface. Although it is big, it is of very few surfaces. On the other hand, a small sphere many contain many surfaces to ensure its smoothness.



Delete surface that cannot be seen

As we mentioned before, the bigger the scene gets, the more surfaces are not scene. These are a total waste of computer resource. If you delete such surfaces, more computer resource will be available for use.

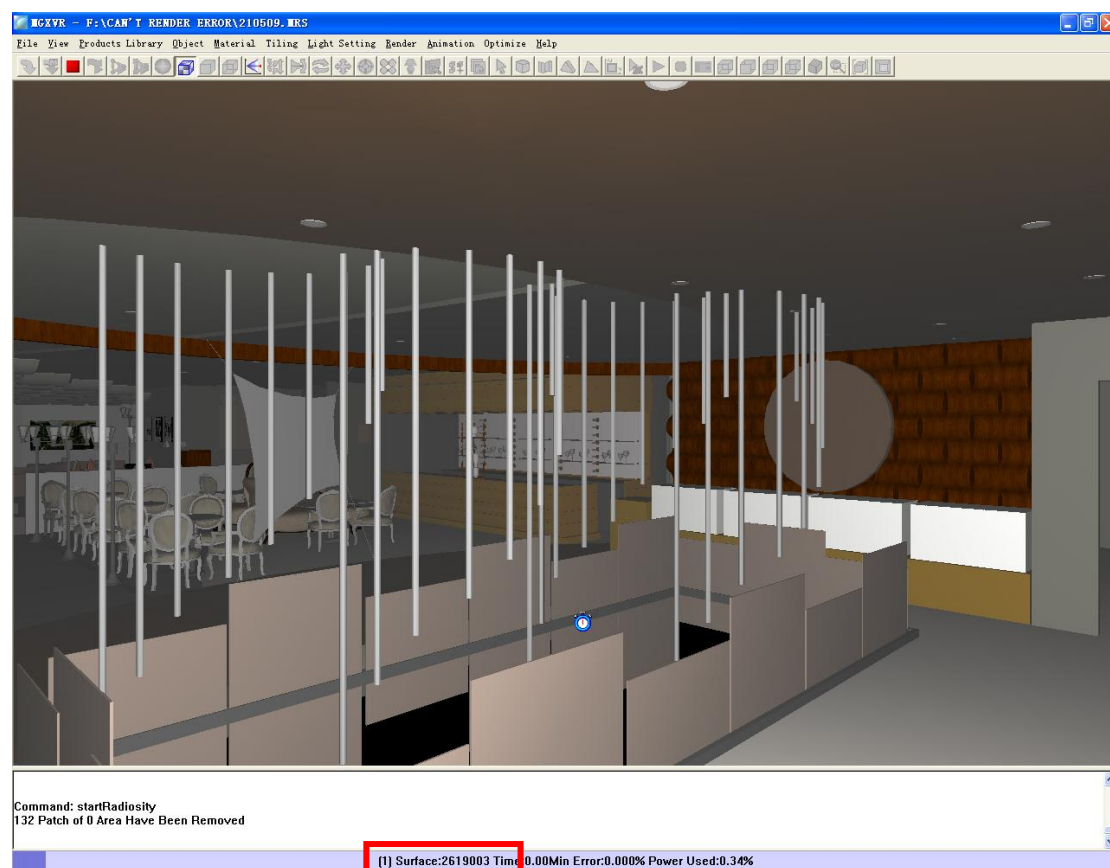
Before we delete a surface, we need to confirm that it is not seen in any required render. If you are only making interior design, all the outside surfaces can be deleted. But if you need exterior rendering, of course you can't delete them. Besides, this operation is usually applicable to wall, floor and ceiling. We do not recommend furniture because its surface is usually complicated.

You need to detach the surface first, then delete. Operation as below:

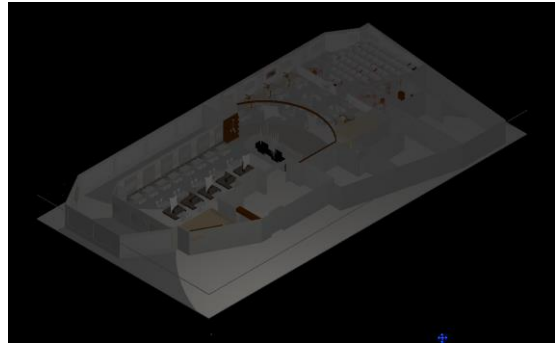
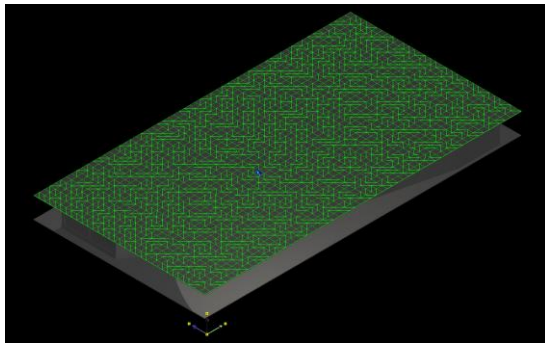
1. object/detach/coplane surface
2. Select target surface. Hold shift to select multiple surfaces. Right click to confirm.
3. object/edit surface/delete
4. Select the detached surfaces. Hold shift to select multiple surfaces. Right click to confirm.

In the example below, you can see the total surface is 2,619,003 under normal precision.

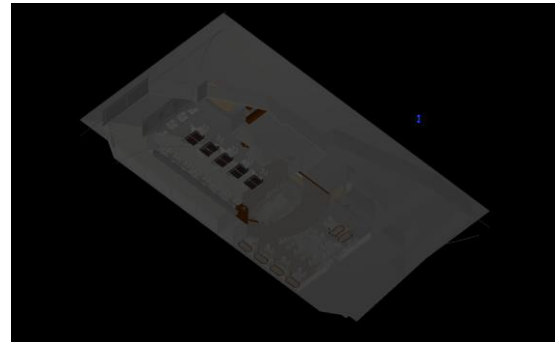
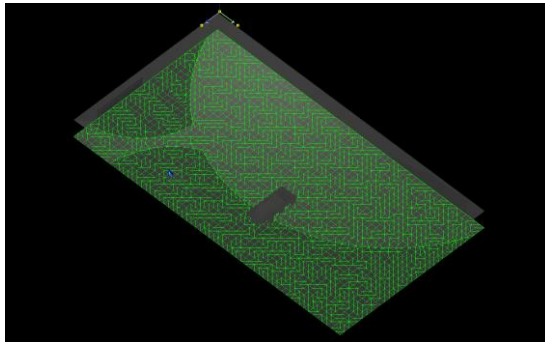
Now we are going to use the two methods above to optimize the scene. We aim to reduce the total surfaces by 30%.



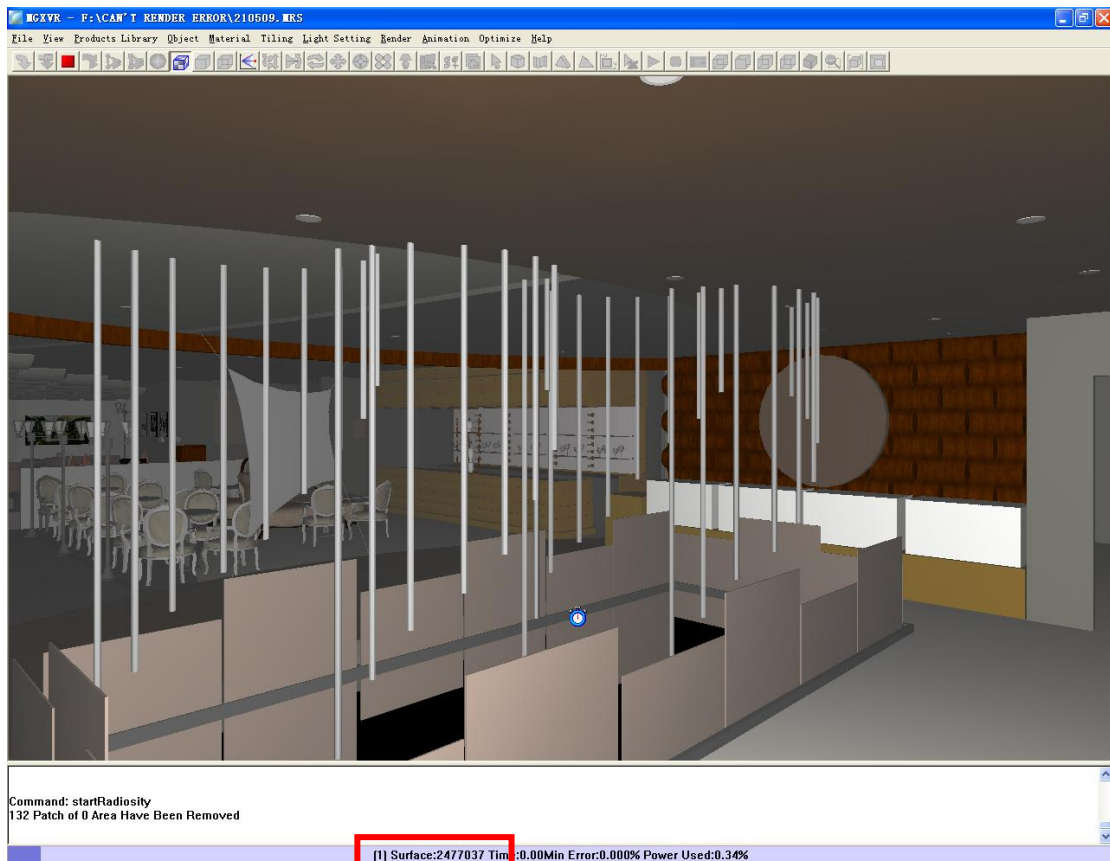
Now we switch to 3D view, detach the top surface of ceiling and delete.



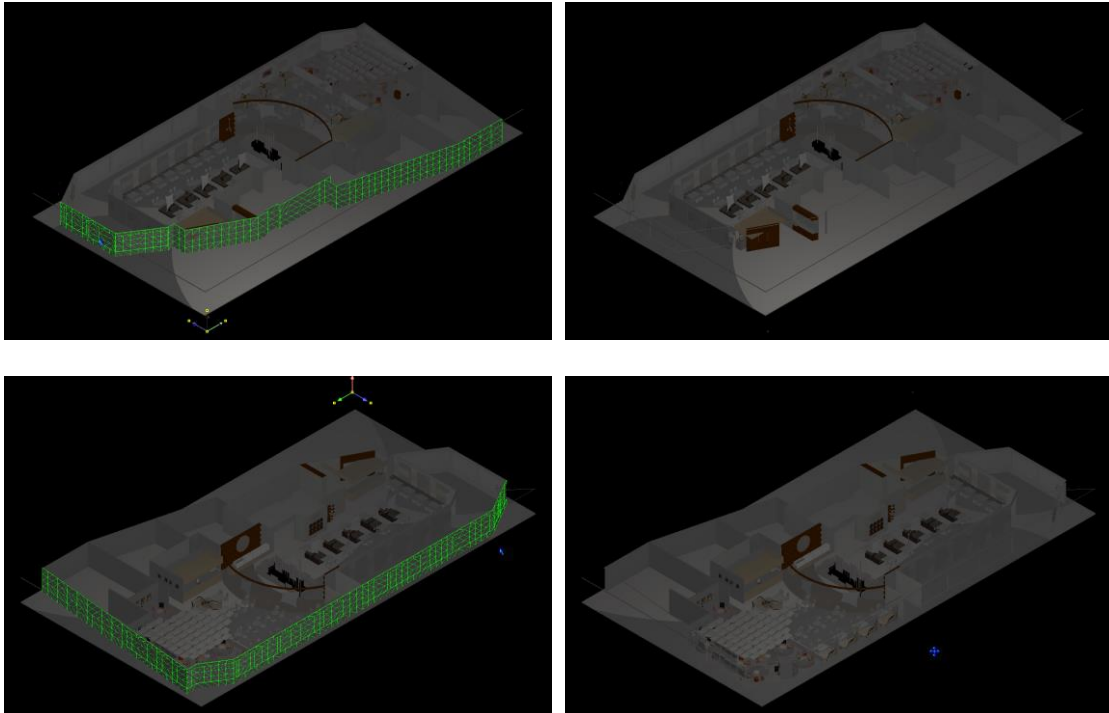
Adjust angle, and delete the bottom surface of floor.



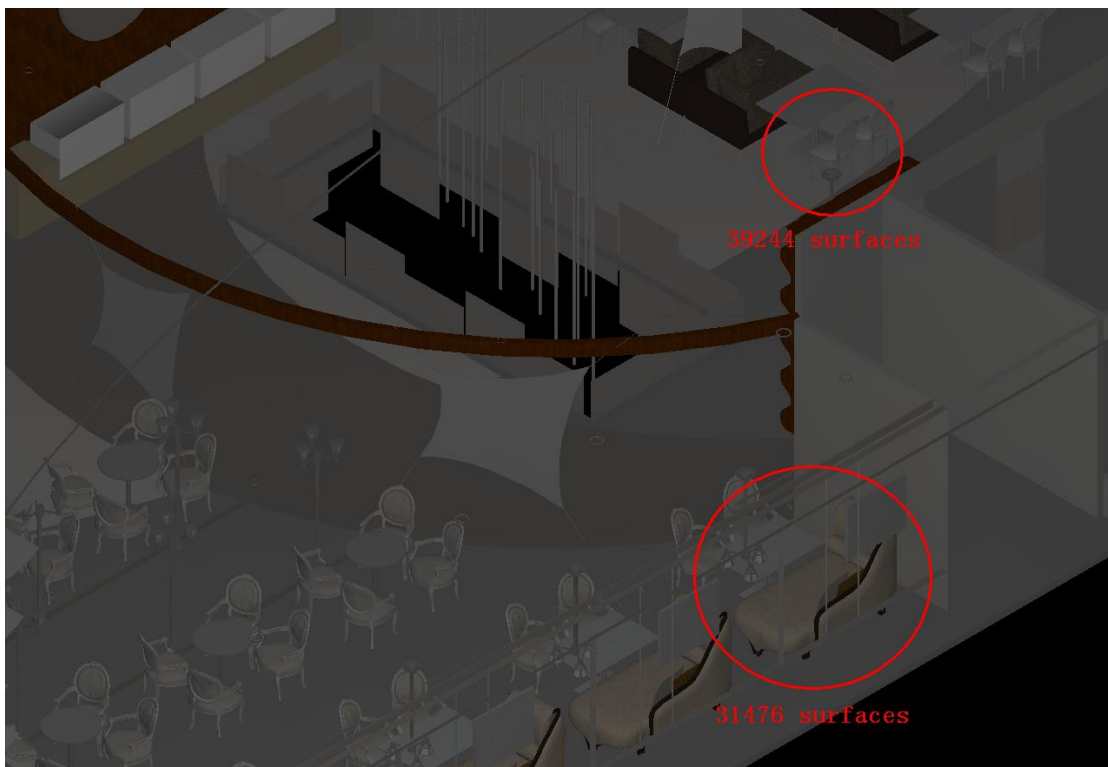
Run radiosity again, you can see there are 2,477,037 surfaces left.



Let's continue to delete those small surfaces.



We will use the model optimize function of InterCAD 7000 to do this part. After examination, the two models circled out below are of over 30,000 surfaces.



Because the scene already consumes a lot system resource, if we optimize in this scene, the speed will be very slow. Here we export the models first, then optimize one by one.

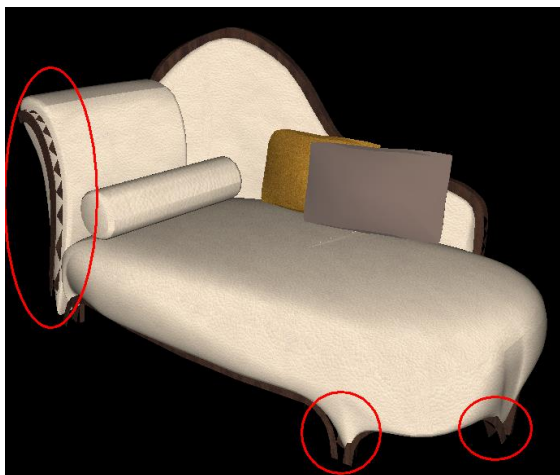
The steps:

1. products library/export object
2. Left click on a model, right click to confirm.
3. Pick a point as insert point.
4. Use "save as" dialog to save the model.

Use "new" command from "file" menu to open an empty scene. Select "import vr block" from "products library", import the model we just saved.



Select "optimize model" from "optimize" menu. Select the sofa and right click, input "80" then click "optimize" button. Look at the picture below, there are errors in the circled area. Click "no" to cancel optimization.

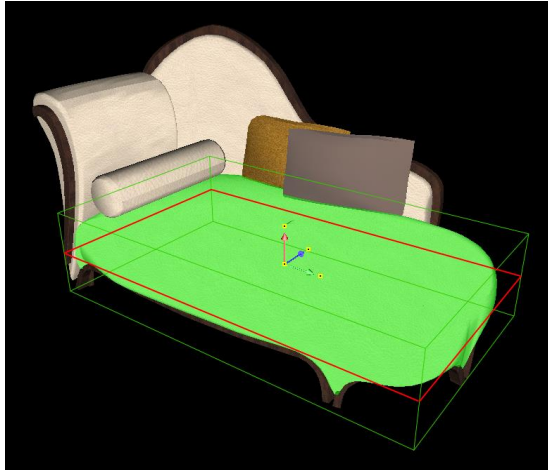


From this example, we can see the model optimize function is suitable to those big surfaces. In the current situation, if we wish to only optimize the bigger surfaces of this sofa, we need to explode the model first. Then we will pick out the parts one by one.

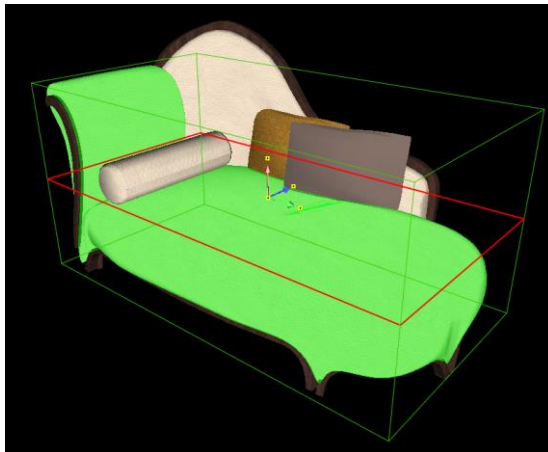
Steps:

1. file/maker/explode library object
2. Click the sofa. There is no need to right click after.

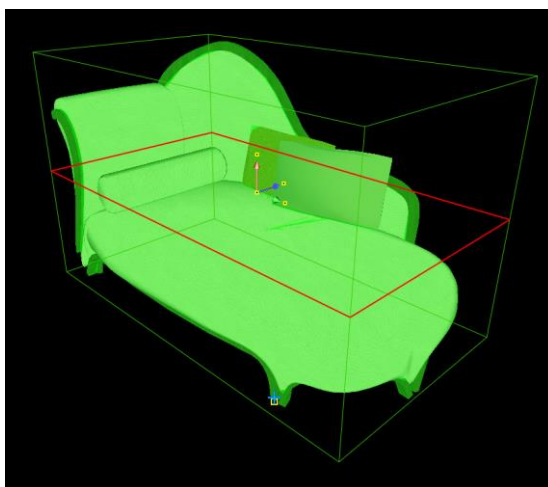
Now we are able to select different parts of the sofa.



Next we will optimize different parts of the model. If error occurs because of the precision is too low, click "No" to cancel. After a few rounds of test, we find out that only the green parts in picture below is suitable for optimization.

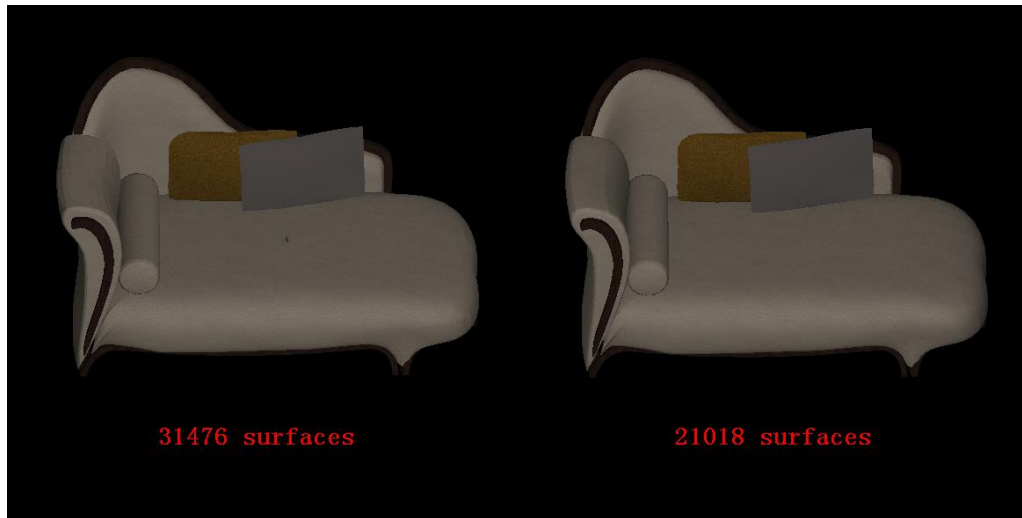


Select "export object" from "products library". Then click all the parts of the sofa. To do it faster, you can switch to window selection mode to make sure every part is selected. If there is no other object in the scene, you can use "export whole scene" command to skip selecting the parts. Finally, define the insert point of the model. You'd better turn on "snap on" from "object" menu when selecting insert point.



Save the model in the pop-up dialog.

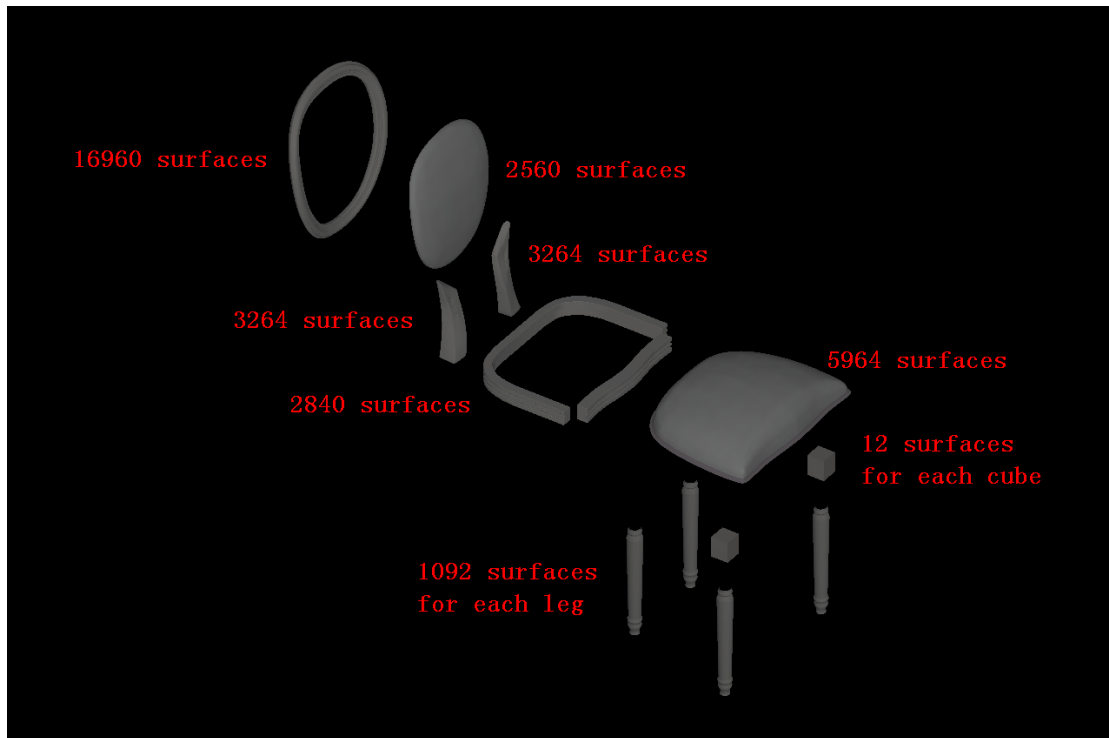
Let's compare the before and after of this model. With the total surfaces decreased by one third, its appearance is hardly changed.



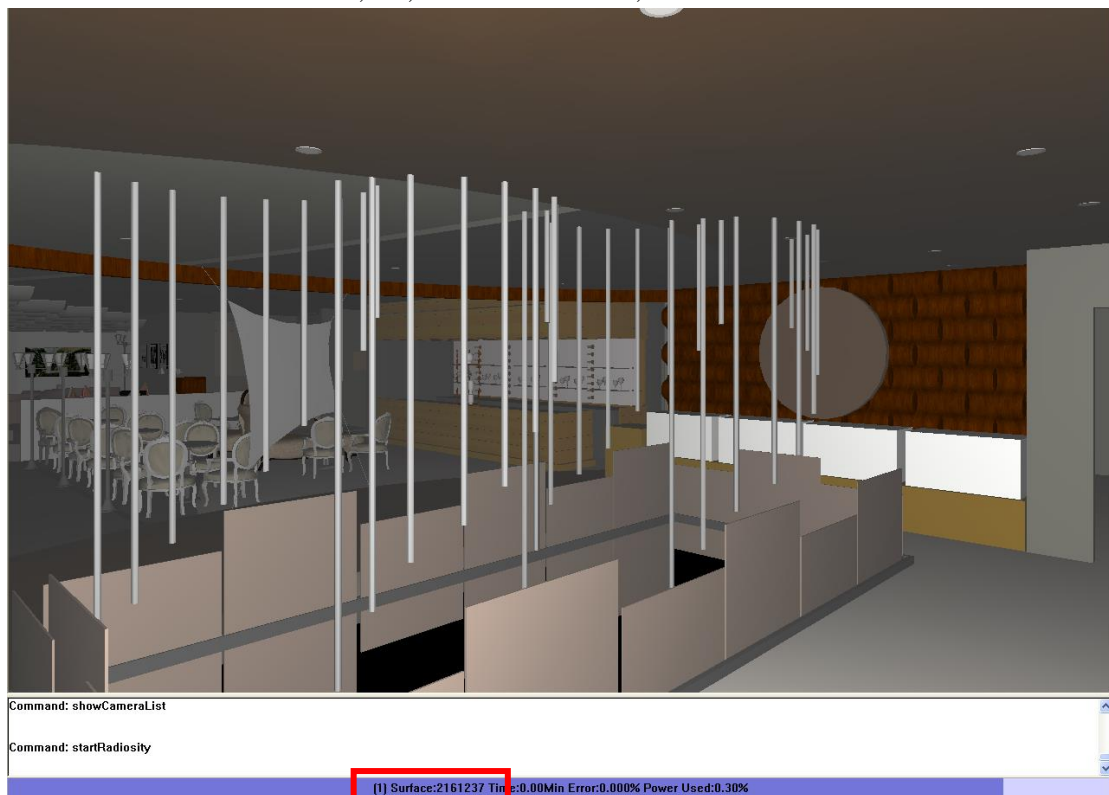
Do the same operation to the dining chair.



If we explode the chair model, analyse the optimization ratio of each part, we will know what is the main part to do it.



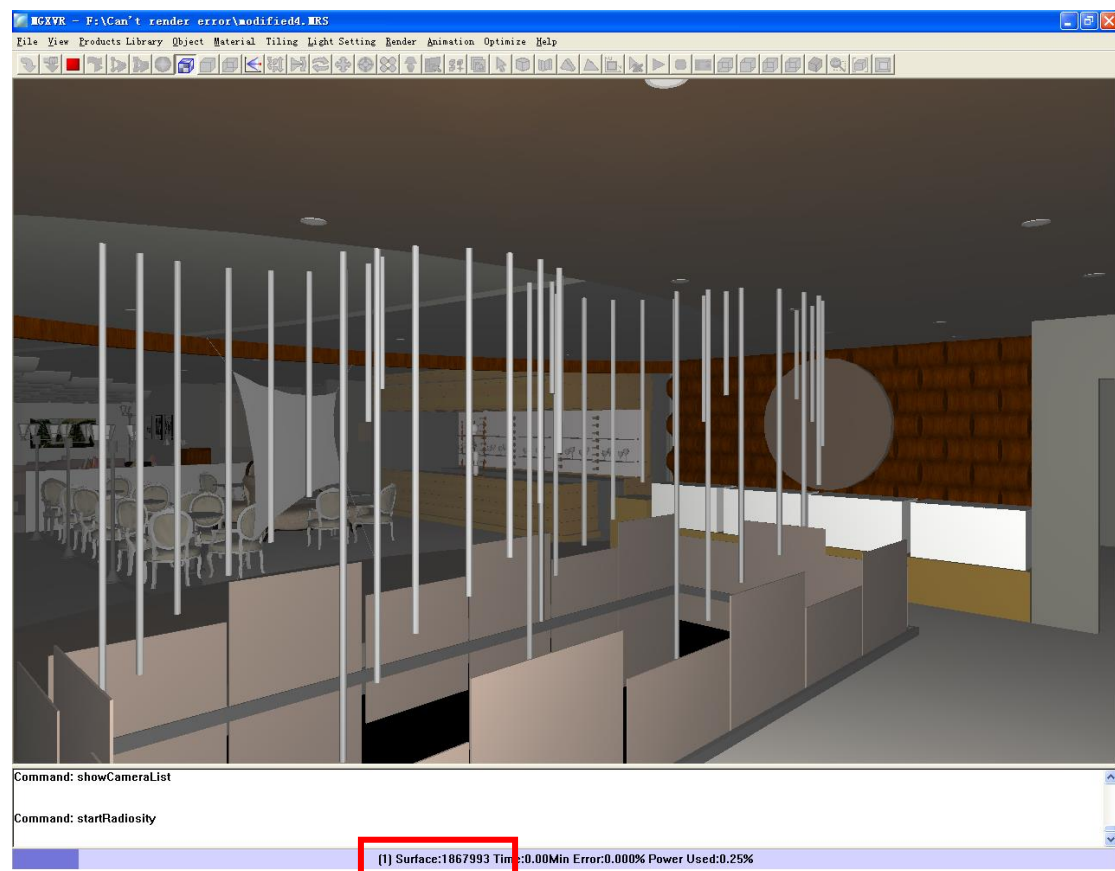
Replace all the sofas and chairs in scene with the optimized ones. Do radiosity again, you can see the total surface is reduced to 2,161,237. More than 300,000 surfaces are removed.



After deeper investigation, we found another three models suitable for optimization.



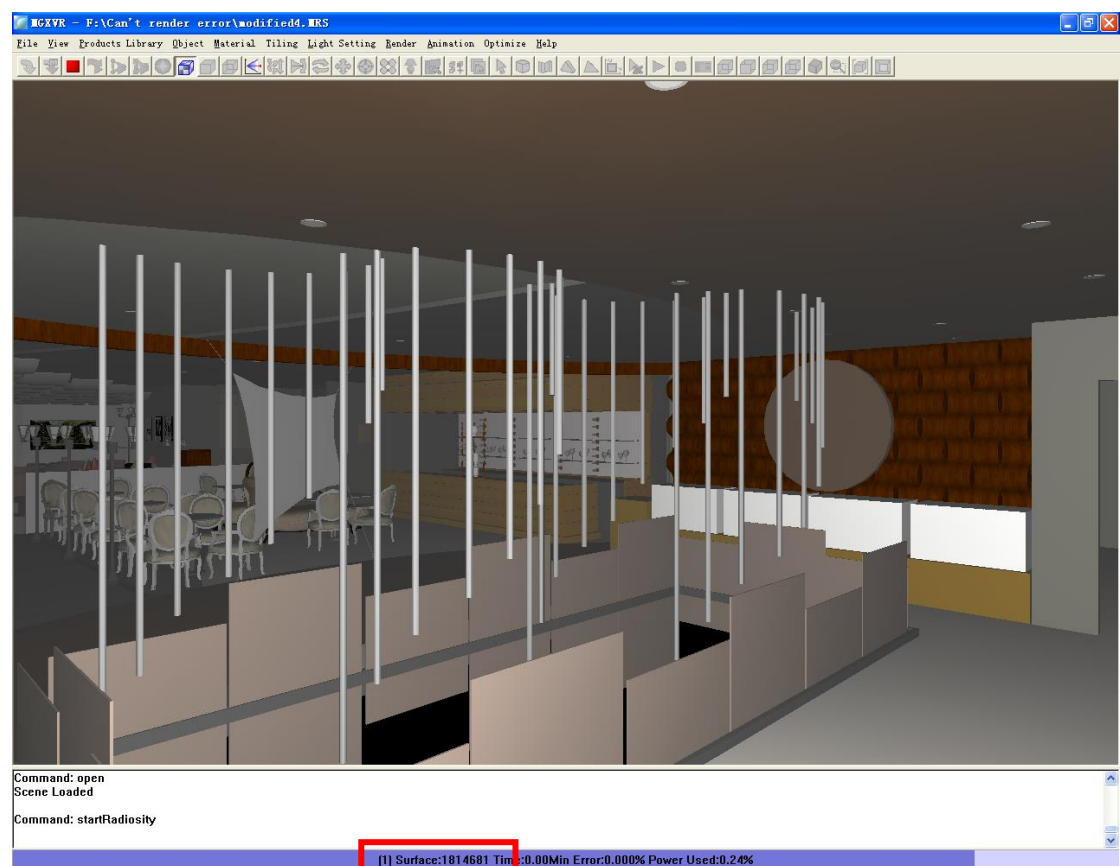
Although the optimization ratio is not high, because of their quantity, the total reduction after optimization is nearly 300,000.



Optimize the lamp in the picture below.

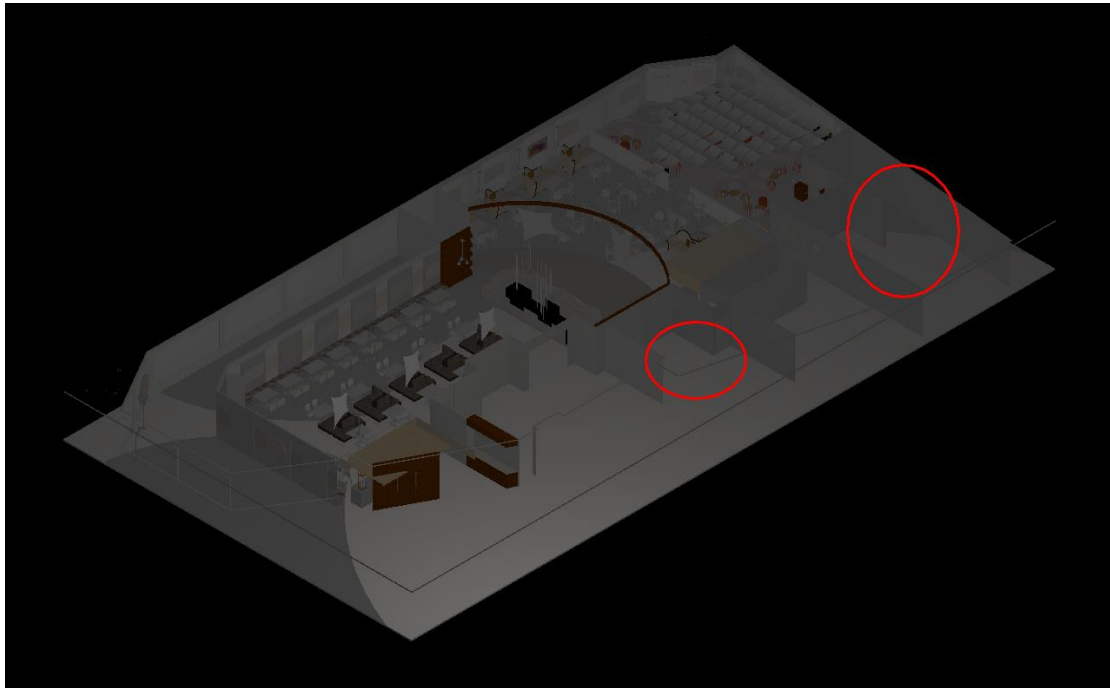


Now total surface is 1,814,681



Till now, we have basically reached our target of reducing 30% of total surfaces.

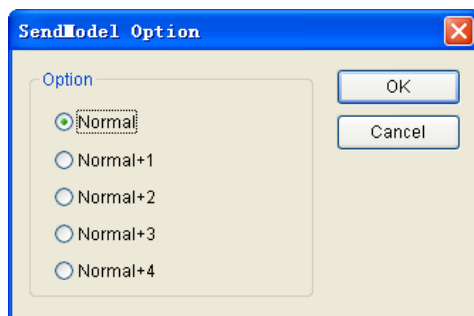
Actually, if you optimize the scene from the very beginning when building a new project, the outcome may be better. For example, the two rooms below are closed, without any layout. They have no use to the project while generating more data. So we suggest not creating them in Modeling. The same reason, if you draw all the ceiling and floor following the wall line, a good quantity of surfaces will be saved. The concept is not to waste resource in places not seen, because all objects imported to VR will consume system resource.



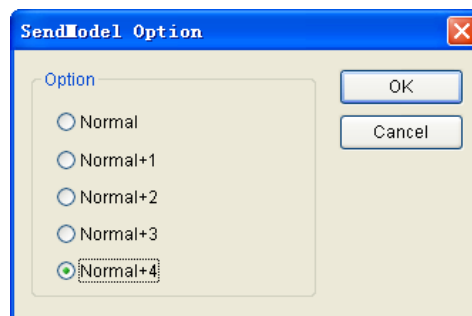
Tips on export from Modeling to VR

When exporting a huge scene to VR, we suggest not to export the whole scene by the same precision and mesh size, but to export several times by the types of objects.

For those simple objects with few curved surfaces, use the default precision. For those complicated yet important elements, use high precision.

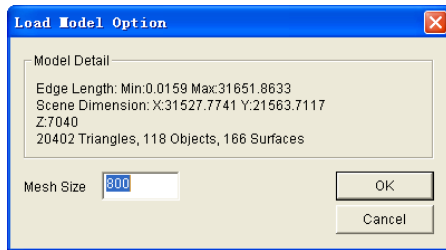


Default precision



Highest precision

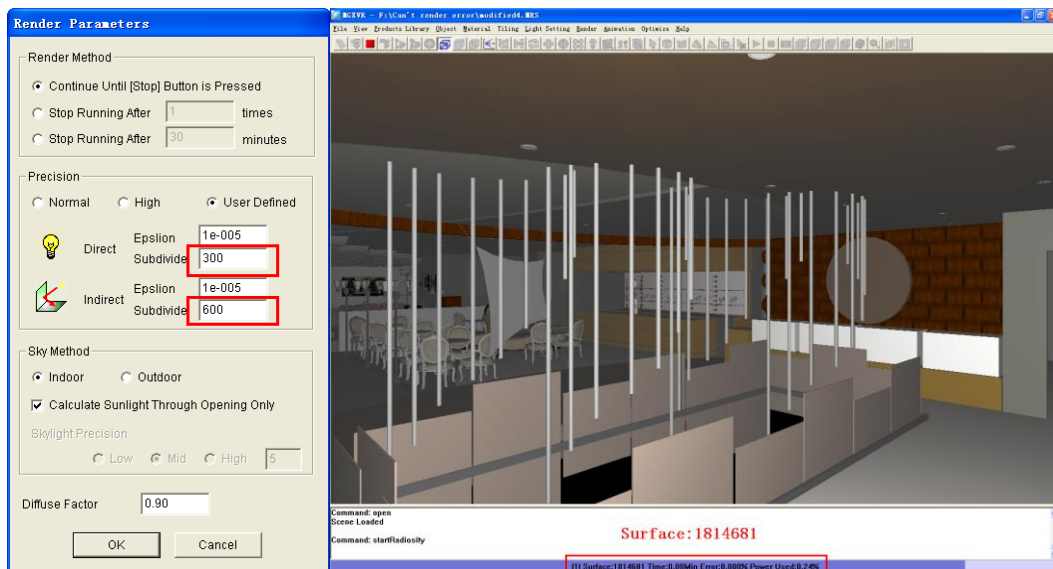
Before the models go into VR, you need to set "mesh size". We shall use different value for different objects. For ceiling, floor and other objects of wide area, we can set mesh size to 1200 to 2000. Usual furniture can go default of 800.



Render parameters

The default parameters of render are balanced for middle and small scenes, around 100 to 200 square meters. If we use it for bigger scene, although the quality is promised, render time is increased greatly. Because the program will further divide the triangle surfaces, the higher the precision, the longer time to render. Since we care more about the whole effect in such project, we can sacrifice some details and precision to increase render speed.

The default normal precision



User-defined precision

