



Mercedes S-Class Millau

Ali Ismail



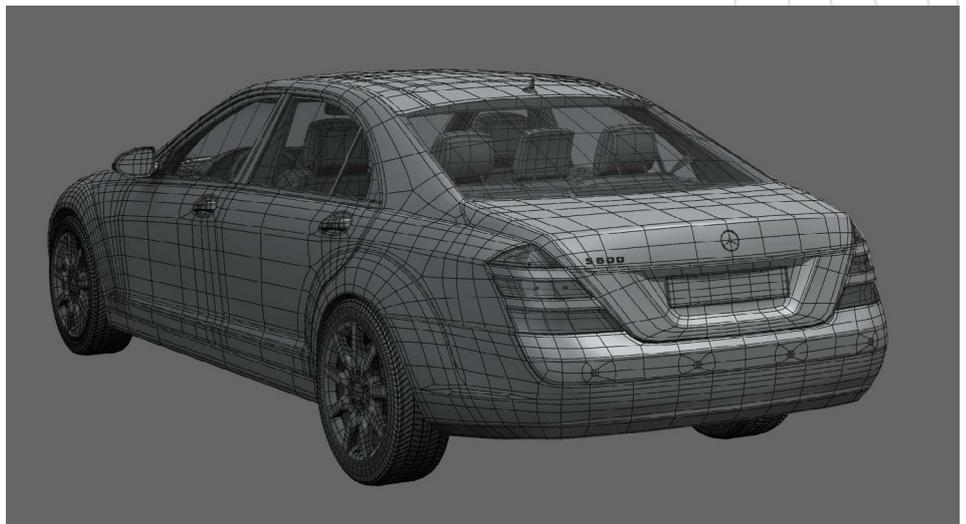
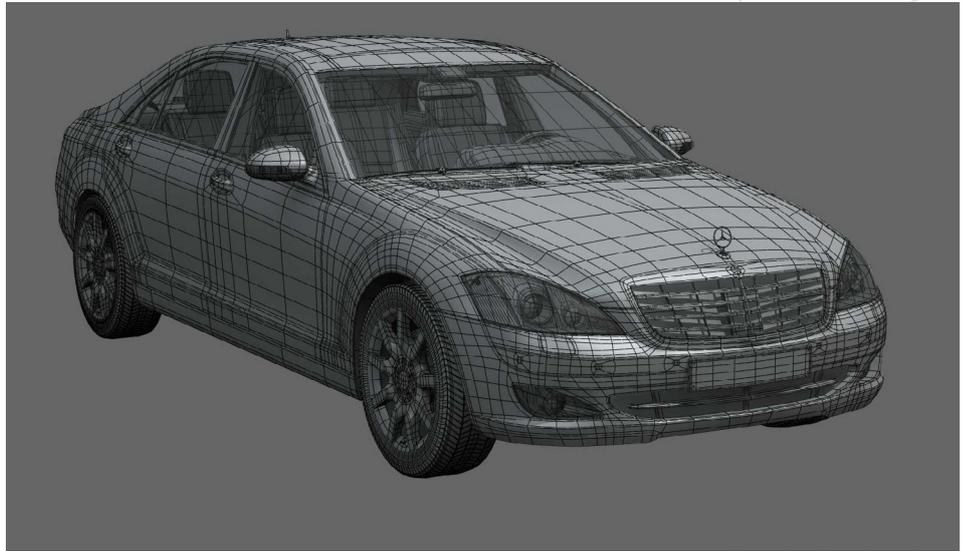


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CAR MODELING OVERVIEW AND TIPS

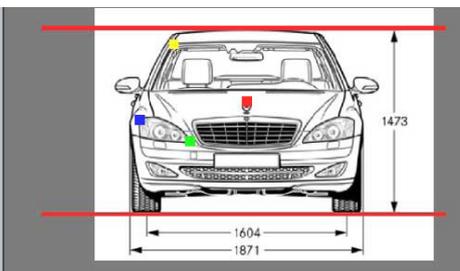
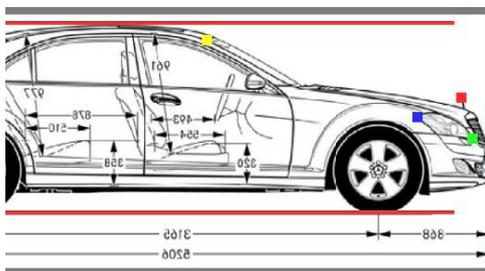
This is not exactly a step by step tutorial about polygon car modeling, it's more of an overview of the process I use and some tips that might help anyone having trouble modeling a car. Although I work in 3dsmax, the process and techniques can be applied to all 3d applications, but this may not apply for one part about spline modeling, which is used only to make the basic polygon mesh, but you can just create the polygons, extrude them or do it any way you like. Well for a start, and I can't stress this enough, but if anyone is just starting out or wants to learn how to model a car *then please* use good blueprints! It's so important to use them, if you are still starting out and can't find blueprints for the car you like the most, check sites such as www.smcars.net or just google it to find the blueprints for the car you want, or order and download brochures from the official sites of the car company. Usually the blueprints come in a single image, It doesn't matter how you extract each view, whether it was in Photoshop or inside your 3d application it doesn't matter, it only matters that you have them in correct scale to each other in your 3d application.

There are many tutorials which give good guidelines about using blueprints. Also it's very important to setup the blueprints properly and as accurately as possible, using reference objects to assist you, light corners for example, wheel badges etc...I may have exaggerated the box reference objects slightly to give them funky colours, but it's only for the purpose of this tutorial. Feel free to do any reference objects in your 3d application as you like, this is only to



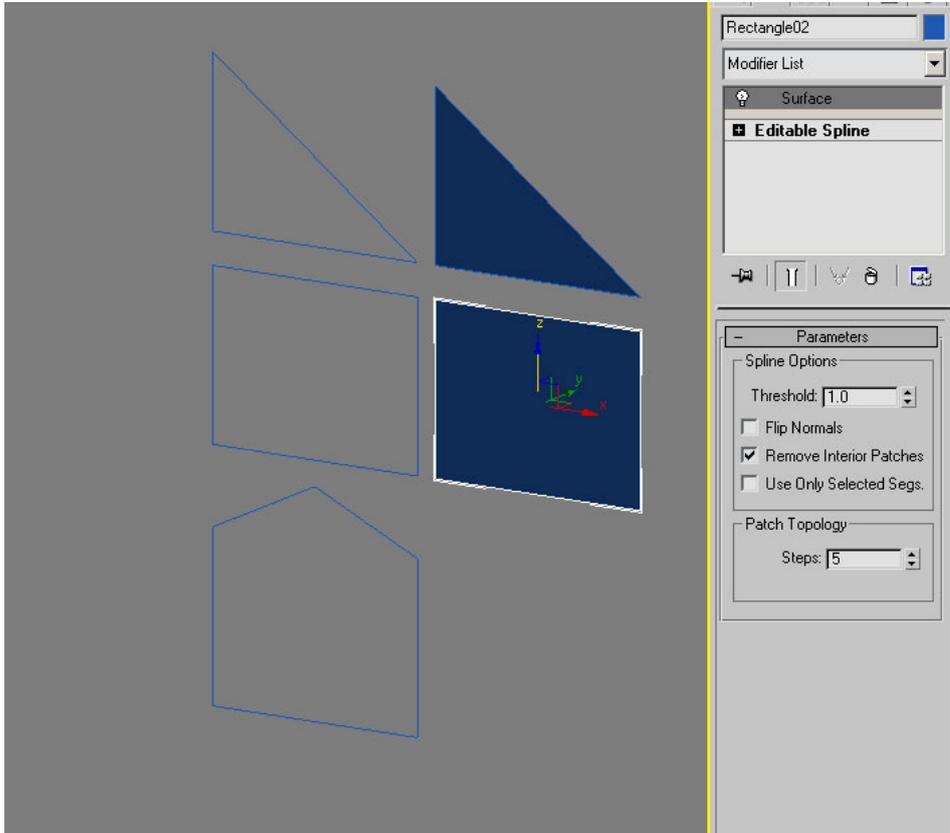
make sure the blueprints are placed correctly. Some of you may be a bit angry at me for not getting to the point yet, but seriously obtaining blueprints and putting them together accurately is such an important step that sometimes gets neglected, so I must stress this now. Now after you have the blueprints ready, you need to start modeling, at last. This is the only part where it's max related but, as I said before, you can simply

create polygons or extrude edges or whatever you like to get a similar basic mesh, as you can see in the later image it's only used to get a mesh like that. Relax it's really no big deal to create a mesh like that in any 3d application, just follow the blueprints and think of a decent wire frame before you create the ploys and you will get it, really it's that simple! If you are having any trouble just look at any finished car wire frames and observe how the edge loops are usually done, it's easy to learn the tools and procedures but it might take time to practice that's all.

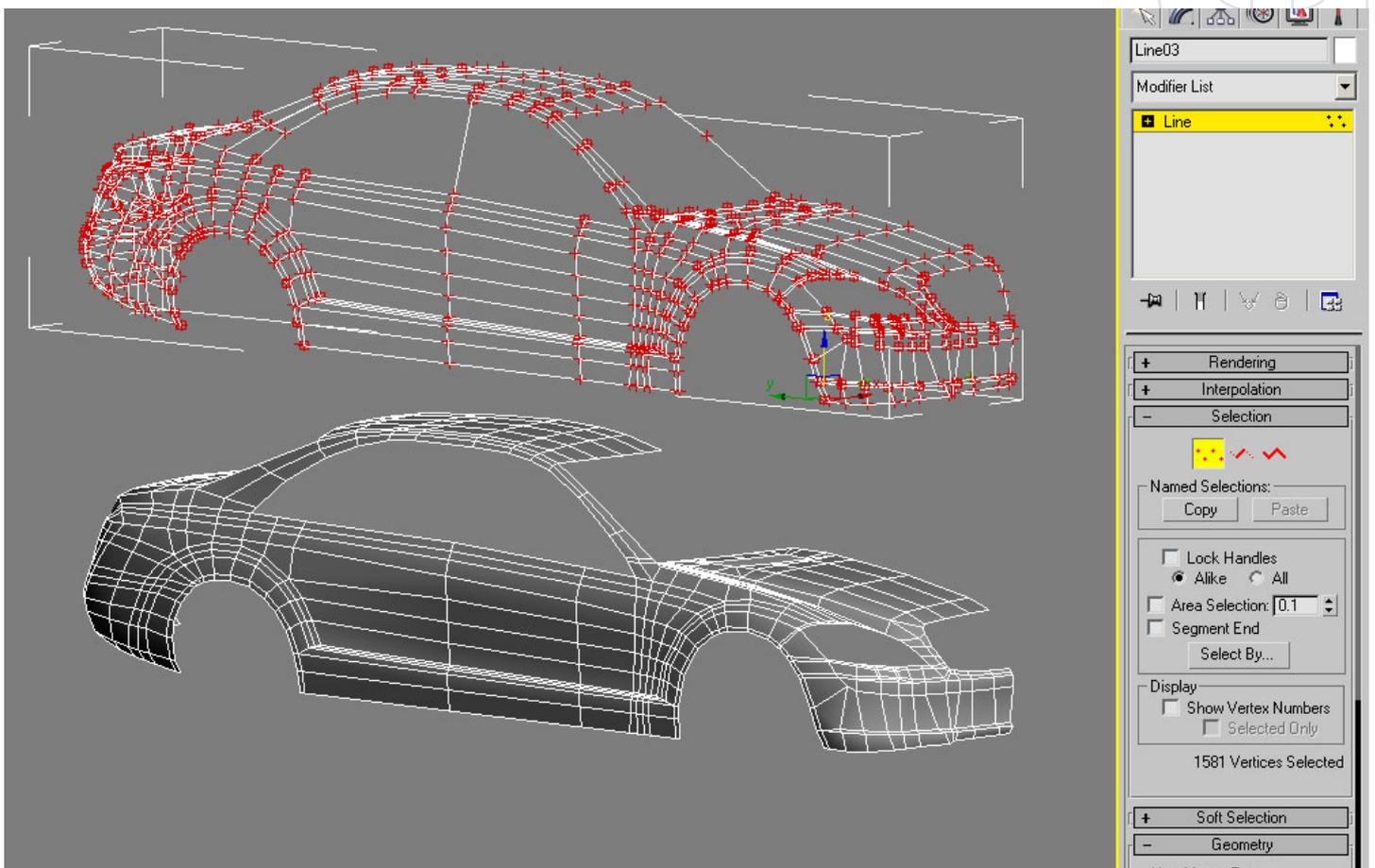


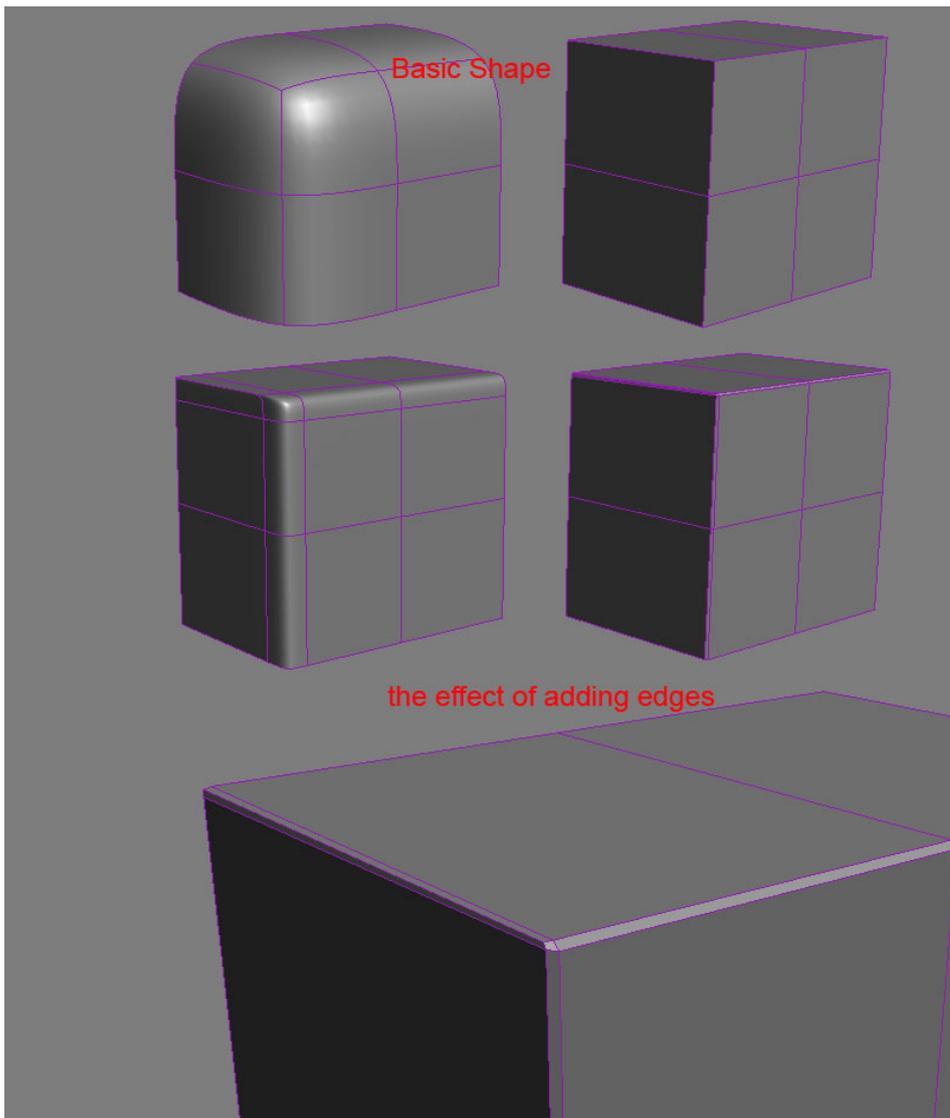
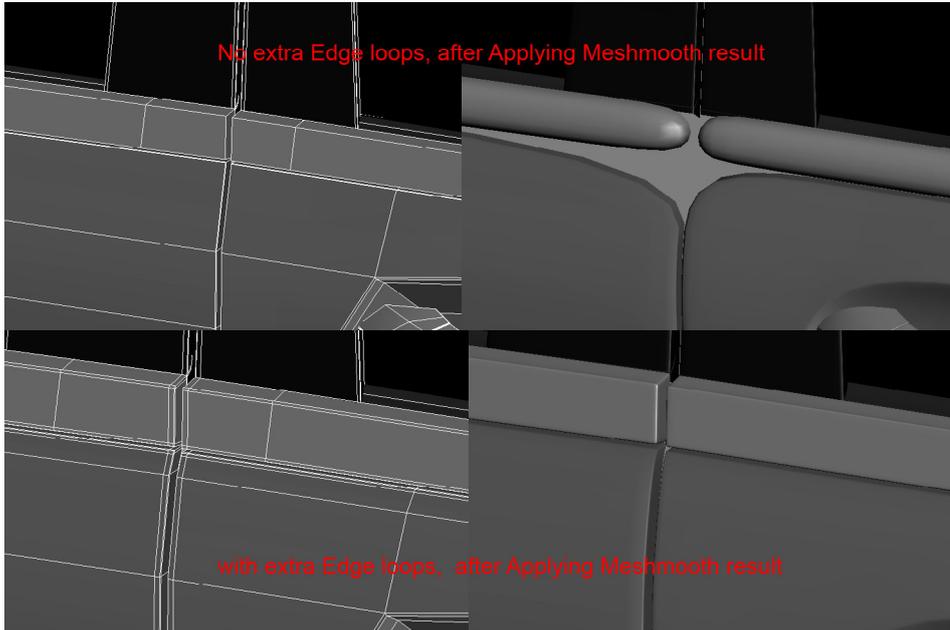


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in many cases could be faster than editing a messed up mesh with too many edges. Also, always check how your mesh looks after you add 'meshsmooth', it helps you realise what you are doing and if there are any mistakes. Let's say you managed to get a nice clean mesh but it hasn't got much details, only the basic form that we have created, it could be made easily by any 3d software even by creating each poly and it's very easy to do. Now some might leave their mesh like that and add meshsmooth to it, but it will scream "I am box modeled", and it will have no sharp edges, etc. The image below shows why you need to add edge loops to get the look you want. In most cases and I know the previous image may look funny and very basic, but I always get asked by people who want to model a high res realistic car and they still don't test with the basics and keep asking why their mesh looks like clay with no sharp edges at the right places, so please forgive me for this.



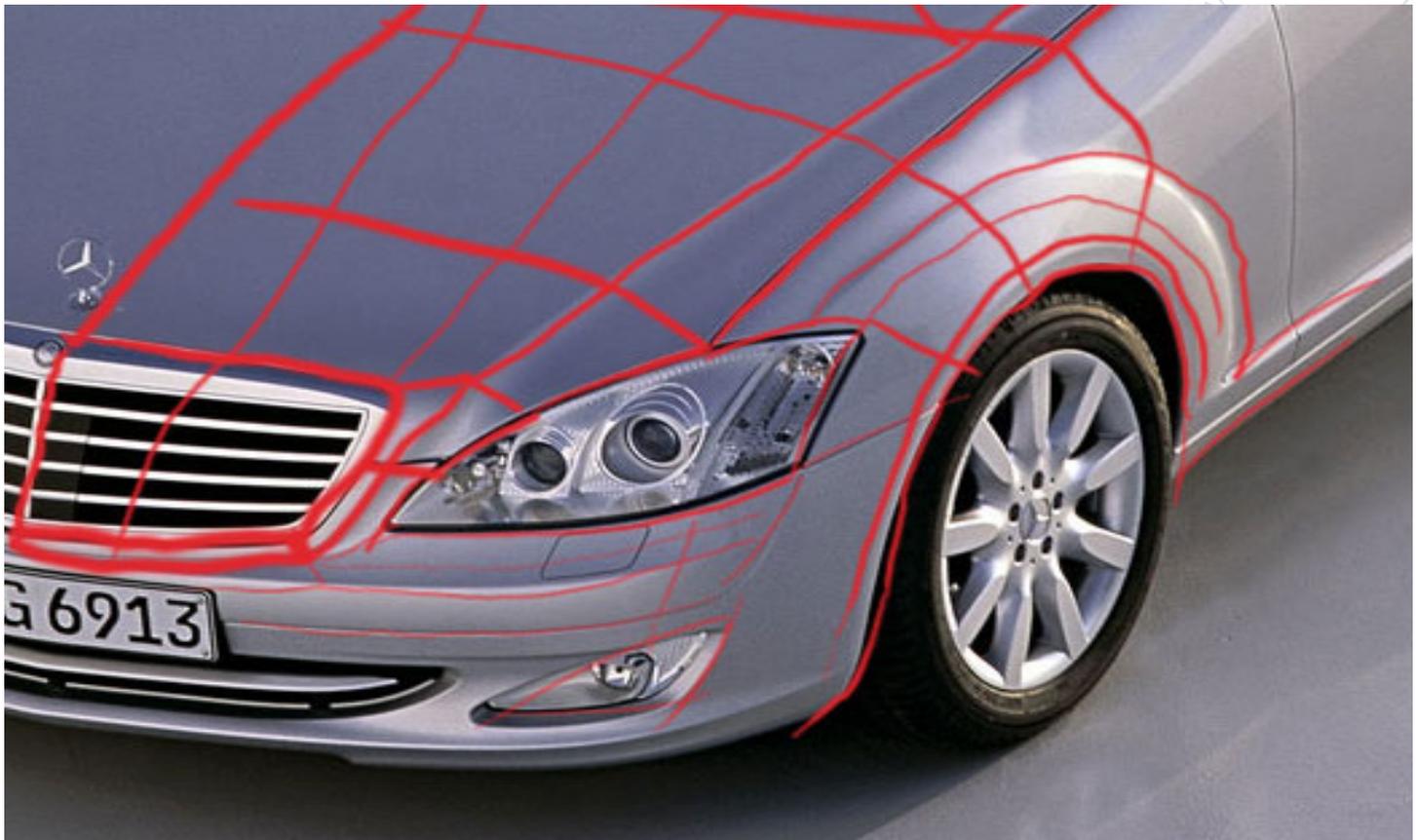
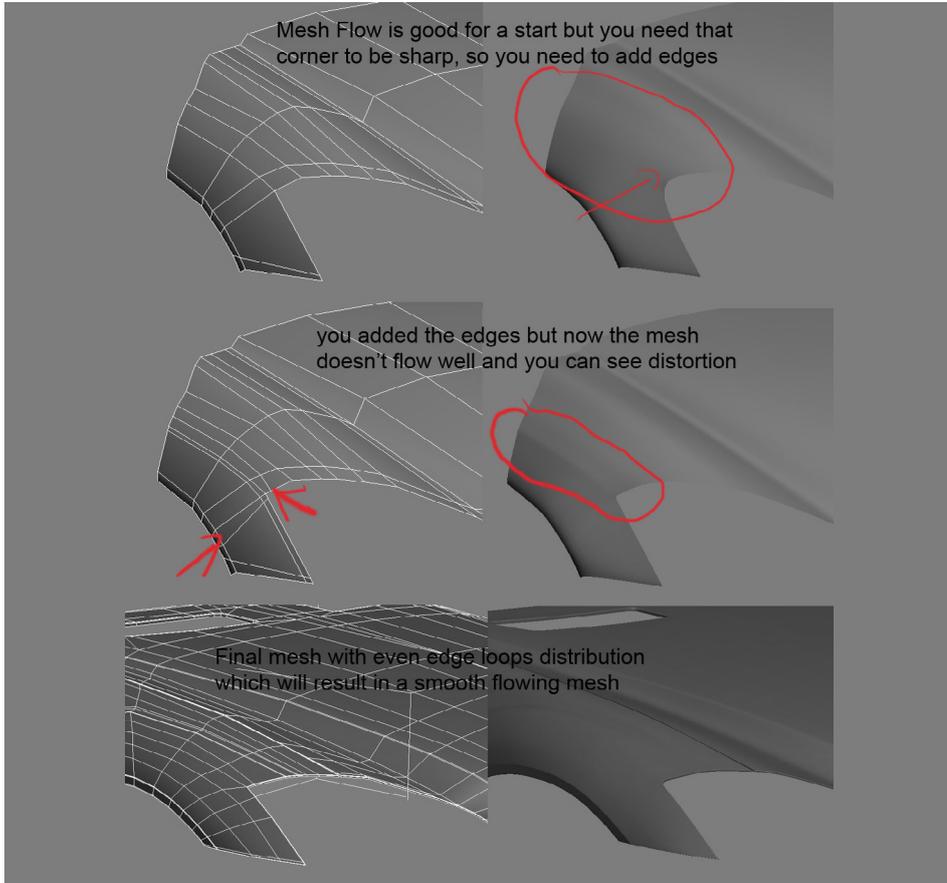


After you start adding edge loops and details, things sometimes start to turn the other way around; your mesh becomes messy with no decent flow and doesn't feel smooth, I take for example this part of a model I made at an early stage, I will try to demonstrate what I mean. Now you could, in some cases avoid adding the edge loops all over by trying to do it smart to get the sharpness you want with as few edges as you can. Try to make an even distribution of edges to fix the areas which gets messed up as a result of adding edges, even if it means adding even more edges, but please try to understand how mesh smooth works when you add edges and anticipate what effect they will have. By the way if anyone found any difficulties doing this mesh, you he can check wire frames of finished cars and try to learn from them, or you can use your tablet to draw a basic wireframe on any image similar to the image below. If you don't have a tablet, just print the image out and draw on it using your pencil, this image will help you realise how to start modeling it. As you can see from my rough drawing, anything will do. I don't draw the wireframe now but when I was starting out learning about edge loops it helped me, you can do as I do now, just look at the model and visualize how you are going to do the edge loops and it will make your modeling faster. One more thing, it's better to check your mesh for any non quad faces, you can see these directly on your smoothed mesh (it will simply look funny at any area with non quads). To check it more easily and quickly, just use the 'check non quad script' (if you aren't using max look for a similar option in your application or, if you can, download a script from the internet). Just type "Select Non Quad" at the maxscript reference in 3dsmax and you will find a tutorial called 'how to select non quad polygons,' or select that tutorial from the 'how to' tutorial menu. In a minute, you will have it ready (no need to learn scripts just copy and paste the script and see the instructions of using it in the tutorial).



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That's all for modeling for now!





CAR RENDERING TUTORIAL

This tutorial will be about rendering a car in 2 different styles. I used V-Ray to render, but you can do the same in all renders, it's the same principle. Firstly, I would like to thank Dominick Cliff, Who made a very short tutorial way back about rendering a car, but it helped me to understand the importance of the surrounding environment for reflections. The cool thing about HDRI is that it makes life a lot easier, it stores both light information and the environment to reflect as well, which makes sense. The most crucial thing to take care about when using an HDRI is that it should fit with the background image or scene you are using if it wasn't taken from the HDRI it self. For example, you obviously can't just put a car on a white background with an HDRI reflecting a beach, it will look apparent even if the reflections on the car and all the render settings and materials are perfect. In some cases when the HDRI is similar to your scene, but not enough, you can try to put the HDRI in a mix map to try to add a different tone of colour to it and play with the light value of the HDRI to make it as close as possible to your scene, but in studio style or other types of renders or scenes with no similar HDRI maps or closed sets etc, it becomes hard to use an HDRI which will give you what you want. There are ready HDRIs in white and black colour which are prepared to simulate lights in a studio, but they can't always give you the results you're after. That's why for studio renders I always depend mainly on lights or reflection from the objects that I make. I will start off with the material so you can test the lights on a good material. Now the material or shader key to any successful car paint should be multilayer. In order to make car paint more realistic, it's not enough to put in just one layer with fresnel reflections. When you observe car paint in real life, and especially when there is intense sun on it you see it reflecting the sunlight but you can also



see the sun being reflected in a glossy blurred reflection. This is why we need to make the 3d car paint in more than one layer. For people using brazil renderer or mental ray in maya, you have a ready car paint material/ shader to use. These will include multilayer reflection and more details by default, it will be easier to use the car paint materials there. Anyway as you can see in the image the reflection will come in different layers. Just put a base material with it

to make the most of the material and a subtle, but needed, other material or 2 to simulate the blurry reflections layer. For this I used a shellac material, the first main slot is a simple-fresnel reflecting material, the second slot is actually a blend material containing a blurry reflections material and a very blurry material (so its actually 3 materials altogether but you get the idea). By blurry I mean 'less glossy' material (a value of 1 glossiness will make a shiny surface,

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a value of 0 will generate an extremely blurry surface). You could generate glossy surfaces by using a bump map (tiny bumps on the surface of the objects make them glossy in the first place, so the shape of the bumps will determine how the surface is blurred) but it's faster and easier to just play with glossiness parameter.



Here are the material settings:

1st layer (main material)

- Base Material: Paint (VRayMtl)
- Shellac Material: Material #302 (Blend)
- Shellac Color Blend: 15.0
- Blend Basic Parameters:
 - Material 1: Material #302 (VRayMtl) [checked]
 - Material 2: Material #304 (VRayMtl) [checked]
 - Mix Amount: 15.0
- Basic parameters:
 - Diffuse: [black]
 - Reflection:
 - Reflect: [white]
 - Highlight glossiness: 1.0
 - Refl. glossiness: 0.999
 - Subdivs: 8
 - Use interpolation: [unchecked]
 - Fresnel reflections: [checked]
 - Fresnel IOR: 1.6
 - Max depth: 5
 - Exit color: [black]

2nd layer (subtle)

- Basic parameters:
 - Diffuse: [black]
 - Reflection:
 - Reflect: [white]
 - Highlight glossiness: 1.0
 - Refl. glossiness: 0.6
 - Subdivs: 8
 - Use interpolation: [unchecked]
 - Fresnel reflections: [unchecked]
 - Fresnel IOR: 1.6
 - Max depth: 5
 - Exit color: [black]

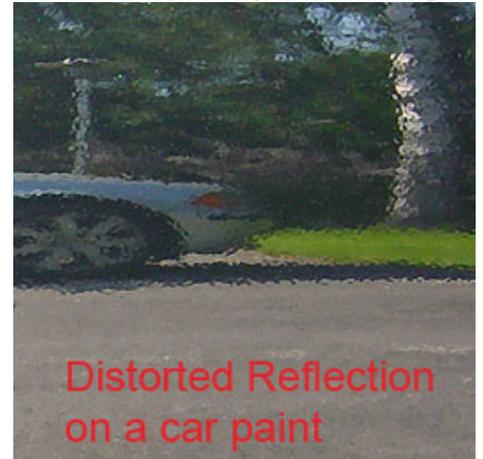
3rd layer (very subtle)

- mental ray Connection:
 - Diffuse: [black]
 - Reflection:
 - Reflect: [white]
 - Highlight glossiness: 1.0
 - Refl. glossiness: 1.0
 - Subdivs: 8
 - Use interpolation: [unchecked]
 - Fresnel reflections: [unchecked]
 - Fresnel IOR: 1.6
 - Max depth: 5
 - Exit color: [black]
 - Refraction:
 - Refract: [white]
 - Glossiness: 1.0
 - Subdivs: 8
 - Use interpolation: [unchecked]
 - IOR: 1.6
 - Max depth: 5
 - Exit color: [black]

your viewing angle) and many more, but if you can understand how it works you can simply apply it all using blend, shellac materials and different falloff maps. The above image is of a car Mirror flicker (you can imagine how much close-up it is. Rendering a studio style render the concept is really simple. Every rendering software has the ability to make objects by generating GI, just make as many objects as you want and think of them as your light sources in your own studio. You can put standard lights in instead of objects as well, but objects are usually easier to change their shapes and looks, and you can give them the same GI material or change each object is properties separately. You can also make the same results using lights, but I find it easier to do with objects since we are going to copy/duplicate them a lot. One thing to mention is that bigger objects will generate more GI than smaller ones by default in VRay. Also, objects lighting effects will decrease when it's far away and will increase when it's close (Decay). Now after you have made giant boxes, spheres, cylinders and what ever you think would be suitable for lights in a studio simply give them a GI material, (sometimes a properly placed single box can be enough for a great render). You need to play with the GI material settings until you are happy, for my final results I used a VRayLightMtl with a multiplier of 3 and gradient ramps for the texture of the giant boxes, plus different material settings for the sphere and

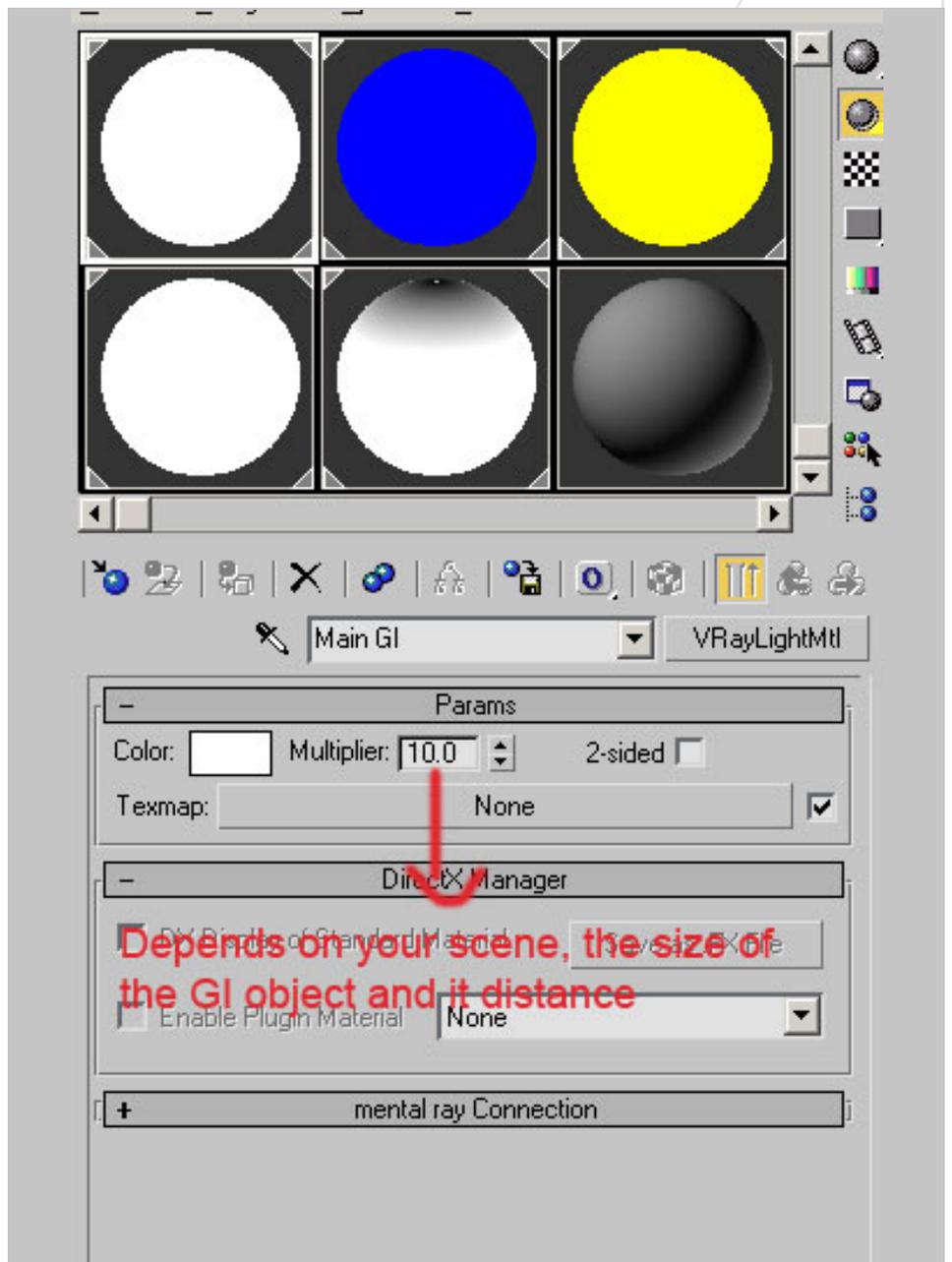
One thing to mention, is that my material is not coloured since its black, obviously, but just by changing the diffuse colour of the main material you will be able to have any colour you want. You can try putting different colours in the less glossy materials as well for different effects. The other thing is that I didn't simulate the sparkling

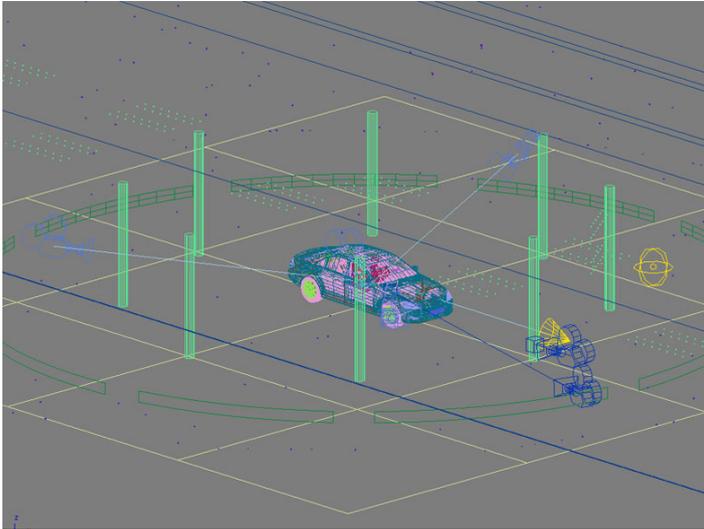
effect of metallic car paint flecks. The reason is that, after observing and checking reference images, I noticed that unless you are doing a very high res extreme close-up image for a car reflecting an HDRI or scene, you can do without it, by adding another layer for: A little trick I used was to not increase the subdiv's of the reflective glossiness to give the surface just a bit of a grainy look. Here are car paint flecks in action (reference images), don't forget that car paints come in different variations; some have flip paint (cool paint which changes colour depending on



other objects. The images show the results obtained from different GI and object reflections. The first one is with the standard giant box on top of the car, the second is with 3 thinner boxes placed around the car. Try playing around with different layouts. The final one is with multiple giant thin boxes and a lot of small spheres scattered around randomly and some spheres organised as if they were lights on top of the car and a few cylinder with less GI multiplier. I also made the scattered spheres have different colours. Now if you hit render and still didn't like the results you could try adding a few lights, it doesn't matter much if they are vray lights or std max lights. It might be partially caused by the decay property of the objects and the fact that the shadows will be softer than what you want if you have too many GI objects.

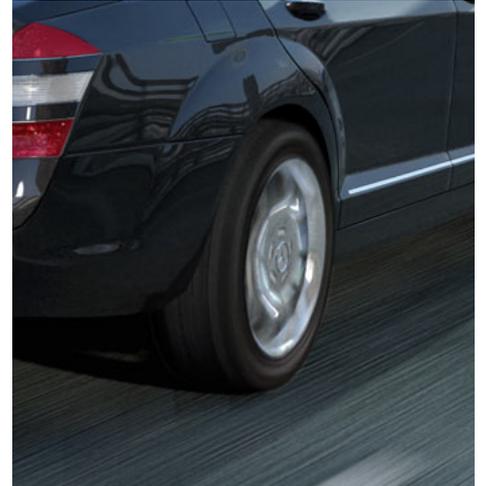
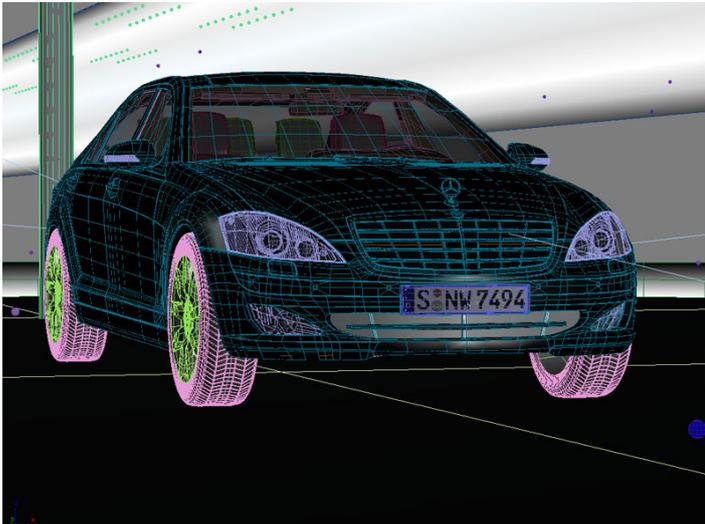
To make the image more interesting you could add an HDRI with a subtle effect to give the feeling of a busy background, which adds to the realism, but you have to make it very subtle so that you can barely notice it, so that it doesn't take over the reflections you worked so hard to get.





Final scene screenshot





RENDERING A CAR IN A SCENE

It's all the same basics (a good environment with a lighting system that's consistent with it). You can basically just put an HDRI to be used for the reflection environment and sky light, but the shadows will be too soft if you depend on the HDRI alone. So, you can just put light sources similar to the HDRI has to supplement it. Basically, an omni or vray light placed in the scene to supplement the sun in the HDRI image. For positioning light you can just put the HDRI image, as visible in the viewport (just click alt+b and place it there for instance) and To get the exact position of the light as the sun in the



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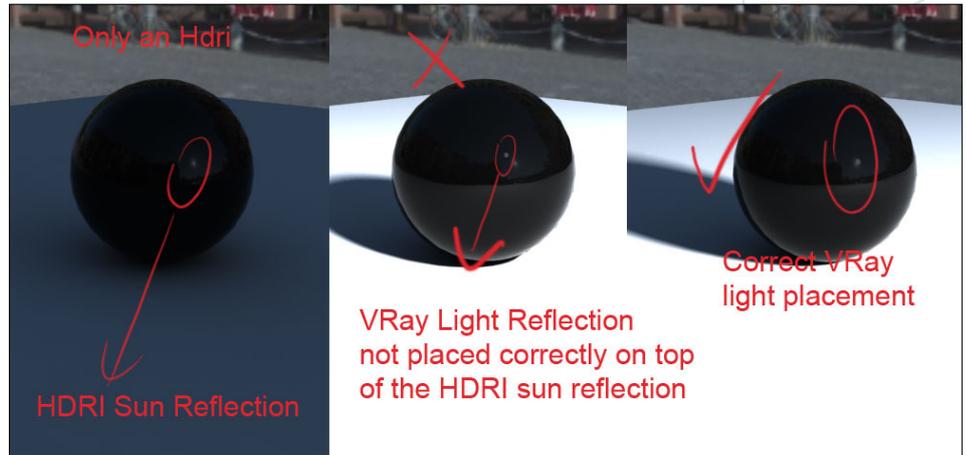


HDRI, to give you more powerful lightning and sharper shadows, use a test sphere.

Just place a reflecting sphere and the HDRI as background, render an image, and you will see the light isn't exactly positioned to be instead of the sun in the HDRI, so move the light until you have the exact position of the light as the sun.

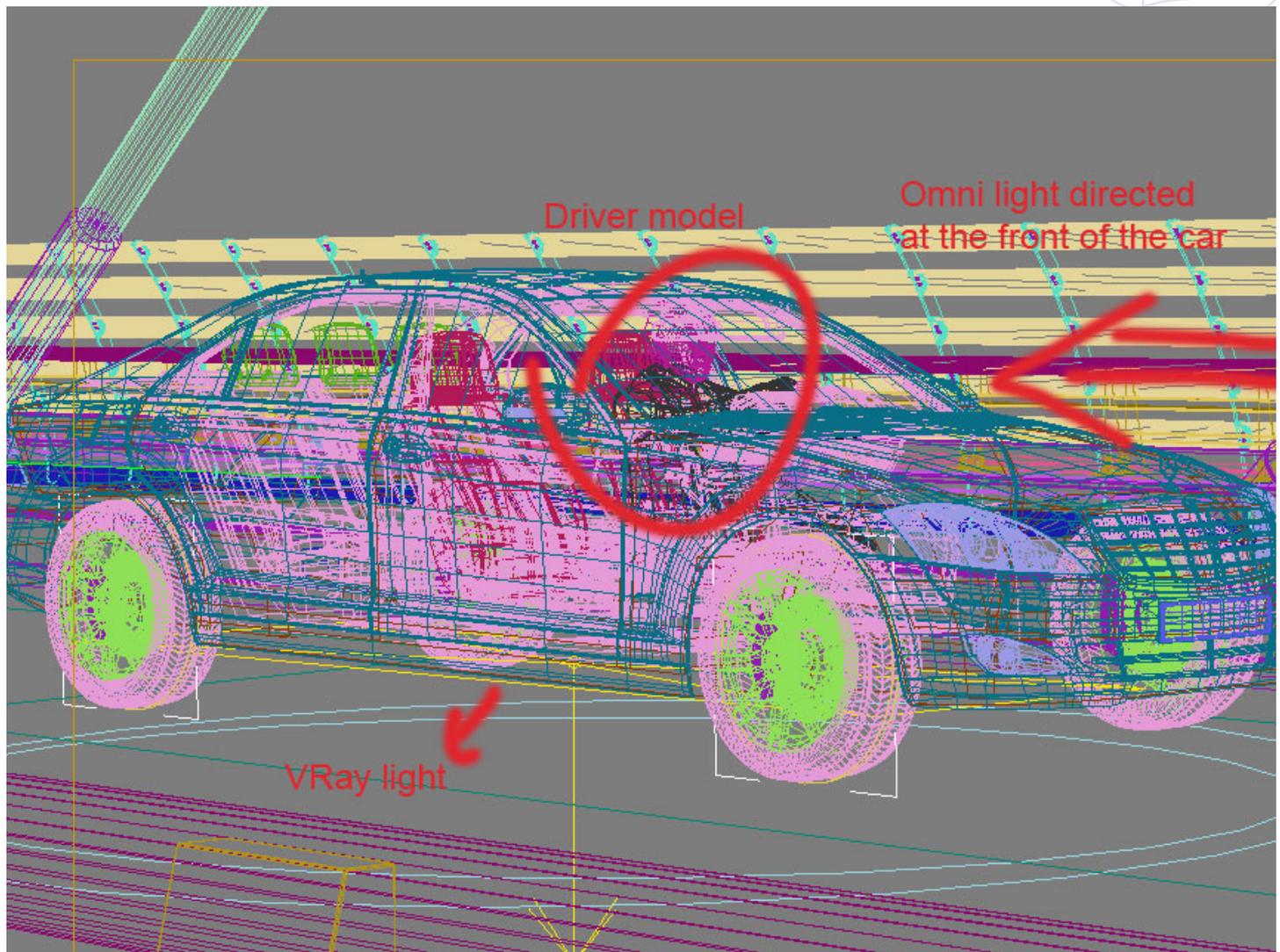
Now after you have the light positioned of the sun and HDRI, start playing with the parameters until you have something you like. Add a few lights if you need to complete it .lighting in some of the dark areas which increasing the GI would be costly to reach (for example, underneath the car, or if you wanted to increase the lightning in front of the car, just place a light in front of it).

Try to add object to your scene for reflections. If you have the time and thought the HDRI wasn't



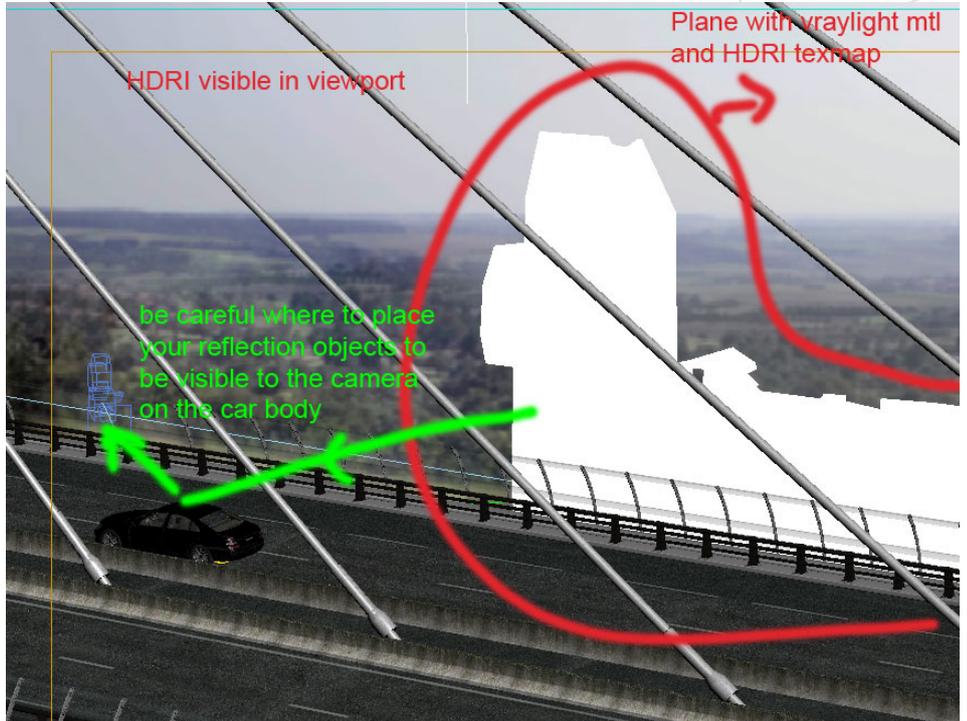
enough at one area (or if you are sick like me) You could do as I do and add a few lowpoly cars which I have from an old project, as if they are travelling at the bridge scene to add tiny reflections. When placing the HDRI I liked

the lighting effect given by a particular one for my bridge scene, but the reflections weren't as great as I wanted them to be, so I made a plane object and gave it a new Vray GI material (vraylightmtl), and the texture map for it was





another HDRI. I liked its reflection, just as the image, and I was very careful where to place it so I can get it to reflect on the car body, (you can give it red material for example just to see how its reflecting then give it the texture back). Unfortunately, in max or vray it's still not featured to get strong lights to reflect and show rays which would help increase the realism, but for now you can try to add it in later post work. Although the principle for rendering a car in a scene or as a studio render are simple but what makes the difference is each little parameter you need to just keep comparing the renders you have with a real photo with similar conditions to compare and fix what ever you think makes the image look unrealistic.



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