Kerkythea 2008: Rendering, Iluminação e Materiais

Recolha de informação sobre Rendering em Kerkythea.
Fautl. 5-2013 - Victor Ferreira

Lista geral de Tutoriais:
http://www.kerkythea.net/forum/viewtopic.php?f=16&t=5720

Luzes

Tipos de luzes do Kerkythea: Omni, spot, IES e Projection (projeção).

Omni: é uma luz multi-direccional, que emite raios do centro para todos os lados, como o sol ou a luz de uma simples lâmpada incadescente.
Spot: é uma luz direcional, como um foco, com um ângulo mais largo ou mais estreito de iluminação.
IES: é um tipo de luz que tem propriedades físicas de intensidade e distribuição da luz descritas em um arquivo com extensão .ies. O resultado é mais realista do que as Omni ou Spotlight simples.
O KT fornece um arquivo como um exemplo, mas você pode encontrar muitos ficheiros IES na web. Muitos fabricantes partilham os arquivos 3D das suas luminárias juntamente com o ficheiro IES respectivo. Também se pode encontrar programas gratuitos que permitem uma visualização rápida da forma da luz IES sem precisar de a inserir no Kerkythea

Controlo de edição visual: a posição e o raio de luz podem ser geridos também com o controlador que você pode encontrar no canto superior direito da janela. O controle deslizante assume funções diferentes dependendo do tipo de luz que for seleccionado: o raio para a omni. HotSpot/falloff para a spot e largura/altura para projetor.

Atenção: Quando se selecciona uma luz (Omni ou IES) aparece uma esfera amarela,que representa a dimensão do emissor. Isto depende do valor do raio, expresso em metros. É extremamente importante que se lembre que esta esfera não deve cruzar ou conter qualquer outro objeto da cena ou poderá obter artefatos estranhos no render.

Tutoriais:
Video tutoriais: http://www.youtube.com/watch?v=_Lura6wxdzI
Criar panorama 360º em Kerkythea: http://www.youtube.com/watch?v=5JFr9wICrXw
http://www.ideias3d.com/tutoriais/kerkythea/configurando-luzes-ies-kerkythea/#more-2094
http://www.ideias3d.com/tutoriais/integracoes/colocando-luzes-ies-sketchup-para-kerkythea/
Instance Brush (relva, tapetes): http://www.youtube.com/watch?v=zuSAB6YERT8
Mapeamento de materiais: http://www.youtube.com/watch?v=f8DZpSqIxXg
Relva: http://www.youtube.com/watch?v=o2cpYsJTFWM

Self-luminance emitter material the average 60w incandescent bulb loses something like 97% of it's power to heat. So it's efficiency is 3% you have efficiency at 1. change it to .03 and you may see something closer to the lumens output.

Remember also that if you have it set to be straight "watts" instead of "watts per meter squared" you are getting 60 watts total from all combined faces with that material. So if you were to have 10 bulbs in the room, each with 8 faces per bulb, with the 60watt material, all 10 bulbs combined would = 60 watts. This is why the per meter squared option is provided.

Dicas para cálculo de potencia de luzes w/m2 (é para o twilight mas aplica-se ao Kerkythea?!)
http://twilightrender.com/phpBB3/viewtopic.php?f=12&t=732

Métodos de Renderização:

Os métodos “tendenciosos” (Biased) normalmente são mais rápidos, porque o cálculo foi optimizado de forma que uma grande parte da imagem é interpolada entre pontos chave. Isto pode levar ao aparecimento, em algumas cenas com configurações de menor qualidade (para serem mais rápidas), de artefactos estranhos conhecidos como manchas.
Os métodos “não tendenciosos” (unbiased), por outro lado, levam mais tempo a calcular, mas tipicamente resolvem de forma mais correcta todas as interacções de luz. Neste caso, os artefactos aparecem sob a forma de ruído na imagem (imagem com “grão”), que diminui gradualmente com o decorrer do cálculo, sob a forma de “passagens de render” (render passes). Nestes métodos mais demorados pode-se interromper o render quando se acha que a qualidade de imagem já atingiu um nível satisfatório para o fim pretendido. Exemplos: MLT, BPT, Path Tracing Progressive(#17) e MLT (BPT).
No uso normal, enquanto se testa a cena, luzes e materiais, recomenda-se utilizar o método 3 - Photonmap quick, que é suficiente para ter uma boa percepção da cena, e é rápido.

Ray Tracing

Photon Mapping

Usar para: renderizar cenas de complexidade média onde uma quantidade fixa de fotões pode distribuir iluminação igualmente por todos os locais da cena. Normalmente perdem-se detalhes conforme a cena vai aumentando de complexidade, ou quando iluminada de forma maioritária por luz indireta.

Adjusting Final Gather settings for PMFG: http://www.kerkythea.net/forum/viewtopic.php?t=9803

Path Tracing

Usar para:

Bidirectional Path Tracing (BiPT)
Usar para:

Metropolis Light Transport (MLT)
Usar para:

Rendering de interior para quem tá com pressa (e não quer utilizar um método unbiased): Photon Mapping High - with pseudo caustics.
Path Tracing Progressive is the best preset for exteriors.

Try making the sun a yellow-orange color and using a bigger sun radius to soften the shadows.
If you decide to use a spherical sky, have a look at the ones available in www.cgtextures.com, in the "Skies 360" section.
There's two other programs using the Kerkythea engine, Podium and Twilight Render, which also work as a SketchUp plug-in. Render presets are interchangeable among all three programs.

Para adicionar um novo método de render para “arquitectos apressados”:
http://www.kerkythea.net/forum/viewtopic.php?f=20&t=5151

Tweaking de Metodo MLT+BiPT:
http://kerkythea.net/tutorials/mlttweaks.pdf

Materiais:
Thin Glass versus Dielectric Glass
If you are using thin glass shader, you can model without the volume. Modelling thing glass with volume, kind of defects idea of thin glass shader. If you model with the volume, use dielectric glass. That will create nice caustics effect from sun/spot/point lights (with pre-set 20. MLT(BPT)). Or if you use mesh emitters and HDR sky (preferred for product rendering), you can use pre-set 19. MLT for faster results. Photon mapping can create caustics too (with caustics pre-set), but the quality is never as good as with unbiased rendering.

Respect the energy conservation law when creating materials (a material cannot reflect more light than it receives, therefore the sum of the difuse + specular + reflection channel in your material cannot exceed 1).

Double check that all of your faces in the Sketchup model are oriented correctly i.e. switch to the "monochrome" face style and make sure that there are no blue faces showing. Materials will not render on the blue face, only on the white faces.

Network Rendering:

2008 - Network Rendering - How to set up a network rendering

You must have 2 machines or more on the same network.

- Save your scene when it's ready to render...
- Put exact same scene and copy of KT on all networked machines you plan to use.
- Start the scene on your 'main' machine... but under networking pulldown in the render settings choose it as 'Server'.
- Start the exact same scene rendering with exact same settings (unbiased settings, or animated

cameras only) on the other machine(s)
- Under the network settings in the render dialog choose 'client'
NOTE: Network rendering does not work for a single image in BIASED render mode such as raytracing or PM+FG.
It only works with UNbiased - such as MLT, PTP, BiPT, MLT(BiPT) - OR - it will work for net-rendering an animation. But stills in PM+FG will not render with network rendering... yet.

- Now there are numbers like this... 123.456.7.89:6200
You need to figure out the IP address for your Server 'main' machine, and replace the numbers for the dummy IP address with the correct IP address so it will read something like 987.654.3.21:6200
leave the 6200 alone, this is the server port.
- Hit 'start' on the client, it should contribute to the rendering.

If you are trying this with an animated cam, the render dialog will pop up asking you where to save the image(s)... be wise and put them in a 'clean and empty brand new' folder... this way all the images will be easy to open with your program you will use to piece together your video.... I like Virtual Dub for quick and dirty test animations (you tell it to open the first numbered image, and it will load them all ready to play for you). I use Premiere for my 'big' animations.

If you want to, you can render ONLY CERTAIN FRAME NUMBERS for your animated camera.

Unfortunately, you have to render the whole animation once in order to 'preview' which frames you would want. I suggest running a tiny test animation with full number of frames for the final but only use the preset for "diffuse texture" (I haven't actually tried this yet, but seems like it would work)
So to set your specific frames:
Go to Advanced Menu, find your animated camera, and find where you can type in the frame numbers. Type them just like windows printing... 1,2,5-6,305-650,700

If you don't know how to find out the IP address for your server, and it's a windows machine, open the command prompt and type 'IPconfig'... I think that's the command.. .and it will return your IP address for you.

Windows Start button>choose "Run">type "CMD" hit enter>type "IPconfig"

Now, on the Server machine, open Window>Network Log to see how the networking is going.

If you are rendering in unbiased method, you can see in the network log if they are actually reading as networked... I believe you need to see the network log on the server machine, not the client. It will not 'commit' to the render constantly and immediately... because of many reasons all having to do with speed. It will commit, depending on the size of the render you are doing, every 5-40minutes, and at the end of the render for the final commit.

For animations, you will see that it will indeed render independantly, and just put the .jpgs into the same file where you specified the server's .jpgs to be placed.

Keep in mind that KT is performing an automatic indirect light cache for your rendering. This light cache is not currently shared to the clients, so they will take a while to render that first image as they do their own calculation for the light cache. This means that with lower light quality settings

you will see a difference in the lighting between the server and the client. If this is not acceptable, simply remember to choose a high quality render type such as PM+FG High+AA. Otherwise it is inevitable that you will see some 'flicker' in your final animation. This is not a reflection on KT's ability to render, this is a reflection on the ability to render a 'preview' versus rendering a 'final'. If you want good quality, you must use good quality render settings.

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save the scene from my main machine to the network server (pasta partilhada na rede por exemplo, de forma a que todos os outros computadores possam abrir o mesmo ficheiro - o kerkythea cliente para poder abrir o ficheiro terá de ter a pasta partilhada montada como uma drive), open the same file on each of the slave machines
when saving, set it to save the scene+materials.
also be sure to save it in .kzx format - it's a lot smaller and opens faster/saves faster over networks.

Para terminar o render de rede:
Just stop rendering first on all clients and wait that they do last commit to server. After all clients have committed you can stop the server and save image. You will notice at network log when clients have stopped.
Existe outro post que diz para para o rende rno servidor que este manda parar os clientes - a testar para ver qual versão é a correcta?
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para contrloar vários computadores a partir de um:
At work I run a computer training lab and use a FREE class room management program called Italc http://italc.sourceforge.net/ that allows me to remotely control all the lab computers. I find it a very useful tool to set up & monitor renders. I also have the drive on my master render machine mapped on the client computers. When things are working right I don't have to leave my desk run a render.

Italc uses an encrypted VNC connection to control a number of computers at once. I suggest loading the video mirroring driver from http://www.demoforge.com/dfmirage.htm this will improve video performance and reduce network over head

ANIMAÇÃO
alguns conselhos de exportação de animação do Sketchup para o Kerkythea
http://courses.be.washington.edu/ARCH/481/1.Tapestry%20Reader/6.How%20To/2.SketchUp%20+%20Kerkythea/5.Animation.html
Animação em frames (imagens individuais)?
http://courses.be.washington.edu/ARCH/481/1.Tapestry%20Reader/6.How%20To/2aFrom%20Frames%20to%20Movie/0.default.html
http://courses.be.washington.edu/ARCH/481/1.Tapestry%20Reader/6.How%20To/2aFrom%20Frames%20to%20Movie/3.Microsoft%20MovieMaker.html

Conselhos Gerais de Modelar Sketchup/Kerkythea
http://architectgraphics.blogspot.pt/2011/02/sketchup-to-kerkythea-tutorial.html
Dar especial atenção aos conselhos numerados de 2 a 7!

Get started with KT and avoid some common problems

http://www.kerkythea.net/forum/viewtopic.php?t=591&start=0&postdays=0&postorder=asc&highlight=

Here are some things that may help you to get started with KT and avoid some common problems .

My image take so long to render , even with low render settings ,what am I doing wrong ?

There are different factors that can make a render take a long time . But one reason is having to many lights (emitters) in your scene . Even if you think you have only a few lights in your scene it can result that you actually have 100 or more then 1000 lights in the scene . How can that be ? It is do to the ability of KT to use Mesh lights as emitters . That means that any object in your scene can act like a light emitter . But you have to be careful with this kind of lights cause each triangle face of the geometry will be counted as a light emitter .So if you want to use Mash lights , make shore your light emitter have a low polygon (Face) count . To convert a mesh in to a emitter , you do that in the Material panel under Advanced and there you give it a self luminance value greater then 0.00 .
So be careful and check if you have given any material by accident a self lamination value greater then 0.00 , cause even the value is 0.02 and you don't notice it in the final image , it will act and be counted by KT as a light and will lead to longer render times.
If you are not sure if this is happening in your scene , have a look at the console log and search for a line that starts like this " Info : Cached ___ lights " . There you will see how many lights KT is calculating .

I have strange shadows and/or light leaking in my image . What am I doing wrong ?

If you have shadow problems or light leaking is probably do to a bad Photon map . Increase your Photon shooting to something like Many – 100000 or very Many – 1000000 .
It is very important to use more Photons like I explained on my tutorial about Photon shooting http://www.kerkythea.net/phpBB2/viewtopic.php?t=441 because the Final Gathering makes its calculation based on the Photon shooting map !!! .If you have a "bad quality" Photon map (not sufficient photons), it dos not mater how much you increase your Final Gathering settings , it won't lead to a good render . It is always better to increase the Photon map quality (more Photon shooting) and have Final Gathering setting set to something like "Rays 900 – very many and Accuracy to good/very good 0.15/1.0 .If you want caustics in your image , then you have to use much more Photons like "A Lot -10 000 000 " or more , depending on your scene .
very important : watch your modeling , if you model a room or building , make sure that your walls , ceiling and floor have thickness , this prevents light leaking
have a look also here : http://www.kerkythea.net/phpBB2/viewtop ... =kerkythea

How do I know that my Photon map is good enough ?

To see your Photon map you have to change your render Method in the Global Illumination panel form "Photon Mapping + Final Gathering (SW)" to "Photon Mapping (Direct + Indirect)" .Now you see that there are a lot of settings not available anymore cause KT will only do the Photon shooting now.(The render will be much quicker now) .The render result will not be a final quality

render , but it is good to see the quality of your Photon map . You will Know if your Photon map is good enough if you can see “correct shadows” in your render (be aware that the image don’t have to be smooth or nice , only look if you can see projected shadows and if the are more ore less defined) . So now that you have a good Photon map , go back and use for you final render the render Method “Photon Mapping +Final Gathering (SW) “.

I have bright random spots in may render .How can I eliminate them ?

If you use Irradiance Gradients then you will have bright spots and may be some artifacts in your render .There is a bug in this feature and should be unchecked . Giannis is working on it and when it is fix then it will be a great improvement in the render engine .
If you don’t use Irradiance Gradients and still have those random bright spots , then it is probably that is caused by reflected caustics (shiny surfaces like glass , water metal …etc) , to avoid them you have to increase the caustic density count to something like 1000 more or les (it depend on your scene and if you have more or less bright spots) . "

I have clouds/blotches in may final image. How can I eliminate them ?

If you have some kind of soft clouds or blotches , then increase the Rays in Final Gathering . The Rays help to smooth out the image .

I have jagged edges , how can I get nice clean edges ?

For that you have to go to Set up and in the Ray trace panel use under AA Method “Production AA” and AA Threshold use a value between 0.3 and 0.1 . This will eliminate the jagged edges of your image .

Render presets

There is some thing else every body should have in mind . When you use the render presets it is better to merge them into your scene , so you will be able to uncheck irradiance gradients and set Gathering depth to 1 . It is also good to have a look at the settings and so you can learn from different render presets and see the main different from one preset and another .

How can I merge the render presetting with my scene ?

Merge the render settings with your scene . OK … you open your scene and then you go to the tool bare and under File go to Merge . There you have a lot of options to merge your scene with new geometry ore new camera or render settings etc. .
Configure the settings the way that you only change the render and GI settings and keep the rest of your scene .Then localize the wanted render preset in the folder “Render settings” and open it , that will do the trick .

Tutorial para fazer piscinas:
http://www.kerkythea.net/forum/viewtopic.php?t=289

Bolear arestas para aumentar a credibilidade das superficies artificiais (tijolos, mesas, etc)
http://www.kerkythea.net/users/jon/bevel_tut.png