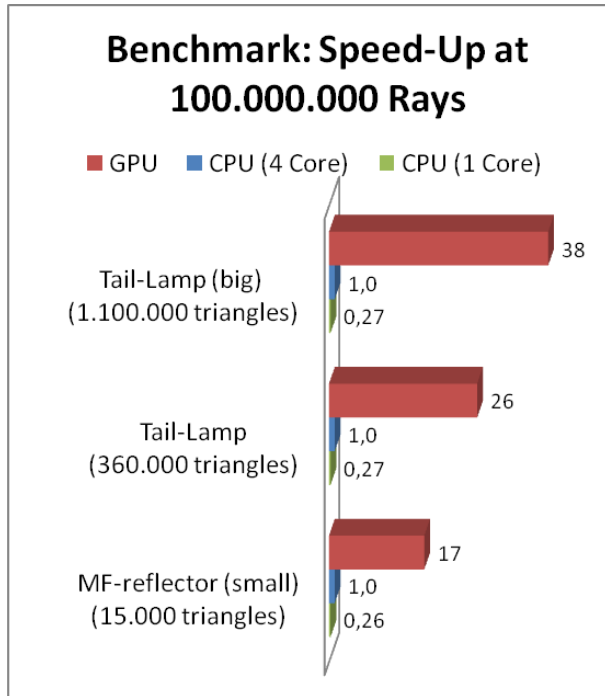


Speed-Up

We tested real life models with the state-of-the-art multi-core simulation method, using the latest Intel i7 multi-core CPU. Then we compared to the latest NVIDIA Fermi graphics card on the same i7 machine.



In average we experienced a speed-up of factor 30 compared to multicore simulation. That means the GPU simulation can be 30 times faster than an ordinary CPU simulations. As your simulation speed is that fast, you can spend more time on improving your setup than on waiting on simulations. Also many very demanding applications like the optimization of light pipes for example can take great advantage of this new power.

Hardware

All you need for the GPUtrace is a NVIDIA graphics card from the Fermi Generation. Different models with different speed and prices are available. You can retrieve a list and recommendations from us. The good thing is that you can achieve fast results already from low cost hardware - but since the CPU is still important to support the fast data transfer towards the graphics card, a fast quad-core processor is advisable.

Conclusion

LucidShape is the first optical simulation software that takes advantage of this cutting edge technology. The speed increase is significant (x30). Future improvements on graphic cards are promising great increase of performance during the next years. For more information, demonstration, and prices please contact us.

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LucidShape

Computer Aided Lighting

World's first
lighting simulation
on graphics cards

GPUtrace



**brandenburg gmbh**
software solutions for the product development

GPUtrace

In recent years LucidShape improved its speed for optical simulation step by step using modern algorithms, multithreading, tessellation, distributed computing, etc. Now we are taking it to the next level: GPUtrace! Modern graphics cards have extra computing power that can be used to speed up the simulation. This is a quantum leap in speed.

Central Processing Units

The heart of every computer is the Central Processing Unit (CPU). All actions of the computer are handled by this little chip. The faster the CPU, the faster the programs will run.

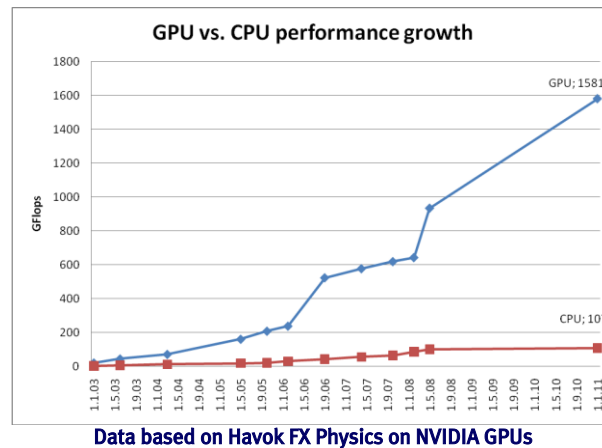
Due to technical restrictions, the CPU is limited to make only one calculation at once. New processors try to compensate for that by just multiplying the number of cores (which are basically multiple CPUs). Up to 12 cores are currently on the market, which can speed up the calculation time by a factor of 12, if supported by the program. LucidShape of course takes already advantage of multiple CPU cores by multithreading, but why not using the graphics power too?



Graphic Processing Units

Every modern graphics card has a GPU on board that has currently up to 512 small processors which are optimized to do geometrical calculations. The new GPUtrace uses those processors to perform the calculations needed for the simulation.

Very promising for that technology is that during the last years, GPUs gained much faster more computational power than CPUs, as you can see in this figure:



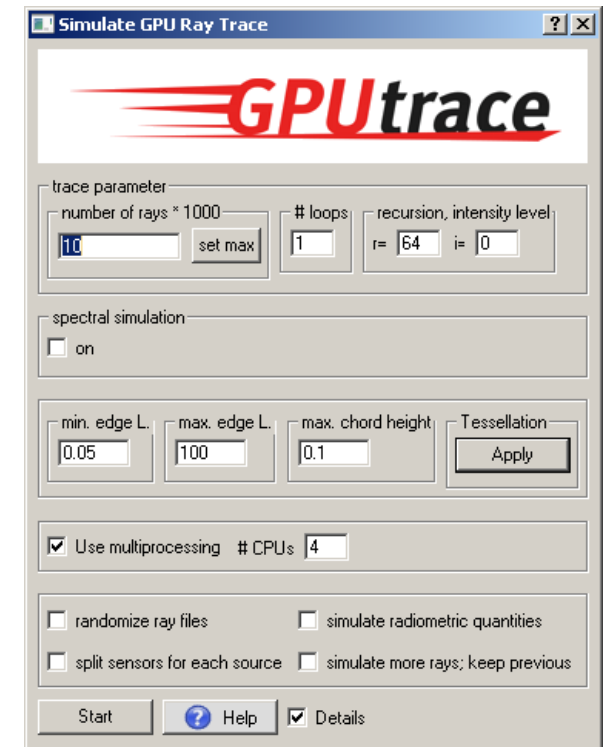
Integration

To take advantage of the GPU simulation, you don't need any extra knowledge. You just enable it by using the GPUtrace Dialog for simulation.

Every LucidShape model can be traced with this new technology without any further modifications.

Tessellation

Because of the fact that graphics card's computations are always based on triangles, the model is tessellated before simulation. The degree of accuracy can be adjusted in the new GPUtrace dialog:



After the model has been triangulated, it is uploaded onto the graphics card and your simulation can start.

