Master Project offer at Acoustics Engineering : Auralization using GPUs

Auralization in room acoustics aims at making the acoustics of a room audible. Vorländer defines the term auralization as follows [Vorländer, 2008]: ”Auralization is the technique of creating audible sound files from numerical (simulated, measured, or synthesized) data.”

The idea is to enable a user to experience the sound quality of a room even though that room might not yet exist. Traditionally, the process of creating the convolution corresponding to the auralization of a sound in a single point in a room has been computationally hard. In this project we propose a different approach in solving the problem is proposed.

In gaming, ray tracing has been used for some time in order to give a realistic impression of an environment. If the same techniques used for ray tracing of light are applied to sound, then the sound quality in any point of any room or environment could be synthesized in real time using merely a high-end graphics card.

The suggested project would involve investigations into the applicability of ray tracing of sound and the implementation of an algorithm for ray tracing of sound on an NVidia graphics card using CUDA.

[Vorländer, 2008] Vorländer M: Auralization: fundamentals of acoustics, modelling, simulation, algorithms and acoustic virtual reality, Springer-Verlag Berlin Heidelberg, 2008

Contact Delphine Bard: delphine.bard@construction.lth.se