Project Ultrasound

Medical Ultrasound is one of the most important techniques used in modern medical imaging. In order to provide a possibility for medical students and specialists to train and improve their skills in this technique, we are integrating real-time medical ultrasound simulation into CATHIS® Simulator.

The basic idea of medical ultrasound simulation:
- Input: 3D scene representing a set of 3D-mesh organs with some predefined tissue properties;
- Processing: simulation of ultrasound waves interaction with the objects using highly parallel computing;
- Output: 2D image similar to real medical ultrasound;

The main objects of the project:
- Implementation of an ultrasound simulation library (C++, CUDA, OptiX);
- Calibration of the model using real medical ultrasound;
- Optimization of the model (real-time speed);

Requirements:
- Physical principles of medical ultrasound
- Experience in C++, Parallel programming
- Nvidia CUDA, OptiX
- Basic experience in 3D Modelling and Image Processing