# BSc/MSc-project

**Title**: Tissue characterization using modern computer hardware

**Description**: Medical ultrasound images can reveal much more than the simply the strength of the echoes form the tissue, represented as brightness in the final image. The echoes from the moving blood allow very precise blood velocity estimation in 2 and 3 dimensions. The same is valid for the tissue, when the area of interest is subjected to a mechanical deformation (push). The displacement map reveals the relative stiffness of the tissue regions, which can be used in a final diagnose by a doctor, or for other purposes where tissue characterization is needed.

The project will start by familiarizing with our experimental ultrasound scanner and the relevant signal processing techniques, and selection of the scope of the project. Then, experimental data acquisition will be made. The acquired data will be processed in Matlab. Later, an implementation in C will be made. Last, an OpenCL/Cuda implementation will be made and verified against the others. The goal is to achieve real-time performance of the method, for convenient use by medical doctors.

**Required qualifications**:  Matlab, C, signal processing

**Responsible institution**: Center for Fast Ultrasound Imaging

**Allowed no of students per report:** 1 - 2

**DTU supervisor**:
Borislav Tomov
Matthias Bo Stuart