3D Transurethral Ultrasound Reconstruction

Master Thesis or Internship Position

In the context of a French-Bavaria University Collaboration we are offering an remunerated internship or master thesis position.

**Topic:** TIMC-IMAG has been developing in the past years a new type of ultrasound probe capable of robotically acquiring trans-urethral 3D ultrasound (TUUS) images [1]. The main focus for the moment has been on the hardware, and there is a current interest to improve the quality of the images. In the previous years, CAMP has developed a series of methods aiming at the improved quality and interpretability of 3D ultrasound images [2,3,4]. In this collaboration we aim to develop new such methods specific to the images acquired with the TUUS probe. The tasks will be learning to control the probe acquisition and investigating three different directions including:

- Increasing the rotation speed of the probe.
- Improve the registration of the 2D images to build a 3D volume.
- Acquiring multi-parametric sequences and summarizing them in 3D.
- Perform a quantitative (e.g. Phantom) evaluation of the developed methods.

**Requirements:**

- Good programming skills are needed. Experience with C, C++ would be beneficial.
- Prior knowledge in signal processing and medical imaging.
- Having worked with ultrasound images is a plus.
- English proficiency and good communication skills are required.

**Duration:** the exchange duration is planned for 4-6 months, starting date flexible as off September 2016.

**Location:** The hosting lab will be TIMC-IMAG (Techniques de l'Ingénierie Médicale et de la Complexité-Informatique, Mathématiques et Applications-Grenoble), a renowned lab in the field of computer assisted surgery and robotics. The lab is located in Grenoble, France, in the center of the Alps with hiking and skiing locations as close as 30 min.

**References**


