
Constitution of a liver deformations database acquired through combined Electromagnetic captors and laparoscopic camera

IRCAD and IHU Strasbourg are two partner institutes aiming at creating new tools for the surgery of the future, notably through a common Research and Development team.

IRCAD (Institut de Recherche contre les Cancers de l'Appareil Digestif) constitutes a reference in the domain of assisted digestive surgery, specifically in the area of minimally invasive surgery, via the use of Augmented Virtuality and Augmented Reality.

The IHU (Institut de Chirurgie Guidée par l'Image) in Strasbourg develops an innovative surgery to improve medical care of the patients, with a personalized approach combining the best minimally invasive technologies with the latest progress in medical imaging.

Many projects are conducted in collaboration between both institutes R&D team. IN this context, they require a common database of liver real deformation field. It will be used as reference to validate the tools developed by the teams, as well as input to various learning methods.

The internship objectives are in a first time to conduct the internal and surface deformation acquisitions of a pig liver in various positions. This will be done with electromagnetic captors for the deformation field, complete with a stereo video acquisition of the external surface of the liver with a laparoscopic camera. This provides visual data similar to real surgical conditions (cf. figure 1).

In a second time, the intern will establish a synchronisation treatment on the various acquired data. The purpose of this step is to provide a temporal and spatial localisation and mapping of the various data flows. The deliverable final product corresponds in a structured database of deformation cases of a given liver. All the associated data are standardised and synchronised spatially and temporally. It will so be easily used to automatize numerical deformation simulation or be used as input for learning tools.

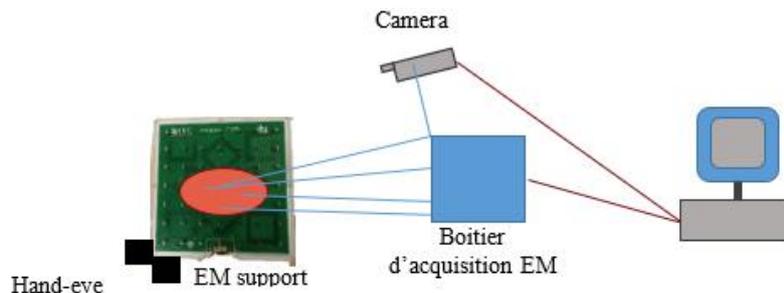


Figure 1 : Montage expérimental d'acquisition des déformations

The IRCAD software are grounded on a common framework *sight* [1]. This open-source framework is a multi-OS C++ libraries collection with a component-oriented architecture. Therefore, a good knowledge of C++ is compulsory for this internship.

[1] <https://github.com/fw4spl-org>

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Rémunération : 1100 € brut/mois

Durée du stage : 6 mois

Date de début du stage : Durant le 1er trimestre 2019

Lieu du stage : IRCAD – Strasbourg – Centre-ville

Développement :

Windows

C++