

Research Internship 2013

Analysis of surgical procedures using data- and text-mining techniques

Supervision:

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Keywords: Data/text-mining, Computer-Assisted Surgery

Context

The MediCIS team has been working on Computer-Assisted Surgery for many years. Within this large field, the explicit understanding of processes during surgical procedures is an important issue that has motivated extended research. The aim is to understand what occurs in the Operating Room during an intervention, such as actions performed by the surgeon himself or by members of his staff. For this internship, the idea will be to analyze surgical procedure thanks to a large amount of data that have been recorded and stored over the last 5 years.

Internship focus

Available data consist first of a set of surgical recordings describing the different activities and steps of the surgical procedure. These data were acquired during operations by an observer recording every tasks performed by the surgeon. With this database, the idea will be to create model of surgical processes, e.g. average surgery or probabilistic tree showing each possible scenario. The second database available is a set of more than 500 post-operative reports. These informatics files were created by surgeons just after the surgery in order to explain particular adverse-event and make a full resume of operations. From this database, the extraction of useful information based on text-mining techniques is feasible and of great interest.

The emphasis of the internship will be given in adapting and developing relevant methods for analyzing and modeling all of these data. Clinical relevance of the results will be confronted with neurosurgeons who are fully involved in this study.

Trainee profile

- Master or engineering school in computer science curriculum
- Knowledge: Data-mining, machine learning, supervised/unsupervised classification
- Programming skills: C/C++, Matlab
- Associated partners: Rennes Neurosurgical department
- English (read, written).

Duration: 5 to 6 months starting February 2013. Earnings planned.