THE INSTITUTE OF INTELLIGENT SYSTEMS AND ROBOTICS*
INTERNSHIP OFFER in Computer Vision and Robotics

Development of computer vision tools for medical data collection
and post-treatment

Abstract: Many procedures of spine surgery require to implant screws in several vertebrae of the patient. For instance, inserting these screws in vertebral pedicles is a major issue for scoliosis correction. Due to the proximity to critical anatomical regions (spinal cord, nerves, aorta, ...), misplaced screws can induce grave complications.

Freehanded placement by unexperienced surgeons may result in relatively high inaccuracy, and thus a significant percentage of surgeries lead to further complications. To try improving precision of this surgery, new medical robots and tools emerged from the market in the last few years to assist surgeons.

The ISIR lab and the Trousseau Hospital are currently collaborating to imagine a new kind of robotic assistance for spine surgery.

Objectives: Currently, with the collaboration of our partner SpineGuard, we are collecting data on ORs. This is done with the collaboration of a medical intern surgeon hired for the project. The candidate will share his/her technical knowledge to help the medical intern collect valuable data in the Operating Room (OR), on real patient cases at the hospital. This will consist in:

- Helping designing and improving the setup for collecting high quality data.
- Helping labelling and post-processing data in order to be ready for statistical analysis.
- Helping in designing automatic processing pipelines to extract information from data.

Data includes DSG signal from SpineGuard tools, and video+audio signals. The intern will take part of the AGATHE team and will work closely with a PhD student.

Candidate Profile: Last year Master of Engineer student in a field related to Computer Science or Robotics.

Required skills:

- Proven knowledge of C++, Python or Java. C++ is preferred. Experience working with the OpenCV library is a plus.
- Comfortable being immersed in an OR with real surgery, working on surgical images.
- Fluent in French or English.

*The Institute of Intelligent Systems and Robotics (Isir) is a Joint Research Unit (UMR7222) under the supervision of Sorbonne University, The French National Centre for Scientific Research (CNRS) and Inserm (ERL-U1150). This multidisciplinary research laboratory brings together researchers and teacher-researchers from different disciplines of Engineering and Information Sciences as well as Life Sciences.
Supervisors: Guillaume Morel, Professor at Sorbonne Université; Jimmy Da Silva, PhD Student, SpineGuard and Sorbonne Université

Duration: 5-6 months, as soon as possible

Location: ISIR (Institut des Systèmes Intelligents et de Robotique), Campus Pierre et Marie Curie, 4 Place Jussieu 75005, Paris

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Send your application by email, with [Development of computer vision tools for medical data collection and post-treatment] in the subject line, a detailed CV and a short motivation letter.

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