



Equipe MediCIS

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Virtual reality simulator: from a research to a mixed tool (research/training).

Localization: Laboratoire Traitement du Signal et de l'Image (LTSI), MediCIS Team

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Context

The evolution of medical simulation technology provides unique opportunities to improve the training of young surgeons. The development of a virtual reality simulator for basic dexterity training in surgery is one of these promising areas. This type of simulator can help young surgeons safely develop their surgical skills without putting patients at risk. Additionally, these simulators can provide an objective evaluation of the surgeons' dexterity and procedural skills, helping to assess their progress and identify areas for improvement. Furthermore, by allowing young surgeons to practice different stages of a surgical procedure in a controlled environment, they can also improve their confidence and ability to manage challenging situations that may arise during surgery.

In recent years, a peg transfer virtual reality simulator has been developed by a partner of the University of Tokyo. On the other hand, the MediCIS team has developed several tools that allow for the automatic assessment of dexterity and procedural skills. Today, we aim to combine these developments to offer our clinical partners a virtual simulator with a user-friendly human-machine interface (HMI). Additionally, we want to record trainee sessions and provide feedback using previously developed methods. Finally, we aim to make automatic data backups on a remote server for future analysis.

Objective of the internship

To achieve this goal, the internship will be divided into multiples steps:

- Integration of simulator apps on a friendly-user HMI;
- Automatization of data acquisition;
- Automatic data backup on a remote server;
- Provide automatic feedbacks;
- User tests.

Profile researched

The intern should be proficient in programming with various languages such as Unity, C++, Matlab, and Python. Familiarity with HMI and network administration is a plus. The working language for this internship will be French and English.

This internship can be for a duration of 3 to 6 months, depending on the candidate. The remuneration will depend on the duration.