



S.I.M.P.L.E.: Smart Intraoperative Messaging Protocol with Less Effort

Project Management and Software Development
for Medical Applications

General Info

Project Title: [Smart Intraoperative Messaging Protocol with Less Effort](#)

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Project Abstract

This project aims at the development of a modern, robust and efficient messaging library that enables the communication between the various devices used in a medical setting

Background and Motivation

Inter-process and inter-device data transfer is needed for many application in many fields. Typically, in the medical field, various devices are operating at the same time during a single intervention and it is very common to need to transfer information between them. This has to happen in a fast and reliable way and it is usually achieved using a communication protocol that the different device manufacturers agreed to use. A standard communication protocol is still yet to be reached. The research library OpenIGTLink [1] represents the standard de-facto, but almost 10 years have passed since its release. The need for a more modern and efficient messaging protocol is clear to the research community.

Student's Tasks Description

Student will initially explore the available library for message generation, (de)serialization and data transportation, such that the most suitable combination of them will be used for the final messaging library. The development of the library will follow the best practices for modern software engineering, it is expected to be developed such that its usage will be ensured for multiple platforms (operating systems, compiler versions, etc) be directly followed and reviewed by the supervisors.

Technical Prerequisites

- Good C++ (preferably C++11/14) knowledge
- Good Python knowledge
- Knowledge of build systems, CI and unit tests is preferred
- Previous experience with Slicer and ROS is a plus.

References

[1]: Tokuda, Junichi, et al. "OpenIGTLink: an open network protocol for image - guided therapy environment." The International Journal of Medical Robotics and Computer Assisted Surgery 5.4 (2009): 423-434.