

Development of an arthroscopic training device using virtual reality



Background

Simulation of arthroscopic approaches allows young surgeons to improve their surgical skills within a safe environment. Current available training modules range from simple analog constructs up to highly complex training robots. Simple constructs help to improve basic manual skills while working with surgical tools. In addition, arthroscopic training robots allow to train triangulation within a 3D anatomical environment while provide haptic feedback to the user. However, such sophisticated training modules cost up to 150'000 CHF that limits their accessibility to young surgeons. An affordable portable training device, which offers a daily training opportunity to young surgeons, could help to close this gap.

Aim

The present project aims to develop a prototype of an arthroscopic training device, which allows training special orientation within a 3D environment (triangulation) using VR technology.

Materials and methods

This thesis will consist of three parts. In the first part, the student will get to know the aspects of arthroscopic approaches and in the team, the required futures of the training device will be defined. In a second part the student will develop and prototype a suitable haptic interface which allows to track the user's movements. In a third part, the student will adapt a software, which processes the haptic input and allows for a graphical tracking of the user's movements.

Nature of the thesis

Theory & Conceptual work 40%, Engineering 20%, Programming 40%

Requirements

Computer Science, programming skills

Supervisors

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Institutes

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