

System for the generation of haptic forces and torques in teleoperation

Multiple contacts, forces and torques.

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Introduction

- Develop systems that helps the surgeon during the intervention.

The application

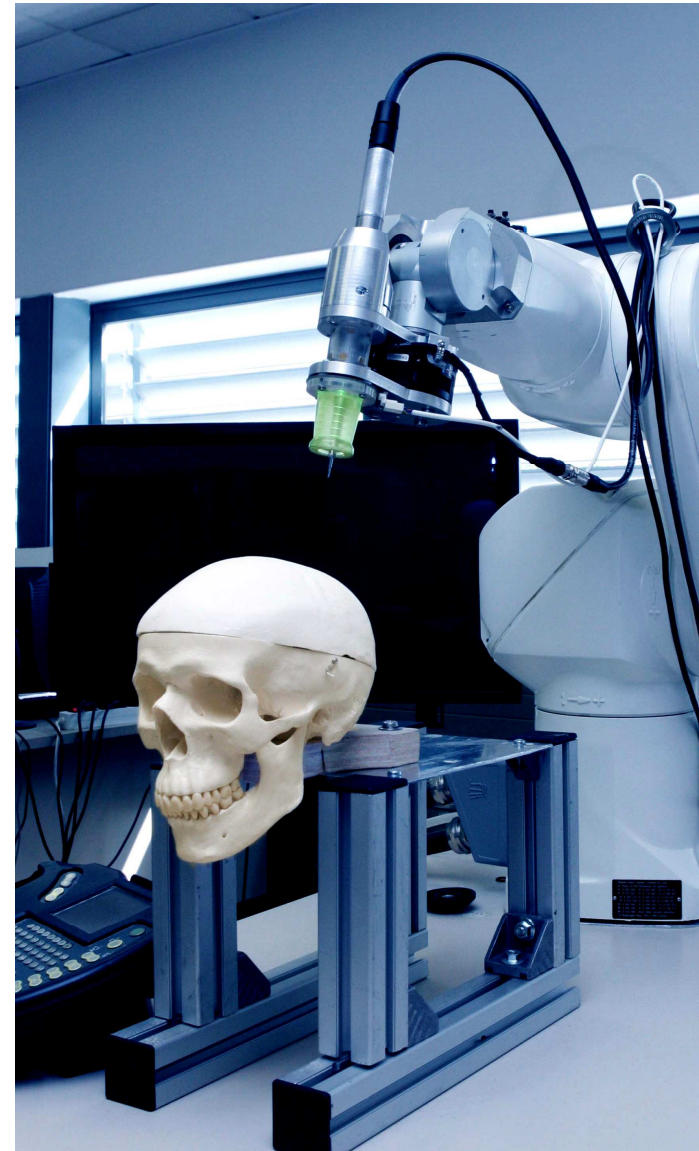
Drilling bones

Needs:

- Velocity control
- Temperature control
- Tremor suppression

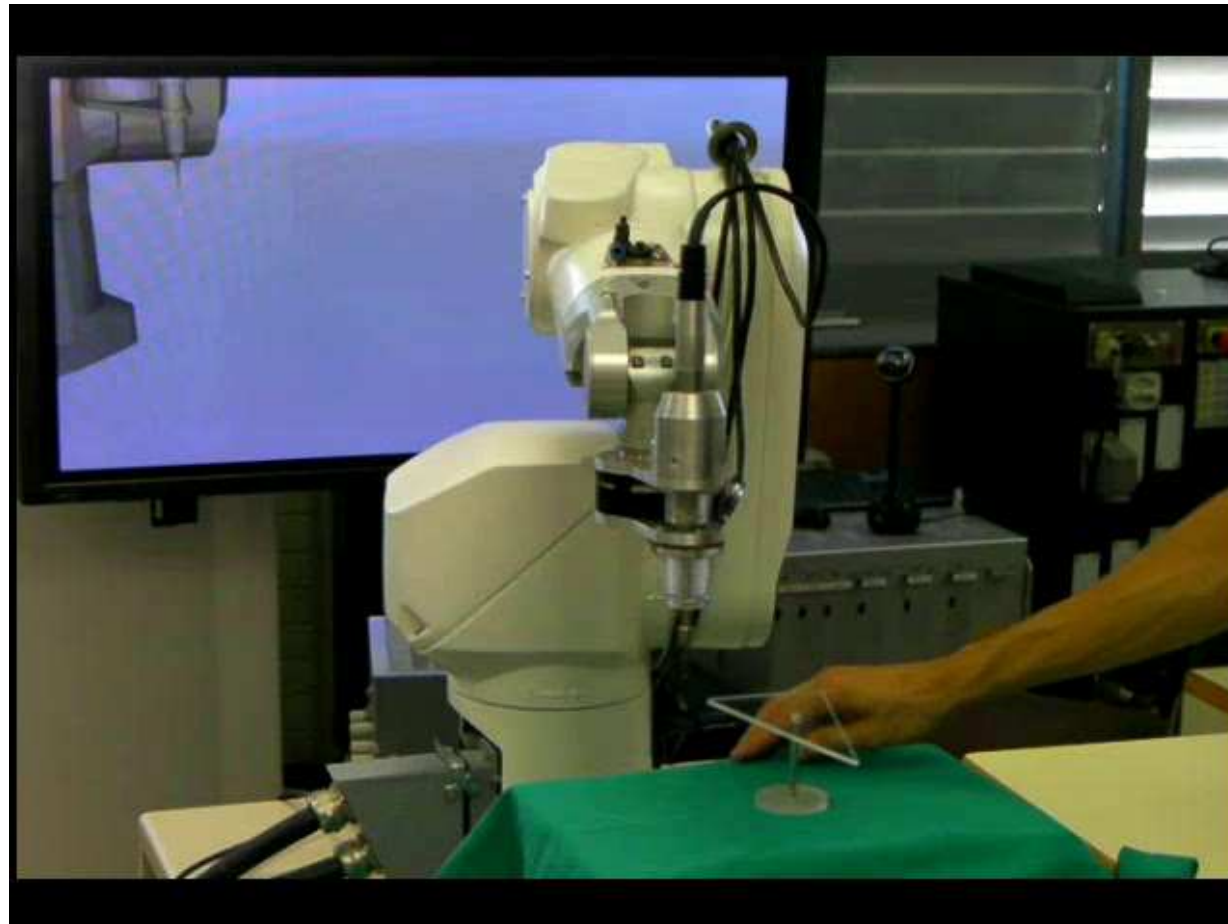
The system

- 6 DoF manipulator
- 6 DoF force sensor
- Tool holder
- Specific hardware
- Software layer



Adding virtual shields

- Defining virtual shields during the surgery



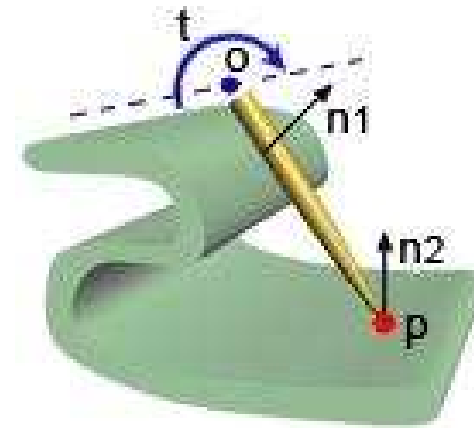
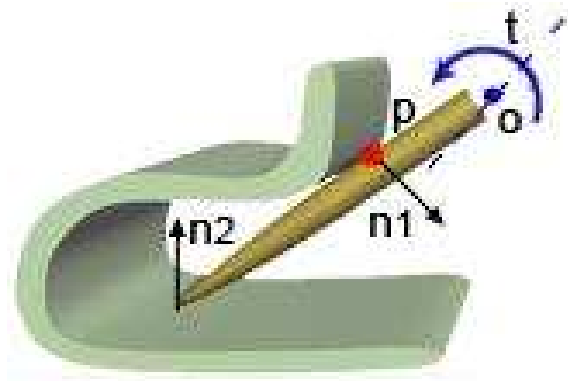
Predefined virtual shields

The virtual shield can be defined in a pre-surgery stage, extracting the models from standard medical images.

Full test over predefined
virtual fixture

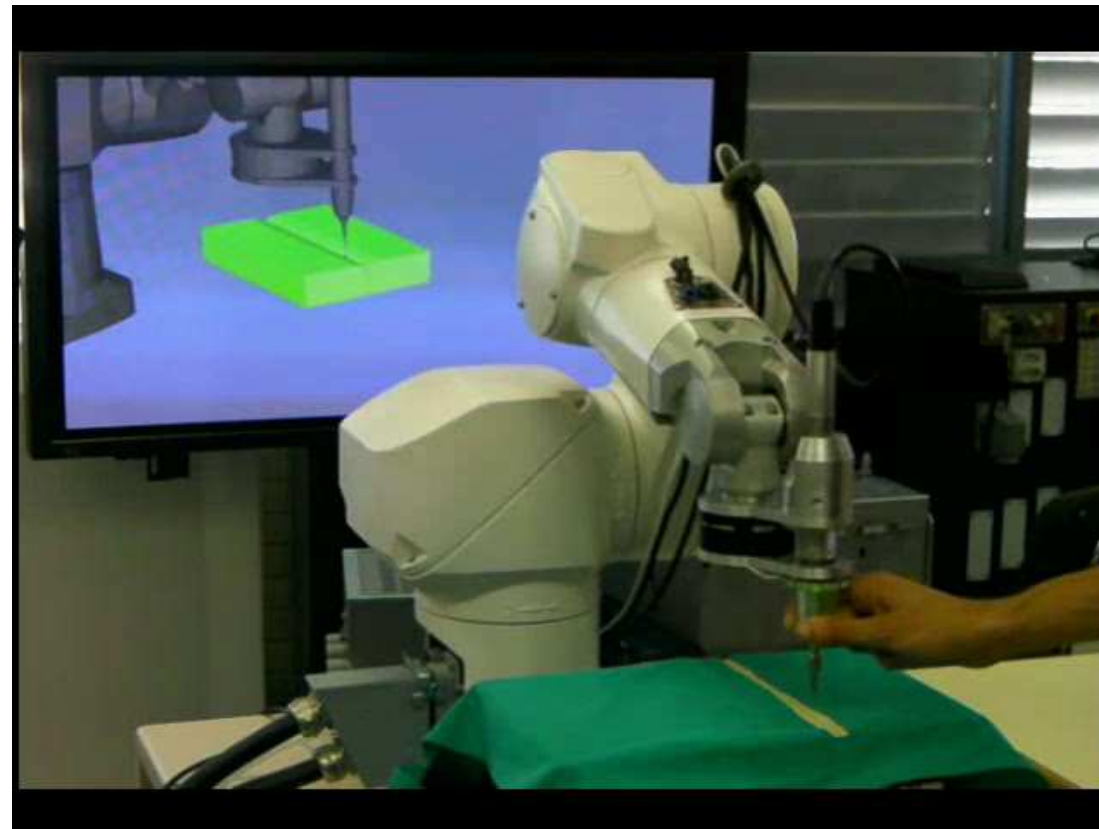
Multiple contacts

Multiple contacts are allowed in order to perform rotation restrictions with a realistic feedback.



Predefined cuts

Due to the 6 DoF force feed-back predefined cuts can be designed and followed during the surgery with an accuracy of 0.4 mm



Anatomical complex fixtures

Since we are using 3D models for the tool and the virtual fixtures those can have anatomical realistic shape.

Drilling over a complex
anatomical virtual fixture

Questions?