'Control of lower limb prostheses, Sit-To-Stand Optimization using Human in the Loop Techiniques

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Context

We have run a previous trial of sit-to-stand optimization with a person using our CYBERLEGs X-Leg knee. The study was focused on the optimization of the torque trajectory of the knee during the sit-to-stand motion. This study illuminated a number of problems we had with the sit-to-stand detection as well as some practical problems such as what happens to the ground reaction force when the socket touches the chair.

We would like to continue this study, which uses the GRF of both the prosthesis and the sound limb to increase the symmetry of the sit to stand action. The focus of this master's thesis would be to improve the procedure and collect data for a number of individuals using the prosthesis in the lab.

CYBERLEGs X-Leg, knee and ankle modules.

Objective

Finish a previous study using GRF to improve knee torque trajectories for a sit-to-stand and stand-to-sit task.

Description of Work

Project will consist of:

- Literature study
- Modifying the protocol for the study

- Adjusting prosthesis controller for task
- Testing of controller with one or more individuals

Experience and Equipment

Labview – The X-Leg ankle and knee are programmed in Labview and will be required to learn for the project.

Matlab – For data analysis and controller development

Location

VUB-MECH/Brubotics (Pleinlaan 9, Floor -1, 1050 Brussels.)

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