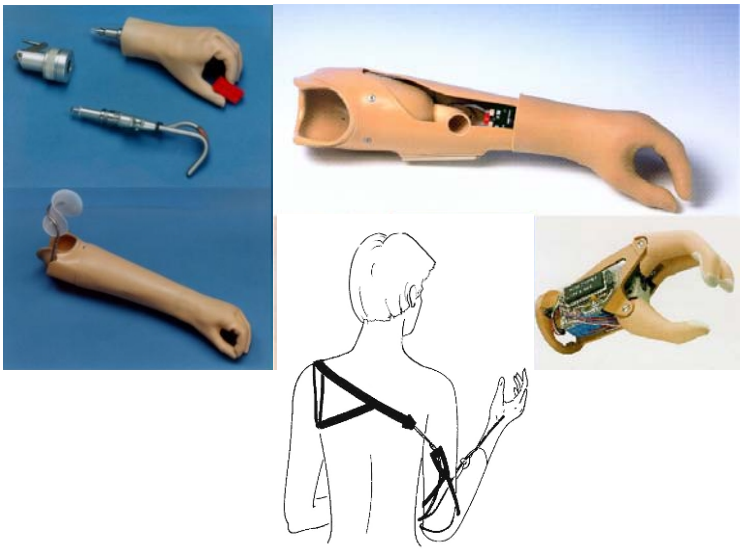
Delft Institute of Prosthetics and Orthotics

DIPO

Innovative Upper Extremity Prostheses and Orthoses



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MASTER GRADUATION PROJECT

IMPROVING CONTROL OF HAND PROSTHESES

Many patients provided with an upper-limb prosthesis abandon their prosthesis after some time. Various studies show rejection-rates of around 30% or even higher. Patients are unsatisfied with their prosthesis not fulfilling their basic demands. One of the major complaints is about the poor controllability of their prosthesis. Most prosthesis lack feedback of the opening width of the hand and the applied pinch force. Currently two types of prosthesis are available, the myoelectric (ME) and the body powered (BP) prosthesis. Despite years of research effort, the ME prosthesis still lacks any force or position feedback. The BP-prosthesis should provide this feedback, but in practice its feedback is often impeded by a large hysteresis. A well functioning BP-prosthesis would be a major advantage to the users of BP-prostheses. Until now little research has been performed to develop an improved BP-prosthesis. At present the Delft Institute of Prosthetics and Orthotics is developing a new BP-prosthesis. To make this new prosthesis a success, many control questions have to be answered. Should the prosthesis be voluntary closed or voluntary opened? Also, what is the maximum achievable performance of body control?

ASSIGNMENT

Design and perform a test to study the performance of body control. Analyse the test results. Quenstions to be answered include:

- What is the performance of body control, compared to myoelectric control?
- Which control principle should be chosen, voluntary closing or voluntary opening?
- Which other advises can be given for the design of new body controlled prostheses?

ADDITIONAL INFORMATION:

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