



## MASTER GRADUATION PROJECT – INDUSTRIAL DESIGN

# HARNESSING MOVEMENTS TO CONTROL A BODY POWERED ARM PROSTHESIS

Upper limb amputees are not satisfied with the commercially available arm prostheses. This is indicated by the high rejection rates of prosthetic devices. The Delft Institute of Prosthetics and Orthotics (DIPO) focuses on the improvement of body powered arm prostheses. These mechanical arm prostheses are controlled by the movements of the user. To harness the movements of the user straps are wrapped around the body (see figures above). Unfortunately users complain about discomfort and poor cosmetics due to the straps. Especially women reject wearing these prostheses during the summer months because the straps are visible through light summer cloths.

Reconsideration of the design of the nowadays used harness systems is essential to meet the user's needs. Several body movements can be considered to power a prosthesis. Therefore different harness systems are needed, which can result in a less striking strap design. Additionally, harness systems might be integrated into the user's cloths. The choice of different materials might increase the comfort when wearing a prosthesis as well.

## ASSIGNMENT

In the scope of this MSc assignment you should consult literature to gain a general understanding of the problems during prosthesis operation. A quick market analysis should give you an insight of which harness systems are available on the market. You should consider different movements capable to power a prosthetic device and design one (or more) prototype(s) of a "movement harnessing system". Finally this (these) prototype(s) should be tested during simple prosthesis control tasks.

## ADDITIONAL INFORMATION:

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