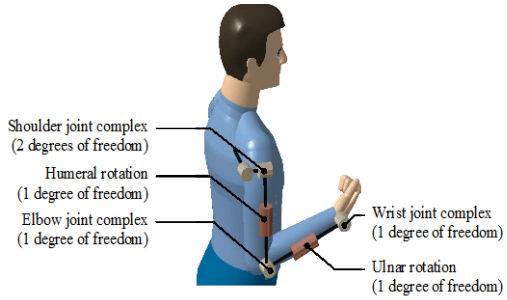
MODULAR HAPTIC ROBOT TO ASSIST UPPER LIMB'S PATIENT IN REHABILITATION PROCESS

Sopartec, the technology transfer company of the Université catholique de Louvain (UCL), presents a unique patented technology to assist upper limb's patient in rehabilitation process.



Technology Keywords

- Patients rehabilitation
- Upper limb
- Morphological adaptability

The UCL invention

This device is a modular haptic robot aimed to assist upper limb's patients in a rehabilitation process. It is composed of five independent modules :

- The first mobilizing simultaneously the flexion/extension and the abduction/adduction of the shoulder;
- The second mobilizing the internal/external rotation of the arm;
- The third mobilizing the flexion/extension of the elbow;
- The forth mobilizing the pronation/supination of the forearm;
- The fifth mobilizing the flexion/extension of the wrist.

Each of them can be used independently or in combination with one or more other modules.

These modules are controlled in such a way that they do not hustle or compel strictly the movement, but rather guiding the patient's arm with suppleness along a predefined or a learned trajectory, as a physiotherapist would do. This particular behavior, so called compliant behavior, is done in three different modes :

- In the **passive mode**, the patient is passive and the robot drives the movement at the patient's arm along the desired trajectory. This mode is useful for patients at the beginning of their rehabilitation process allowing to practise as much as possible with adaptable trajectory in relation to their needs.
- In the **semi-passive** mode, the patient interacts with the system. The patient initiates the movement and the robot helps him while imposing to stay on the desired trajectory. If the patient is not enough active, the robot stops. This mode is useful for patients who have already recovered a part of their mobility and who are able to orientate and impose their force.
- In the **active mode**, the patient himself initiates and executes the movement while the robot imposes to stay on the desired trajectory. This mode is useful at the end of the rehabilitation stage when the patient has almost recovered the use of its arm.

Technology Status

This work is the subject of a patent application : PCT patent application filed on 10/02/2010 and published under No. WO 2010/092089.
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Sopartec would like to talk to companies interested in developing and commercializing this opportunity.

Contact	
Frédéric Ooms, Ph.D. *Senior Patent & Licensing Manager*	
Tel	+32-(0)10-390 021
Email	f.ooms@sopartec.com
Web	www.sopartec.com www.uclouvain.be