



## Movement Assisting Devices

MANUFACTURING OF PERSONALISED KINETO-DYNAMICS PARTS AND PRODUCTS  
FOR WORKERS, ELDERLY AND CHILDREN

Newsletter 4 – April 2018

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### MOVAID CONSORTIUM

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### Focus on sensor technology



The MovAiD project is highlighting more and more the potential for future servitisation. The integration of products and services found in the area of orthopaedics can provide improved customisation and improved efficiency.

Key for the servitisation is the integration platform that combines all the information from sensor technology and other data inputs, simulations, design, machine interaction, supply chain and after-sales support.

The last newsletter focussed on the integration platform. In this newsletter, we want to explore the basis for data driven design and customisation: sensor technology.

We currently investigate motion and pressure sensors to create a unique individualised movement capture. This then feeds into the whole simulation and design framework before printing highly-personalised, kineto-dynamic movement assistive devices. Secondly, the embedded sensor will allow tracking the right use of the device, acceptance by the user and identifying the need to replace spare parts.

#### MovAiD Coordinator Sir Saeed Zahedi

## Get our latest news

Read about the presentation of the MovAiD paper at the OT World and watch a recording of the AnyBody webinar.

### MovAiD paper to be presented at OT World

We will present a MovAiD paper regarding sensing technology at OT World in Leipzig in May 2018. OT world is a major trade show and congress. It enables inter-professional interchange between orthotists and prosthetists, orthopaedic shoe technicians, podiatrists and chiropodists, rehabilitation technicians, therapists and doctors, engineers and funding organisations. ISPO will also disseminate MovAiD at OT World. Please visit us at the stand!

### Watch 'Simulations as a tool for human-centred exoskeleton design'

Hosted by Pavel Galibarov from AnyBody Technology this webinar is presented by product specialist Ananth Gopalakrishnan. The online discussion focuses on simulations and exoskeleton design, eco simulations and cases studies. The session finishes with questions and answers from participants. Watch more [here](#).

### Update on Work Packages (WP)

Read the latest updates and results from WP2 MovAiD Integration Platform focusing on sensing technology as well as an interview from project partner GaitUp.

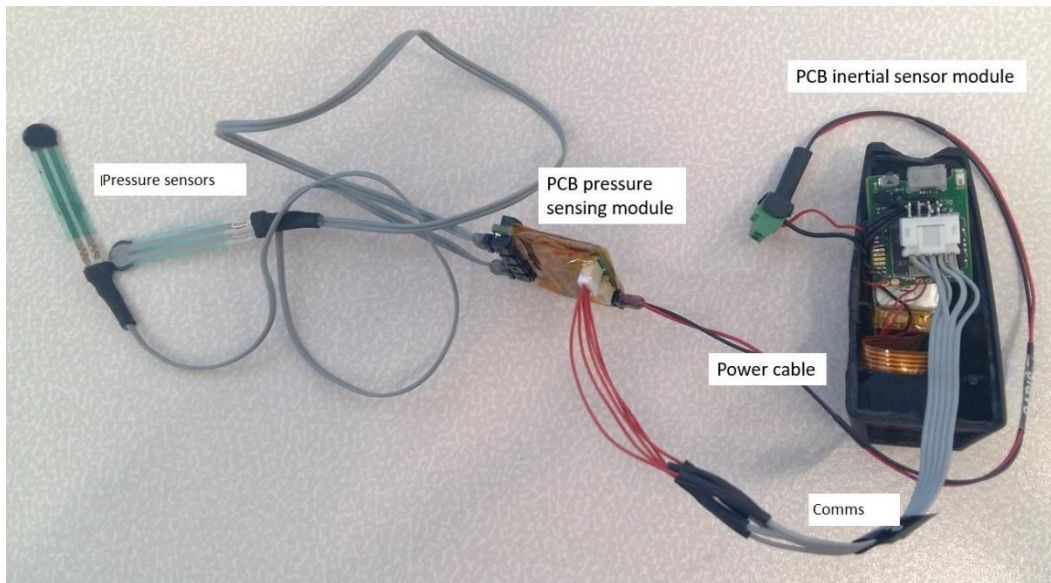
### Versatile and dedicated sensors

The aim of WP2 is to design a versatile and dedicated sensor network to be embedded in the movement assistive devices (MAD).

The sensor network measures the kinematics needed to feed the automatic design tools. Having sensors in the MAD helps to collect data while the device is being worn. These assess parameters and demonstrate the usefulness to correct the movement disorder. They help to understand how the user accepts the device and identify any need to replace spare parts.

Taking into consideration the information from the embedded sensors, a sensor network design was proposed that includes inertial sensor as well as interface pressure sensors.

Below is an example of a prototype sensor network:



We have collected data using the proposed sensor network and are currently in the post-processing stage. The sensor data will be fed back to the integration platform via a smartphone application where it will serve two purposes: data driven design and post-sales support and service.

### Introducing GaitUp

As a partner of the MovAiD project, GaitUp's role is to build new solutions for measuring human movement, using small and low-cost inertial sensors in combination with proprietary advanced algorithms.

'Our technology helps to obtain meaningful and accurate outcome parameters during locomotion for instance. In particular within the MovAiD consortium, we have created an easy and self-calibrating algorithm for measuring the 3D kinematics of a customer. That serves as input to design a personalized movement assistive device,' explains Rebekka Anker.

She adds: 'We have also developed the core electronic sensor chip to be embedded in the movement assistive devices to monitor its daily use by the wearer. The smart sensors transmit processed data, such as real-time walking phases, to a centralized integration platform where doctors and other stakeholders can receive warnings if the device needs a check-up.'

### Strategy: looking to the next stage

As stated before, the vision of MovAiD is the seamless integration design of advanced custom-made and spare parts with flexible manufacturing technologies. Flexible manufacturing technologies will allow the production of customised parts at a competitive and affordable price, which hopefully will be comparable with currently mass-produced items.

But pricing is not all. The product needs to fulfil its intended functionality to a high satisfaction. The awareness of the potential of sensor-driven design optimisation and customisation has just started, and we will experience exciting times in this sector.

User acceptability is a key area. Therefore, their engagement with technology and interaction with their movement assistive device will prove to be another important aspect. In the O&P cases, close interaction between the clinician and the user and data exchange can lead to a better clinical outcome. Same applies for the industrial case the H&S adviser and worker can benefit from the collected and analysed data of the movement assistive device.

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**Questions? Contact us**



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