



Movement Assisting Devices

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

Newsletter 3 – December 2017

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A new personal touch for customised devices

As a European project focusing on manufacturing personalised orthotic devices, MovAiD represents true innovation and the real added-value of customised products, thanks to the ground-breaking influence they will have in responding to previously uncovered market needs.

40 million workers in the European Union are diagnosed with musculoskeletal disorders and 30% of people over 65 suffer from musculoskeletal conditions. Motion deficits and neuromuscular diseases, while lower in numbers, have a tremendous social impact, since children suffering from such pathologies can nowadays only benefit from costly craft-made devices or from amateur home-made solutions.

This new concept of highly-personalised and kineto-dynamic equipment developed through MovAiD enhances and complements the physiological natural movement of the human body by passively redistributing forces and torques, sustained while interacting with the environment.

At the M24 Meeting in Milan in October 2017, we learnt more about how MovAiD partners are working further on fine tuning Movement Assisting Devices (MADs) design tools and additive 3D printing production technologies, as well as spare parts and use-related services.

Marco Cavallaro

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Get our latest news

Read the latest from MovAiD including a roundup of the M24 Meeting in Milan and the winner of this year's British Limbless Ex-Serviceman's Association (BLESMA) award.

Roundup M24 meeting in Milan

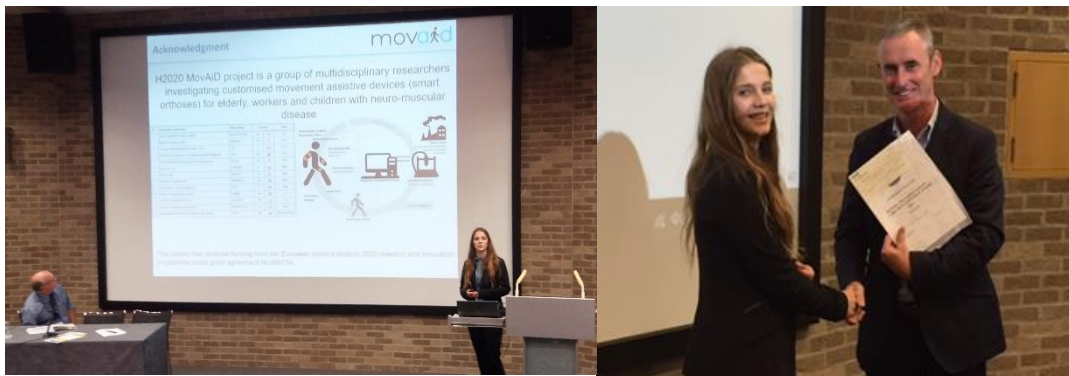
This October, the Istituto di Tecnologie Industriali e Automazione – Consiglio Nazionale delle Ricerche welcomed the MovAiD project partners to discuss latest developments.

Nadine Stech, from coordinating project partner Chas A Blatchford & Sons Limited (UK), says: *'We have reached a stage where the integration of activities is crucial.'*

The focus of the meeting was to present the novel concepts for movement assistive devices (MADs), look further into the advances made in computational design within the project as well as the development of the Integration Platform.

Partners also took the opportunity to present samples of advanced materials to the group, demonstrate and update everybody on the additive manufacturing machines and processes, including structural and body fitting parts.

MovAiD paper awarded BLESMA prize



Picture 1: Research Engineer Lou-Ann Raymond (Chas A Blatchford & Sons Ltd) receives BLESMA prize during the ISPO UK MS annual Scientific Meeting.

Congratulations to Research Engineer Lou-Ann Raymond and the team of engineers and scientists at Chas A Blatchford & Sons Ltd! They were recently awarded the British Limbless Ex-Serviceman's Association (BLESMA) prize during the ISPO UK MS Annual Scientific Meeting last September in Cambridge, UK.

Expressing her delight at winning this prize, Nadine Stech says: *'It highlights the overall need for high-quality research in orthotics. By researching plantar pressure*

measurements for their suitability in the normal living environment, we hope to raise the level of care for orthotic patients in future.'

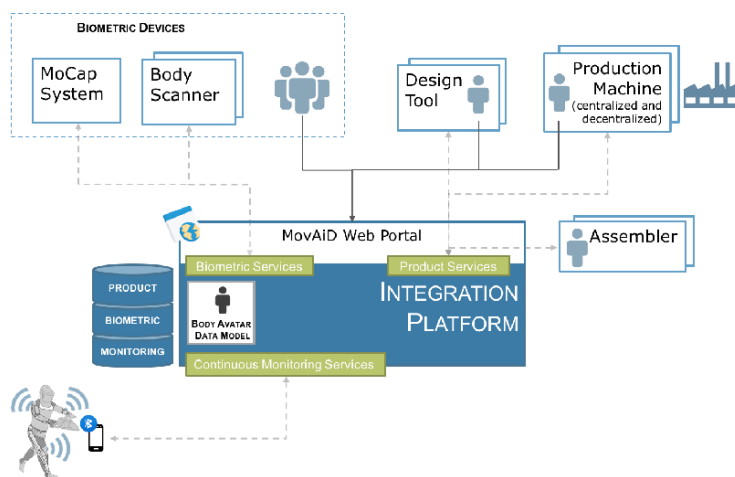
This research focuses reducing the number of sensor cells without losing important information regarding centre of pressure within locomotion dynamics.

It will help integrate plantar pressure measurement estimation into the Movement Assisting Device (MAD), not only in the clinical but also in the everyday living environment.

Update on Work Packages (WP)

Read the latest updates and results from WP2 MovAiD Integration Platform

Moving toward a more Integrated Platform



At the core of the MovAiD project, the Integration Platform now combines advanced technologies and coordinates actors and devices to create the most customised movement assistive devices. It now links biometrics devices,

product customization

Picture 2 – MovAiD Integration Platform Architecture

and sensor data.

'It helps us to effectively manage all the data so we can also provide intelligent product-life-cycle support,' explains Research Engineer Giuseppe Landolfi from the Department of Technology Innovation at Istituto Sistemi e Tecnologie per la Produzione Sostenibile, University of Applied Sciences of Southern Switzerland.

Now, this more innovative version of the platform can better manage data received from biometric devices while orchestrating production machines, design tools and assembler services. The smartphone application also connects the platform with sensors and provides user-awareness creation services. At the same time, a pressure sensors is being developed. A foot-worn sensor with wearable sensor system including inertial, barometric pressure and interface embedded algorithms can detect temporal gait phases while walking. In the next period, the team hope to take it one step further. *'The sensor system will be further improved to*

communicate with the smartphone application. This can for example display activity monitoring parameters of the clinician or end user. It can further be used to inform the customer about wrong postures or movements and, if necessary, schedule visits.' adds Landolfi.

Strategy: looking to the next stage

In recent years, mass customization has satisfied major personalisation requests in various industries from automotive to fashion. But, this approach often demands compromise.

In the prosthetic and orthotic market, this compromise crucially impacts function and comfort. The design phase, ideally linked to the manufacturing step, also becomes more difficult.

To face such limitations, MovAiD wants to set new strategies that seamlessly integrate the design of advanced custom-made and spare parts with flexible manufacturing technologies, possibly creating spare parts on demand. This would guarantee faster delivery time at a more competitive and affordable price.

The final goal is also to define, develop and validate methodologies and tools able to manage fast production, distribute custom-made parts and deliver personalised products.

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