

## Healthcare industry BW

### WearRAcon Europe 21

Date:  
05-Oct-2021 - 07-Oct-2021

Venue:  
Online

Costs:  
175-415 \$

Organiser:  
Wearable Robotics Association  
673 Potomac Station Drive  
#801  
Leesburg, VA 20176  
USA

Language:  
English

Links:  
[🔗 WearRAcon Europe 21](#)

WearRAcon Europe 2021 will give insight into European aspects of industrial exoskeleton technologies and their assessment methodologies. This will be linked closely with the physical live experiments of Exoworkathlon, held in conjunction with the conference.

Other therapeutic and preventive exoskeleton research topics will be discussed as well in synergy with the global WearRAcon conference family. The conference is a collaboration with the Wearable Robotics Association, Fraunhofer IPA, and University of Stuttgart.

*All sessions are held in the GMT+2 time zone*

#### PROGRAM AT A GLANCE (as of 27.07.21)

##### **DAY 1 – Tuesday, October 5, 2021**

09:00 – 09:20	Dr. Urs Schneider, Fraunhofer IPA, Germany Welcome Speech
09:20 – 10:20	Keynote Speech – Prof. Dr. Michiel de Looze, TNO, The Netherlands Reducing the barriers for implementation of exoskeletons in practice
10:20 – 10:40	Live from Exoworkathlon I
10:40 – 11:00	Live Spotlight Demo I Session Benchmarking & Assessment I
	Dr. Ulrich Glitsch, Institut für Arbeitsschutz der DGUV, Germany Challenges in the biomechanical assessment of industrial exoskeletons
11:00 – 12:00	Dr. Jawad Masood, CTAG, Spain TestEd: Occupational Exoskeleton Testbed from concept to reality Mathilde Schwartz, INRS, France

Mathilde Schwartz, INRS, France

Cardiorespiratory effects of using a robotic back-support exoskeleton during a repetitive lifting task

12:00 – 13:00

Lunch break

13:00 – 13:30

Impulse Talk I – Prof. Dr. Klaus Bengler, Technische Universität München, Germany

Assistance Systems – A Challenge for Development and Evaluation

Session Human Factors & Acceptance

Prof. Dr. Cordula Kropp, Universität Stuttgart, Germany

13:30 – 14:10

I E: reasons and methods for user involvement

Jérémy Lefint, KIT-ITAS / Fraunhofer IPA, Germany

WHO accepts WHAT? – The dilemma of subjective factors and their integration into the product development process

14:10 – 14:40

Poster Presentation Session I

14:40 – 15:00

Live Spotlight Demo II

15:00 – 15:30

Session Exoskeleton Systems II

Session Benchmarking & Assessment I

15:30 – 16:15

Terry Buttler, Lean Steps Consulting, USA & Prof. Dr. Jason Gillette, Iowa State University, USA

Upper Body Exoskeleton Benchmark and Assessment Best Practices

## DAY 2 – Wednesday, October 6, 2021

Time

Activity

09:00 – 09:10

Christophe Maufroy, Ph.D., Fraunhofer IPA, Germany

Morning Greetings

09:10 – 09:40

Impulse Talk II – Jesús Ortiz, Ph.D., IIT, Italy,

Developing exoskeletons for the industry of today and tomorrow

Session Exoskeleton Research

Prof. Dr. Simona Crea, Scuola Superiore Sant'Anna, Italy

Occupational exoskeletons: challenges, opportunities, and lessons learned

09:40 – 10:40

Prof. Dr. Carlos Rodriguez Guerrero, VUB, Belgium

The Exo4Work project. Methods, Results and lessons learned.

Mark Tröster, Fraunhofer IPA, Germany

ExoPflege – Development of an active exoskeleton to support the human trunk- and shoulder-arm-system

10:40 – 11:00

Live from Exoworkathlon II

11:00 – 11:20

Live Spotlight Demo III

Session Exosuit Research

Dr. Maziar Sharbafi, Technische Universität Darmstadt, Germany

11:20 – 12:00

Morphology and compliance roles in designing exosuits

Jan Kuschan & Henning Schmidt, Fraunhofer IPK, Germany

Realtime Action Recognition as a basis for Smart Exosuits

12:00 – 13:00

Lunch break

13:00 – 13:20

Live Spotlight Demo IV

13:20 – 14:00

Session Exoskeleton Systems II

14:00 – 14:30

Impulse Talk III – Israel Benavides, Ford Europe, Germany

Scientific studies on Exoskeletons at Ford

14:30 – 15:00

Poster Presentation Session II

Session Digital Biomechanics

Prof. Massimo Sartori, University of Twente, The Netherlands

Musculoskeletal Modelling for Bio-Protective Robots

15:00 – 16:00

Prof. Dr. Michael Skipper Andersen, Aalborg Uni, Denmark

Design and analysis of exoskeletons with musculoskeletal models

Prof. Dr. Lars Fritzsche, imk automotive GmbH, Deutschland

Assessing the efficiency of exoskeletons in physical strain reduction by biomechanical simulation with AnyBody Modeling System

## DAY 3 – Thursday, October 7, 2021

Time

Activity

09:00 – 09:10

Christophe Maufroy, Ph.D., Fraunhofer IPA, Germany

Morning Greetings

9:10 – 9:40

Impulse Talk IV – Dr. Ralph Hensel-Unger, Audi AG, Germany

Occupational Exoskeletons in the Gap Between Expectations and Reality

End-User Forum I

09:40 – 10:20

Anke Richter, Weldplus, Germany & Christiane Pohlmann, SLV Nord, Germany

Support of ergonomics during welding by using augmented reality tools

10:20 – 11:00

Poster Presentation Session III

11:00 – 12:00

End-User Forum II

Dr. Petra Abele, Sozialversicherung für Landwirtschaft, Forsten und Gartenbau, Germany

12:00 – 12:50

Exoworkathlon Results

The Exoworkathlon Team, Fraunhofer IPA & Universität Stuttgart, Germany

Dr. Urs Schneider, Fraunhofer IPA, Germany

## EXOWORKATHLON

Industrial exoskeletons are fascinating new systems. They have the potential to protect against physical overload, reduce sick days, improve the quality of work and increase the satisfaction and quality of life of the workers.

The EXOWORKATHLON is intended to show the potential of industrial exoskeletons in simulated use cases and, above all, to encourage mutual exchange on this exciting topic. Different tasks with back-supporting and upper body exoskeletons are devised to collect, show and discuss data related to user feedback, ergonomics, metabolism/energy consumption and production quality.

### Tasks

For this first edition of the EXOWORKATHLON four tasks were defined.

In Task 1, manual box handling, a typical back-stressing work process from logistics, is considered. Task 2 includes various overhead assembly activities, which are particularly stressful for the upper extremities. In Task 3 is the focus on welding with the reproduction of real welding tasks in a constrained position, which can induce high stress in the upper extremities. Task 4 includes a representative group-work activity from timber construction, in which two people must assemble wooden beams and strips at overhead height.

These tasks are carried out twice by young workers (trainees and technical students) – once with and once without an exoskeleton. This enables an intra-individual anonymous evaluation of the effects of exoskeleton support, based on the different assessment and methods used for the different tasks.

### Venues

The EXOWORKATHLON will take place twice this year, once in the context of WearRAcon Europe in Stuttgart on October 5 – 6 and once in a compact format at the A+A Trade Fair in Düsseldorf on October 26 – 29. Live reports of the event will be given during the first two days of WearRAcon Europe, while the results will be presented on the third conference day.

### About the EXOWORKATHLON Team:

The Biomechatronic Systems department of the Fraunhofer Institute for Manufacturing Engineering and Automation IPA in Stuttgart has an extensive expertise in the field of ergonomic analysis of heavy physical work as well as with the evaluation and development of exoskeletons. Together with the Institute for Industrial Manufacturing and Factory Operation IFF of the University of Stuttgart and the worldwide exoskeleton association "Wearable Robotics Association", this interdisciplinary team is developing the application-oriented experiment EXOWORKATHLON with ergonomics and exoskeleton expertise.

Further information on the EXOWORKATHLON is available [here](#).

Contact [conference@wearablerobotics.com](mailto:conference@wearablerobotics.com) for more information.

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### Source

Wearable Robotics Association

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### Further information

- ▶ Fraunhofer Institut für Produktions- und Automatisierungstechnik, IPA