

# EXOWORKATHLON

October 5 – 6, 2021 in Stuttgart (WearRAcon Europe)

October 26 – 29, 2021 in Düsseldorf (A+A Trade Fair)

## Motivation

Industrial exoskeletons are fascinating new devices.

They are developed and used in order to facilitate some work functions and to prevent from musculoskeletal diseases. They may even improve the work output quality in some cases.

**EXOWORKATHLON** wants to assess, show and discuss this.

**EXOWORKATHLON** wants to focus on prevention in particular for young workers.

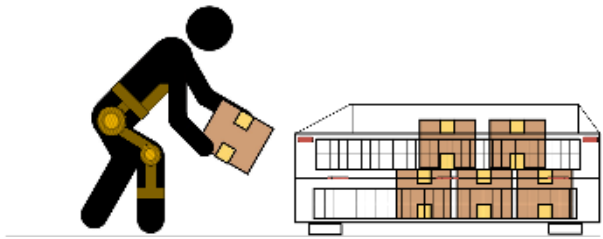
Organized by:



Sponsored by:



# Overview of the tasks



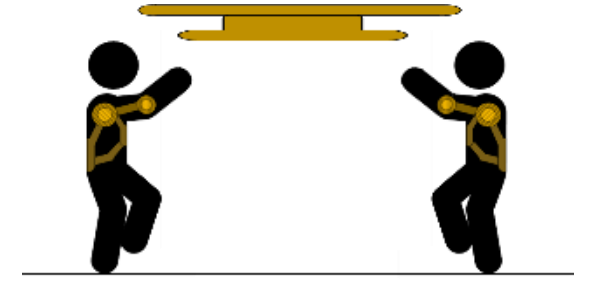
**TASK 1**  
Box handling



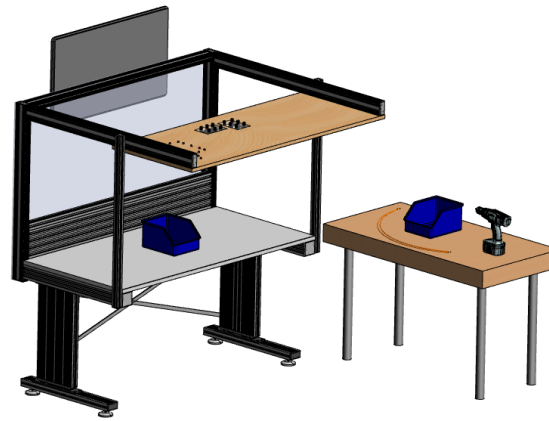
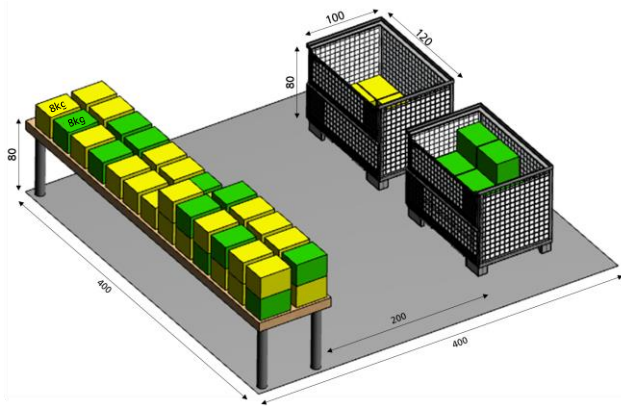
**TASK 2**  
Overhead assembly



**TASK 3**  
Welding



**TASK 4**  
Collaborative assembly



# Overview of the assessment methods

- The tasks are run twice per participant – once with and once without an exoskeleton.
- For an intra-individual anonymous comparison, the following assessment methods are used for the different tasks.



## **User feedback (T1-T4)**

(Questionnaire, Body Discomfort)



## **Quality (T2, T3)**

(duration of the activity, accuracy in task)



## **Muscle activity (T1, T2)**

(EMG of one selected muscle group)



## **Metabolic (T3)**

(Impedance cardiography)



## **Cardiovascular load (T1-T4)**

(GoX Labs Boost)

# Supporting companies & individuals

## Participating Companies

**ottobock.**

**RB 3D**

**skelex**

**German Bionic**

**HUNIC**

**LEVITATE**  
TECHNOLOGIES, INC.

**ergo**  
Santé

## Sponsors

**GoX**  
LABS

**XSENS**

**WELDPLUS**  
AUGMENTED TRAINING & SOLUTIONS

## Planning in collaboration with

Dr. Ralph Hensel-Unger, AUDI Konzern-Ergonomie,  
Dr. Sascha Wischniewski, BAUA  
Dr. Ulrich Glitsch, DGUV IFA  
Christiane Pohlmann, SLV Nord

Organized by:



Sponsored by:





# The EXOWORKATHLON Team



**Dr.med. Urs Schneider**  
Fraunhofer IPA and  
Institute IFF, University Stuttgart

Phone +49 711 970-3630  
urs.schneider@ipa.fraunhofer.de



**M.Sc. Verena Kopp**  
Fraunhofer IPA and  
Institute IFF, University Stuttgart



**M.Sc. Marco Schalk**  
Institute IFF, University Stuttgart



**Dr.-Ing. Enrique Bances P.**  
Institute IFF, University Stuttgart

**Dpt. Biomechatronic Systems (IPA):** <https://www.ipa.fraunhofer.de/en/expertise/biomechatronic-systems.html>

**Dpt. Mensch-Technik-Interaktion (IFF):** <https://www.iff.uni-stuttgart.de/forschung/mensch-technik/>

Organized by:



**University of Stuttgart**  
Institute of Industrial Manufacturing  
and Management IFF

Sponsored by:

