

AugmentX – Exoskeletons and Lift assist devices



Location: R&MM @VUB

Introduction

Description

The AugmentX infrastructure allows to assess physical augmentation solutions that enhance or augment the physical capabilities of a worker. Examples of augmentation devices include smart hoist, ergonomic tables, chairs, tools, cobots, exoskeletons and other peripherals. AugmentX provides the necessary tools to assess cognitive and physical load. It also features a portfolio of the latest human augmentation technologies for demonstrator development.

AugmentX uniquely combines a highly accurate **research lab** (@R&MM) with a **demonstration and validation lab** (@ProductionS and @ISyE) in a more realistic production setting. A large part of the measurement equipment is **mobile** for in situ measurement campaigns at companies. These devices have an appointed default location/owner:

- **AugmentX_Research Lab in Brussels** allows to assess human augmentation technologies in a controlled environment with high precision measurements. Payloads in this lab are limited to 20kg.
- **AugmentX_Validation & Demonstration Lab in Kortrijk (integrated in INFRA HEAL & INFRA FLEX)** where the human augmentation technologies can be safely but less accurately assessed and improved in a more realistic manufacturing environment.
- **AugmentX_Mobile lab:** on-site assessments of human augmentation technologies.

Scope

This document is intended as a **thematic fiche** on infrastructure of the **R&MM core lab** facility. Consequently this document only covers elements that have the R&MM facility as default location and fit in the scope “**Exoskeletons and lift assist devices**”.

This thematic fiche is part of three thematic fiches that together cover the complete R&MM infrastructure:

- AugmentX - Cognitive and Physical assessment
- AugmentX - Exoskeletons and lift assist devices
- AugmentX - Cobots and robots

For questions relating to the infrastructure presented on this fiche, please contact AugmentX@Flandersmake.be

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Exoskeletons

Overview

Exoskeletons in industrial applications not only enhance worker safety and reduce the risk of injuries but also improve overall productivity and worker comfort. These wearable devices can be customized to specific job requirements and are increasingly being adopted in various industries to address ergonomic challenges and improve the working conditions of employees.

Industrial applications of exoskeletons include :

- **Construction and Heavy Lifting:** Exoskeletons can assist construction workers and laborers by providing additional support when lifting heavy objects, reducing the risk of back injuries, and minimizing fatigue during long hours of work.
- **Manufacturing:** In manufacturing and assembly-line operations, workers often perform repetitive tasks that can lead to musculoskeletal disorders. Exoskeletons can help reduce strain on the arms and shoulders, improving worker comfort and productivity.
- **Logistics and Warehousing:** Workers in warehouses and logistics centers often engage in tasks like order picking and carrying heavy loads. Exoskeletons can make these tasks more manageable and efficient by providing support to the back and upper body.
- **Agriculture:** Farm workers who engage in activities such as planting, harvesting, and carrying heavy equipment can benefit from exoskeletons to reduce physical strain and increase efficiency.
- **Shipbuilding and Dock Work:** Shipbuilders and dockworkers frequently handle large and cumbersome materials. Exoskeletons can assist in handling heavy objects and performing tasks like welding in challenging positions.
- **Mining and Extraction:** Exoskeletons are used in mining operations to help miners carry heavy loads, especially in deep underground mines where the physical demands are substantial.
- **Maintenance and Repair:** Maintenance workers in industries like aviation, automotive, and aerospace can use exoskeletons to support their arms and reduce fatigue when working in overhead positions for extended periods.
- **Oil and Gas Industry:** In the oil and gas sector, exoskeletons can aid workers in tasks such as pipe handling, equipment maintenance, and inspections in challenging environments.

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- Electricity and Utilities: Exoskeletons can assist utility workers who need to climb poles, towers, or work at heights, improving their safety and reducing fatigue.

The following tables yield an overview of the available exoskeletons.

Brand	Model	Type	Power
Laevo	Flex	Back	Passive
Innophys	Every	Back	Passive
Paexo - Ottobock	Back	Back	Passive
Laevo	2.5	Back	Passive
Heroware	Apex	Back - Suit	Passive
German Bionics	Cray-X 4th gen	Back	Active
Auxivo	Carry Suit	Back	None
Auxivo	Lift Suit	Back - Suit	Passive
Auxivo	Omni suit	Shoulder - Back - Suit	Passive
Levitate	Airframe	Shoulder	Passive
Paexo - Ottobock	Shoulder	Shoulder	Passive
Comau	Mate	Shoulder	Passive
Ekso Bionics	Evo	Shoulder	Passive
Hilti	EXO So1	Shoulder	Passive
SkelEx	360	Shoulder	Passive
Festool	Exo Active 18V	Shoulder	Active
Hilti	T-22	Shoulder	Active
Noonee	Chairless chair	Legs	None



Laevo Flex



Innophys Every



Paexo Back



Laveo 2.5

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Hero Wear Apex



German Bionics Cray-X



Auxivo Carry Suit



Auxivo Lift Suit



Auxivo Omni Suit

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Levitate Airframe



Paexo Shoulder



Comau Mate



Ekso Bionics - Evo



SkelEx - 360



Hilti EXOS

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FLANDERS
MAKE
DRIVING INNOVATION IN MANUFACTURING



Festool - Exo Active 18V



Hilti T22



Nonnee - Chairless chair

Interested?

Contact AugmentX@flandersmake.be for more information.