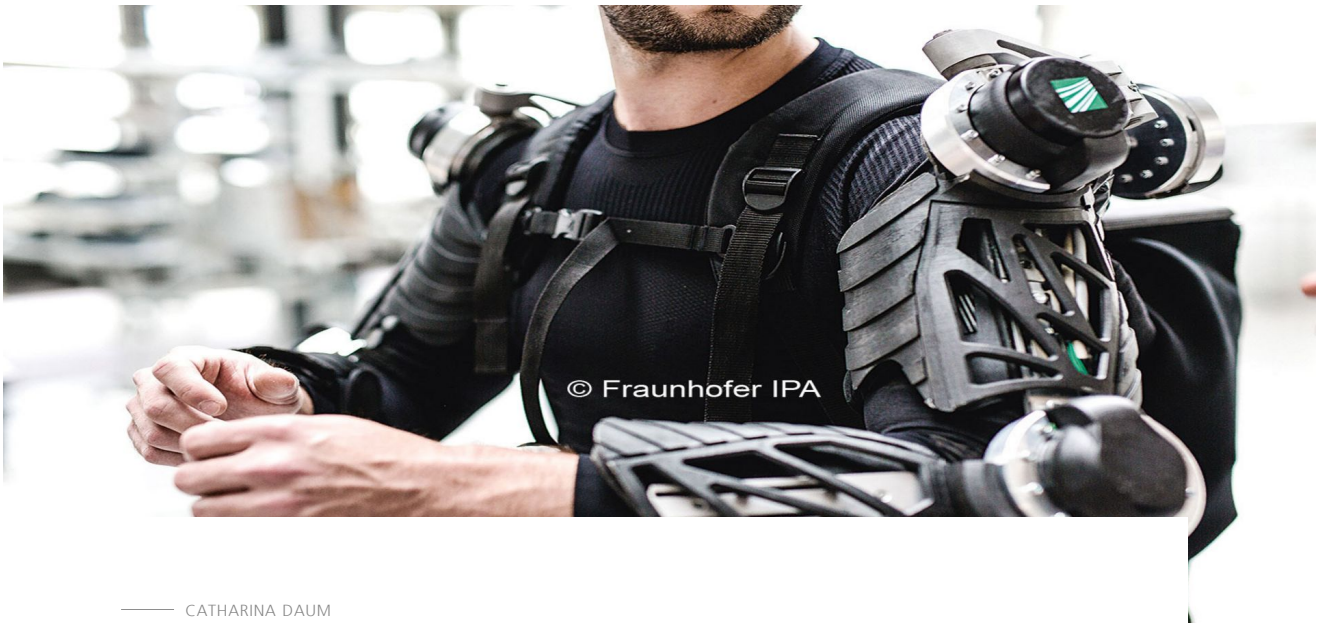


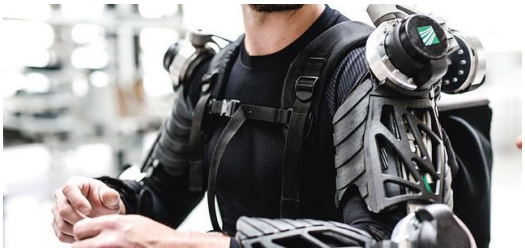
CATHARINA DAUM

The robocop of the working world

What could be more futuristic than wearing a motorized robot jacket? Although the Exo Jacket might sound like a distant dream, it is in fact an actual project of the Stuttgart-based Fraunhofer Institute for Manufacturing Engineering and Automation IPA. Dr. Urs Schneider, department head, paints a picture of the working world of the future.

In the past, people paid little attention to injuries caused by incorrect or extreme loads in the workplace. This has changed. Employers are focusing more and more on developments such as aging workforces or the increasing shortage of skilled employees. Companies are therefore keen to retain qualified employees; using state-of-the-art equipment, where necessary. Dr. Urs Schneider and his colleagues are tasked with building such equipment as well as regularly generating new ideas.

Dr. Urs Schneider, Fraunhofer IPA (Picture: Fraunhofer IPA)



The Exo Jacket might sound like a distant dream, it is in fact an actual project of the Stuttgart-based Fraunhofer Institute for Manufacturing Engineering and Automation IPA. (Picture: Ludmilla Parsyak, © Fraunhofer IPA)

How did the Exo Jacket come about, Dr. Schneider?
At our Institute, we have over 15 years of experience in the fields of orthotics, physiotherapy, prevention and human-computer interaction. Eventually, we decided to transfer this research expertise to the working world. The Fraunhofer Institute has been developing the Exo Jacket for five years now. Only about 150 people worldwide are working on exo-skeletons; with the Exo Jacket, we have made great progress compared to others. My colleagues come from the most diverse fields: electronics, mechatronics, design, medicine and more – allowing us to proceed very much on our own. During the test

phase, we rely on the feedback of our scientists and test people who report on how the jacket feels, what's working well and where improvements are needed. Their responses have been very positive – the only drawbacks are perhaps their bruises and sore spots from testing (laughs).

And what is your goal?

The primary purpose of the Exo jacket is to aid workers during heavy lifting and overhead tasks. This can be advantageous in several areas: from assembly and intralogistics to delivery services and mechanical engineering. We have been receiving two requests a day on average from prospective buyers around the world. Even private individuals want to know if the Exo Jacket can help them with everyday tasks such as shopping or gardening.

You call the Exo Jacket "a wearable e-bike." What makes you compare the two?

It's really quite simple: the Exo Jacket lightens your load, making you quicker, but still leaving you with work to do. It provides up to 50 percent of auxiliary strength for employees, supplying additional energy through drive modules at the elbows and shoulders whenever necessitated by circumstances. People can also use the Exo Jacket without the motors. In addition, joint chains on the shoulders and a back module that mimics our spinal column offer passive support while allowing all these body parts to move freely.

6.9 million people worldwide suffer serious occupational injuries every year. The resultant production losses in Germany alone cost employers 13 billion euros every year. To what extent can the Exo Jacket help reduce these figures?

Motorized support can definitely help with these problems. An exhausted employee is automatically less cautious; the Exo Jacket makes work less tiring and reduces the risk of injury. The additional energy it provides can reduce peak loads. A lighter workload helps muscles and joints, which in turn reduces aches and pains – leading to a better quality of life.

Can people use the Exo Jacket today?

The second-generation prototype is undergoing CE certification by the German Technical Inspection Association, also known by its German acronym TÜV. The jacket is made of plastic parts, special non-flammable batteries, electric motors and a measurement computer on the back for ideal monitoring of results. It currently weighs 14 kilos, which is naturally far too heavy. Our goal is 8 kilos, with the bulk of the weight on the pelvis and torso. This will help alleviate the load on shoulders. We are still in the prototype phase, however, but hope to begin selling a commercial version about a year and a half to two years from now.

Are such load-reducing aids for employees necessary in times of automation and Industry 4.0?

Absolutely! Even if the degree of automation in production and assembly is on the rise, the employee continues to play a pivotal role. In customized products, for instance, where it is not worth the effort to program machines and robots. Or maintenance and repair work that only specially trained technicians can do. The list goes on. One thing is certain: reducing an employee's bodily burden is key, which is precisely why we decided to develop the Exo Jacket.

CATHARINA DAUM
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