A suit-X trio designed to support workers: Meet MAX

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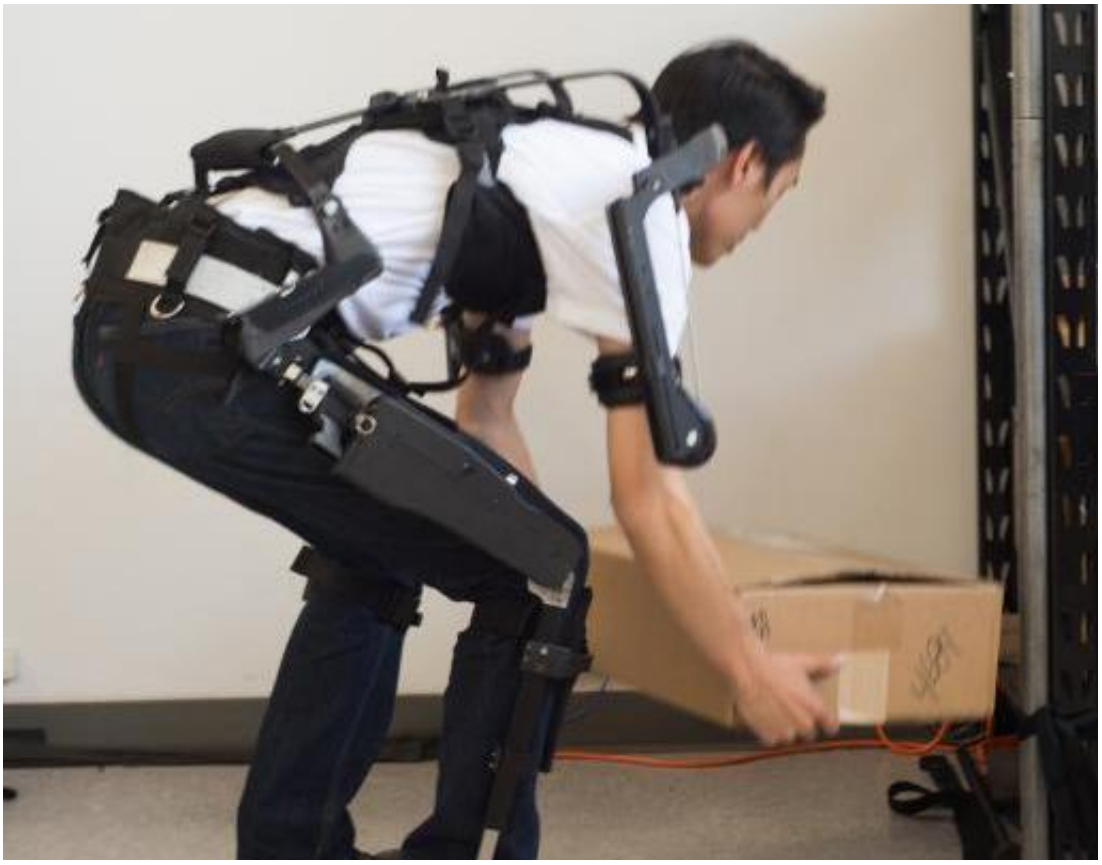

(Tech Xplore)—Not all of us park our bodies in a chair in the morning and cross our legs to do our work. In fact, just think of vast numbers of workers doing physically demanding or just physically repetitive tasks

including bending and lifting.

Workers on construction sites, factories and warehouses might cope with aches and pains brought on by their work. Hopefully, the future will provide an easy answer for workers to suit up in a suitable way for them to avoid these aches and pain.

There is a new kid on the block aiming to address such a solution, and a number of tech watchers have put them in the news this month. A California-based group aptly called suit-X announced its MAX, which stands for Modular Agile Exoskeleton. The company designs and makes exoskeletons.

"MAX is designed to support workers during the repetitive tasks that most frequently cause injury," said a company release.

Will Knight in *MIT Technology Review* said that this essentially is " a trio of devices that use robotic technologies to enhance the abilities of able-bodied workers and prevent common workplace injuries."

Target users, for example, could include those who carry out ceiling inspections, welding, installations and repairs. "It's not only lifting 75 pounds that can hurt your back; it is also lifting 20 pounds repeatedly throughout the day that will lead to injury," said Dr. Homayoon Kazerooni, founder and CEO, suitX."The MAX solution is designed for unstructured workplaces where no robot can work as efficiently as a human worker. Our goal is to augment and support workers who perform demanding and repetitive tasks in unstructured workplaces in order to prevent and reduce injuries."

Seeker referred to the MAX system as an exoskeleton device that could potentially change the way millions of people work.

Credit: suitx

Seeker noted its advantages as workplace exoskeletons in several ways, being lightweight such that the user can walk around unimpeded. "The exoskeleton units kick in only when you need them, and they don't require any external power source."

MAX is a product with three modules. You use them independently or in combination, depending on work needs. The three modules are backX, shoulderX, and legX.

According to the company, "All modules intelligently engage when you

need them, and don't impede you otherwise."

The backX (lower back) reduces forces and torques.

The shoulderX reduces forces; it "enables the wearer to perform chest-to-ceiling level tasks for longer periods of time." In a video the company defines shoulderX as "an industrial arm exoskeleton that augments its wearer by reducing gravity-induced forces at the shoulder complex."

The legX was designed to support knee joint and quadriceps. It incorporates microcomputers in each leg. They communicate with each other to determine if the person is walking, bending, or taking the stairs." *Seeker* said these communicate via Bluetooth, monitoring spacing and position.

Credit: suitx

Kazerooni spoke about his company and its mission, in *Seeker*. "My job is easy. I sit in front of a computer. But these guys work all day long, put their bodies through abuse. We can use bionics to help them." He also said he and his team did not create this "because of science fiction movies. We were responding to numbers from the Department of Labor, which said that back, knee and shoulder injuries are the most common form of injuries among workers."

Will Knight meanwhile has reflected on the bigger picture in exoskeleton developments. Can they help in preventing injury on the job and help prolong workers' careers? "New materials, novel mechanical designs, and cheaper actuators and motors have enabled a new generation of cheaper, more lightweight exoskeletons to emerge in recent years," he wrote. "For instance, research groups at Harvard and SRI are developing systems that are passive and use soft, lightweight materials."

Some companies, such as BMW, said Knight, have been experimenting with exoskeletons. "The MAX is another (bionic) step toward an augmented future of work."

More information: www.suitx.com/max-modular-agile-exoskeleton