Space engineers are building robotic suit for soldiers, workers

2018-08-18

By ZHAO LEI |   
 China Daily |  
 Updated: 2018-08-18 04:25

Many people were deeply impressed by the powered metal suit worn by Tom Cruise in the film Edge of Tomorrow. Though real-world technologies are still far from enabling such advanced machines, engineers are moving in that direction.  
Chinese engineers from multiple institutes have developed several types of anthropomorphic wearable robots, popularly known as powered exoskeletons, and have been testing them.  
Among these endeavors, engineers from the Beijing Institute of Precision Mechatronics and Controls, part of the China Academy of Launch Vehicle Technology, seem to be ahead of others, since they can mass-produce their products as soon as the first contract is inked.  
Yu Zhiyun, a senior researcher at the institute, told China Daily on Friday on the sidelines of the ongoing 2018 World Robot Conference in Beijing that his team has used its expertise gained in the research and development of carrier rocket equipment to build an advanced powered exoskeleton.  
"An exoskeleton's key components are electric motors, actuators, transmission devices and servo systems, and we are good at these machines because they are also heavily used in carrier rockets," he said. "In addition, the power management and movement control mechanisms in an exoskeleton are similar to those on a rocket."  
The modular robotic suit designed by the institute has two parts — arms and legs — and each can be operated independently.  
When they are combined, the 39-kilogram exoskeleton can enable the wearer to carry as much as 50 kg of gear, ammunition or supplies and walk three hours at a speed of 4 kilometers per hour — the normal walking speed of an adult without a heavy load. The robotic suit is very flexible and nimble — wearers are able to squat, kneel, climb stairs and slopes or even execute a side kick, Yu said.  
It can be used in military and civilian fields alike, according to the designer.  
"The suit can help soldiers carry heavy weapons and equipment when they fulfill tasks on a plateau or mountainous region where transport vehicles have trouble traveling. It can also assist artillerymen when they load heavy shells into their guns," he said. "In civilian sectors, it can be useful to firefighters in search and rescue operations, porters at train stations and airports, as well as sorters in delivery companies, greatly reducing their workloads and helping to protect their health."  
Yu said the institute intends to promote the exoskeleton first to factories of the China Academy of Launch Vehicle Technology, since their workers often need to carry and install heavy components on a rocket.  
The 707th Institute of China Shipbuilding Industry Corp and the Northwest Institute of Mechanical and Electrical Engineering of China North Industries Group Corp have also built powered exoskeletons, aiming at military users.  
Yu said that compared with other domestic models, his type features a simpler structure and fewer parts and is easier to maintain because it adopts electromechanical devices to assist the exoskeleton's movement, as opposed to the hydraulic apparatus commonly used.

http://www.chinadaily.com.cn/a/201808/18/WS5b772f54a310add14f386712.html