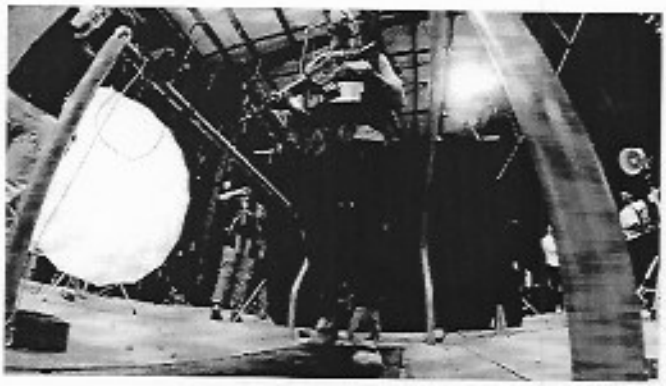
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Soldiers crossing with Soft Exosuit tech to lighten fatigue

23 September 2015, by Nancy Owano



The Defense Advanced Research Projects Agency (DARPA) is testing exoskeletons on real soldiers. Deep in the woods in Maryland, reports *IEEE Spectrum*, the U.S Army Research Laboratory (ARL) at Aberdeen Proving Ground in Maryland has been testing their performance.

Soldiers wear the prototype underneath their battle gear; they hike a three-mile course, Evan Ackerman in *IEEE Spectrum* described the surfaces they cross as roadways and moderately rugged wooded terrain.

The suit, in brief, could lighten soldier's load. The goal has been to help alleviate muscle strain and energy expenditure during their tasks, so that they are better prepared for other tasks during missions.

The *IEEE Spectrum* video shows them in testing phase. The evaluators are watching out for stride lengths and frequency, muscle activity and energy expenditure.

They are seeking answers to questions such as Does it really cut energy expenditure? Does it help the soldier to walk faster?

Ackerman said it is a system of powered cables, adding carefully timed pulling forces to natural movements so that the user's muscles expend less energy.

The system comes from Harvard University's Wyss Institute for Biologically Inspired Engineering, and it was developed under a contract from DARPA. The Wyss team announced the DARPA contract in September last year, referring to the device as the Soft Exosuit.

A key word on their development agenda has been comfort, to keep a soldier's fatigue and injury risks at bay.

The Wyss researchers would be the first to acknowledge that theirs is not the first exoskeleton structure. They what they tried to improve: the suits have been typically connected at a few locations on the body using straps or belts and using motors or elastic materials to assist with joint movements. "However," they said, "exoskeletons often fail to allow the wearer to perform his or her natural joint movements, are generally heavy, and can hence cause fatigue."

Instead, the Wyss researchers turned to a "soft" solution that is composed primarily of specially designed fabrics, lighter than other exoskeletons. They call their solution an exosuit. The goal has been to come up with a suit with minimal restrictions to the wearer's motions, in turn avoiding problems relating to joint misalignment.

"Exosuits," they said, "exemplify a new class of applications for soft robotics, an emerging field that combines classical robotic design and control principles with active soft materials."

They said Soft Exosuit technology involves new forms of functional textiles, flexible power systems, soft sensors, and control strategies for seamless human-machine interaction.

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