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Sensors create minimum load for wearer

LEGS, from Local 1

braces are attached to a modified pair of Army boots and are also connected, although less rigidly, to the user's legs.

More than 40 sensors and hydraulic mechanisms function like a human nervous system, constantly calculating how to distribute the weight being borne and create a minimal load for the wearer.

"There is no joystick, no keyboard, no push button to drive the device," says Kazerooni, a professor of mechanical engineering. "The pilot becomes an integral part of the exoskeleton."

In lab experiments, says Kazerooni, testers have walked around in the 100-pound exoskeleton plus a 70-pound backpack and felt as if they were carrying just five pounds.

Eventually, the device could help rescuers haul heavy equipment up high-rise buildings or turn tired troops into striding super soldiers.

What it won't do is turn you into a Borg, one of the gadget-happy gladiators of "Star Trek" fame.

"The exoskeleton is not going to magically transform people into killing machines," says Kazerooni, a professor of mechanical engineering. "They're really good, it turns out, at enabling firefighters, soldiers, post-disaster rescue crews to carry heavy loads over great distances for hours."

Video of the BLEEX in action can be viewed at <http://www.me.berkeley.edu/hel/bleex.htm>
 The next step for the BLEEX team is making the power source quieter and stronger and miniaturizing components.

BLEEX is funded by the Defense Advanced Research Projects Agency, the Pentagon research and development arm, and was among the projects being showcased at a DARPA tech symposium this week in Anaheim.

The project is one of scores in the field of robotics, which ranges from industrial machines that assemble cars to orthotics -- surgical devices that activate or supplement weakened

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limbs or functions.

Excitement about robotics was fanned by this week's DARPA-sponsored Mojave Desert race for fully autonomous vehicles, and the field is making strides worldwide.

In Japan, a leader in robot research, Sony Corp. has developed a child-shaped walking robot, known as Qrio, and Honda Motor Co. has also developed a walking, talking humanoid robot. This spring, some Japanese companies plan to start marketing a "robot suit," a motorized, battery-operated device intended to help old and infirm people move around.

The current favorite in the DARPA race came out of Carnegie Mellon University, where professor Matthew Mason is working on intelligent robots including the Mobipulator, which uses its wheels to move things as well as locomotion.

"There's just too much to do," says Mason. "Every time that there is an advance in computing, there are just so many more Kazerooni isn't offering test drives of the exoskeleton. But if he were, Mason would be interested.

It looks really exciting, Mason said. I'd like to try it on myself.

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