Researchers roll out strap-on robotic legs

Device lightens load for soldiers, firefighters

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BERKELEY, Calif.—Moveover Bionic Man and make room for BLEEX—the Berkeley Lower Extremities Exoskeleton, with strap-on robotic legs designed to turn an ordinary human into a super soldier.

Ultimately intended to help people like soldiers or firefighters carry heavy loads for long distances, these bots are made for marching.

"The design of this exoskeleton really benefits from human intellect and the strength of the machine," says Homayoon Kazerooni, who directs the Robotics and Human Engineering Laboratory at the University of California, Berkeley.

The exoskeleton consists of a pair of mechanical metal leg braces that include a power unit and a backpack like frame. The 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 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, test subjects 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 troopers into walking super soldiers.

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

"The exoskeleton is not going to magically transform people into killing machines," says Kazerooni, known to his students as Professor Ron. "They're really good, it turns out, at enabling firefighters, soldiers, post-disaster rescue crews to carry heavy loads over great distances for hours."

So, no cyborg cops. But at least you get Terminator legs.

Video of the BLEEX in action, which can be viewed at http://www.ee.berkeley.edu/bleex.html, shows a steel-spiked symbolis of man and machine, marching about to the techno-industrial drone of grinding motors.

The next step for the BLEEX team is making the power source quieter and stronger and miniaturizing components.