

Research To Help Wounded Vets

Combined effort between Holliston company, WPI to improve technology for prosthetic limbs

By Eileen Kennedy
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Liberating Technologies Inc. President William Hanscom works on a prosthetic arm at the company's Holliston facility.

Liberating Technologies, a Holliston-based medical device company, has paired up with researchers at Worcester Polytechnic Institute to develop better, more life-like prosthetic limbs for injured veterans returning from war.

Liberating Technologies Inc. of Holliston and the university will conduct their individual research and in some cases they will share their expertise.

"I think there has been a lot more focus on research of this kind over the last 10 years. I do think a lot of it is due to the current war. The advanced medical technology available today means that it will help research and development of lower and upper limb prosthetics for active military personnel," said William Hanscom, president of Liberating Technologies. Eventually the research that is used for soldiers will be available for the general population, he said.

Creative Collaboration

The Holliston company recently received the last portion of a \$5 million grant, which it shares with Foster-Miller Inc. of Waltham and Innersea Technologies of Bedford. The grant was through federal funds earmarked in a defense appropriations bill as part of a budget package.

WPI's \$860,000 grant to do this work comes from the U.S. Army's Military Amputee Research Program of the Telemedicine and Advanced Technology Research Center. It also received another \$150,000 from the Westborough-based John Adams Innovation Institute to develop marketing and business development for the center and to help stage a national neuroprosthetics conference at the school this year.

Ted Clancy, associate professor of electrical and computer engineering, leads the lab that will study the electrical signals that control normal activity in limbs, and then to apply that knowledge to make prosthetics with better control.

One of the biggest problems in prosthetics is creating a limb that can do several tasks simultaneously, such as moving it forward or backward and grabbing an object at the same time. Both Hanscom and Clancy hope to improve upon what already exists.

Clancy and Hanscom have shared ideas, and some WPI seniors will work at Liberating Technologies in the fall as part of their senior project. They also unsuccessfully applied for a grant together, but were successful in getting other, separate grants.



A prosthetic hand made by Liberating Technologies in Holliston.

"They have ideas and we have ideas, we all bring our knowledge to the table," Clancy said.

"It's tremendously helpful to be able to talk to those at Liberating Technologies because they are looking at the whole field (of prosthetics) while I might be looking more at rehabilitation or span into clinical studies. They help ground the work and help us continue to focus on what's important to look at."

The artificial arms and hands Liberating Technologies makes are already fairly sophisticated. They use microprocessors to pick up electrical signals from nerves and muscles to move its arms and hands. It develops its own shoulder joints, wrists, elbows and some hands, while using some hands from a U.K. company.

In some cases, patients can think of how they want to move their arm or hand, and the nerves, using certain muscles as connections, can send the proper signal to the prosthetic. Since it uses microprocessors, the limbs can be customized by tweaking the software, Hanscom said.

"It's more than just the limb itself. We develop the signal acquisition technology, batteries, chargers, cosmetic covers," he said. The company contracts out the manufacturing of many components, but assembles the finished product in house because so many are customized.

Hanscom and Clancy were former colleagues at Liberty Mutual, which had a Research Center for Safety and Health.

As the one of the largest carriers of workman's compensation insurance, the company created a center for research and development of prosthetics to get people back to work. Eventually, Liberty Mutual chose to sell the group, which led Hanscom and other managers to buy it and create Liberating Technologies in 2000. Hanscom is also a WPI graduate.