

# Ideas on the Edge



## No More Oranges

ADDING THE DIMENSION OF TOUCH TO COMPUTER SIMULATION WILL REVOLUTIONIZE TRAINING, FROM NURSING TO BOMB DISPOSAL.

For generations, the humble orange has been a stand-in for the human arm as nurses learned how to give injections.

But an emerging branch of computer technology now offers a more realistic and useful learning experience.

The orange is being replaced by a system that combines a computer, a special monitor-and-mirror combination,

and something that looks and feels like the handle of a syringe. As students look into the monitor and operate the syringe, they see the needle enter a human arm and “feel” the resistance of skin and underlying tissue. The key to the experience is the “haptic” device—from the Greek word for “touch”—connected to the syringe handle. The device, driven by tiny motors and controlled by sophisticated software, provides the tactile feedback.

When the students have completed the “injection,” the system analyzes their performance in terms of angle and pressure, and provides suggestions for improvement.

Such medical simulations are among

**RESEARCH THAT MATTERS**  
REAL-WORLD BENEFITS FOR ONTARIANS:

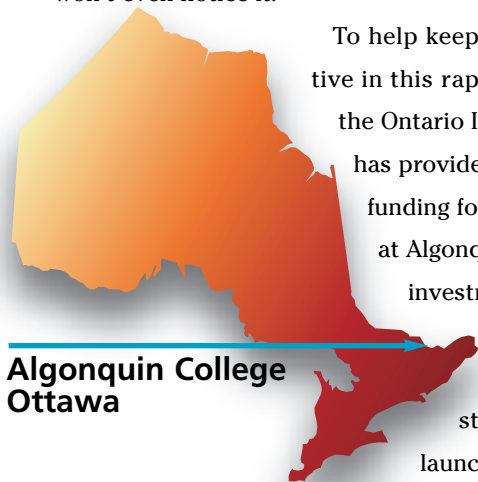
- high quality education and experience for programmers
- jobs and prosperity through spin-off companies

**HAPTICS TECHNOLOGY  
CAN GIVE SURGEONS A  
HANDS-ON ORIENTATION  
TO NEW TECHNIQUES—EVEN  
IN REMOTE LOCATIONS.**

the applications being explored by Dr. Jack Treuhaft of Algonquin College in Ottawa. He and his colleagues have developed a surgical training station that can

be used to give doctors a hands-on orientation to new techniques—even in remote locations. And haptic technology is also well-suited to training personnel in the handling of hazardous materials or objects. “Basically,” explains Dr. Treuhaft, “haptics can be used anywhere it’s really good to learn what you’re doing before you actually get in there!”

But it’s probably in the area of controls that the technology will see its broadest application. The global explosion in interactive entertainment will demand the development of increasingly sophisticated devices. And haptics will play an increasing role in all kinds of controls. One car manufacturer already uses haptic feedback for its climate control system. “It’s one of those technologies that’s going to get buried in a number of things and we won’t even notice it.”



To help keep Ontario competitive in this rapidly-evolving field, the Ontario Innovation Trust has provided significant funding for haptics hardware at Algonquin College. The investment is paying off already. One of Dr. Treuhaft’s students will soon launch his own haptics

company. And the college’s program is equipping a new generation of programmers with highly-valued skills and experience. “Haptics is very demanding from a programming point of view,” explains Dr. Treuhaft. “We’re seeing students get hired because they’ve had experience with this technology here at Algonquin.”

### Putting the D into R&D

Jack Treuhaft retires this year after a long and distinguished career. Asked about the importance of research, he shared some important insights, especially about the role of colleges...

“We have to keep in mind that there are different kinds of research. Of course, there’s fundamental research over long periods, and mid-term efforts being pursued by universities and some large companies, say in a three- to five-year time frame. But there’s also the need to take existing knowledge and turn it fairly quickly into new products and new ideas—putting the “D” into R&D. That’s really the role that I think the colleges can play.”

To that end, Algonquin has been partnering with an Ontario company, Handshake VR, to help them develop software for programming haptics devices. The college’s participation also played an important role in Handshake’s successful efforts to obtain venture capital funding.

**Project:** Hi Fidelity Hapto-Visual Research Centre  
**Institution:** Algonquin College  
**Research Discipline:** Engineering/Information Technology  
**Principal Investigator:** Jack Treuhaft  
**Trust Investment:** \$152,247  
**Total research investment from all sources:** \$381,437



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### Infrastructure for Innovation About the Ontario Innovation Trust

The Ontario Innovation Trust was created in 1999 by the Government of Ontario to invest in research equipment and facilities at Ontario’s universities, colleges, hospitals and other non-profit research institutions. The Trust is governed by a volunteer Board of Directors, according to the terms of a Trust agreement established by the Ontario government. A small permanent staff looks after day-to-day operations.

Since its inception, the Trust has committed almost \$843 million to strengthen Ontario’s position in the global marketplace of ideas. This represents more than a third of the \$2.44 billion in total funding that has been invested in Trust-supported projects.