ENGINEERING SERVICES INC.

Toronto entrepreneur sees his robotic-prototypes company thrive in era of space missions and technological breakthroughs

BY SANDRA GUY

AT A GLANCE

LOCATION:
TORONTO, ON

FOUNDED:
1982

EMPLOYEES:
20+

AREA OF SPECIALTY:
ROBOTIC-PROTOTYPE MANUFACTURING

DR. ANDREW GOLDENBERG, A NATIVE OF BUCHAREST, Romania, took to his home country's serious study of mathematics and physics and found himself drawn to the most challenging field of the late 1960s: electronics.

"The most challenging aspect of engineering in the late 1960s was electronics; I was attracted to the challenge of that study," recalls Goldenberg, who serves as a professor for three departments at the University of Toronto and as founder and president of his own company, Engineering Services Inc. At the university, he teaches and researches mechanical, industrial, computer, electrical, biomaterial, and biomedical engineering.

Founder and president Dr. Andrew Goldenberg.

Goldenberg, who immigrated to Israel with his family when he was 16, attended the best schools in his field including Technion, the Israeli Institute of Technology. He earned his bachelor's of applied science in electrical engineering and his master's in electrical engineering with a specialty in control systems. He received his PhD in control systems from the University of Toronto in 1976.

Yet his biggest insights occurred in 1975 when he joined an elite team of engineers from a variety of disciplines to work on developing technology that became the robotic arm of the space shuttle. "It's the arm on which the astronauts sometimes are riding outside of the shuttle, or which is used to grab satellites or to do repairs underneath the shuttle," says Goldenberg, who worked for SPAR Aerospace Ltd. while he served on the team that conducted research on behalf of NASA and the National Research Council of Canada.

Because the team comprised software engineers, electrical engineers, aerospace engineers, mechanical engineers, and others, Goldenberg recognized the value of engineers from varying disciplines working together. "It was unusual at that time for the disciplines to work together," he says. The experience also made the young PhD realize that he didn't know everything.

Goldenberg reluctantly agreed to move into what he considered the theoretical domain when the University of Toronto asked him to teach and research there in 1981. Goldenberg gained a valuable concession: he hired professional engineers to staff his lab. He supervised th0em on projects conducted for, and paid by, private companies. The research was not for profit because it was done under the university's aegis, and it enabled the private companies to use robotics systems to resolve inefficiencies and conduct tasks more proficiently. "We worked with IBM Canada to develop robotic machines with high accuracy that made printed circuit boards for computers," Goldenberg says.

The entrepreneurial experience led Goldenberg to start his own company, Engineering Services Inc., 28 years ago. The company specializes in making robotics prototypes and products to enable companies and government agencies, ranging from IBM to hospitals and universities to the Canadian Space Agency, to advance their technological

expertise, whether to increase efficiency, perform more exact surgeries, or to explore Mars.

Engineering Services develops technology and products and then sells the rights to the technology to a larger entity that can handle the manufacturing, marketing, sales, and service aspects. At one time, the company had 54 full-time employees. However, this number fluctuates as the company sells rights to the technology. "We are a prototypes maker," Goldenberg explains. "We sell parts of the company or lines of products that provide revenue to enhance our operations so that we continue to grow the business."

For example, Engineering Services sold its laboratory robotics operations nine years ago to VIRTEK Vision International Ltd., which in turn sold it to Bio-Rad Laboratories.

Engineering Services' latest success is its December 2009 award of two multimillion-dollar contracts with the Canadian Space Agency (CSA). The company was hired by CSA to create tools and vehicles that will ultimately explore the moon and Mars. "The first batch of instruments and equipment will be used to train the scientists/operators/astronauts on Mars-like environments," Goldenberg says. "Our equipment is designed to be the prototype so that we learn how to do the operations and determine the kind of equipment that will be needed [for Mars and lunar explorations in the future]." The resultant equipment will explore and bring back objects from Mars and the moon.

Engineering Services also is working on developing robotic technologies that would enable surgeons to operate remotely and more precisely on prostate-cancer patients while the patient remains in an MRI machine, as well as technology that would shrink the size of equipment used in medical, chemical, and biotech labs in order to more deeply analyze human tissue and elements of chemical composition.

On the defence front, the company is working to develop mobile platforms that would enable police and the military to improve explosive-ordnance disposal and more accurately find and detonate improvised explosive devices, which have constantly plagued anti-terrorism forces serving in Iraq and Afghanistan.

Goldenberg even sees his company's products eventually coming into the lives of everyday people. "I believe that robotics will become, in the near future, an integral part of human life for day-to-day activities, much like PCs and cell phones," Goldenberg says. "As a business, we are gearing up for that opportunity. It will require inspiration, vision, specialized human resources, and new technology significantly more advanced than that available today." CEQ

Mobile robot for explosive-ordnance disposal (EOD).

Engineering Services Inc.

Our business is 'Robotics and Automation'

The technologies developed by ESI are used in the following industrial sectors:

Law enforcement
Medical surgery
Nuclear industry
Space industry
Military, security and defense
Biotechnology laboratory automation
Power utilities
Manufacturing

Some of ESI's projects are listed below:

Handling and neutralizing explosives and ordnance
Surveillance and reconnaissance with mobile platforms
Software for anti-terror blast modeling and assessment
Entering hazardous sites through remote operation
Dispensing DNA and bacteria in biotechnology applications
Repairing of live underground gas pipes
Automatic protection of jet fighter pilots
Locating underground anti-personnel and vehicle mines
Remote MRI-guided surgery
Design of modular and reconfigurable robot arms

890 Yonge Street, Unit #800
Ph: (416) 595-5519
www.esit.com

Toronto, ON M4W 3P4
Fa: (416) 595-9994
info@esit.com