

# TORONTO MEETS EILAT @ TECHNION ROBOTICS WORKSHOP

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By Amanda Jaffe-Katz

Rabbi Lee Buckman, head of Tanenbaum Community Hebrew Academy of Toronto (TanenbaumCHAT Jewish High School), led a group of 13 students in November 2015 who had just started learning robotics this school year, to get hands-on practice and advanced knowledge at Technion. The group teamed up with 12 Israeli pupils from Goldwater High School in Eilat, and participated in a 3-day experiential learning workshop on "Robotic Models in Science and Engineering" spearheaded by Prof. Igor Verner at Technion, and at MadaTech – the Israel national Museum of Science, Technology, and Space, where they also engaged with a humanoid robot.

One group, taught by Dr Dan Cuperman at the Center for Robotics and Digital Technology Education in the Faculty of Education in Science and Technology, worked on designing, constructing, and programming robots that model biological systems. To this end, they studied snake robot locomotion.

A second group practiced spatial ability with robots in the Robotics and Computer Integrated Manufacturing

Lab in the Davidson Faculty of Industrial Engineering and Management. Instructed by lab engineer Sergei Gamer, the students learned to visualize and program rotation of a numbered cube to fit a puzzle board.

Verner said that spatial ability represents a huge barrier for many, including Technion novice students of engineering. He devised a way to teach this skill via robotics that leads to an improvement of many percentage points in students' measured spatial ability.

The method, using the principles of CDIO (Conceive, Design, Implement, Operate), serves as a bridge between theory and practice. Building on the educational opportunities afforded by human-in-the-loop robotics, Verner's team focused the learning of novice students to help them understand the principles of robot operation, foster spatial skills, and raise awareness of their importance in industrial robotics.

Canadian participants Jacob Beallor and Adam Gropper said that they enjoyed the workshop. Beallor added that

the experience enabled him to perform hands-on testing of whether he wants to study engineering at university.

The delegations were accompanied by teachers and interns, who described the Israel experience as "enriching and educational for the kids."



(Pictured above and below) High school participants learn spatial ability with robots in the Robotics and Computer Integrated Manufacturing Lab in the Davidson Faculty of Industrial Engineering and Management.



## A Day in the Life of StudentTechnion

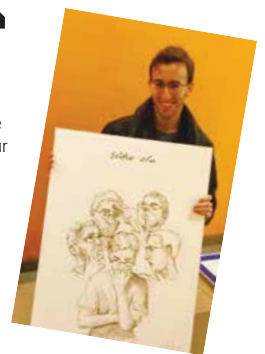
The "StudentTechnion" series began spontaneously as a visual diary of the events and challenges that accompany Technion studies, seen through the eyes of Yuval Pnueli – a second-year undergraduate student of Mathematics and Computer Science and a participant in the Technion's Program for Excellence – the Rothschild Scholars Program. The 18 illustrations of the StudentTechnion exhibition, curated by Anat Har-Gil, are currently on display in the Ullmann Teaching Center.

Pnueli, 24, believes that even though the pictures are drawn from his own personal experience, any student or alumnus can identify with them.

Pnueli also draws in pastels and acrylics, but pen and pencil are his favorite tools. "The beauty of sketching is the ability to quickly capture the essence of a person, an animal, or a place," he says. "The sketch need not

be as realistic as a photograph, but should capture the essence of your interest and convey your feelings as an artist."

Many renowned scholars and success stories have emerged from the Excellence Program. Most recently, Noa Gantz won second place in the David Azrieli Prize competition for projects by Israeli architecture students for her work, "Minus 400: Rethinking the meeting between man and the environment at the Dead Sea."



Yuval Pnueli, second-year undergraduate student of Mathematics and Computer Science, participant in the Rothschild Scholars Program, and caricaturist.

