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STEM Presentation





We can not teach like in the past



Students do not see the connection between the subjects that are taught to them.

They have no idea when they are going to use this material, if at all.

Teachers teach according to a curriculum and do not necessarily know answers.

Children are born in to the computer world



The world today is a world of embedded computer systems.

We find them in

media systems

watches

phones

remote control

precise agriculture

Sensors

automotive systems

autonomic cars

drones

mobile robots

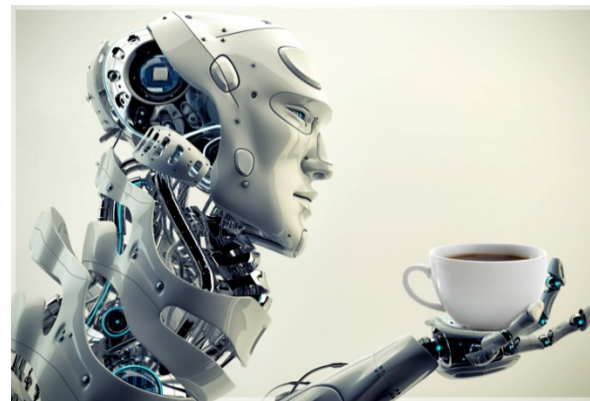
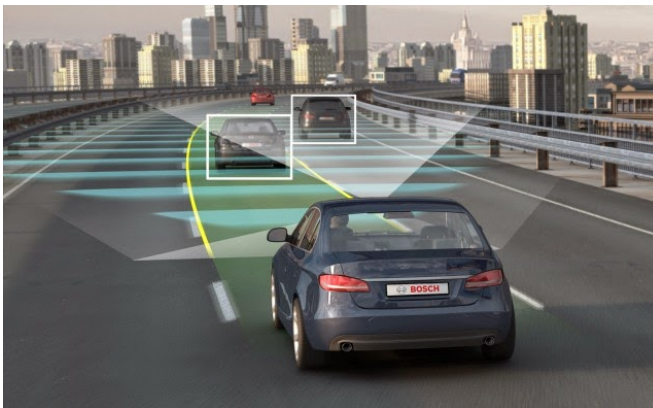
druid robots

and many more



A few years ago we could not understand terms such as:

'wearable computers' or the 'internet of thing' **WEARABLE TECH**



Everyday a new surprising product or application appears and months later we cannot imagine how we lived without it.

Our world is one of **innovation and **creativity**.**



The economy of a country, the earning capacity of its people, is largely dependent on these capabilities.

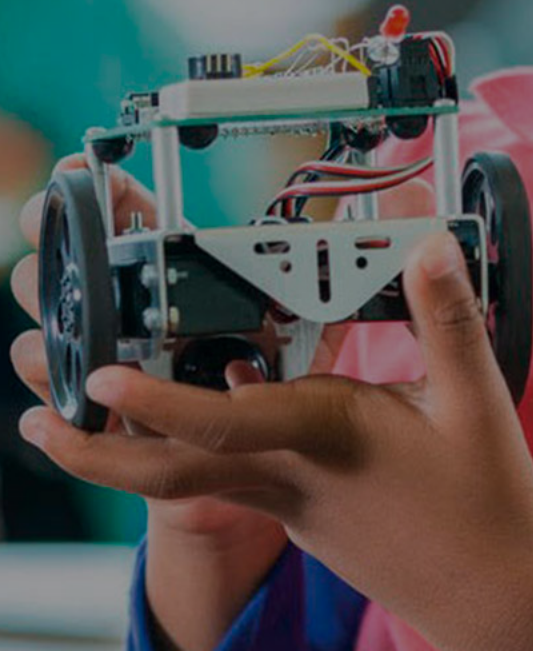
The real challenge of the educational system is how to train students to be part of this world.

So, where to go?



STEM

Science, **T**echnology,
Engineering and **M**athematics



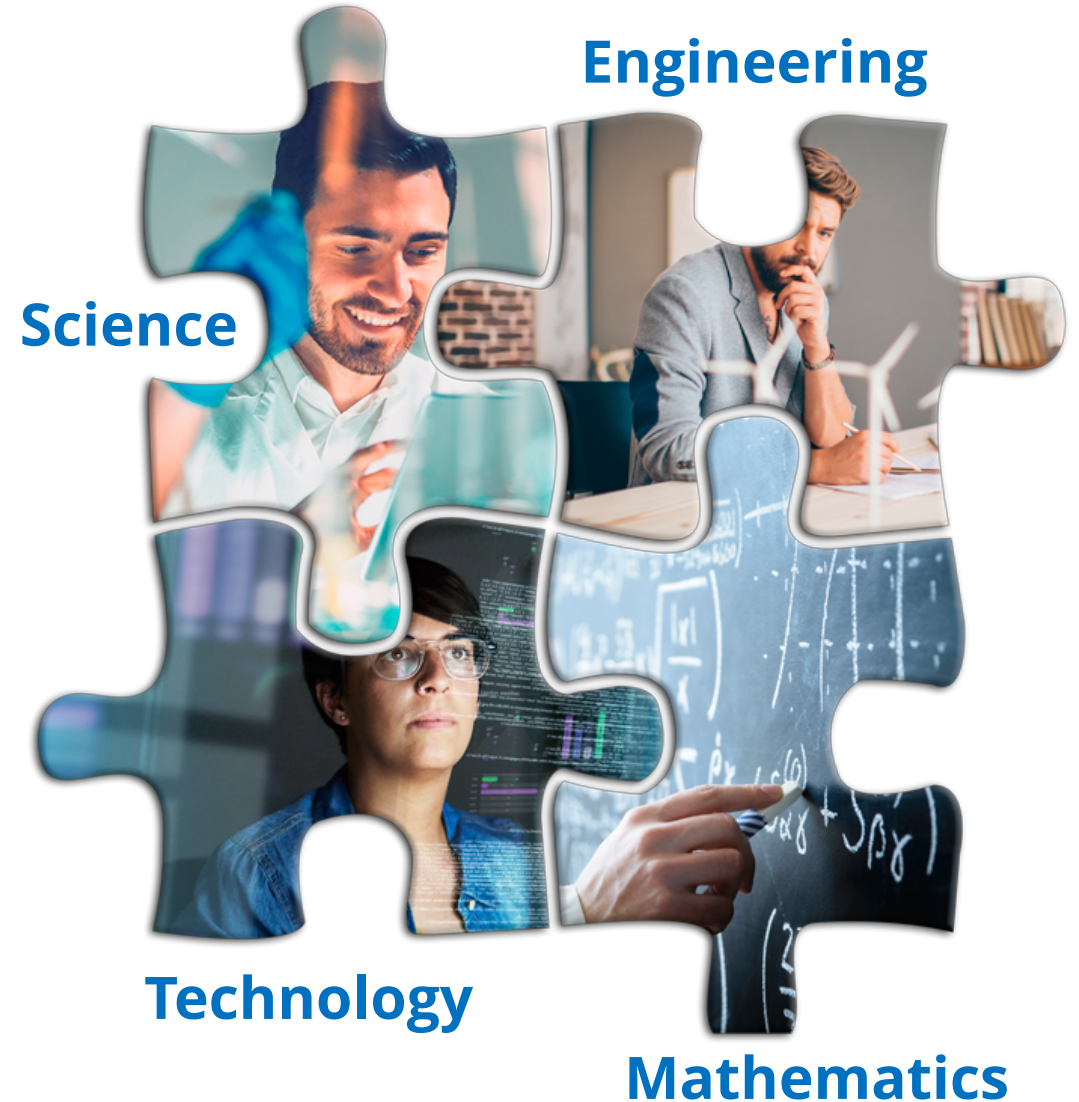
What is STEM?

Science, Technology, Engineering, Mathematics

The integration of these fields using experiments is how to prepare students for present and future work/careers.

To build **innovation** and **creativity** skills.

To have the students **understand** how systems work, to have them **believe in** themselves that they can **do better** and that they can **realize** their ideas.



Some notes about STEM

The world is facing a shortage of STEM qualified workers.

Bringing STEM education to the forefront will create massive economic and quality of life improvements.

Between 2014 and 2024 the number of STEM jobs will grow 17% (5% higher than standard jobs) / Changetheequation

In 2020 there will be 1.4 million unfilled computer specialist job openings in the United States alone. The global unfilled openings will match that number / U.S Dept. of Labor

The average median hourly wage of STEM jobs is 100% higher than the standard unskilled laborer / Changetheequation

Program 1

Science and Mathematics

Science is behind everything we see, we sense and we use.

Presently, studies are divided artificially to the fields – physics, chemistry, biology, environment.



In **primary** school – mainly measurements and observation

In **middle** school – experiments and phenomena time behavior

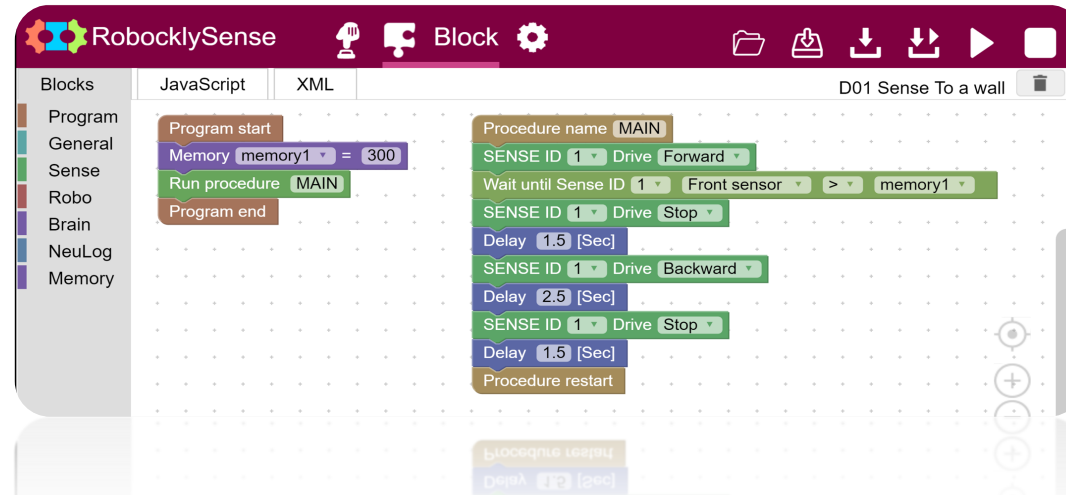
In **high** school – experiments with mathematical analysis and science laws

Science study builds **observation** and **thinking abilities**.

The mathematics is the language of the science laws

Program 2

Coding and Logic Algorithms



“We live in a time of extraordinary change. How can we make sure everyone has a fair shot at success in this new Economy? The answer is coding and computer science education.”

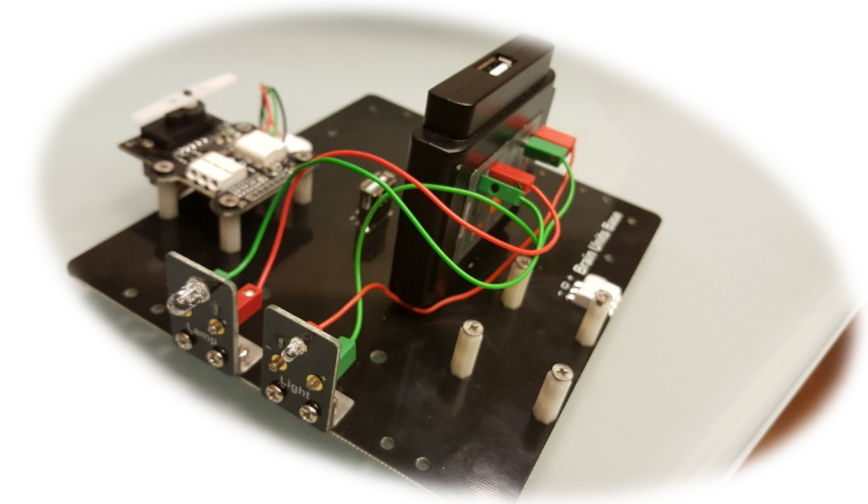
President Barak Obama, 2016 State of the Union



Program 3

Robotics Technology and Engineering

- Robotics education is learning technology that deals with the **design, engineering, construction, operation of sensors and application of robots.**
- It is important provides students with an understanding of robotics technology and coding to enable them to participate in the most rapid growth world

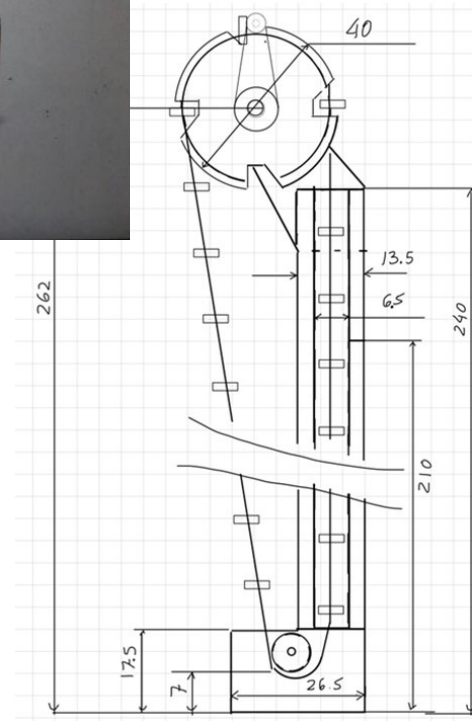
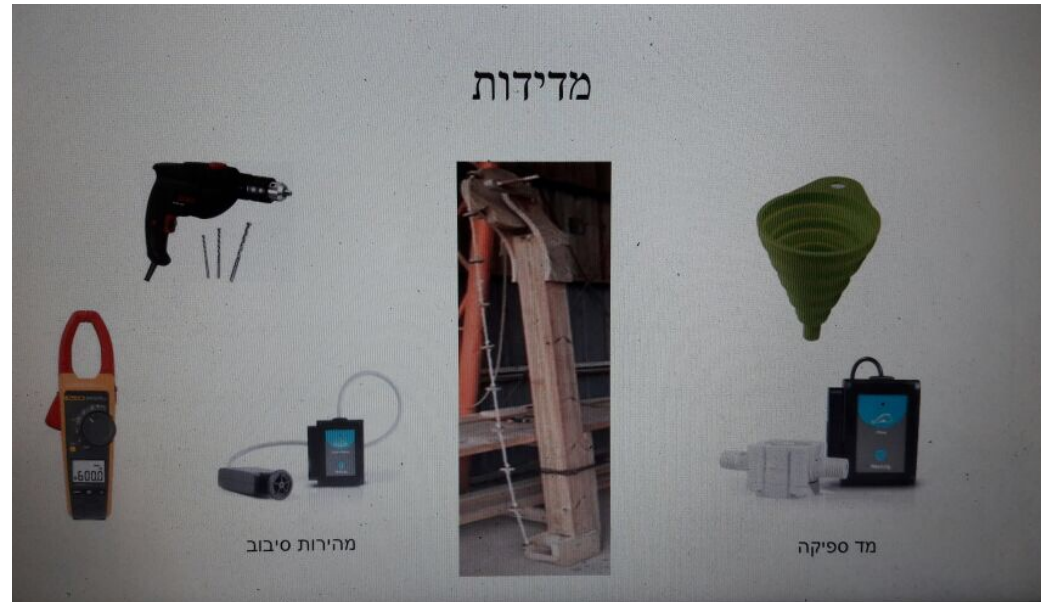


Program 4

Science and Robotics Projects

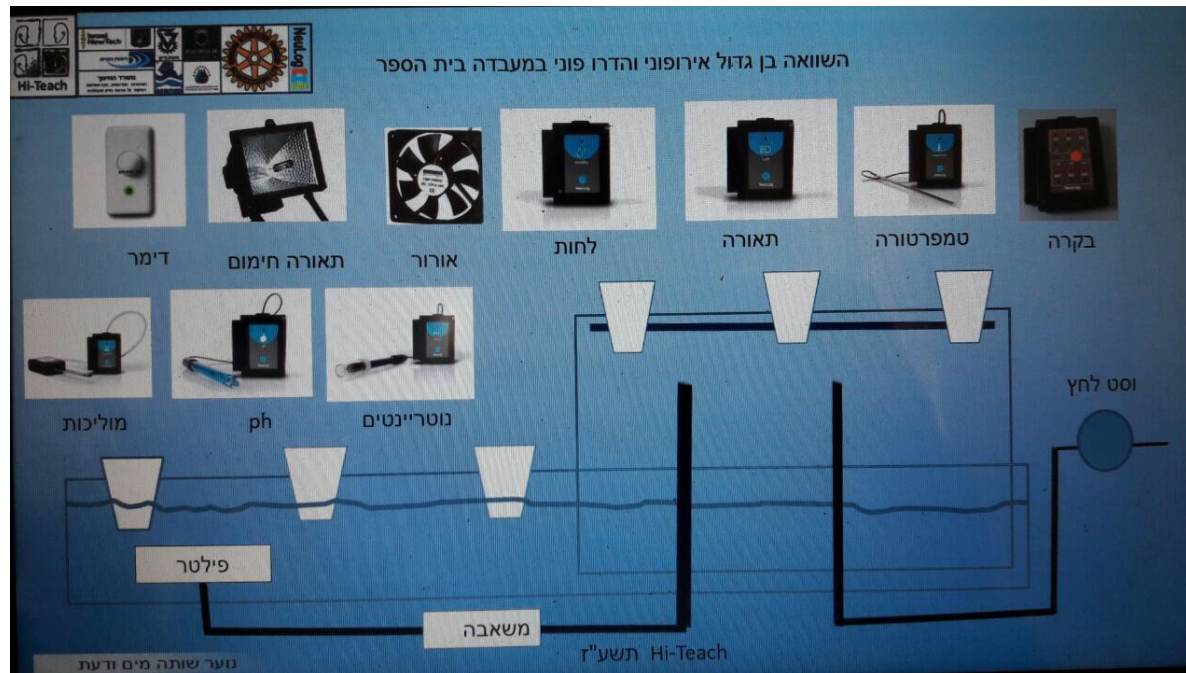
- This is the challenge stage for the students.
- Every student at any age can find a project to make (solve, design, implement, program, report)
- It integrates the knowledge they acquired in the previous programs and builds their creativity and innovation skills.
- The following are some examples of projects done in Israel

Well water pump design and measurements

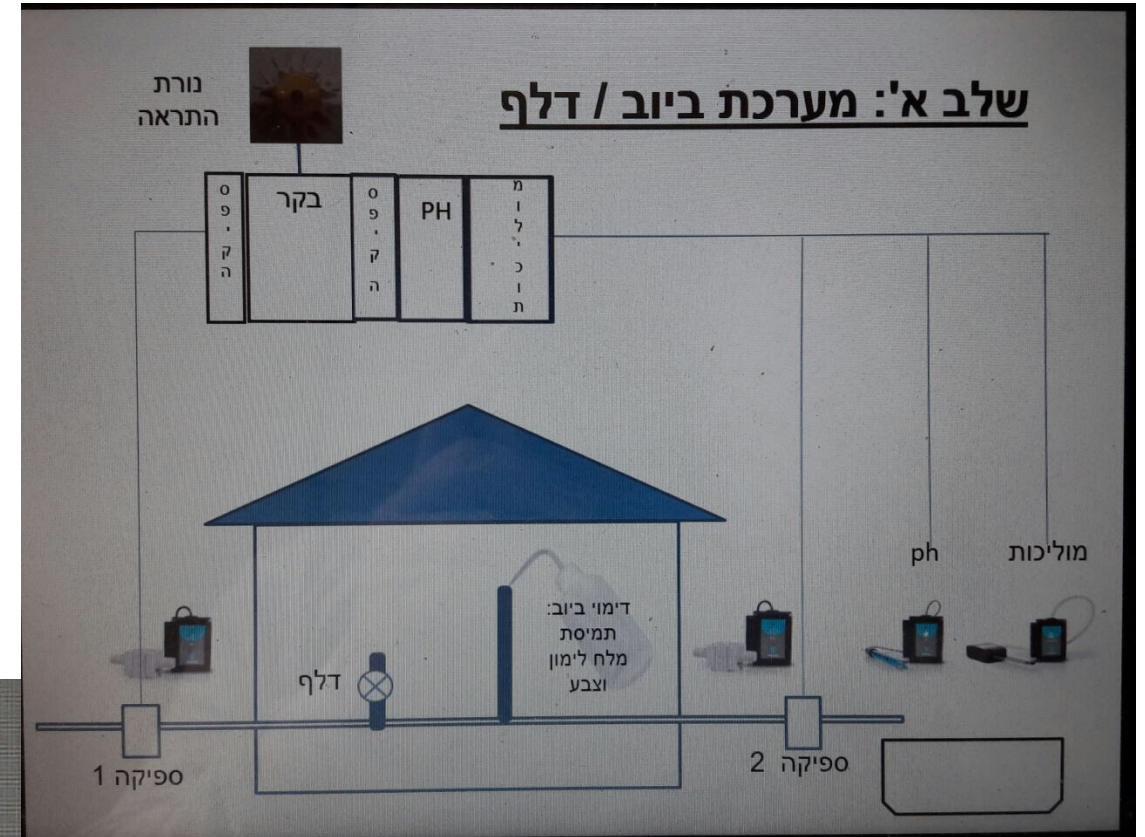


Precise Agriculture

Aeroponic and Hydroponic agriculture



Drain leakage alert system



```
Program start
Memory memory1 = NeuLog FlowRate ID 1
Memory memory2 = NeuLog FlowRate ID 2
Memory memory3 = memory2 - memory1
Memory memory4 = 0.2
If Memory memory3 > memory4 run procedure Proc1
Robo ID 1 Motor M1 Off
Program restart

Procedure name Proc1
Robo ID 1 Motor M1 On CW
Procedure end
```

Autonomic Submarine for ecologic monitoring

Man and Sea competition

התלמידים

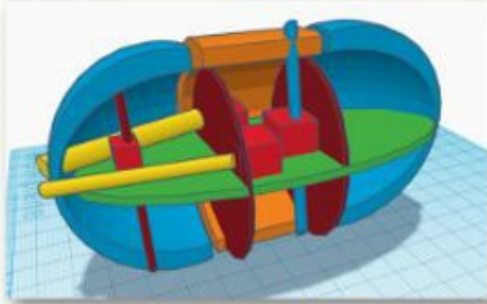
הילה ויסנברגר
שחר אדמוני
עופרי אהרון

מנחי תוכן

פרופ' הוגו גוטרמן
אוני' באר שבע
יואב רטנר אגף ים
וחופים במשרד
להגנת הסביבה

מורים מלווים

לילך מוזיקנט
עדי לק



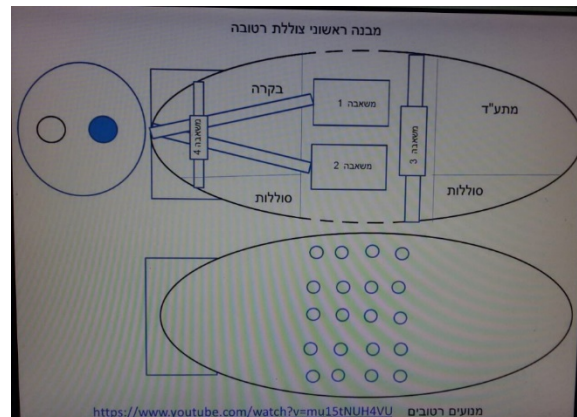
דגם צוללת רטובה



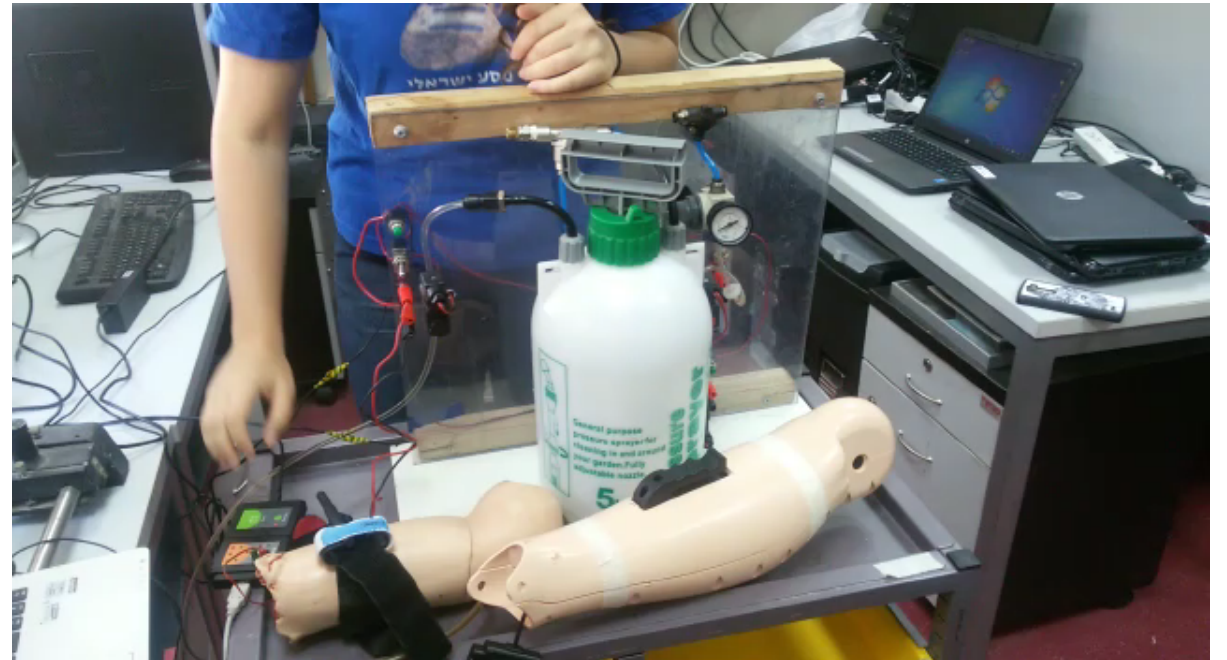
חיישן ובקר NeuLog



דגם תחרות Seaperch



Tourniquet trainer for paramedics



*“The principal **goal of education** in schools should be creating men and women who are capable of **doing new things**, not simply repeating what other generations have done”*

Jean Piaget

Swiss philosopher and scientist 1988



Thank You!