The first Israeli TRIZ conference: "TRIZ - Theory and Application"

THE POST CONFERENCE REPORT

The first Israeli TRIZ conference "TRIZ – Theory and Application" took place in Holon Institute of Technology on November 23, 2009. Holon Institute of Technology was a host for this event.

The main objective conducting the first Israeli TRIZ conference was achieved: TRIZ was introduced to the academic and industrial community in Israel by providing both high level tutorial presentations for newcomers and presenting professional papers by Israeli TRIZ practitioners.

About 200 people attended the conference. There were participants from various sectors: ~65% of audience represented leading companies of different domains of Israeli industry, scientists and teaching staff of Israeli Universities and Institutes represented ~20% of audience, ~10% of audience were represented by TRIZ services providers.

Prof. Gady Golan, Dean of the Faculty of Engineering, Holon Institute of technology has presented the "Technology Leaders" program at HIT that includes the following courses:

1. Entrepreneurship, marketing and business plan strategies
2. "TRIZ methodology and application"
3. Negotiating technology and development of communication skills

"Inventive Thinking: TRIZ methodology and application" has been incorporated into engineering curricula studies for the first time in Israel, as a part of the "Technology Leaders" program courses in Electronics Engineering curricula, at the Holon Institution of Technology - HIT.

SHORT OVERVIEW OF PRESENTATIONS

TRIZ Tutorials:

TRIZ Overview by Isak Bukhman, VP of Altshuller Institute, Master of TRIZ

The main goal of this lecture was to introduce the main TRIZ ideas and philosophy to a wide spectrum of audience. Three directions were highlighted: TRIZ overview & main Ideas, where TRIZ can be applied, and benefits of using TRIZ.

TRIZ Innovation Roadmaps for Projects Creation & Problem Solving by Isak Bukhman, VP of Altshuller Institute, Master of TRIZ

The lecture's main target was to present how to use the modules of TRIZ in combination with other proven methods for project creation and problem solving. TRIZ Value Innovation Roadmap is the basic source for individual Project Innovation Roadmap creation.

TRIZ theory and methodology - lectures from different science disciplines:

Industrial Mathematics and Systematic Inventive Thinking by Adir Pridor, Ph.D. President and CEO Industrial Mathematics LTD

The pivot of Industrial Mathematics is the creation of mathematical models that adequately represent practical environments, posing needs for new solutions or insight. This abstraction process shares a few significant features in common with Systematic Inventive Thinking (SIT). Such aspects of mathematical modeling were illustrated by some case studies, taken from real-world applications, like production scheduling, day-care management, and traffic control.

Inventive thinking: Who and when by Prof. Shulamith Kreitler, Tel-Aviv University, Department of Psychology

The lecture focused on identifying the cognitive and personality characteristics of individuals who tend toward inventive thinking in comparison with individuals who tend more toward creative thinking. Cognitive characteristics were explored in terms of the theory of meaning (created by Kreitler & Kreitler) and motivational processes in terms of the cognitive orientation theory (created by Kreitler & Kreitler). It was shown that creative thinking was characterized by a balanced emphasis on processes underlying

both personal-subjective meanings and interpersonally shared meanings, while inventive thinking relies predominantly on processes characterizing interpersonally shared meanings. Further, creative thinking relies motivationally mainly on promoting their inner world and needs, complemented by contributing to society at large, while inventive thinking relies rather on a more functionally-oriented motivation focused on the external world and the immediate needs in one's environment. A major conclusion is that inventive thinking differs from creative thinking both in the involved cognitive processes as well as in the underlying motivations, but both types of thinking are necessary and may be promoted by focused interventions.

Biomimicry Technology and TRIZ by Dr. Sara Greenberg, the Faculty of Engineering, Holon Institute of Technology

Shape, size, sound, color and behavior are only a short list of nature's parameters that was used to carry out vital functions such as camouflage, warning, attraction and survival.
The use of existing natural phenomenon and effects as resources for problem solving and system development is one of the fundamental TRIZ ideas. Biomimicry is one of such resources. Biomimics, one of many nature's solutions, was used as a solution prototype for many problems solving in the different fields of technology: engineering, architecture, medicine, biotechnology, and aviation. Biomimics solutions allow engineers to comprehend the law of synchronization of system parameters (this law states that the necessary condition for existence of any effective technical system is the coordination of its related parameters) in the most accessible and effective way.

Organization Vision & Targets as a Cause of Failure and Ways to overcome it with TRIZ by Ido Lapidot, Intel Systematic Innovation, TRIZ leader

Most organizations tend to develop their own unique culture. This culture influences the behaviors of individuals and teams who are part of the organization and eventually creates thinking patterns and paradigms. Problems arise when these paradigms guide the organization to take the same type of decisions over and over again, oblivious of other potential alternatives. Over time, the organization is at risk of not being able to fulfill the full potential of its resources, products, and services, creating waste and opening the door for competition.
Integrating the TRIZ concepts into the classical management vision pyramid can help the organization identify its "right" vision and mission.
Formulating organizational targets and indicators using two contradictive dimensions will help the organization avoid "show stoppers" in the form of psychological inertia, thereby allowing the organization to continually increase its value, while setting one-dimensional targets creates the risk of focusing on one dominant domain only and, over time, reduction in organization value.

Customer Needs Identification with Modern TRIZ Tools by Dr. Anatoly Agulyansky, Senior Integration Engineer, Intel

Note: this presentation was included in the Program of the conference but was cancelled by author

The Development of Novel Bone Cement for Treatment of Vertebral Compression Fractures (VCFs) by Ronen Shavit, R&D Engineer, NMB

The common treatment procedure for VCFs, named Vertebroplasty, is based on the injection of a mixture of polymethylmethacrylate (PMMA), bone cement, and a contrast agent into the vertebral bodies using fluoroscopy. An alternative treatment procedure developed in the USA, named Kyphoplasty, involves the introduction of an inflatable bone tamp into the compressed vertebral body, with the intention to elevate the compressed vertebra. The balloon expansion creates a cavity, which is then filled with PMMA based bone cement mixture. The main disadvantage of both the procedures was PMMA bone cement leakage. The high viscosity bone cement was proposed to be used because of its ability to maintain high viscosity during the whole Vertebroplasty procedure. Another benefit of using the high viscosity bone cement was to shorten the procedure time allowing the surgeon to treat more than one vertebra during a single procedure.

TRIZ in Industry:

Creative technological solutions using systematic inventive thinking by Prof. Gady Golan, Dean of the Faculty of Engineering, Holon Institute of Technology

This paper describes the possibility of systematic inventive thinking using structured algorithms.
This systematic method of thinking stands behind many past inventions in the 20th century.
The main idea in finding solutions to problems using the "inventive thinking tools" is by looking for essential contradictions in the system.
This essential contradiction and the ways to reveal it, is the heart of our new course.
Here at the Holon Institute of Technology we decided to recognize the inventive thinking course as an integrated part of the engineering curricula together with "entrepreneurship and marketing" as a complete unit for the future "technological leadership program".

Intel TRIZ story by Amir Roggel, Intel Systematic Innovation, TRIZ leader

Intel is the leader in Semiconductor Industry. 40 years of track record in innovation, and global presence in multiple countries and sites, makes introduction of Systematic Innovation methods and TRIZ a challenging journey.
Intel's Innovation vision into the 21st century and the typical problem solving needs in an advanced semiconductor company were highlighted.
TRIZ progress in Intel Corporation and its propagation approaches were discussed. Examples of TRIZ application were also provided.

The Secret of ARIZ - Removing Production Line Constraint Example by Eli Youker, Process and Equipment Engineer, Intel

Note: this presentation was included in the Program of the conference but was cancelled by author

A case study of improving optical lenses in Israeli industry by Dr. Alex Chernobelsky

During the manufacturing of eye lenses, microscopic debris appeared and damaged a high percentage of the product. The problem was solved by changing the lenses polishing material from glass to a synthetic polymer using TRIZ methodology for problem solving.

Note: this presentation was not included in the Program of the conference but was added by conference chairman decision

Reduce R&D to Production Transfer Risk by Reverse TRIZ Semantic Analysis by Alex Talalyevsky, Manufacturing and Development Engineer, Intel

Defining and predicting failures precisely is an important part of any manufacturing or business. It is most beneficial in preventing surprises during Lab to Fab stage, when the main product is being expected by a hungry market. This early stage of any goods fabrication usually requires fast and high quality transfer to the Fab of tools, processes, quality control systems and supporting procedures as they were developed in the Lab, to reduce the risk. This stage is usually defined as a bad time for changes. Thus, the level of prediction and accuracy of risk assessment should be equal to the level of readiness for troubleshooting in case of failure. Currently used Standard FMEA has not evolved for many years and does not conform with modern requirements of industry, as it does not direct how to find and generate the required solution when failure appears.

TRIZ FMEA software was found in practice to be a complete tool, which conforms to all requirements mentioned above. This paper gives an example of TRIZ FMEA usage on a live project at an Intel fabrication site, where semantic analysis and reverse thinking helped to locate where negligible procedural corrections can lead to maximal benefits. Some of the live case details were generalized to guard Intel Intellectual Property rights.
The case study presented in this work illustrates the following:

- TRIZ methodology is usable for risk reduction during Lab-to-Fab technology transfer in any of existing high volume manufacturing industries (HVM).
- TRIZ FMEA is compatible with fabrication site (Fab) needs, possibilities, and BKMs.
- TRIZ analysis tools increases Fab personnel expertise in short time.
- TRIZ FMEA is compatible with all types of industries whose business is sequential goods fabrication or transportation.

- TRIZ FMEA is a significant milestone in TRIZ integration within HVM industries.

TRIZ in Schools and Universities:

Creativity and Education by Prof. Yuli Tamir, member of the Israeli parliament (The Knesset)

Prof. Yuli Tamir was our special guest at the first Israeli TRIZ conference representing Israeli parliament members and education policy as the former Minister of education.

In her talk, Prof. Yuli Tamir discussed the following topics :

- Formal education does not include "the engine" needed for developing creativity in schools.
- What would be the appropriate combination between formal and creativity education in Israeli education system?
- New methodologies for "creative thinking skills" should be incorporated in Israeli teaching programs.

Development of TRIZ in Israel by Vladimir Petrov, ITA President, Master of TRIZ

Note: this presentation was included in the Program of the conference but was cancelled by author

TRIZ master panel:

TRIZ masters panel (Vladimir Petrov, Yehuda Stupniker, and Isak Bukhman) was asked for two questions: “is TRIZ a science?” and “how TRIZ is represented in the educational area?”

Answer on the first question was unanimous – TRIZ is a science.

Members of panel gave reconcilable answers on the second question. Vladimir mentioned that TRIZ is not enough represented in the educational area and this situation should be improved. Yehuda focused audience attention to the moral aspects of TRIZ education and responsibility of TRIZ deployment. Isak proposed to introduce TRIZ as a specialty into Institutes of Technology with traditional academics degrees.

The conference organizational committee would like to express the deep appreciations to HIT team, to all presenters, to TRIZ supporters, and to all participants for their devotion and hard work.

Conference chairperson and member of conference organizational committee:

Dr. Sara Greenberg, TRIZ and Systematic Innovation, Holon institute of technology. Academic community representative

Members of conference organizational committee:

Prof. Gady Golan, Dean of the Faculty of Engineering, Holon Institute of technology. Initiating and promoting TRIZ studies for engineers in Israel.

Amir Roggel, Systematic Innovation TRIZ leader, Intel. MATRIZ board member. Industrial community representative.

Isak Bukhman, VP of Altshuller Institute, Master of TRIZ. A professional TRIZ advisor and specialist.


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