Sixth TRIZ Symposium in Japan, 2010

Collection of Abstracts of All the Presentations from Overseas

Aug. 9, 2010 (3rd version)
Program Committee

EI01- Khomenko (Canada) (Keynote)

General Theory on Powerful Thinking (OTSM): Digest of Evolution, Theoretical Background, Tools for Practice and Some Domain of Application.

Nikolai Khomenko (Insight Technologies Lab, Canada)

OTSM is a Russian acronym proposed by Genrich Altshuller to describe the next evolution of Classical TRIZ. The acronym can be translated into English as the "General Theory on Powerful Thinking" Mr. Altshuller proposed the idea to transition from Classical TRIZ to OTSM in the mid 1970's. Some background ideas for this transition were developed in the 1980's, initiating the formal development of OTSM. Altshuller considered Classical TRIZ had matured as a theory about creating tools for solving technical creative (non-typical) problems. When people began using a TRIZ-based toolbox for non-technical applications, Altshuller posed the question: "How should TRIZ be transformed from a theory for solving technical problems into a domain-free theory for solving complex generic problems?" In this paper the results of 25 years of OTSM research are summarized with proposed directions for further development.

EI02- Karimi (Iran) (Keynote)

TRIZ Activities in Iran: Transfer to a new nationwide paradigm by TRIZ application and promotion

Mahmoud Karimi and Sara Salimi
(Iranian Institute of Innovation & Technological Studies (IIITS), Iran)

A multidisciplinary group of educated people interested in TRIZ as a new strange term and focused on it since then. What have done in Iran about TRIZ and why Medias like TV, Radio and newspapers are used for TRIZ promotion has explained in this paper. The paper is about how people has attracted to ask "What is TRIZ?" and guided to understand its philosophy, methodology and applications in different areas of daily activities to technical problems and business. In the country of motivated people for learning and thinking, they want to understand the core of philosophy of knowledge before applying any tools. So it was important to explore how a new radical approach of thinking like TRIZ could be believed, accepted, developed and applied. TRIZ has used for solving different problems of its application and promotion nationwide. Several problems at strategic level of Ministry of Education and also simple problems of students in school have experienced TRIZ.

E01- Cheong(Korea)

TRIZ at SMD: Unique Situation, Unique Goals, Unique Approaches

SeHo Cheong, Len Kaplan, Valeriy Prushinskiy
(Samsung Mobile Display, South Korea)

TRIZ team at Samsung Mobile Display works in unique situation. Usually, TRIZ teams solve problems, "How to improve on industry achievements?" SMD, however, possesses the position of technological leader. As a result, TRIZ problems here are "How to make things that nobody in industry has made yet?" or "How to produce absolutely new product or implement absolutely new process?" The unique goals of SMD TRIZ team are based on ultimate objective, "Remain the Global #1 in displays." SMD TRIZ team applies TRIZ to the challenges the team faces. As a result, the team develops and implements the unique approaches to its day-by-day work.

E02- Pheunghua(Thailand)

Implementing TRIZ in Thailand

Tanasak Pheunghua (The Inventor Development Co., Ltd., Thailand)

In Thailand TRIZ has become known gradually for these several years as a possible way for innovation. For introducing TRIZ, different approaches are tried in the industries in Thailand. Most common approach is to start with the training of engineers in TRIZ, and is still very far from possible product or process innovation they want to achieve. Project-based learning is another approach being tried where coaching or consulting by experienced practitioners is needed. All the approaches try to follow the TRIZ methodology, but they seem not understood well by the students and their organizations. People and companies use mostly conventional tools and conventional thinking ways. Such an old paradigm in problem solving is still the big barriers against the penetration of TRIZ. How to make people understood that TRIZ way of thinking process should replace the conventional one is the main issue. The present paper describes the approaches we are trying, and the barriers against them, for achieving the ideal final results of developing people and businesses in Thailand's industry.

E03- Yoon(Korea)

OTSM-TRIZ Guide to Increase Effectiveness of Root Conflict Analysis

Hongyul Yoon (TRIZ Center, South Korea)

Root Conflict Analysis is adopted most frequently in engineering and research problem solving not only through TRIZ but also through the other problem solving tools. Compared to the popular use of it, its effectiveness seems poor, which the author defines as the degree to help the problem solver to transform the initial problem situation into clear description of simple problems. The author tries to offer a general process of how to deploy RCA more effectively through the guide of OTSM-TRIZ. First, ENV model is formulated to identify the initial harmful phenomenon as the target. The Multi-Screen Thinking based on OTSM-TRIZ leads the next step to provide an overview in order to reduce psychological inertia and increase objectiveness of the perception. 3 Postulates of TRIZ are applied as a way adapted by the author to get proper problem models to Substance Field Model.

E04- Yoo(Korea)

From Technical to Business Contradiction :

An Example of New Gantry Crane

Seung-Hyun Yoo, Manyop Han (Ajou University, Korea),
Ung-Rak Jeong (Graduate School, Ajou University, Korea)

A new vertically rotating type of gantry crane is developed. The new concept was evolved from the main contents of TRIZ, such as Dynamicity, Spheroidality, Periodic Action in 40 principles. The new idea was implemented in new system and usual design activities were followed. The product is designed in system and element level. Engineering simulation shows the concept was successfully realized and the dynamic simulation reveals the exact clockwork of the system. But the difficult problem appears after this real engineering accomplishment. As the system is so huge, it is not possible to sell so far. The problem emerged not in the technology but in the business. The business problem reveals quite reasonable example of a business contradiction. Struggle with this problem without success is described.

E05- Platt(USA)

Design For Innovation in Manufacturing

Richard Platt (Intel / Strategy + Innovation Group LLC, USA),
Sergei Ikovenko(GEN3 Partners, USA), Joe Ficalora (Joe Ficalora Associates, USA)

Speed and Profitability are cornerstones of manufacturing, the tools and methods used, define the ability to get competitive advantage. Rapid proto-typing tools are an industry standard, however the advantages that these provide are now common place for many to use.
The true competitive advantage is gained when using these tools in new, unique and different ways than they have typically been used.
Learn the Way of a veteran rapid proto-typer from Intel, demonstrating that innovation in manufacturing could become a core competency with simple and elegant innovation tools and methods.
A case study from Intel manufacturing will be illustrating the method being applied, resulting in a patent filing and the establishing a new next generation standard PCBA assembly.
Understand a new set of methods and approaches simplifying the process and mitigating the risk all the while lowering product and process costs during the all critical NPI phases of manufacturing.

E06- Cascini(Italy)

Computer-Aided Problem Solving: A Dialogue-based System to Support the Analysis of Inventive Problems

Yuri Borgianni [1], Niccolò Becattini [2], Gaetano Cascini [2], Federico Rotini [1]
([1] Università degli Studi di Firenze, Italy; [2] Politecnico di Milano, Italy)

The paper presents the research activity developed by the authors in the field of Computer-Aided Inventive Problem Solving: an original dialogue-based software application has been developed by integrating the logic of ARIZ with some OTSM-TRIZ models in order to guide an user also with no TRIZ education to the analysis of inventive problem. The proposed software system, even if still at a prototype stage, is radically different from any existing TRIZ-based software tool and it has been already tested both with students at university and with employees of a few Small and Medium Enterprises. The full presentation will detail the structure of the algorithm and the results of the first testing activities.

E07- KWLee(Korea)

Quick TRIZ process and the related TRIZ activities in Korea

Kyeong won, Lee (Korea Polytechnic University, Korea)

Author has developed the "Quick TRIZ" process showing contradictions of a problem into the modified conflict diagram in T.O.C (Theory of Constraints) visually. Some cases including non technical areas show the effectiveness of the process for TRIZ beginners and specially, general persons in non technical fields. The "Quick TRIZ" process is compared to the simplified TRIZ process such as USIT and ASIT. In this paper, the related TRIZ activities in Korea related to the "Quick TRIZ" are presented.

E08- Filmore(UK)

Computer-Aided (Systematic) Innovation: New Tools and New Ways of Thinking

**Darrell Mann (Systematic Innovation Ltd, UK),
Dr Paul Filmore and Mir Abubakr Shadad (University of Plymouth, UK)**

The paper discusses recent research to proceduralise and automate aspects of the TRIZ/Systematic Innovation process. Three particular areas are discussed:

1) The development of a toolkit (AEGIS) aimed at increasing the speed with which designers can evolve designs using TRIZ-based 'intelligent mutation algorithms.
2) The development of a piece of software (ApolloSigma) aimed at speeding the process of identifying high potential patents from the global patent databases.
3) The development of a toolkit (iTrenDNA) aimed at helping engineers and designers to better understand unspoken consumer and market needs.

Each aspect of the work will be described in the context of a range of exemplar case study examples:

E10- HJKim(Korea)

How to use TRIZ in non-technical area?

HyoJune Kim (GEN3partnersKorea, Korea)

Many persons have tried to use TRIZ in non-technical area. I think there is no right way and wrong way. Every trial will have it's own value and contribute to the effort to use TRIZ in non-technical area. Here, I will introduce another possibility as using TRIZ in business area. Absolutely, this method will be based on classical TRIZ but I believe this method will expand the usage of TRIZ to some higher degree. At first I will define creativity in unique and simple way. I found another meaning of 40 inventive principles and separation principles based on such an definition of creativity. Finally I will explain the relationship between Technical Contradiction and Physical Contradiction. You could see the structure of problem based on such an relationship between contradictions. If you understand such a thinking flow, you could find simple and powerful method "How to use TRIZ in non-technical area". You can also understand why Altshuller called "Physical" contradiction and "Technical" Contradiction. This paper will just analyze classical TRIZ in unique way. But such a new approach will introduce another usage of TRIZ in various field including business, political, diplomatic area etc. I will not say true or not-true, but I will suggest possibility at symposium.

E11- HWLee(Korea)

Concept Development of a Variable Compression Ratio Engine Using TRIZ

Hong-Wook Lee, Won Gyu Kim, Myung Rae Cho, Jin Woo Cho, Sang Hee Lee
(Hyundai-Kia Motor Company, Korea)

The variable compression engine means that the compression ratio of the engine can be controlled at each engine operation condition. When the more power of engine is needed during high load, the compression ratio is decreased, and when the higher efficiency is needed during low load, the compression ratio is increased. Many companies have been carrying out their own research in to VCR Engines, so that each company has different type of VCR engine, but so far VCR engines have not been mass-produced. In this study, TRIZ is applied to develop new concept of VCR engine. Various tools of TRIZ have been used in this study: “Function analysis” is applied to analyze previous VCR models, and “Trimming” to make new contradiction, then “ARIZ” to solve this problem.

E12- JSHan(Korea)

Development of a New Weight Sensor for a Washing Machine by Using TRIZ Problem Formulation

JinHa JEONG, Jeong-Su HAN, and JunHoe CHOI
(Samsung Electronics, Korea)

Recently, energy regulation pushes development of eco-saving products. Washing machine, one of energy consuming product, can reduce water usage and heating energy of water by controlling water supply based on the weight of laundry. There are two conventional weight sensing methods in washing machine. One is sensing the force of inertia of a rotating motor and the other method adopts a weight sensor, called LVDT sensor. The former renders inaccurate weight and the latter is expensive. To develop an accurate and inexpensive weight sensor, we have adopted TRIZ tools such as a problem formulation, RCA and function analysis to identify a problem, and FOS (Function-Oriented Search) algorithm to generate suitable solutions. As a result, we have obtained even weight sensing performance and 80% cost effective than a conventional weight sensor. Furthermore the developed sensor has increased manufacturability and easy installation due to its simple structure.

E13- JBKim(Korea)

Real-Time and Realistic 3D Facial Expression Cloning

Jung-Bae Kim, Youngkyoo Hwang, Won-Chul Bang and James D.K. Kim
(Samsung Electronics)

3D virtual world has been researched intensively. In particular, animating facial expression of an avatar, representative for a user, has been issued. There are two kinds of interface to clone the user's facial expression: mocap-based interface using lots of IR cameras and markers, and vision-based interface using only one color camera. The vision-based interface would be desirable for most users at home. However this interface has very challenging problems to capture and track the user's subtle 3D expression in real time. We present a novel method to deal with those difficulties by using TRIZ methodology. We use a personalized 3D expression

model to do real-time cloning, and make a muscle model to track 3D movements on cheeks and forehead having no outstanding features.

E14- SKKim(Korea)

Design of Regional Code Adaptation for Mobile Advertisement by Using Theory of Inventive Problem Solving

Song-Kyoo Kim (Samsung Eletronics, Korea)*

The paper deals another practical TRIZ applications for information technologies that is similar with the previous adaptation. Mobile Advertisement (MobAD) enabler is considered as the target to apply the TRIZ for enhancement. The enabler can make usage of a variety of advertisement delivery methods and also specify a standard set of advertisement metrics data that are recorded and then collected to enable the measurement of the response to ad contents and ad campaigns. MobAD regional code is the new MobAD technology that is designed to give flexible operations by using TRIZ method for the revenue generating of operators.