The 22nd Japan TRIZ symposium 2026

Collection of Abstracts

2026.6.6

Symposium Organizing Committee

==========

EI01 (Keynote Lecture)

The relationship between the development of generative AI and TRIZ

Oleg Feygenson, PhD, TRIZ Master, President of MATRIZ Official

The first publication on TRIZ appeared in 1956, the same period when the term “artificial intelligence” was first introduced. However, only today do we see the explosive development of AI, driven by advanced information-processing algorithms, large-scale data processing, and unprecedented computing power.

This keynote speech explores the evolving relationship between Generative AI and TRIZ, focusing not only on opportunities, but also on practical limitations and hidden risks. While AI can rapidly generate ideas, identify analogies, and expand the solution space, it often struggles with correct problem formulation, identification of secondary problems, selection of the most relevant resources, and evaluation of implementation constraints.

The keynote will demonstrate how TRIZ can serve as a structured framework for significantly increasing the effectiveness of Generative AI in engineering and innovation tasks. Function Analysis, Function-Oriented Search (FOS), Advanced Function Approach (AFA), contradiction thinking, and Resource Analysis will be discussed as practical mechanisms for improving prompt engineering, reducing AI hallucinations, protecting confidential technical information, and transforming chaotic idea generation into focused problem solving.

Special attention will be given to AI-enhanced cross-domain innovation, identification of functionally leading areas, and practical methods for avoiding “idea overload” caused by excessive AI-generated alternatives.

The keynote will include real industrial examples and case studies from Samsung Electronics, demonstrating how innovative solutions were developed under severe implementation constraints, where changing the product itself was often almost impossible.

The presentation is intended for engineers, R&D specialists, innovation managers, TRIZ practitioners, consultants, educators, and everyone interested in the future integration of AI and systematic innovation methodologies.

The central message of the keynote is that the future does not belong to “AI instead of humans” or “AI instead of TRIZ.” Instead, we are entering an era where AI, guided by structured inventive thinking, creates a new architecture for solving complex engineering and innovation problems.

JI02 (Special Lecture)

From the geocentric model of inspiration to the heliocentric model of data

～Co-creation of TRIZ and AI born from patents～

Hajime Shirasaka

(SHIRASAKA Patent Attorney Corporation and AI Samurai Inc.)

In December 2025, patent applications in Japan surged to 82,188, a 2.7-fold increase compared to the same month of the previous year. With the widespread adoption of AI-powered tools, the focus of invention is shifting from "inspiration" to "data." This represents a paradigm shift equivalent to the shift from the geocentric to the heliocentric model.

TRIZ, originally developed by Altshuller after analyzing approximately 200,000 patents in the Soviet Union and later 2 million in the United States, was essentially a data-driven way of thinking. It can be said to have anticipated the AI era by half a century.

Currently, 3.7 million patents are generated globally annually, with China accounting for 1.79 million of those, bringing the cumulative total of Chinese patents to tens of millions. This report will cover the progress of research integrating generative AI with Chinese patents. AI democratizes TRIZ, and TRIZ structures AI—the co-creation of the two will open up new horizons for invention.

This lecture will provide an overview of the background to the surge in patents, the latest examples of AI co-creation, and introduce new patent activities in Japan in the age of the heliocentric model of data.

JI00 （Tutorial）

Explanation of TRIZ for beginners to understand easily

Motoharu Miki（NPO Japan TRIZ Society）

Responding to customer needs and providing attractive products and services is one of the most important challenges for any company. However, many companies struggle to create hit products and innovative services. TRIZ offers valuable insights and practical methods to address this challenge.

In this seminar, participants will first gain an overview of TRIZ and its key concepts. The session will then focus on one of the most widely used TRIZ tools, the Inventive Principles, which are derived from the analysis of a vast number of patents and provide systematic guidance for solving technical problems and generating innovative ideas.

Through a simple hands-on workshop, participants will experience the practical application of TRIZ and gain firsthand insight into its power as a tool for innovation and problem-solving.

J01

“AI × QFD × TRIZ × Taguchi Method”

～An AI-powered development process that creates hit products～

Tomohiko Katagiri (IDEA Inc.)

In recent years, the use of generative AI in research and development has been rapidly advancing, but challenges such as "ideas being generated but not leading to actual product development" and "Information increasing but not being translated into technical challenges" have become apparent.

This presentation proposes an "AI-powered R&D process" that integrates QFD (Quality Function Deployment), TRIZ, and the Taguchi Method™ into a series of development processes, and further combines them with generative AI such as Patsnap Eureka and ChatGPT.

We will introduce how traditional development processes are transformed by accelerating customer requirements analysis, technical challenge identification, innovative solution exploration, and optimization/robust design using AI, illustrated with actual development case studies.

J02

Practical application of inquiry-based learning in Suruga Bay using TRIZ as a tool

— Marine and intellectual property creation education through collaboration between elementary, junior high, high school, and college: "Point → Line → Plane → Solid" —

Takayoshi Ohtsu（Tokyo University of Science / NIT, Numazu College）

Our function-based, objective-specific problem-solving program includes a problem-solving program using TRIZ and a program exploring the application of technology using the TRIZ System Operator.

In recent years, an increasing number of clients who receive consulting services are able to use generative AI such as ChatGPT. We are increasingly using generative AI in our consulting services.

At last year's TRIZ Symposium, we reported that TRIZ and generative AI can be used in conjunction with each other in the following two processes:

1) A process of intentionally changing the object O of function (S+V+O) to find new applications (an idea similar to the TRIZ science effect)

2) A process of using the TRIZ System Operator to grasp information and trends from the past, present, and future to extract future needs and issues.

In this report, we show that using the programming features of ChatGPTs to control the generative AI according to the user's needs is very important for making these TRIZ processes more efficient.

J03

Earthquake Prediction Research Based on the TRIZ Philosophy (3):

Technologies and Future Directions for

EQ Prediction Notices/Warnings/Emergency Warnings

Toru Nakagawa (Professor Emeritus at Osaka Gakuin University)

As I presented at last year's symposium, Earthquake Prediction Society of Japan (EPSJ) is working toward publicly issuing short-term/imminent earthquake (EQ) prediction warnings based on observations of EQ precursor phenomena rather than long/medium-term statistical forecasts. To achieve this goal, we must engage in comprehensive efforts from broader perspectives, not limited to the current R&D tasks of individual EQ prediction methods. These efforts include: (a) establishing a vision and defining challenges, (b) clarifying requirements for solutions, (c) developing organizational and technical processes to solve the challenges, (d) conducting scientific and technical research and building systems, (e) developing and verifying prediction methods, (f) disseminating and promoting methods in academia and society, (g) applying EQ prediction methods by public organizations in real time for disaster prevention and mitigation, etc.

This paper provides an overview of these aspects and concrete examples of EQ prediction methods useful for the three steps of warnings: notices, warnings, and emergency warnings. I conclude that we should now proceed to the second stage, for verifying these methods through collaborative research projects within EPSJ.

J04

AI integrated TRIZ deployment

How to solve social problems by creating evolutionary systems

Ikuo Yoshizawa, Hisataka Izawa, Mamoru Ohashi, Osamu Ikeda

(Business and Management TRIZ Research Subcommittee, Japan TRIZ Society)

This research group aims to research and disseminate TRIZ (Inventive Problem-Solving Theory) for use in business and management fields. To date, we have proposed applications to management tools such as BSC (Balanced Scorecard) and BMC (Business Model Canvas), as well as a seven-stage problem-solving framework addressing social conditions such as the SDGs (Sustainable Development Goals). In our 2025 report, "Framework for Creating 'New Product/Service' Systems," we introduced generative AI and reported on the emergent process of business models combining untapped resources and latent needs.

This year, we focus on "everyday problems with social dilemmas" involving complex vested interests.

We considered a new approach to solving these problems and creating "evolutionary systems" that lead to innovation. Specifically, we integrated and strengthened generative AI (such as Gemini) into the TRIZ thinking process advocated by this research group, systematizing a logical emergent procedure from contradiction resolution to the creation of future-oriented concepts.

Although referred to as "AI-Integrated TRIZ Deployment," this is synonymous with the "Framework for System Creation Approaches" in previous reports. This report will discuss the effectiveness of providing instructions (prompts) to the generating AI at each stage.

J05

Linking TRIZ promotion and intellectual property practices in the LLM era

— Preventing missed inventions, failure to secure patents, and setbacks in the Forward Time Order (FTO) process —

Yoichi Hasegawa (Japan TRIZ Society)

With the advancement of generative AI, intellectual property (IP) tasks such as drafting invention disclosures and claims during new patent application considerations, conducting prior art searches and invalidation searches before filing, responding to rejections, reviewing the invalidation of competitors' patents, and conducting foreclosure (FTO) searches are not only becoming significantly less burdensome but also improving in quality.

However, the problem of failing to launch a product or experiencing a significant drop in sales, profits, and profit margins due to failing to conceive the best idea (or a higher-level conceptual claim covering it) or failing to conceive a second-best, third-best, etc. idea (or a higher-level conceptual claim covering it) that could adequately compete with the best idea remains unresolved. Furthermore, while some individuals can successfully handle rejection responses and secure patent rights that fully cover the best idea and strong alternatives, others fail to do so, leading to the entry of later competitors. Finally, the problem of discovering the existence of unavoidable prior patents of competitors late in development, resulting in development setbacks, has not been completely resolved.

This presentation will re-analyze the causes of these problems that remain unresolved despite advancements in LLM (Learning and Learning Management), and propose directions for countermeasures.

J06

Building an efficient invention platform that anyone can use

Kimihiko Hasegawa, Narumi Nagase, Hirotsugu Ishihara, Toshiaki Masaki, Yasunori Nakao,

Daiki Ikegaya

(Intellectual Property Creation Research Subcommittee, Japan TRIZ Society)

When we attempt creative problem-solving, we often use divergent thinking methods such as brainstorming and checklists to generate numerous ideas. However, obtaining a final concrete solution often requires further time spent using logical convergent thinking methods, and this doesn't guarantee an original and feasible solution.

Therefore, one might consider using TRIZ to pursue original and feasible creative problem-solving. However, TRIZ is a vast system, making it difficult for beginners to use practically, hindering its utilization.

We have previously proposed building a database of innovative problem-solving examples (idea database) and using it as a hint for idea generation by searching for specific examples in this list. This time, we propose a thinking format that can support the process from technical problem identification to commercialization through a Q&A format by applying generation AI to this idea database.

J07

An examination of the effectiveness of TRIZ in the context of AI utilization

～From the activities of the Intellectual Property Creation Research Subcommittee～

Narumi Nagase

(Intellectual Property Creation Research Subcommittee, Japan TRIZ Society)

In recent years, with the significant improvement in AI processing capabilities, the use of AI has rapidly expanded across a wide range of sectors, from corporations to individuals. Almost anyone who desires it can now easily implement and use AI. Many people are now casually consulting AI for advice that previously relied on experts in specific fields or highly skilled individuals.

While issues such as hallucination still remain, an environment where AI use is commonplace is rapidly being established.

In this environment, does TRIZ (Technical Research and Problem Solving) have any effect on problem-solving? What differences does the presence or absence of TRIZ make? Furthermore, what insights can be gained from a TRIZ perspective regarding AI application? To address these questions, we conducted an AI-based problem-solving simulation using a manufacturing site problem.

J08

Technical problem-solving methods utilizing TRIZ and AI

Heikan Izumi（Sanjo City University）

TRIZ is a systematic method for generating innovative ideas based on inventive principles extracted from patent information. However, for unskilled engineers, abstracting technical problems into TRIZ inventive principles is difficult, posing a barrier to generating new ideas. This research proposes a method to support product development by introducing generative AI into the TRIZ abstraction process and by searching for specific technical examples from TRIZ's abstract inventive principles. Through empirical experiments based on the proposed method, we will verify the effectiveness of utilizing generative AI in TRIZ.

J09

Product Management for Manufacturing:

A Guide to Improvement, Value Creation, and ChatGPT Utilization

Kiyohisa Nishiyama, Manabu Sawaguchi, Masao Oda (Ritsumeikan University)

This presentation will use "Product Management for Manufacturing: Improvement x Value Creation x ChatGPT Utilization Guide" as a case study to introduce the possibilities of new problem setting and problem solving support using generative AI based on the concepts of VE (Value Engineering) and TRIZ (Inventive Problem Solving Theory). In particular, focusing on Chapter 9, "Problem Setting Methods Using VE/TRIZ-Based Generative AI," we will position conversational generative AI, including ChatGPT, not merely as a text generation tool, but as a "collaborative intellectual partner" that supports problem setting, function organization, issue clarification, and idea generation in VE and TRIZ. Specifically, we will explain how generative AI can be used in processes such as function definition, function system diagram creation, function evaluation, and alternative idea generation in VE, using actual prompt examples. Furthermore, while touching on its relationship with contradiction resolution and idea generation support in TRIZ, we will consider the roles of "problem setting ability," "problem structuring ability," and "value judgment," which will be important in the era of generative AI, and look ahead to the possibilities of creative problem solving by combining VE/TRIZ and generative AI.

J10

Space-Constraint-Driven Radical Innovation in Social Infrastructure

Atsunori Someya (Metropolitan Expressway Company Limited),

Manabu Sawaguchi (Ritsumeikan University)

Improving and upgrading aging social infrastructure in urban areas is an urgent issue, as strict spatial constraints prevent the application of conventional designs and construction methods.

In previous research, the authors have identified instances where these spatial constraints, conversely, become the starting point for technological innovation, proposing this as "spatial constraint-driven radical innovation."

This presentation will examine two large-scale improvement cases on urban expressways.

By re-examining the on-site challenges from the perspective of "technical and physical contradictions" in TRIZ, we will verify how new technologies and construction methods were derived.

This will unravel the practical thought process by which spatial constraints, which are barriers, are transformed into a driving force for technological innovation.

J11

Future prediction using the TRIZ System Operator with the R&D-specialized AI "Patsnap Eureka"

Takashi Ogata (IDEA Inc.)

At last year's TRIZ Symposium, I reported that in the TRIZ System Operator, in order to grasp past, present, and future information and trends and extract future needs and challenges more efficiently, it is important to use a programming function like ChatGPTs, which allows customization of ChatGPT, to control the generated AI in a conversation with the user and tailor it to their needs.

This time, I will report that by utilizing the new Skill function of "Patsnap Eureka," our AI tool specializing in the R&D field, we have made it possible to run programs that were originally incorporated into ChatGPTs on Eureka's AI. As a result, we have been able to perform future predictions in a short time based on more accurate information sources such as patents, papers, and technology databases, which are Eureka's strengths.

J12

Project to consider proactive disclosure

As a project activity of the TRIZ-Rx subcommittee

Narumi Nagase, Yuji Mihara, Kimihiko Hasegawa, Osamu Ikeda, Yasunori Nakao

（TRIZ-Rx subcommittee, Japan TRIZ Society）

The Japan TRIZ Association has recently seen a decline in membership. While efforts are being made to recruit new members, primarily through symposiums, the number of young people joining is extremely low.

Furthermore, with the widespread use of social media for information acquisition, the dissemination of TRIZ information is not expanding. It seems there are very few opportunities for individuals to easily encounter TRIZ or to learn about it casually out of curiosity.

The TRIZ-Rx subcommittee has been working on building a database with multiple search functions that allows users to view various TRIZ initiatives presented at past TRIZ symposiums.

While we are considering making it publicly available, we are still not reaching individuals who are just starting to learn about TRIZ or are beginners.

Therefore, we have begun an initiative to more actively publish information and knowledge about TRIZ on the web, making it accessible to anyone, even non-members of the Japan TRIZ Association, who wishes to access it.

J13

AI integrated TRIZ deployment

Introduction to the method of creating functional diagrams

Ikuo Yoshizawa, Hisataka Izawa, Mamoru Ohashi, Osamu Ikeda

(Business and Management TRIZ Research Subcommittee, Japan TRIZ Society)

This research group aims to research and disseminate TRIZ (Inventive Problem-Solving Theory) for use in business and management fields. To date, we have proposed applications to management tools such as BSC (Balanced Scorecard) and BMC (Business Model Canvas), as well as a seven-stage problem-solving framework addressing social conditions such as the SDGs (Sustainable Development Goals). In our 2025 report, "Framework for a New Product/Service System Creation Approach," we introduced generative AI and reported on the emergence process of business models combining untapped resources and latent needs.

This year, we have rephrased the "System Creation Approach Framework" from previous reports as "AI-Integrated TRIZ Deployment," focusing on "familiar problems with complex social dilemmas" involving various vested interests.

We have found that using generative AI to visualize functional diagrams is effective in the process of creating "evolutionary systems" that solve such problems and lead to innovation. Therefore, we will introduce a method for creating functional diagrams using appropriate procedures.