TFC23 TOWARDS AI-AIDED INVENTION AND INNOVATION
INTERNATIONAL TRIZ FUTURE CONFERENCE OFFENBURG UNIVERSITY, SEPTEMBER 12-14, 2023

Conference Programme

Pre-Conference Workshop: Monday, 11 Sept. 2023   CEST Time (Paris, UTC+2)

3.00pm – 4.30pm	**TRIZ Tutorial and Workshop:** *Pavel Livotov and Quentin Lemaire, Offenburg University* Application of Generative Pre-trained Transformers for Automated Ideation with TRIZ: a Competition between OpenAI ChatGPT and Google Bard

Day 1: Tuesday, 12 Sept. 2023   9.00am – 6.00pm   CEST Time (Paris, UTC+2)

9.00am – 9.15am	**Opening Ceremony**
9.15am – 10.00am	**Introductory address:** *Stelian Brad, ETRIA President* Mapping the Evolutionary Journey of TRIZ and Pioneering Its Next S-Curve in the Age of AI-Aided Invention
10.00am -3.15pm	Paper presentations and discussions (see the daily programme below)
3.15pm – 4.00pm	**Keynote 1:** *Alex Agulyansky, PRIZ Guru Inc., USA* Identifying Customer Needs: Harnessing AI for Effective Problem Solving and Innovation
4.15pm – 5.00pm	**Keynote 2:** *Rod King, Ideal Solutions Management, USA* Chaotic Problems, TRIZ, and AI-Universal Problem Solving
5.15pm – 6.00pm	**Workshop 1:** *Davide Russo, University of Bergamo, Italy* Empowering Effective Problem Solving: The Next Generation of Technical Information Retrieval Tools

Day 2: Wednesday, 13 Sept. 2023   9.00am – 6.00pm   CEST Time (Paris, UTC+2)

9.00am – 9.45am	**Keynote 3:** *Valery Tsourikov* How new AI tools will Change Technical Creativity in Near Future
10.00am – 3.15pm	Paper presentations and discussions (see the daily programme below)
3.15pm – 4.00pm	**Keynote 4:** *Gerald Haman, The SolutionPeople Network, USA* How AI Enhances the KnowBrainer Innovation Process
4.15pm – 5.00pm	**Keynote 5:** *Nicolai Schumann, Universal Storyteller, UK* My Muse, the Robot - Innovation and Creativity in Times of AI
5.15pm – 6.00pm	**Workshop 2:** *Bryan Cassady, Global Entrepreneurship Alliance, Belgium* AI-Augmented TRIZ: Unleashing the Power of Jeda.ai for Enhanced Problem Analysis and Solution Generation

Day 3: Thursday, 14 Sept. 2023   9.00am – 6.00pm   CEST Time (Paris, UTC+2)

9.00am – 9.45am	**Keynote 6:** *Yu Xiong, OxValue AI, University of Surrey, UK* AI-empowered Technology Valuation Approach
10.00am – 10.45am	**Keynote 7:** *Ian Mitchell, UK* AI and its Possible Impact on my Structured Problem Solving Experience - 25 Years as a Practitioner
10.45am – 4.30pm	Paper presentations and discussions (see the daily programme below)
4.30pm – 5.15pm	**Workshop 3:** *Denis Cavallucci, INSA Strasbourg, France* Artificial Intelligence Assisted R&D: Contradiction Graphs Extracted from Patent Corpuses Using AI Techniques
5.15pm – 6.00pm	**Final Discussion and Closing Ceremony**

Conference Programme

Day 1: Tuesday, 12 September 2023   Time is Central European Summer Time CEST (Paris, UTC+2)

9.00am – 9.15am	**Opening Ceremony** *Pavel Livotov, Conference General Chair, Offenburg University* *Denis Cavallucci, Scientific Chair, INSA Strasbourg*
9.15am – 10.00am	**Introductory address:** Mapping the Evolutionary Journey of TRIZ and Pioneering Its Next S-Curve in the Age of AI-Aided Invention *Stelian Brad, ETRIA President* *Abstract*
10.00am – 11.00am	**Session 1: AI-aided Innovation and Patent Analysis** *Chair: Davide Russo*
10.00am – 11.00am	1. Question Answering with Transformers and Few-Shot Learning to find Inventive Solutions for IDM-TRIZ Problems and Contradictions in Patents *Stefan Trapp, Nathanael Großer and Joachim Warschat* *Abstract* 2. Navigating the Knowledge Network: How Inter-Domain Information Pairing and Generative AI Can Enable Rapid Problem-Solving *Nicolas Douard, Ahmed Samet, George Giakos and Denis Cavallucci* *Abstract* 3. Multi-Domain and Heterogeneous Data Driven Innovative Problem Solving: Towards a Unified Representation Framework *Iliass Ayaou and Denis Cavallucci* *Abstract* 4. Innovation Logic: benefits of a TRIZ-like mind in AI or text analysis of patent literature *Simon Dewulf and Peter R N Childs* *Abstract*
11.00am – 11.15am	Break
11.15am – 1.00pm	**Session 2: AI and Sustainable Innovation** *Chair: Swen Guenther*
	5. Function-Oriented Search, TRIZ and the Sustainable Use of Information Resources *Jochen Wessner* *Abstract* 6. Research on Production Innovation Problem Identification Process Based on FRT *Jianguang Sun, Bo Zhang, Can Lu, Ranye Du and Runze Miao* *Abstract* 7. Classification of Nature-Inspired Inventive Principles for Eco-innovation and their Assignment to Environmental Problems in Chemical Industry *Mas'udah, Pavel Livotov, Sandra Santosa and Akhmad Suryadi* *Abstract* 8. Problem Analysis for Green Industrial Policy *Isabel Estevez and Justus Schollmeyer* *Abstract* 9. How to Inspire Students for TRIZ – TRIZ as an Enabler for Product Development in a new Sustainable Study Programme *Kristina Steinbiss and Jochen Orso* *Abstract* 10. Unified Eco-innovation Methodology Based on TRIZ and C-K Theory *Ousmane Senghor, Marie Ndiaye and Khalifa Gaye* *Abstract*

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1.00pm – 2.00pm	Lunch break
2.00pm – 3.00pm	**Session 3: General Vision of TRIZ and Approaches to Systematic Innovation** *Chair: Kai Hiltmann*
	11. Functional Approach to Subversion Analysis in New Product Development *Oleg Abramov* *Abstract*
	12. Functional Value of TRIZ Components - universal Concept and direct Implications *Christian Iniotakis* *Abstract*
	13. Impact of Theory of Inventive Problem Solving (TRIZ) on Innovation Portfolio Development *Nikhil Phadnis and Marko Torkkeli* *Abstract*
	14. Partially Defined Boolean Functions in TRIZ *Jerzy Chrząszcz* *Abstract*
3.00pm – 3.15pm	Break
3.15pm – 4.00pm	**Keynote 1:** Identifying Customer Needs: Harnessing AI for Effective Problem Solving and Innovation *Alex Agulyansky*
4.00pm – 4.15pm	Break: Discussion, Networking
4.15pm – 5.00pm	**Keynote 2:** Chaotic Problems, TRIZ, and AI-Universal Problem Solving *Rod King*
5.00pm – 5.15pm	Break: Discussion, Networking
5.15pm – 6.00pm	**Workshop 1:** Empowering Effective Problem Solving: The Next Generation of Technical Information Retrieval Tools *Davide Russo, University of Bergamo*

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Day 2: Wednesday, 13 September 2023   Time is Central European Summer Time CEST (Paris, UTC+2)

Time	Session
9.00am – 9.45am	**Keynote 3:** How new AI tools will Change Technical Creativity in Near Future *Valery Tsourikov*
9.45am – 10.00am	Discussion and Organisational Announcements
10.00am – 11.00am	**Session 4: AI-aided Innovation and Product Development** *Chair: Denis Cavallucci*
	15. AI based Pointer to Geometric Effects *Davide Russo, <u>Simone Avogadri</u> and Christian Spreafico* *Abstract*
	16. Opening up New Fields of Applications with TRIZ Reverse – Conceptual Framework, Software Application, and Implementation Challenges *<u>Swen Günther</u>, Simon Dewulf and Darrell Mann* *Abstract*
	17. A Multi-Stage AI-based Approach for Automatic Analyzation of Bike Paths *<u>Büsra Alili</u>, Ingo Dittrich, Jochen Baier, Oliver Taminé, Johannes Deyringer and Nicolas Mahn* *Abstract*
	18. Enhancing Creativity in Deep Learning Models with SAVE-Inspired Activation Functions *Stelian Brad* *Abstract*
11.00am – 11.15am	Break
11.15am – 1.00pm	**Session 5: Sustainability and Eco-Innovation** *Chair: Hans-Gert Gräbe*
	19. Problem Modelling for Sustainability in Business Environment by Linking TRIZ and Systems Engineering *Vladimir Sizikov* *Abstract*
	20. The Law of Reliable Resource Supply: Making Altshuller's Laws of System Evolution Sustainable *<u>Justus Schollmeyer</u> and Kartik B. Ariyur* *Abstract*
	21. Integrating TRIZ and MCDM for Innovative and Sustainable Decision-Making: A Case Study in the Life Cycle of Olive Oil *<u>Mohamed Amir Keskes</u>, Remy Houssin, Alaeddine Zouari, Diala Dhouib and Jean Renaud* *Abstract*
	22. Sustainability, TRIZ and Packaging *Jochen Wessner* *Abstract*
	23. TRIZ and Chaos: First Principles for Emergency First Responders *Darrell Mann* *Abstract*
	24. Use of Function Analysis in the Design of Multi-Functional Products *<u>Marek Mysior</u> and Sebastian Koziołek* *Abstract*

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Time	Session
1.00pm – 2.00pm	Lunch break
2.00pm – 3.00pm	**Session 6: Impact of Systematic Innovation and TRIZ in Society** *Chair: Claudia Hentschel*
	25. Bringing back a source – TRIZ in Social Science *Nadine Schumann, Ken Pierre Kleemann and Hans-Gert Gräbe*　　　　　*Abstract* 26. Using TRIZ to Write a Good Thesis on Time *Jerzy Chrząszcz*　　　　　*Abstract* 27. Assessing Business Excellence Approaches from the Perspective of Directors: Exploring the Role of TRIZ *Soumaya El Youssoufi, Mohamed Mazouzi, Mouhcine Ibn Maamar and Nouhaila Sahiri*　　　　　*Abstract* 28. TRIZ-based Model of Social System *Pavel Azaletskiy, Olga Eckardt, Andrei Kuryan and Vladimir Petrov*　　　　　*Abstract*
3.00pm – 3.15pm	Break
3.15pm – 4.00pm	**Keynote 4:** How AI Enhances the KnowBrainer Innovation Process *Gerald Haman*
4.00pm – 4.15pm	Discussion / Break
4.15pm – 5.00pm	**Keynote 5:** My Muse, the Robot - Innovation and Creativity in Times of AI *Nicolai Schumann*
5.00pm – 5.15pm	Discussion / Break
5.15pm – 6.00pm	**Workshop 2:** AI-Augmented TRIZ: Unleashing the Power of Jeda.ai for Enhanced Problem Analysis and Solution Generation *Bryan Cassady, Global Entrepreneurship Alliance, Brussels*

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Time is Central European Summer Time CEST (Paris, UTC+2)

9.00am – 9.45am	**Keynote 6:** AI-empowered Technology Valuation Approach *Yu Xiong*
9.45am – 10.00am	Discussion and Organisational Announcements
10.00am – 10.45am	**Keynote 7:** AI and its Possible Impact on my Structured Problem Solving Experience - 25 Years as a Practitioner *Ian Mitchell*
10.45am – 11.00am	Discussion / Break
11.00am – 12.30pm	**Session 7: Approaches to Systematic Innovation and Case Studies** *Chair: Remy Houssin*
	29. WTSP Report (6) Catalogues of TRIZ and Around-TRIZ Sites in the World (Preparing for Gamma Edition) *Toru Nakagawa, Darrell Mann, Michael Orloff, Simon Dewulf, Simon Litvin and Valeri Souchkov* *Abstract* 30. Improving Usability Services and User Experience of Online Museum Virtual Exhibition with TRIZ Theory *Fazal Gilani and Ching-Hung Lee*　　　　　　　　　　　　　*Abstract* 31. The Impact of Using Resources on Waiting Time in the Queueing Model with FlexSim *Jyhjeng Deng*　　　　　　　　　　　　　　　　　　　　　*Abstract* 32. Reduction of Bubble-induced Defect in Semiconductor Lithography Process *Kyoung Whan Oh, Takashi Sasa, Seok Heo, Daejung Kim, Ouiserg Kim and Jung-Hyeon Kim*　　　　　　　　　　　　　　　　　　　　　　　　*Abstract* 33. TRIZ-based Approach in Remodeling Invasive Glucometer *Ashley Edward Roy Soosay, Muhammad Hamdi Mahmood, Khairul Fikri Tamrin and Narayanan Kulathuramaiyer*　　　　　　　　　　　　　　　　　　*Abstract*
12.30pm – 1.00pm	34. TRIZ, Truth & AI *Darrell Mann*　　　　　　　　　　　　　　　　　　　　　*Abstract*

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Time	Content
1.00pm – 2.00pm	Lunch break
2.00pm – 3.00pm	**Session 8: AI-aided Innovation and Product Development** *Chair: Stelian Brad*
	35. TRIZ Ideas in a Systematic Presentation *Petr Shimukovich* *Abstract* 36. Assessing the environmental performance of the food industry using unsupervised machine learning *Zineb Nafi, Rachid Benmoussa and Fatine Elharouni* *Abstract* 37. Incorporating TRIZ Methodology into Semi-Structured Interviews for Innovative Insights *Marwa Ben Moallem, Remy Houssin, Amadou Coulibaly, Mohamed Haykel Ammar, Diala Dhouib and Mohamed Abdellatif* *Abstract* 38. Intelligent Character Recognition of Handwritten Forms with Deep Neural Networks *Hartwig Grabowski* *Abstract*
3.00pm - 3.15pm	Break
3.15pm – 4.15pm	**Session 9: Impact of Systematic Innovation and TRIZ in Society** *Chair: Jerzy Chrząszcz*
	39. TRIZ in Marketing Management: Study of Current Situation *Joanna Majchrzak and Iwona Michałowska* *Abstract* 40. Dilemma or False Dilemma: A Sequence of Steps to Avoid the Trolley *Justus Schollmeyer* *Abstract* 41. An Experiment on the Impact of TRIZ-Inspired Thinking on Solving Insight Problems *Ralf Laue and Amory H. Danek* *Abstract* 42. Determination of Optimal Functionality *Kai Hiltmann* *Abstract*
4.15pm – 4.30pm	Break
4.30pm – 5.15pm	**Workshop 3:** Artificial Intelligence Assisted R&D: Contradiction Graphs Extracted from Patent Corpuses Using AI Techniques *Denis Cavallucci, INSA Strasbourg*
5.15pm – 6.00pm	**Final Discussion and Closing Ceremony**