Curriculum Vitae

of

Nikolai Khomenko

OTSM-TRIZ-expert and researcher, specializing in problem, knowledge, and team management for working on complex cross-disciplinary innovative situations and non-standard problems

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Curriculum Vitae

1. Independent researcher, educator and coach in OTSM-TRIZ-based management of problems, knowledge, and team members consisting of diverse professionals. The aim of the management and coaching is to maintain sustainable innovation process relevant to various domains of human activity: research, production, product development, marketing, cost deduction, quality improvement, forecasting and knowledge management, business development, education, strategy and tactics planning for private and/or state institutions.

2. Diplomas:
   - Master of Science in Engineering.
   - Master of TRIZ (one of 64 people around the world awarded by the author of Classical TRIZ - Genrich Altshuller).

3. Places of work and positions:

   2003-present European Institute for Energy Research (Karlsruhe, Germany): sustainable innovation manager and problem solving coach, researcher and OTSM-TRIZ expert. Member of the Sustainable Energy Region Group.

   2000-present Institute Nationale Scientifique Appliqué (INSA) (Strasbourg, France), associate professor (PAST) of OTSM-TRIZ.

   1999-present Insight Technologies Lab (Toronto, Canada), president and owner. Organization for outsourcing research and education. Specialization of the company: research in the area of sustainable innovation; knowledge and problem management; educational technology to develop creative, analytical, and problem-solving skills in individuals and organizations; coaching in dealing with complex non-standard innovative problem situations; teaching various categories of students to deal with complex cross-disciplinary problem situations. Some recent clients of the company: Alstom (France), Valeo (France), ArvinMeritor (USA-France), Forecia (France), Salomon (France), PSA Peugeot-Citroen (France), European Aero-Space Agency (EADS), Center of earlier intellectual development for Kids “Pochemuchika” (Toronto, Canada), LG-Electronics (south Korea), Samsung (South Korea), EnBW (Germany), EDF

(France), Master Food (USA-Poland).

2000-2003 Samsung Electronics Advanced Institute of Technology (Suwon, South Korea), coach and trainer for innovative problem-solving situations.

1999 LG-Electronics Learning Center (Pyangtake, South Korea), visiting professor.

1997-1999 Independent Consulting Group (Minsk, Belarus), senior researcher.

1997-1999 Minsk Electronic and Information Technologies University (Minsk, Belarus), visiting professor.

1997-1999 Institute of Modern Knowledge (Minsk, Belarus), visiting professor.

1997 LG-Electronics Production and Engineering Research Center (LG-PRC) (Pyangtake, South Korea), TRIZ-expert in problem solving, leader of troubleshooting research group.

1994-1997 Orient Soft (Minsk, Belarus), senior researcher.

1988-1994 Invention Machine Laboratory (Minsk, Belarus), senior researcher.

1988-1989 Radio-engineering Institute, Artificial Intelligence Laboratory (Minsk, Belarus), TRIZ-expert, leader of research group.

1981-1988 Research Institute of Agriculture, Laboratory of Mobile Automation Systems (Minsk, Belarus), senior engineer-researcher.

1977-1981 Research Institute of Measurement Devices (Minsk, Belarus), engineer and leading engineer.

1972-1977 Radio-engineering institute (Minsk, Belarus), Master of Engineering.

4. Pedagogical Activity:

2004-current INSA Strasbourg, France Scientific Director of Postgraduate Program certified by Conference Des Grand Ecoles: Advanced Master in Innovative Design (30 ETCS – European Credit Transfer System).
Six modules, one a week, are delivered each year for participants who already have a Master's degree and would like to obtain deeper knowledge on OTSM-TRIZ for Sustainable Innovation. Students of the program include top managers and R&D managers of industry and research centers, as well as professionals from various organizations. In the course of the program students must complete a final project in which they must analyze real-life problem situations in engineering, research, business and other domains of human activity. Final projects in which engineering problems are analyzed regularly result in filing for patents. This is a unique educational program on the basis OTSM-TRIZ certified by International Association of Old Universities – Conference De Grand Ecole. The diplomas received through this program are recognized internationally.

2008, January Participant of European Project - TETRIS.
Aim of the project: to develop a set of educational materials for the entrance-level OTSM-TRIZ education for middle and high schools, colleges, universities, research centers, R&D, and industries in Germany, France, Italy, Austria, and Latvia.

2008, April Theoretical Background of Classical TRIZ and OTSM and applications for real-life research problem solving: Learning by Doing.
Initial Training for researchers of the European Institute for Energy Research (EIFER) was provided on the basis of Learning by Doing. Participants learn some fundamentals of Classical TRIZ and OTSM and the way in which they could be used for real-life research problem solving.

2008, March Den Haag, Holland. Workshop on the application of "Yes-NO" Games For Teaching OTSM-TRIZ and Other School Subjects.
Workshop on the implementation of OTSM-TRIZ for increasing efficiency of education and developing learning and problem-solving skills in the educational institutions for students of various ages and majors. Participants: parents and professional educators.

2008, January Ensenada, Baja California, Mexico. Workshop on introducing OTSM-TRIZ into Educational System (ages from 3 to 26).
Participants: professors of pedagogy and managers of educational system in Baja California.

2008, January Founder and leader of the international network: "OTSM-TRIZ for Kids and Educational System."
Network includes professional educators, OTSM-TRIZ coaches and managers of education from Korea, Mexico, several countries of the European Union, Canada, Russia, Belarus and Ukraine. Members of the network develop educational materials for different levels of educational systems of their countries, from preschool education to Ph.D. students and their professors. These materials are translated into English, Spanish and Korean Languages. The educational materials are usually based on the real-life pedagogical experience and tested in pilot places organized and supported by the members of the network.

2007, November Frankfurt, Germany. "Classical ARIZ and OTSM-based Contradiction Technology."
Tutorial for participants of international scientific conference: TRIZ FUTURE 2007. The subject of the tutorial: introduction to theoretical background of classical TRIZ, classical ARIZ and OTSM "New-Problem" and "Contradiction" technologies. Frankfurt, Germany.

2007, October Milan, Italy. OTSM-TRIZ instruments for sustainable innovation.
First acquaintance with classical TRIZ and OTSM application to sustainable innovation for members of Italian network - Innovation Circus.

2007, September Strasbourg, France. Seminar: "What is OTSM-TRIZ and how it could help develop learning and thinking skills in our students?"
Training for participants of the European Project: "New learners in the new Europe"

2007, March Vinci, Italy. Educational Program "OTSM-TRIZ and some of its tools."
Participants: Italian TRIZ Expert and researchers of the Italian TRIZ association "Apeiron."

2007, February Monterrey, Nuevo Leon, Mexico. Educational program: **"**OTSM instruments for sustainable innovation."
Participants: professionals, top managers and CEOs from small and medium businesses. Training was organized by the Institute of Innovation and Technology Transfer of Nuevo-Leon in the framework of the project Monterrey - International City of Knowledge.

2007, February Monterrey, Nuevo Leon, Mexico. First level of advanced educational Program: Fundamentals of classical TRIZ and OTSM.
Participants: directors and professionals from small enterprises. Training was organized by the Institute of Innovation and Technology Transfer of Nuevo-Leon as part of the project Monterrey - International City of Knowledge.

2007, February Monterrey, Mexico. Seminar: "What is OTSM-TRIZ and how it could be used for sustainable innovation?"
Special half-day seminar for top management of a cosmetics manufacturing company.

2007, February Monterrey, Nuevo Leon, Mexico, Faculty of Psychology, University of Nuevo Leon (UANL). First acquaintance with OTSM and TRIZ: psychological aspects in OTSM-TRIZ-tools for problem solving.
Special educational program was developed for professors and researchers in the field of psychology. The four-day seminar was organized by the Institute of Innovation and Technology Transfer of Nuevo-Leon as part of the project Monterrey - International City of Knowledge..

2006, May and September Advanced level educational Program: "Altshuller's Algorithm for inventive problem solving – ARIZ". Monterrey, Mexico.
Participants: professionals of R&D from small and medium enterprises of the State Nuevo Leon, Mexico. In the course of the training real-life R&D problem situations were considered. One of the results: one problem was solved and patent was filed.

2006 Educational program "Fundamentals of OTSM and Classical TRIZ"
Company: Energy of Baden Württemberg (EnBW), Karlsruhe, Germany.
The initial education training was delivered to the top managers of R&D departments.

2006 ALSTOM Company. Educational program: Basics of OTSM and Classical TRIZ.
Participants: R&D professionals and managers.

2005-2007 European Community project: "New learners in the new Europe"
This project was carried out as part of the SOCRATES program. *Teachers and researchers of five countries were involved. Project was dedicated to developing and disseminating non-linear educational technologies for teaching foreign languages and developing thinking skills on the basis of OTSM-TRIZ approach.*

2005- 2006 IntelGames - Educational Center for kids, parents and teachers. Moscow, Russia.
First classes took place in October 2005. Stable experimental space for educational research and courses for parents and other educators will be established in 2006 in cooperation with members of

the Jonathan Livingston Project.

2004 Participation in the project Innovate America, which involved teaching modern OTSM-TRIZ technologies to children and their teachers, with the goal of developing intellectual skills and new educational technologies (In cooperation with American Society for Quality (ASQ) and GOAL/QPC).
One book was translated into English; publication is planned for several others books and other educational materials; educational consulting, coaching and Virtual Classroom project under development. Series of animated interactive movies are under development. This series is dedicated to assisting teachers and parents in teaching the fundamentals of OTSM-TRIZ to kids of various ages. The project is oriented toward Family and Home schools which are becoming increasingly more popular in USA and are part of the strong public movement which strives to answer the demands of the modern accelerated and changeable world and to overcome disadvantages of modern educational system. Parents and home teachers have organized associations to disseminate among themselves the experience they have gained.
In frame of this project one more subproject is under construction – Virtual Classroom. This project is dedicated to combine OTSM-TRIZ and Non-Linear Educational technologies with modern interactive Internet-based educational technologies.

1985-present Author and coordinator of International Educational Project "Jonathan Livingston."
The goal of this project is further development of problem-solving technologies and the development of new educational strategies that could be used with greater efficiency for teaching problem solving. The overall goal of the project is harmonization and integration of OTSM-TRIZ problem solving and knowledge management technologies into the educational system. In 2003 our team had initiated international project (in Korea) concerned with implementing OTSM-TRIZ technologies into the educational system at all levels, from preschoolers to Ph.D. students. Today first part of the project has begun, dealing with the preschooler problem-solving education. As one of the results of the "Jonathan Livingston" project, in 2003 our textbook for pedagogical colleges was published in Russia. This is the very first text book of this kind, written in cooperation with T. Sidorchuk and S. Leluch, and was recommended for distribution among pedagogical colleges of Russia by the Russian Ministry of Education. Now this book is under translation into Korean and Spanish languages for our common project with Korean colleagues.

2003-present Institute Nationale Scientifique Appliqué (INSA) Strasbourg (former name ENSAIS), France, associate professor (PAST) of OTSM-TRIZ
Taught courses for students, professors, industry and research professionals, co-supervised Ph.D students, and various student projects. Main educational program: Advanced Master of Innovative Design, with 5 modules allocated to teaching OTSM-TRIZ application in problem solving and new paradigms for Knowledge Management.

2005 Ford Motors Company, Detroit USA. Educational Program Introduction to OTSM TRIZ.

2000-2003 Ecole Nationale Superieur des Art et Industries de Strasbourg (ENSAIS), Strasbourg, France, part time associate professor of TRIZ.
Taught courses for students, professors, industry and research professionals, co-supervised Ph.D students and final projects.

2002-2004 Center of creative early intellectual development for preschoolers and various school ages “Pochemuchika” (Toronto, Canada).
Introduction course about OTSM-TRIZ problem solving and how to use it for creative imagination development.

2002 North View Community Center, (Toronto, Canada) visiting professor.
Course: fundamentals of problem solving for teenagers.

2000-2003 Samsung Advanced Institute of Technology (Suwon, South Korea). Visiting professor
Taught courses on classical TRIZ and OTSM-TRIZ for professionals of Samsung Group and Japanese Companies: Sanyo and Nikkei Mechanical (up to 80 hours per course).

2000 Poland, Czech Republic
Taught courses for university professors, and industry (up to 80 hours)

2000 Toronto, Ontario, Canada. Jewish Community Educational Center
Course: introduction to problem solving and its application in learning English as a second language.

2000 Toronto, Canada. JAVIS program, TRIZ-based Problem Solving Training courses.

1999 LG-Electronics Learning Center (Pyangtake, South Korea), visiting professor
Course: “TRIZ Mastering in engineering and production problem solving: advanced level” - 88 hours.

1997 Gurzuf, Crimea, Ukraine. International Children Center “ARTEK”.
Three-day course for pedagogues of the center and pedagogical college; introduction to classical TRIZ and its uses within the educational process (20 hours).

1997-1999 Minsk Electronic and Information Technologies University (Minsk, Belarus), visiting professor
Course: “Using TRIZ in Electronics” - 40 hours.

1997-1999 Institute of Modern Knowledge (Minsk, Belarus), visiting professor
Course: “TRIZ-approach to problem solving in management and show business” - 36 hours.

1994-1997 Russia, Belarus, Ukraine.
Courses for pedagogues of middle school, elementary school, preschool, and Chelyabinsk Pedagogical University: Using TRIZ in children’s creative ability development. 40 hours.

1997-1999 Independent Consulting Group (Minsk, Belarus), senior researcher.
Courses: TRIZ-approach to problem solving for the customers of the company (15-30 hours).

1994-1997 Company Orient Soft, Minsk, Belarus), senior researcher.
Courses: TRIZ-approach to problem solving in business process reengineering for customers of the company (15-40 hours).

1989-1994 Invention Machine Laboratory (Minsk, Belarus), senior researcher.
Course: Using TRIZ and Invention Machine software for engineering problem solving.

1985-1993 Minsk TRIZ-Technologies Center.
Course: TRIZ technologies for problem solving in different area of human activity: basic and advanced levels. 140 Hours.

1981-1988 Research Institute of Agriculture, Laboratory of Mobile Automation Systems (Minsk, Belarus), senior engineer-researcher.
Course: TRIZ-approach to engineering: basic level - 40 hours. For Research Institute staff.

1980-1981 Research Institute of Measurement Devices (Minsk, Belarus), engineer and leading engineer.
Course: TRIZ-approach to engineering problem solving: fundamentals. 30 hours.

5. Research activity:

2008, February-present Research and development of OTSM-based instruments to organize and manage complex interdisciplinary national and international research projects. How non-standard problems could be treated by the means of OTSM and classical TRIZ.
Some OTSM-based tools were originally developed for the purposes of problem solving, but it has been showed that they could also be useful for management of various research projects (for instance, OTSM Problem Flow Networks Approach can be thus used). However, it is necessary to develop these tools further in order to increase their efficiency for some difficulties we have in the domain of long-term international cross-disciplinary research projects, such as Sustainable Energy Region Development.

2007-present Research and development of tools for practical uses of supporting transformation and changes in companies and organizations.
In the course of this research project we have cooperated with various partners around the Globe (INSA Strasbourg, France; European Institute for Energy Research and University of Karlsruhe, Germany; Institute of Innovation and technology Transfer; Italian TRIZ association; International Network of researchers in the Computer aided Innovation). The project has selected OTSM-tools for sustainable innovation in various organizations, both public and private.

2003-present European Institute for Energy Research, Karlsruhe, Germany.
Researching the application of OTSM-TRIZ-based tools to the complex energy-relevant problems. For example: how to decrease the price of the Biomass Gasification power plant? OTSM Problem Flow Networks approach was developed and tested. Subsequently this approach was applied to many other cases at several other worldwide companies: ALSTOM, Peugeot-Citroen, EADS, VALEO, Bosh-Siemens, etc.

1986-present Research in the domain of integration of OTSM-TRIZ-based tools with computer support for thinking and problem solving as well as knowledge processes and aided innovation.

First results were achieved in the 1986 and several years later implemented in the commercial software known as the Invention Machine. It was done in the shape of combined Human-Computer reasoning, in the shape of dialogue between the computer and a human. The dialogue was based on ARIZ-85-C (G.Altshuller, classical TRIZ). Now we have developed the concept of computer-aided thinking based on the recent achievements in developing OTSM-tools for solving complex interdisciplinary problems, such as the OTSM Problem Flow Networks approach. In combination with dialogue-based reasoning it could be helpful to the new generation of knowledge management systems based on knowledge processes.

1981-present Research in education in order to develop educational technologies for teaching complex interdisciplinary problem solving and managing sustainable innovation process in private companies and government organizations.
As a result of this research, several educational technologies and tools for developing skills of powerful thinking, problem solving, and creative imagination have appeared. Those non-linear pedagogical instruments are now used by educators of various countries in Europe, Asia and North America.

2005-2008 Participation in European Community project: "New learners in the new Europe"
This project is part of the SOCRATES program. Teachers and researchers of five countries are involved. This project is dedicated to developing and disseminating not-linear educational technologies for teaching foreign languages and developing thinking skills based on OTSM-TRIZ approach. It is necessary to research the corrections necessary in order to fit the requirements of national educational systems and mentality of different nations.

2005-2006 IntelGames - Educational Center for kids, parents and teachers. Moscow, Russia.
First classes took place in October 2005. Stable experimental space for educational research and courses for parents and other educators will be established in 2006 in cooperation with members of the Jonathan Livingston Project.

2004 Participation in the project "Innovate America," intended to teach to kids and their teachers the modern OTSM-TRIZ strategies for developing intellectual skills, and new educational technologies.
The project is oriented toward home-schooling which is increasingly popular in the USA and have already become a strong public movement, in response to the demand of the modern accelerated and changeable world, and in order to overcome the disadvantages of modern educational system. Parents and at-home teachers have organized associations and circulate the accumulated experience among the members.
This project offers a particularly interesting means of investigating the new ways of communication between teachers who belong to different cultural and languages traditions.

2003-present Institute Nationale Scientifique Appliqué (INSA) Strasbourg, France, associate professor (PAST) of OTSM-TRIZ.
Various aspects of OTSM-TRIZ application in different fields: Organization of scientific research, Application for Information System Structure of Enterprise Development, Application of the OTSM-TRIZ approach for Business Organizational structure development and management, Problem Solving and management. Research and development in the domain of new concepts and paradigm

of knowledge management based on OTSM-TRIZ.
Co-supervising Ph.D. students, as well as final and other projects of INSA and industrial students. Researching educational processes in order to develop new educational approaches to teaching innovative concept of problem solving and problem flow management. Developing new technologies of learning and managing knowledge necessary to solve complex cross-disciplinary problems.
This research project was also concerned with the most efficient ways of implementing OTSM-TRIZ technologies into corporate culture.

2000-2003 Ecole Nationale Superieur des Art et Industries de Strasbourg (ENSAIS), Strasbourg, France, associate professor of OTSM-TRIZ technologies.

2000-2003 Samsung Advanced Institute of Technology (Suwon, South Korea), external consultant and researcher.
- *Introduction of OTSM-TRIZ Technologies into corporate culture of Samsung Group.*

1999-present Insight Technologies Lab (Toronto, Canada), president and head of international virtual research team (South Korea, Canada, Russia, Belarus, Ukraine, Latvia, Mexico, USA).
- *OTSM-TRIZ Technologies for problem solving.*
- *Problem solving technologies for complex sets of contradictions.*
- *Non-linear education technologies for teaching OTSM-TRIZ-based problem solving*
- *Ability to use non-linear education technologies for teaching various subjects, such as foreign languages.*
- *Introducing OTSM-TRIZ technologies into various types of organizations and transforming them into sustainably innovative companies or organizations.*
- *Developing new OTSM tools for sustainable process of innovation.*
- *Developing further problem flow networks approach which would integrate all other OTSM-based tools into one general system used for problem management, OTSM-based knowledge management; all of this is necessary for sustainable innovation management.*
- *Developing background for computer support for sustainable innovative companies and organizations.*

1997-1999 Independent Consulting Group (Minsk, Belarus), senior researcher.
- *Ability to use Letters of Credit in economic system of the Republic of Belarus and other republics of the former USSR.*
- *Created a policy that set long-term goals for reengineering the educational system of the Republic of Belarus. Investigated the specific resources available in order to create a unique set of concepts to meet individual needs.*
- *Developed recommendations for creating new economic policies for the Republic of Belarus, using existing resources.*
- *Used OTSM-TRIZ technologies to predict evolution of the system.*

1997 LG-Electronics Production and Engineering Research Center (Pyangtake, South Korea), TRIZ-expert in problem solving, leader of troubleshooting research group.
- *Worked on the causes of damage in production processes of various products, particularly concerning TV sets, computer monitors, and software development.*

1994-1997 Orient Soft (Minsk, Belarus), senior researcher.

- Used TRIZ-approaches for problem solving in management and business process reengineering.

1989-1994 Invention Machine Laboratory (Minsk, Belarus), senior researcher.
- Studied objective laws of system development in the field of car engine subsystems, as well as the history of the subsystems evolution.
- Researched and developed a working algorithm of Invention Machine software, served as the leader of the research group (versions 1.0 and 1.5).
- Worked on problems arising in the use of Invention Machine software.

1988-1989 Radioengineering Institute, Artificial Intelligence Laboratory (Minsk, Belarus), TRIZ-expert, leader of research group.
- Developed an experimental version of problem-solving software based on ARIZ-85-C.

1981-1988 Research Institute of Agriculture, Laboratory of Mobile Automation Systems (Minsk, Belarus), senior engineer-researcher.
- Developed automation systems for various subsystems of mobile agricultural machines: control systems for engines, hydraulic transmission, tools for agricultural machines, etc.

1977-1981 Research Institute of Measurement Devices (Minsk, Belarus), engineer and leading engineer.
- Developed a telemetric system for measuring the natural nuclear radiation of the Earth for meteorology satellite "Meteor"
- Developed voltmeter with broad band of signal frequency (0 - 1 GHz).

1981-2002 Minsk TRIZ-Technology Center.
– Developed general algorithms for resolving contradictions in various areas of human activity.
- Developed effective training techniques for the educating professionals in the area of problem solving.

General information

1. Nikolai Khomenko
2. Date of birth: 09 December 1954.
3. Place of birth: Simferopol, USSR.
4. Address:
   153 Pinecrest Rd.
   Pefferlaw, Township of Georgina,
   Ontario, L0E 1N0
   Canada.

5. Married.
   Two daughters:
   Natalia (year of birth - 1982),
   Maria (year of birth - 1985).

6. Education:
   Master of Science in Engineering.

TRIZ Master certificate awarded by the creator of TRIZ G. Altshuller

7. Career:

since 2003 European Institute for Energy Research (Karlsruhe, Germany), part time: problem solving coach, researcher and OTSM-TRIZ expert in sustainable innovation.

since 2003 Institute Nationale Scientifique Appliqué (INSA) Strasbourg (former name before 2003 - ENSAIS), France, part-time associate professor (PAST) of OTSM-TRIZ. Education, research, industrial consulting and coaching in the domain of problem flow management. Developing new paradigm for learning and managing knowledge in order to solve complex cross-disciplinary problems based on OTSM-TRIZ approach.

2000-2003 Samsung Electronics (Suwon, South Korea). Visiting professor, external consultant and researcher in OTSM-TRIZ-based knowledge management for problem solving.

2000-2003 Ecole Nationale Supérieur des Art et Industries de Strasbourg (ENSAIS), France, part-time associate professor of OTSM-TRIZ.

1999 Insight Technologies Lab (Toronto, Canada) president.

1999 LG-Electronics Learning Center (Pyangtake, South Korea), visiting professor.
1997-1999 Independent Consulting Group (Minsk, Belarus), senior researcher.
1997-1999 Minsk Electronic and Information Technologies University (Minsk, Belarus), visiting professor.
1997-1999 Institute of Modern Knowledge (Minsk, Belarus), visiting professor
1997- LG-Electronics Production and Engineering Research Center (Pyangtake, South Korea), TRIZ-expert in problem solving, leader of troubleshooting research group.
1994-1997 Company: Orient Soft (Minsk, Belarus), senior researcher.
1989-1994 Company: Invention Machine Laboratory (Minsk, Belarus), senior researcher.
1988-1989 Radio-engineering Institute, Artificial Intelligence Laboratory (Minsk, Belarus), TRIZ-expert, leader of research group.
1988-1981 Research Institute of Agriculture, Laboratory of Mobile Automation Systems (Minsk, Belarus), senior engineer-researcher.
1981-1977 Research Institute of Measurement Devices (Minsk, Belarus), engineer and senior engineer.
1972-1977 Radio-engineering institute (Minsk, Belarus), Master of Engineering.

Pedagogical activity

The main goal of this field lies in developing new training technologies and training courses for delivering OTSM-TRIZ-based problem solving technologies to different kinds of students - engineers, researchers, professors, teachers, children, businessmen, image makers, and consultants. In these courses students study the main models and tools of OTSM-TRIZ and learn how to apply these models in their professional and everyday lives. Educational technologies development continues the Problem Flow Management based on OTSM-TRIZ Problem Flow Networks approach, which was developed over the past several years as part of research carried out in the Insight Technologies Lab, Jonathan Livingston Project, and in cooperation with INSA Strasbourg. Based on this research, the educational program Advanced Master in Innovative Design (30 ECTS – European Credit Transfer System) was created at INSA Strasbourg in 2004 and successfully delivered each year since then. The program was certified by the Conference Des Grand Ecoles, International association of Universities for controlling quality of educational programs.

Two OTSM-TRIZ-based educational projects are now supported by the European Union. These projects were developed on the basis of our research in applying OTSM-TRIZ to the needs of education. As part of these projects, various educational programs are now being developed, along with websites for supporting these educational programs. These educational programs are dedicated to initial education in applying OTSM-based approaches for solving real everyday problems. The research that was collected by the psychologists of Moscow State University (Russia) shows that kids who learned OTSM-TRIZ-based tools for problem solving have greater psychological stability when faced with complex problems. This means that the children have lower stress levels and learn other subjects easier.

Educational activities were performed during 2006-2007 in Mexican state Nuevo Leon, Monterrey. This collaboration was initiated by the Institute of Innovation and Technology Transfer (I2T2) and several private and public institutions of Monterrey.

OTSM-based Problem Flow Networks approach to managing knowledge in the course of problem-solving process and in the course of evolution of the organization itself. It is dedicated to helping participants (members of the company and invited experts) in solving complex cross-disciplinary problems to learn more about the subjects relevant to the problem situation.
For kids and students of schools and universities this approach is helpful in studying new subjects, both in their formal education and in life-long learning.
For the teachers and professors it is helpful to reorganize their educational courses according to the network of problems, with which students should be able to deal with after education and increase the level of coordination between educational programs that are delivered in the educational institutions.

In cooperation with participants of Jonathan Livingston Project the educational technology named Non-Linear Approach to Education was developed. Based on this approach, teachers could develop reliable cross-disciplinary educational programs. For instance, languages and basics of OTSM could be learned simultaneously, through one educational program. European Union has invested in the development of this project and its dissemination in five European countries.

Within the framework of the Jonathan Livingston Project a set of educational materials for system of OTSM-TRIZ education has been developed. A series of animated interactive educational films is also being developed. The first part, produced both in Russian and in English, is intended to help parents and teachers in teaching their kids and students the OTSM ENV model for describing an element of a problem situation. This film, of course, can also be helpful to adults. A book has been written for the same purpose in collaboration with INSA Strasbourg – Utilisation de la théorie TRIZ dans les métiers du BTP. This book explains in detail the most powerful tools of classical TRIZ-ARIZ by G.Altshuller, along with other ideas of classical TRIZ, illustrating them with examples from the area of civil engineering. This book also contains a list of items, which together form an idealistic image of a general powerful problem-solving approach to be developed in the future. This image has been composed as the result of more than twenty years of research carried out by the members of JL-Project around the world in various countries and with people who belonged to cultures with different habits of thought. This image is useful for comparing various problem-solving tools and understanding the directions of their future evolution. We use this image to show to our students advantages and disadvantages of various approaches, including new ones that appear every year, and the ways in which they can evaluate them on their own. This image is also useful for teachers and can help them develop training courses; as well, it can assist OTSM researchers in choosing the next research goal.

2004 - 2009 INSA Strasbourg, France Scientific Director of the Postgraduate Program certified by Conference Des Grand Ecoles: Advanced Master in Innovative Design – AMID - (30 ETCS – European Credit Transfer System).
AMID is a year-long program with a small number of students – usually no more than twelve. This enrolment cap is necessary in order to provide the appropriate quality level of the unique elite educational program. The students of this program are managers of R&D, project managers, top professionals from various European companies and government organizations.
Six modules, one week each, are delivered each year for participants who already have a Master's degree and would like to obtain deeper knowledge on OTSM-TRIZ for Sustainable Innovation. Students of the program include top managers and R&D managers of industry and research centers, as well as professionals from various organizations. In the course of the program students must complete a final project in which they must analyze real-life problem situations in engineering, research,, business and other domains of human activity. Final projects in which engineering problems are analyzed regularly result in filing for patents. This is a unique educational program on the basis OTSM-TRIZ certified by International Association of Old Universities – Conference De Grand Ecole. The diplomas received through this program are recognized internationally.

2000-2009 Institute Nationale Scientifique Appliqué (INSA) Strasbourg, France, part time associate professor (PAST) of OTSM-TRIZ.
Courses for students, professors, industry and research professionals, co-supervision of Ph.D. projects, including final projects.
One of the most important achievements of the year 2003: the program for post-graduate students, Advanced Master's degree of Innovation Design, was approved by the international organization Conference de Grand Ecoles. Eight modules out of eleven were developed under my supervision. Today, a team of professors involved in the program are working on its further development in order to ensure better coordination of the modules taught by several teachers and better alignment of subjects, and to increase the overall efficiency of the program. Non-Linear Educational Approach is used in five modules of the main course dedicated to teaching OTSM-TRIZ. This program draws the

attention of various organizations to the activities of INSA Strasbourg in the areas of OTSM-TRIZ problem solving and its applications for the theory of design.
In addition, a typical technology for determining the focal topics of Ph.D. projects based on OTSM-TRIZ approach has been developed. This technique appear as part of Problem Network that was developed as part of the OTSM Problem Flow Networks approach. Within this approach, research in certain areas could be viewed as a specific problem situation and the general approach could be adjusted accordingly.

2008-2009 Coaching session at Bombarier Europe Berlin, Manheime, Wroclaw,

2008, January Participant of European Project - TETRIS.

Aim of the project: developing a set of educational materials for the entrance-level OTSM-TRIZ education for middle and high schools, colleges, universities, research centers, R&D, and industries in Germany, France, Italy, Austria, and Latvia.

2008, April Theoretical Background of Classical TRIZ and OTSM and applications for real-life research problem solving: Learning by Doing.
Initial Training for researchers of the European Institute for Energy Research (EIFER) was provided on the basis of Learning by Doing. Participants learn some fundamentals of Classical TRIZ and OTSM and the way in which they could be used for real-life research problem solving.

2008, March Den Haag, Holland. Workshop on the Application of "Yes-NO" Games to Teaching OTSM-TRIZ and Other School Subjects.
Workshop on the implementation of OTSM-TRIZ for increasing efficiency of education and developing learning and problem-solving skills in the educational institutions for students of various ages and majors. Participants: parents and professional educators.

2008, January Ensenada, Baja California, Mexico. Workshop on introducing OTSM-TRIZ into Educational System (ages 3 to 26).
Participants: professors of pedagogy and managers of educational system in Baja California.

2008, January Founder and leader of the international network: "OTSM-TRIZ for Kids and Educational System."
Network includes professional educators, OTSM-TRIZ coaches and managers of education from Korea, Mexico, several countries of the European Union, Canada, Russia, Belarus and Ukraine. Members of the network develop educational materials for different levels of educational systems of their countries, from preschool education to Ph.D. students and their professors. These materials are translated into English, Spanish and Korean Languages. The educational materials are usually based on the real-life pedagogical experience and tested in pilot places organized and supported by the members of the network.

2007, November Frankfurt, Germany. "Classical ARIZ and OTSM-based Contradiction Technology."
Tutorial for participants of international scientific conference: TRIZ FUTURE 2007. The subject of

the tutorial: introduction to theoretical background of classical TRIZ, classical ARIZ and OTSM "New-Problem" and "Contradiction" technologies. Frankfurt, Germany.

2007, October Milan, Italy. OTSM-TRIZ instruments for sustainable innovation.
First acquaintance with classical TRIZ and OTSM application to sustainable innovation for members of Italian network - Innovation Circus.

2007, September Strasbourg, France. Seminar: "What is OTSM-TRIZ and how it could help develop learning and thinking skills in our students?"
Training for participants of the European Project: "New learners in the new Europe"

2007, March Vinci, Italy. Educational Program "OTSM-TRIZ and some of its tools."
Participants: Italian TRIZ Expert and researchers of the Italian TRIZ association "Apeiron."

2007, February Monterrey, Nuevo Leon, Mexico. Educational program: **"**OTSM instruments for sustainable innovation."
Participants: professionals, top managers and CEOs from small and medium businesses. Training was organized by the Institute of Innovation and Technology Transfer of Nuevo-Leon in the framework of the project Monterrey - International City of Knowledge.

2007, February Monterrey, Nuevo Leon, Mexico. First level of advanced educational Program: Fundamentals of classical TRIZ and OTSM.
Participants: directors and professionals from small enterprises. Training was organized by the Institute of Innovation and Technology Transfer of Nuevo-Leon as part of the project Monterrey - International City of Knowledge.

2007 Psychological aspects of the OTSM-TRIZ-based problem solving process.
A four-day training program was created and delivered to researchers in the field of psychology. It was attended by the professors and researchers of the Faculty of Psychology, University of Nuevo Leon, Monterrey. Included step-by-step analyses of various psychological aspects of the problem solving process and the tools used to decrease mental inertia and develop image of the solution.

The seminar was organized by the Institute of Innovation and Technology Transfer of Nuevo-Leon as part of the project Monterrey - International City of Knowledge.

2006, May and September Advanced level educational Program: "Altshuller's Algorithm for inventive problem solving – ARIZ". Monterrey, Mexico.
Participants: professionals of R&D from small and medium enterprises of the State Nuevo Leon, Mexico. In the course of the training real-life R&D problem situations were considered. One of the results: one patent was filed and several problems solved.

2006 Educational program "Fundamentals of OTSM and Classical TRIZ"
Company: Energy of Baden Württemberg (EnBW), Karlsruhe, Germany.
The initial education training was delivered to the top managers of R&D departments.

2006 ALSTOM Company. Educational program: Basics of OTSM and Classical TRIZ.
Participants: R&D professionals and managers.

ALSTOM is a worldwide company. In the April of 2007 their high-speed train established word record of speed for a train – 540 km per hour.

2005-2007 European Community project: "New learners in the new Europe"
This project was carried out as part of the SOCRATES program. *Teachers and researchers of five countries were involved. Project was dedicated to developing and disseminating non-linear educational technologies for teaching foreign languages and developing thinking skills on the basis of OTSM-TRIZ approach.*
Teachers and researchers of five countries are involved in this project, dedicated to developing and disseminating non-linear educational technologies for teaching foreign languages and developing thinking skills based on the OTSM-TRIZ approach. The director of this project is Alexander Sokol (Riga, Latvia), author of Thinking Approach and member of Jonathan Livingstone Project.

2005- 2006 IntelGames - Educational Center for kids, parents and teachers. Moscow, Russia.
Collaboration in the field of teaching teachers, parents, and kids to solve complex problems.
First classes took place in October 2005. Stable experimental space for educational research and courses for parents and other educators will be established in 2006 in cooperation with members of the Jonathan Livingston Project.

2005 Ford Motors Company, Detroit USA. Educational Program Introduction to OTSM TRIZ.
The participants were professionals from various departments of Ford Company and from Delphi.

2004 Participation in the project Innovate America, which involved teaching modern OTSM-TRIZ technologies to children and their teachers, with the goal of developing intellectual skills and new educational technologies (In cooperation with American Society for Quality (ASQ) and GOAL/QPC).
One book was translated into English; publication is planned for several others books and other educational materials; educational consulting, coaching and Virtual Classroom project under development. Series of animated interactive movies are under development. This series is dedicated to assisting teachers and parents in teaching the fundamentals of OTSM-TRIZ to kids of various ages. The project is oriented toward Family and Home schools which are becoming increasingly more popular in USA and are part of the strong public movement which strives to answer the demands of the modern accelerated and changeable world and to overcome disadvantages of modern educational system. Parents and home teachers have organized associations to disseminate among themselves the experience they have gained.
In frame of this project one more subproject was under construction (later terminated) – Virtual Classroom. This project is dedicated to combine OTSM-TRIZ and Non-Linear Educational technologies with modern interactive Internet-based educational technologies.

1985-present Author and coordinator of International Educational Project "Jonathan Livingston."
The goal of this project is further development of problem-solving technologies and the development of new educational strategies that could be used with greater efficiency for teaching problem solving. The overall goal of the project is harmonization and integration of OTSM-TRIZ problem solving and knowledge management technologies into the educational system. In 2003 our team had initiated international project (in Korea) concerned with implementing OTSM-TRIZ technologies into the

educational system at all levels, from preschoolers to Ph.D. students. Today the first part of the project has begun, dealing with the preschooler problem-solving education. As one of the results of the "Jonathan Livingston" project, in 2003 our textbook for pedagogical colleges was published in Russia. This is the very first text book of this kind, written in cooperation with T. Sidorchuk and S. Leluch, and was recommended for distribution among pedagogical colleges of Russia by the Russian Ministry of Education. Now this book is under translation into Korean and Spanish languages for our common project with Korean colleagues. T. Sidorchuk is the director of department of educational technologies of pedagogical college and scientific director of research center of preschool education. S. Leluch is director of kindergarten. Her kindergarten was one of the twelve experimental kindergartens where approbation of methodology was done during last 10 years.

In 2003, this educational program was recommended for distribution among pedagogical colleges of Russia by Russian Ministry of Education.

In September of 2006, one of the members of the project Tatiana Sidorchuk was awarded by medal of Yanush Korchak – the most important teaching award in Russia.

In the course of the project, a great deal of research had been collected, and by 2007, two Ph.D. projects have been defended. The dissertation project of Alla Nesterenko, also a member of the project, was considered a breakthrough in pedagogy. Two members of the project were invited, as keynote speakers, by the Altshuller Institute for TRIZ study (USA) to the conferences TRIZCON 2006 and TRIZCON 2007

In 2006, a game developed by a member of the JL-Project Nelly Kozyreva was selected for an award by the Association of Russian Businessmen.

In 2006 and 2005, kids from our pilot kindergarten won six awards in the children's competition "I am a researcher."

Our book Thoughtivity for Kids was selected for an award by the jury of the International exhibition "Creativity and Innovation" which took place in Sebastopol, Ukraine. Sixteen countries from around the world were participating in the exhibition.

Educational material for parents and teachers available on the JL-Project Web site (www.jlproj.org) in Russian English and Spanish.

2002-2004 Center for Development of Creative Imagination for preschool and school children.(Toronto, Ontario, Canada)
Introduction course: OTSM-TRIZ problem solving and the ways in which it may be used for the development of creative imagination.
Courses offered to the teachers of the Center in order to help them in further development of educational programs of the Center.

2002 North View Community Center, (Toronto, Canada) visiting professor.
Course: fundamentals of problem solving for teenagers.
Teenagers of North View area of Toronto participate in the training in order to improve their thinking and problem solving skills. The course used non-linear educational technologies based on our research and employed several types of intellectual games and riddles.

2000-2003 Samsung Advanced Institute of Technology (Suwon, South Korea) visiting professor

Courses on classical TRIZ and OTSM-TRIZ for professionals of Samsung Group and Japanese company Nikkei Mechanical (up to 80 hours per course).
About two hundred professionals from different companies, belonging to Samsung Group and coming from Japan, participated in these trainings in order to improve their problem solving skills. Some real problems encountered by the students were used as training problems in the course. As a result, ideas were generated and accepted for further development.
More than ten problems were solved during coaching, and the president of Samsung Advanced Institute of Technology accepted the results of our work and honoured me with a personal award of recognition.
OTSM-TRIZ Technologies were recognized by the president of the company as one of the key technologies for increasing competitiveness, and the goal of becoming a member of the group of five worldwide leaders on innovation was established. Several more Russian TRIZ-Experts were invited, and two more additional TRIZ teams were organized within companies of Samsung Group.

2000 Ecole Nationale Supérieure des Arts et Industries de Strasbourg (ENSAIS), Strasbourg, France, part time associate professor of TRIZ.

Courses for students, professors, industry and research professionals, co-supervision of Ph.D students and final projects (up to 40 hours per course).
As a result of supervising four final projects several, patents were filed by industrial companies. Six Ph.D. students with various research topics are under co-supervision now, and several projects of different ENSAIS laboratories are under coaching now.
Several training sessions were provided for the professionals of industrial companies within the framework of Action Collective in collaboration with ADEPA.
An international educational project was proposed, as part of application for a grant from the European community (potential participants – France, Spain, Czech Republic, and Latvia).

2000 Poland, Czech Republic

Courses for university professors and industry members (up to 40 hours).
Six industrial problems were workshopped, and courses of introduction into OTSM-TRIZ technologies were offered.

2000 Jewish Community Educational Center

Courses of introduction to problem solving and using it for learning English as a second language. Short introductory training sessions were provided for students of the community center in order to increase their problem-solving skills.

2000 JAVIS program, TRIZ based Problem Solving Training course Toronto, Canada.

Courses of introduction to problem solving and using it for learning English as a second language. Short introductory training sessions were provided for students of the community center in order to increase their problem-solving skills.

1999 LG-Electronics Learning Center (Pyangtake, South Korea), visiting professor

Course for engineers and researchers: "TRIZ Mastering in engineering and production problem

solving: advanced level" - 88 hours.
Professionals from six departments of LG-Electronics company participated. Seven production problems were solved in class.

1997 LG-Electronics Production Research Center (Pyangtake, South Korea), visiting professor
Course for engineers and researchers: "TRIZ in engineering and production problem solving: fundamentals" -40 hours.
Professionals from LG-Production Research Center, LG-Display Plant and LG Living System Laboratory participated. During classes and express consultations several production and research problems (software developing for instance) were solved.

1997 International Children's Center ARTEK and pedagogical college of the Center.

Training course for pedagogues of the center and college-level introduction to classical TRIZ and its applicability in the educational process (20 hours).
Participants - professional pedagogues and managers of the International Center. After the course was completed, the president of the center made the decision of starting the TRIZ project.

1997-1999 Minsk University of Electronic and Information Technologies (Minsk, Belarus), visiting professor
Annual course: "Using TRIZ in Electronics" (40 hours).
Participants – students and professors of the University.

1997-1999 Institute of Modern Knowledge (Minsk, Belarus), visiting professor
Annual course for management students: "TRIZ problem solving in management and show business" (36 hours).
Participants – management students. During the course, students developed ideas for their own business projects.

1994-1997 Russia, Belarus, Ukraine.
Seven courses for pedagogues working in the middle school, elementary school and preschool: Using TRIZ in developing children's creative ability (40 hours each).
Participants – 96 teachers. In these courses, several real pedagogical problems were analyzed and solved.

1997-1999 Independent Consulting Group (Minsk, Belarus), senior researcher.
Three courses for staff of the client's company: TRIZ-approach to problem solving (15-30 hours). Students used training models to solve real problems.

1994-1997 Orient Soft (Minsk, Belarus), senior researcher.
Provided four courses for clients: "TRIZ-approach to problem solving in business process reengineering" (15-40 hours).
During these classes we used the training problems proposed by the participants.
On average, up to 70% of participants learned how to solve their problems successfully within the specified time frame.

1989-1994 Invention Machine Laboratory (Minsk, Belarus), senior researcher.
Offered six courses for the staff of customer companies: Using TRIZ and Invention Machine software to solve engineering problems (40 hours per course).
Participants – professionals from large plants and research centers that work with electronics, as well as car and spacecraft production.

1985-1993 Minsk TRIZ-Technologies Center.
Delivered fourteen courses (140 hours per course): TRIZ-technologies for problem solving in different areas of human activity: basic and advanced levels.
230 participants from different universities, research institutes of Belarus Academy of Science and production companies.
During these classes we usually used the problems proposed by the participants as part of the training. Some of the students later received patents; others work now as TRIZ consultants in well-known companies in North America, Europe, and Asia.
Some fields touched upon in the annual educational courses by the students of the Minsk OTSM-TRIZ Technologies Center (1980-1997):

- Metallurgy.
- Drying of wood.
- Heating water in a thin current layer.
- Electronics.
- Machine-tool construction.
- Microelectronics.
- Punching.
- Powder metallurgy.
- Micro filters production.
- The anticipated evolution of the agricultural machine for harvesting (cleaning) grain cultures (rice, wheat, etc.).
- The anticipated evolution of the agricultural machine for alignment of a surface and improvement of ground structure (before sowing).
- Analyzed production defects in order to eliminate their causes.
- The device for boiling water in a spacecraft.

1981-1988 Research Institute of Agriculture, Laboratory of Mobile Automation Systems (Minsk, Belarus), senior engineer-researcher.
Offered three c*ourses for the staff of the research institute: TRIZ-approach to engineering, basic level (40 hours per course).*
During the classes, two predictions about agriculture machine development were produced.
Four production and research problems were solved.

1980-1981 Research Institute of Measurement Devices (Minsk, Belarus), engineer and senior engineer.
Delivered courses for the professionals at the research institute: "TRIZ-approach to solving engineering problems: basics (30 hours per course).
Students of the course were professional electronic engineers who developed different types of electronic measuring devices.

Research activity.

Now and for the nearest future, I am planning to continue research in the following four key directions:

1. Further development of the new paradigm of Problem solving: “From solving problems one by one to managing the Problem Flow,” in order to help organizations and individuals to deal with their problems efficiently. This research will serve as a background for our other research activities, mentioned bellow as subtopics of this more general field.
The actual goal of the research is improving and developing OTSM-based instruments to increase their efficiency of implementation to complex non-typical interdisciplinary problem situations. Such problem situations cannot be clearly outlined in the beginning, and it is difficult to identify precisely what should be treated as the solution for the complex problem situation. Usually this kind of problem is better viewed as a permanent process of managing the problem situation. Modern OTSM-TRIZ tools work well for relatively small non-typical problem situations that involve several dozens of problems and contradictions. However, in order to work on large non-typical problem situations, we need to involve new tools to process the old and generate new knowledge, as well as store and share between professionals of various domains. These tools must be also useful for ensuring better communication between professionals from different domain of knowledge relevant to the large and complex interdisciplinary problem situations.

2. Further development of the new paradigm for knowledge management: “From an informational database and knowledge sharing, to a knowledge base used to support the Problems Flow Management.” To put it briefly: from sharing knowledge to processing and generating knowledge. This type of knowledge management system, devoted to assisting organizations, permanently captures all knowledge: individual knowledge of professionals, management, scientific knowledge and other kinds of knowledge relevant to various domains of the organization activity, keeping it for future needs and efficiently using it when, where, and however it is necessary by the person responsible for the organization’s needs. These types of systems and tools could be useful in many ways, but especially in problem-solving management and strategic planning to transform a conventional company into the company of sustainable innovation. In this direction, we will primarily focus on systems for Computer Support for Human Thinking (CSHT).

3. Further development of the new paradigm of non-linear education technology: “From skills necessary for using the typical solutions discovered by somebody in the past, to developing skills necessary to build a solution for complex cross-disciplinary problems right now, right here, on one’s own.” This is extremely important, if the new generation of students is to be created, ready to act efficiently in the world of accelerated changes, when old typical solutions cannot be applied efficiently any longer. Our international experience during the last ten years shows that most of the time OTSM-TRIZ experts are invited when professionals cannot handle non-typical problems or would like to speed up their projects to win either business or research competitions.

4. Development of various ways of implementation and deployment of OTSM-TRIZ-based technologies and approaches into corporate culture and modern educational system, in order to make them more dynamic and assist them in performing their functions better, quicker and with fewer expenses. In other words, this means assisting these organizations in being sustainably innovative and adjusted to the modern world of rapid change.

Below we provide some detail on research projects which were completed within the framework of these four research topics.

Previous and present research projects, devoted to developing OTSM-TRIZ-based approaches and tools for problem solving, aimed at developing simplified procedures for resolving contradiction and organizing the process of effective problem solving by the team of engineers, who may be working on relatively small non-typical problem situations, or up to several dozens of contradictions and/or problems.

Another area of our research involves further development of OTSM-TRIZ-based instruments for managing more complicated problem situations that include large networks of engineering, research, management and others kind of problems (hundreds or even thousands of problems and contradictions). This is why we have to consider computer support for working with this kind of problem situations. We call this system Computer Support for Human Thinking (CSHT).

As a senior researcher I took part in the development of special software - “Invention Machine” Versions 1.0 and 1.5 (Later TechOptimizer and now GoldFire software), which used some results produced in my own research.

I was invited to participate in the Invention Machine project as a system architect after in 1986-1997 I developed pilot software that was able to lead its users through the first part of ARIZ (Algorithm for solving inventive, non-typical problems). Based on the same principles as were used to computerize ARIZ, some other tools of classical TRIZ and OTSM could be supported by the computer. One particular interesting effect was discovered when the pilot software was used. Those who used the software several times over the course of several days could learn unconsciously how to perform steps of ARIZ and begin formulating their problems according to certain rules which were used by the computer to support the human thinking process. This educational effect could be useful in creating OTSM-TRIZ education software. In order to continue developing this kind of educational software, at least one good programmer should be closely involved with the project, at least for one year. Today we have a great deal of experience and some new OTSM tools, as well as some principles for developing this educational software for supporting the human thinking process with the aid of a computer. Eventually users will start to use the same rules without computer support, or will use the computer for complex situations in order to have a precise report of the work on the problem.

A Problem Flow Networks approach was developed in the course of my research for working on complex interdisciplinary problem situations. We used existing software to create this approach. However, with specialized software we could obtain more functionality for the computer support of the human thinking process. This computer software could considerably help people to increase thelevel of formalization used for describing an initial fuzzy situation and then formalizing some of analytical procedures. Some of general ideas of Problem Flow Networks Approach were published by IJCAT in 2007.

Currently I am one of research coordinators of the educational process and system within the framework of Jonathan Livingston Project. Leaders of pedagogical teams are involved in this project. These teams represent several types of professional educators who work with students of different ages. Together, we collaborate in order to develop efficient methods of OTSM-TRIZ education and to harmonize its integration into the modern educational system. Two coordinators of the project

were invited to TRIZCON conference in 2006 and 2007 as keynote speakers on OTSM-TRIZ-based pedagogical technologies, which we created as a result of our research in this area. In January of 2008 some of JL-Project team members were invited to participate in the educational project in South Korea. The aim of the project was disseminating, within the Korean educational system, some of the OTSM-TRIZ non-linear educational technologies, which we developed within the framework of JL-Project and tested at Russian pilot spaces. Korean delegation visited our pilot spaces in 2003 and, as a result of that visit, they developed the project which they are starting this year.
As one more result of the JL-Project research appeared the very first ever textbook for pedagogical colleges dealing specifically with preschool education. The educational program based on this textbook was approved and recommended for distribution around Russian pedagogical colleges by the Russian Ministry of Education. I am one of the coauthors of the book, which was translated and published in USA under the name *Thoughtivity for Kids* and received an award in 2006 from the jury of International Saloon of Innovation.
Based on my research, the members of Jonathan Livingston Project and I are developing a set of educational materials for the OTSM-TRIZ educational system, which will be implemented in modern educational system in Russia, South Korea and France. In the January 2008 European project TETRIS started to develop educational materials will be used by educational institutions in Italy, Germany, Austria, France and Latvia.

Another focus of my research is in developing efficient ways to introduce OTSM-TRIZ approaches into the corporate culture. On this subject, another book was written in cooperation with INSA Strasbourg – Utilization de la théorie TRIZ dans les métiers du BTP. This book explains in detail the most powerful tools of classical TRIZ-ARIZ of G. Altshuller, along with other ideas of classical TRIZ, illustrating them with examples from the field civil engineering. This book also contains a list of items, which together form an idealistic image of a general powerful problem-solving approach to be developed in the future. This image has been composed as the result of more than twenty years of research carried out by myself and other members of JL-Project around the world in various countries and with people who belonged to cultures with different habits of thought. This image is useful for comparing various problem-solving tools and understanding the directions of their future evolution. We use this image to show to our students advantages and disadvantages of various approaches, including new ones that appear every year, and the ways in which they can evaluate them on their own. This image is also useful for teachers and can help them develop training courses; as well, it can assist OTSM researchers in viewing the entire field of potential research (big picture) and choosing the next research goal.

Based on the same ideas and ideas as the Problem Flow Networks (PFN), this approach was developed as a methodology for handling Ph.D. and other research projects, beginning with the fuzzy, unclear situation and moving to obtain the big picture of the research and problem field and to choose a specific research topic, most important under the given conditions, on which one will then focus in the course of the research project. Essentially, this is very similar to the process of initial analysis of the problem situation, which poses a set of problem which need to be solved and then applies tools based on OTSM and classical TRIZ.

I am also the coordinator of the team of people from different countries who work in collaboration with JL-Project: members of the team come from Russia, Belarus, Ukraine, Latvia, Belgium, Netherlands, South Korea, Canada, Italy, Austria, and Mexico. On the basis of my research and in cooperation with these people, we are working on a set of educational materials for OTSM-TRIZ learners and teachers and examining the ways in which these tools could be used for developing satisfactory conceptual solutions. We are also looking for the opportunity of collaborating on

developing software that could support human thinking during the problem solving process. The purpose of this work is a summary of the results of all the research that I have collected over the last twenty-eight years.

2008, February-present Research and development of OTSM-based instruments to organize and manage complex interdisciplinary national and international research projects. How non-standard problems could be treated by the means of OTSM and classical TRIZ.
Some OTSM-based tools were originally developed for the purposes of problem solving, but it has been showed that they could also be useful for management of various research projects (for instance, OTSM Problem Flow Networks Approach can be thus used). However, it is necessary to develop these tools further in order to increase their efficiency for some difficulties we have in the domain of long-term international cross-disciplinary research projects, such as Sustainable Energy Region Development.

2007-present Research and development of tools for practical uses of supporting transformation and changes in companies and organizations.
In the course of this research project we have cooperated with various partners around the Globe (INSA Strasbourg, France; European Institute for Energy Research and University of Karlsruhe, Germany; Institute of Innovation and technology Transfer; Italian TRIZ association; International Network of researchers in the Computer aided Innovation). The project has selected OTSM-tools for Sustainable Innovation in various organizations, both public and private. Some of the results of the research project are going to be implemented in the TETRIS project, which is supported and maintained by the European Union. This project started in January 2008 and will go on for two years. the results of the project are going to be implemented in Germany, Italy, France, Austria, and Latvia.

2003-present European Institute for Energy Research, Karlsruhe, Germany.
Researching the application of OTSM-TRIZ-based tools to the complex energy-relevant problems. For example: How to decrease the price of the Biomass Gasification power plant? OTSM Problem Flow Networks approach was developed and tested. Subsequently this approach was applied to many other cases at several other worldwide companies: ALSTOM, Peugeot-Citroen, EADS, VALEO, Bosh-Siemens, etc. Our research will also concern the implementation of OTSM-based tools for team and research management, as well as for planning research strategy and tactics.

1986-present Research in the domain of integration of OTSM-TRIZ-based tools with computer support for thinking and problem solving as well as knowledge processes and aided innovation.
First results were achieved in the 1986, in the shape of the software which led the user through first part of ARIZ and facilitated discovery and clear formulation of the system of contradictions underlying the problem situation. Several years later the result was implemented in the commercial software Invention Machine (then TechOptimizer and now GoldFire Innovator)
It was done in the shape of combined Human-Computer reasoning, in the shape of dialogue between the computer and a human. The dialogue was based on ARIZ-85-C (G.Altshuller, classical TRIZ). Now we have developed the concept of computer-aided thinking based on the recent achievements in developing OTSM-tools for solving complex interdisciplinary problems, such as the OTSM Problem Flow Networks approach. In combination with dialogue-based reasoning it could be helpful to the new generation of knowledge management systems based on knowledge processes.

Our recent research shows that our results could be useful in the sustainable innovation management, which is interested in working with knowledge. These results could be used for developing the new generation of knowledge management systems for research organizations and associations. This knowledge processes based on the knowledge management system could be viewed as a replacement for the modern system of knowledge management, which is based only on the paradigm of gathering and sharing knowledge. The integration of OTSM-TRIZ-based tools with knowledge management tools could solve various problems of the knowledge management departments of various companies and organizations. For example, this approach could offer a solution to the problem of extracting knowledge for the purpose of introducing it into a KM system. Collaboration between OTSM experts and KM professionals in problem-solving sessions allowed us to extract knowledge from those who specialized in narrow areas of professional knowledge. In order to pose the correct problem to be solved and developing a solution of the problem, OTSM experts extract relevant knowledge and present it in a formalized way that facilitates proceeding from the description of the initial problem situation to developing the concept of a satisfactory solution which can be prototyped and implemented. During this process we extract and generate new knowledge that could be useful for strategic planning and for product development in R&D projects as well. The tools for problem and knowledge management could also be useful in developing and implementing various business models for commercial companies and organizations.

1981-present Research in education in order to develop educational technologies for teaching complex interdisciplinary problem solving and managing sustainable innovation process in private companies and government organizations.
As a result of this research, several educational technologies and tools for developing skills of powerful thinking, problem solving, and creative imagination have appeared. Those non-linear pedagogical instruments are now used by educators of various countries in Europe, Asia and North America. In 2003 delegation of Koreans working in the national educational system have visited our pilot kindergartens in several Russian cities. In January 2008 an educational project has begun, which is intended to last for several years and to introduce non-linear pedagogical technologies based on OTSM-TRIZ into the Korean educational system.

2005-2008 Participation in European Community project: “New learners in the new Europe”
This project is part of the SOCRATES program. Teachers and researchers of five countries are involved. This project is dedicated to developing and disseminating not-linear educational technologies for teaching foreign languages and developing thinking skills based on OTSM-TRIZ approach. It is necessary to research the corrections necessary in order to fit the requirements of national educational systems and mentality of different nations.
This project is interesting for my own research as a testing ground for the techniques intended to transfer knowledge to teachers who belong to different educational systems and cultural traditions. Based on this experience, appropriate corrections and improvements will be carried out.

2005- 2006 IntelGames - Educational Center for kids, parents and teachers. Moscow, Russia.
Collaboration in the field of teaching teachers, parents, and kids to solve complex problems.

First classes took place in October 2005. Stable experimental space for educational research and courses for parents and other educators will be established in 2006 in cooperation with members of the Jonathan Livingston Project.
This research project is dedicated to developing further educational technologies and testing the results of OTSM research which was carried out in the light of the new paradigms and new approaches to problem solving and knowledge management. Collaboration with the Educational Center will increase the number of experimental locations and promote the communication and knowledge transfer to parents and professionals of the Russian educational system.

2004 Participation in the project "Innovate America," intended to teach to kids and their teachers the modern OTSM-TRIZ strategies for developing intellectual skills, and new educational technologies.
The project is oriented toward home-schooling which is increasingly popular in the USA and have already become a strong public movement, in response to the demand of the modern accelerated and changeable world, and in order to overcome the disadvantages of modern educational system. Parents and at-home teachers have organized associations and circulate the accumulated experience among the members.
This project offers a particularly interesting means of investigating the new ways of communication between teachers who belong to different cultural and languages traditions.
This project intends to investigate the new pathways of communication between teachers who belong to different cultural and linguistic traditions. It is necessary to discover the methods of teaching teachers, who will then teach others teachers, how to facilitate, in parents and kids, the development of the thinking skills for solving problems and managing their own knowledge. Those teachers for teachers should perform the role of mediators between the researchers who work with the JL-Project and the teachers who belong to the American culture of education. A great deal of conflict exists here, which needs to be studied and eliminated.
As part of this general goal, another subproject is under construction – Virtual Classroom. This project combines OTSM-TRIZ and non-linear educational technologies with the modern interactive Internet-based educational technologies. This technology is also intended to aid the development of the new ways of communication between the JL-Project members and the educational community around the world, thus saving time and money for further development of the JL-Project.

2003-present Institute Nationale Scientifique Appliqué (INSA) Strasbourg, France, associate professor (PAST) of OTSM-TRIZ.
Various aspects of OTSM-TRIZ application in different fields: Organization of scientific research, Application for Information System Structure of Enterprise Development, Application of the OTSM-TRIZ approach for Business Organizational structure development and management, Problem Solving and management. Research and development in the domain of new concepts and paradigm of knowledge management based on OTSM-TRIZ.
Co-supervising Ph.D. students, as well as final and other projects of INSA and industrial students. Researching educational processes in order to develop new educational approaches to teaching innovative concept of problem solving and problem flow management. Developing new technologies of learning and managing knowledge necessary to solve complex cross-disciplinary problems.
This research project was also concerned with the most efficient ways of implementing OTSM-TRIZ technologies into corporate culture.
All these methods are very popular around the world right now, and the company is going to apply this integrated technology to its strategic research and predictions.

Integration of OTSM-TRIZ technologies into the corporate culture is a pressing research topic, and is closely connected to the research in the area of the new educational technological developments, which may be used to teach the OTSM-TRIZ approach more efficiently to professionals.
Problem management is very new area of research, and this approach is based on OTSM-TRIZ technologies of problem solving. Problem management is a later stage of OTSM-TRIZ evolution and includes new technologies of forecasting development, as well as a knowledge representation methodology that has problem solving and problem management as its goal. This field is complementary to traditional knowledge management but is conducted throughout problem solving vision.
Today the general research described in the beginning of the chapter is still continuing. In particular, this applies to the Problem Flow Networks approach based on four OTSM-TRIZ technologies and OTSM-TRIZ Fractal Model of problem solving process, as well as on the ENV model dedicated to describing elements which take part in the problem situation and other resources which could be used to solve a problem situation.

1999-present Insight Technologies Lab (Toronto, Canada).
Organization for outsourcing research and education. Specialization of the company: research in the area of sustainable innovation; knowledge and problem management; educational technology to develop creative, analytical, and problem-solving skills in individuals and organizations; coaching in dealing with complex non-standard innovative problem situations; teaching various categories of students to deal with complex cross-disciplinary problem situations. Some recent clients of the company: Alstom (France), Valeo (France), ArvinMeritor (USA-France), Forecia (France), Salomon (France), PSA Peugeot-Citroen (France), European Aero-Space Agency (EADS), Center of earlier intellectual development for Kids “Pochemuchika” (Toronto, Canada), LG-Electronics (south Korea), Samsung (South Korea), EnBW (Germany), EDF (France), Master Food (USA-Poland), Ford Motors (Detroit, USA), GOAL/QPC (USA), European Platform for Transformation, American Society for Quality, European Organization for Quality
Various educational projects were and are going to be performed in North America (USA, Canada), Europe (France, Germany, Poland, Czech Republic) and Asia (Korea and Japan) in order to test and develop further educational technologies to efficiently disseminate various applications of OTSM-TRIZ approach.
The general research described in the beginning of the chapter is currently still continuing. In particular, About Problem Flow Networks approach based on four OTSM-TRIZ technologies, on the OTSM-TRIZ Fractal Model of problem solving process, and on the ENV model dedicated to describing the elements which are involved in the problem situation and other resources that could be used in solving a complex cross-disciplinary problem situation. This approach is based on four types of graphs used in OTSM to present information about problem situation and maintain the problem solving process according to the OTSM model. Each of these four types of graphs appears as a specific semantic network that is built according to certain rules that evolved as a result of our previous research. Each of the next types of these semantic networks is based on the earlier model and is transformed into next kind of network. These four types of network are: Problem Flow Network, Contradiction Network. Parameter Network (specific), and Parameter Network (generalized). This procedure, at the same time, drives the process of building ENV model of a solution. Our current research is dedicated to discovering new rules and techniques that will increase the level of formalization of the given process named Problem Flow Networks Approach.

2000-2003 Ecole Nationale Superior des Art et Industries de Strasbourg (ENSAIS), Strasbourg, France, part-time associate professor of OTSM-TRIZ.
Co-supervised final student projects and Ph.D. projects in various fields, connected to both industrial engineering and management, and to OTSM-TRIZ-based problem solving technologies for education and implementation.

2000-2003 Samsung Advanced Institute of Technology (Suwon, South Korea), external consultant and researcher.
- *Introduction of OTSM-TRIZ Technologies into the corporate culture of Samsung Group.*
Goal of our research: to find a more sufficient way of introducing OTSM-TRIZ into the corporate company culture.

1999 Insight Technologies Lab (Toronto, Canada), president and head of international virtual research team (South Korea, Canada, Israel, Russia, Belarus, Ukraine, Latvia).
- *OTSM-TRIZ Technologies for problem solving.*
- *Problem-solving technologies for complex sets of contradictions.*
- *Non-linear educational technologies for teaching OTSM-TRIZ-based problem solving*
- *Ability to use Non-Linear Education Technologies for teaching different subject, for instance - foreign language as a second language.*
- *Implementation of OTSM-TRIZ technology for different kinds of organizations.*
All of this research was intended toward further developing of OTSM-TRIZ, and of appropriate educational technologies for teaching general approaches to problem solving. Currently our virtual team consists of 16 people and each of them is the leader of a partciualr team of researchers or teachers.

1997-1999 Independent Consulting Group (Minsk, Belarus), senior researcher.
- *Ability to use Letters of Credit in economic system of the Republic of Belarus and other republics of the former USSR.*
- Created a policy that set long-term goals for reengineering the educational system of the Republic of Belarus. Investigated the specific resources available in order to create a unique set of concepts to meet individual needs.
- Developed recommendations for creating new economic policies for the Republic of Belarus, using existing resources.
This Research resulted in several extensive reports which outlined the problems, the investigations conducted, and the solutions proposed by a variety of experts in their respective fields.
The Government Republic of Belarus utilized some of proposed solutions.

1997 LG-Electronics Production and Engineering Research Center (Pyangtake, South Korea). TRIZ-expert in problem solving, leader of troubleshooting and research team.
- Researched the cause of damages during production processes of different articles related to the TV set and computer monitor production and software development. Usually several experts in their field were involved in the research and some experiments were conducted.

1994-1997 Orient Soft (Minsk, Belarus), senior researcher.
- Ability to use the TRIZ approach for problem solving in management and business process reengineering.
This research was conducted in the course of real problem-solving processes.

1989-1994 Invention Machine Laboratory (Minsk, Belarus), senior researcher.
- Researched objective law of system evolution in the field of car engine subsystems and the history of the subsystems evolution.
– Researched the interaction between TRIZ principles, standards and laws of system evolution.
- Developed a working algorithm of Invention Machine software, acted as the leader of the research group (versions 1.0 and 1.5).
- Researched user problems in using Invention Machine software.
For the first project we investigated patents and the history of subsystems. As a result, it was proposed that certain algorithms of subsystems should be merged in order to work more efficiently. During the second project several members of our team analyzed approximately 1500 examples of engineering solutions. Results were used in developing the Invention Machine software version 1.5. The last two projects were carried out during real problem-solving processes, conducted in the course of the investigation of the work performed by the users of the Invention Machine software.

1988-1989 Radio-engineering Institute, Artificial Intelligence Laboratory (Minsk, Belarus), TRIZ-expert, leader of research group.
- Developed an experimental version of problem-solving software based on ARIZ-85.
During the research a working algorithm and an experimental version of the software were developed.

1981-1988 Research Institute of Agriculture, Laboratory of Mobile Automation Systems (Minsk, Belarus), senior engineer and researcher.
- Developed an automation system for different subsystems of mobile agriculture machines: control systems for engine, hydraulic transmission, different tools of agriculture machines, etc.
As a result of this research, several electronic devices were invented, patented, and implemented.

1977-1981 Research Institute of Measurement Devices (Minsk, Belarus), engineer and senior engineer.
- Developed a telemetric system for measuring the nature of the Earth nuclear radiation for meteorology satellite “Meteor.”
- Developed a voltmeter with large band of signal frequency (0 - 1 GHz).
All of these devices were implemented, and several copies of telemetric system were set up on several satellites and used for several years.

1981-2002 Minsk OTSM-TRIZ Technologies Center.
- Developed general algorithms for resolving contradictions in different areas of human activity.
- Developed effective training techniques needed to teach professionals how to solve their individual problems.
- Developed a general approach for solving a complex problem situation with a set of contradiction connected to distinct fields of human activity.
All of these research projects helped to develop new educational technologies for education in problem solving. These technologies provided a more effective educational approach for students of different ages and specialties.

Other activities

Since 2008. Member of the international scientific group IFIP WG 5.4. The group was created in September 2005 to examine the role that Computer Aided Innovation will play in the Innovation Process.

Since 2007. Member of the scientific comity of Alintec (**Al**leanze per l'**in**novazione **tec**nologica). ALINTEC is an alliance of Italian research centers and other organizations that are involved in study, development and application various methods of systemic innovation.

2008. TRIZ consortium, France. The consortium was created in the year 2007 to develop methods of deploying TRIZ and OTSM approaches and instruments in an organization and integrating them into corporate culture of the organization.

2008. Working group of Belorussian TRIZ experts organized to develop proposals for the government of South Korea on cooperation in the domain of TRIZ and OTSM education. The group is organized by request of the Korean side within the framework of cooperation between the republic of South Korea and the Republic of Belarus in the domain of education.

2008. Discussion on potential ways of cooperation in implementing of OTSM-TRIZ based educational technologies in the school for gifted kids, planned in the state Baja California of Mexico.

2007-2008. Sponsor of the project "International Center for Child Education". The project is dedicated to creating an international educational research centre in which professionals might work to create, study, and disseminate various educational technologies in order to develop thinking skills in preschoolers and students of elementary schools. The center is located in Ulyanovsk, Russia.

2007. Preparing proposals on educational projects in some African countries.

2007. Developing a proposal for the European Community on the subject of implementing TRIZ in South-East Asia.

2007. Developing an application for European Community on the subject of disseminating around Europe the world-wide experience of implementing TRIZ and OTSM for industry, research and education.

2006-2007. Developing proposals for informational support of teachers and parents who would like to teach kids TRIZ and OTSM instruments for a variety of uses, as well as developing thinking skills which will be necessary in the future world of rapid changes. Some of these proposals will be implemented in the framework of the TETRIS project, to begin in January 2008 in several counties of the European Community, sponsored by European Commission.

2006-2007. Participated in the project concerned with implementing OTSM-TRIZ in the USA educational system. The goal of the project is the implementation of TRIZ and OTSM for teaching Science, Technology, Engineering and Math (STEM education). USA experts in education are interested in the results and achievements of the Jonathan Livingston Project and would like to use our results and experience in their project.

2006-2007 Participated in the project of preschool and elementary school education reform in Mexico, State Nuevo Leon. The goal of the project, which is still under development, is the introduction into the educational program of the development of thinking and problem solving skills in preschoolers and elementary school students.

2005 Was invited, as an OTSM-TRIZ expert and representative of JL-Project, to take part in “round table” of developers and manufactures of educational techniques, toys, and games for earlier thinking skills development. Moscow, Russia.

2005 Cooperated with COMCON TRIZ sponsors of award for contribution to the development and dissemination of the OTSM-TRIZ approach for the education of kids at various educational organizations.

2005 Participated in organizing the world-wide conference TRIZ Future in 2005(Gratz, Austria). Conference was organized by the European TRIZ association.

2004 In cooperation with the other members of the JL Project we administered an award to a group of three teachers for their contribution to disseminating and further developing OTSM-TRIZ pedagogic in their region in Russia.

2003 Sponsored the project of mounting a memorial plate on the building in Petrozavodsk (Russia) where Altshuller (author of TRIZ) lived and worked.

2002 Sponsored the project concerned with republishing Altshuller’s heritage.

2002 In collaboration with two others members of Jonathan Livingston Project, developed first the TRIZ textbook for students of pedagogical college. A draft of the second version has already been prepared, and we are collecting critical reference for next iteration. The book is intended for students who will be teaching preschoolers.

Since 2002 Sponsored the Center of Earlier Thinking Skills Development of kids (Toronto, Canada).

2001-2004 Sponsored projects developed by the Altshuller Foundation

2001-2004 Member of scientific board of European TRIZ association – ETRIA**.**

1997-2005 Chief editor of the internationally recognized WEB-site WWW.TRIZMINSK.ORG

1999-2005 Permanent member of TRIZ Masters Council of International TRIZ Association.

1985-present. Leader of OTSM-TRIZ Technologies Center in Minsk, Belarus. At the present time, the Center has been transformed into a virtual community of people from three continents. This took place because many members of the Center are currently holding contracts around the world as TRIZ experts, whereas TRIZ experts from other countries (Japan, Ukraine, Russia, Israel, South Korea, Nederland, Czech Republic, Latvia) have joined our educational project “Jonathan Livingston”. The goal of this project is to arrive at new educational technologies for the development of children’s creative abilities from pre-school age and to improve the quality of the education system.

1999 Acted as the keynote speaker at the national TRIZ Day in France, Strasbourg

1989-1999 Member of the council of International TRIZ Association.

1993-1996. Designed and implemented training classes for children of diverse ages. Parents reported that these classes were successful in motivating the students to dedicate more time and effort to their schoolwork, read more, and assist their parents in solving business problems.
This happened because children understood that they needed additional knowledge for successful problem solving. This activity helped to understand and develop a lot of useful training that we now use for adult training classes.

TRIZ Education.

My TRIZ education began in 1980, when I attended a month-long training workshop (140 academic hours). I subsequently continued to study with the author of TRIZ, G. Altshuller (1984-1998), and to carry out my research under his supervision.

Certified by G. Altshuller as TRIZ Master (one of 64 people so qualified). It is currently the highest degree in the field of TRIZ.

1986 TRIZ-based Problem Solving Technology (advanced) (80 hours). Advanced School of Management (Simferopol, Ukraine). Leader of the course – G. Altshuller

1985 TRIZ-based Problem Solving Technology (upper intermediate) (80 hours). Dnepropetrovsk Training Center (Dnepropetrovsk, Ukraine). Leader of the course – G. Altshuller

1984 TRIZ-based Problem Solving Technology (intermediate) (140 hours). Dnepropetrovsk Training Center (Dnepropetrovsk, Ukraine). Leader of the course – G. Altshuller

1980 TRIZ-based Problem Solving Technology (beginning) (140 hours). Minsk Radioengineering University (Minsk, Belarus). Leader of the course – V.Tsourikov.

Publications and Conferences

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   Contradiction resolution in artificial intelligence software for concept design stage of product developing.
   Conference proceedings: CAD system for product development. USSR, Minsk. 1988.

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12. L.Bachilo, N.Khomenko, V.Tsourikov.
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14. N.Khomenko.
Using game “Yes-No” for teaching TRIZ.
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15. B.Bushov, N.khomenko, J.Bartl, P.Jurman (English).
Innovations in TIPS and IM.
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16. N.Khomenko, N.Shpakovsky (Russian).
Designing a rotary-shellboard machine.
TRIZ Jornal. Volume 1-1996.

17. A.Karlov, N.Khomenko (Russian).
Educational problems and TRIZ pedagogy in modern university education.
Proceedings of international conference “Problems of creative thinking technology”. Ukraine, Sevastopol. 1996.

18. A.Karlov, N.Khomenko (Russian).
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   Conference: "Creative problem solving technologies". Chernogolovka 1985.

3. Invention Machine software as software for innovation process support.
   Conference: "Creative problem solving and innovations" Jurmala, 1987.

4. Solving contradictions in artificial intelligence software for the concept design stage of product development.
   Conference: CAD system for product developing. USSR, Minsk, 1988.

5. Software for classes in inventive problem solving.
   Conference proceedings: Engineering creativity. USSR, Miass, 1988.

6. Contradiction as a system of elementary contradictions.
   Conference proceedings: Engineering creativity. USSR, Miass, 1988.

7. Using multidimensional space of features for system descriptions.
   Conference proceedings: Engineering creativity. USSR, Miass, 1988.

8. Experimental version of software based on ARIZ for solving problems in a long-distance space communication between the Earth and space probes. Presentation and express consultation in the Institute of Space research of Bulgaria, Sofia, 1989.

9. Invention Machine Software. Conference: "Modern problems of Artificial Intelligence". Bulgaria, Sozopol, 1989.

10. Designing a rotary-shellboard machine.
    Congress of International TRIZ Association. Petrozavodsk, 1989.

11. Using game "Yes-No" for teaching TRIZ.
    Conference of TRIZ-pedagogues. Petrozavodsk 1990.

12. Contradiction technologies for solving difficult engineering problems. One-day presentation for "Energia" plant that developed and produced spacecraft. Russia, Kaliningrad, 1990.

13. Educational problems and TRIZ pedagogy.
    Conference proceedings "Education in XXI century". USSR, Minsk, 1991

14. Software that helps to invent. International exhibition "Expo-91". Bulgaria, Plovdiv, 1991.

15. Software that uses TRIZ. One-day presentation for engineers. Poland, Gdansk, 1991.

16. Software that uses TRIZ. One-day presentation for professors at Warsaw University and engineers. Poland, Warsaw, 1991.

17. 3-day classes for engineers of “Auto-VAZ” plant. One of the largest plants which develop and produce cars.

18. TRIZ-technologies and education. One-day seminar for teachers of Minsk comprehensive schools. Minsk, 1993.

19. TRIZ and imagination development. Three-day classes for professors at Cheliabinsk Pedagogical University. Russia, Cheliabinsk. 1994.

20. Problem solving technologies for preschool education. Three-day classes for preschool teachers of Ulianovsk. Russia, Ulianovsk 1994.

21. TRIZ and consulting. One-day presentation in research and scientific-consulting company VOMA. Minsk, 1995.

22. Problem-solving technologies for preschool education. Three-day classes for preschool teachers of Samara. Russia, Samara, 1994.

23. Three-day presentation: “Using TRIZ for professional education” for teachers of Ulianovsk Automobile College. Ulianovsk, 1996.

24. Long-term experiments in education. One-day presentation in International Children Center ARTEK. Ukraine, Crimea, ARTEK 1997.

25. One-day presentation in LG Living System Laboratory. South Korea, Seoul. 1997.

26. Mastering TRIZ education through using non-linear educational technologies. Ukraina, Sebastopol, 1997

27. Problem solving and the educational process. Presentation at the Conference of Belarussian physic teachers. Minsk, 1998.

28. TRIZ Technologies in management consulting. Presentation at Canadian Management Center. Canada, Toronto, 1999.

29. Fundamental approaches for problem solving and innovations. LG-Chemical research and production center. South Korea, Tanchju, 1999.

30. OTSM-TRIZ as a universal approach to problem solving. One-day classes and express consultations in vacuum cleaner development. LG Home appliance laboratory. South Korea, Seoul, 1999

31. TRIZ Technologies for problem solving. Seneca College, Canada, Toronto, 1999.

32. The national TRIZ Day in France, - One of keynote speakers. 1999.

33. Introduction to OTSM-TRIZ-based technology of problem solving. Lectures for top managers of LG Living System. Seoul, South Korea. 2000.

34. Problem solving techniques. Jewish Community Center. Canada, Toronto, 2000.

35. TRIZ consulting: practical aspects. Engineering University of Brno. Czech Republic, Brno. 2000.

36. OTSM-TRIZ: how does it work in other areas of knowledge. Presentation for top management of the company Master Food Polska. Poland Sohachev, 2000.

37. Using TRIZ for concept generation in new products. Presentation for top managers of Combi-Clip Company. Enshede, Netherlands. 2000.

38. What is TRIZ and how it could be used to aid early education? Presentation for teachers at Downsview Middle School. Toronto, Canada.

39. Problem solving techniques. Jewish Community Center. Canada, Toronto, 2001.

40. Using OTSM-TRIZ Technologies in management and business. Presentation for members of research laboratory BETA, ULP. Strasbourg, France. 2001.

41. Using OTSM-TRIZ Technologies for generating new product concepts. Workshop for members of innovation team of Arvin Meritor France. Orleans, France. 2001.

42. OTSM-TRIZ and costs reduction: how it works. Presentation for members of TRIZ-France Association. 2001.

43. Introduction of OTSM-TRIZ Technologies into corporate culture. Presentation for top management R&D department of BOURJOIS-CHANEL. Paris, France. 2001.

44. Using Yes-No games for OTSM-TRIZ education. Presentation for members of TRIZ-France Association. 2001.

45. How to introduce OTSM-TRIZ into a company efficiently? Short presentation for top managers of R&D Department of Samsung Electronics. Suwon, Seoul, Korea. 2001.

46. Most efficient ways of implementing OTSM-TRIZ. Presentation for top management of TRIZ-Corporation, Suwon, Korea. 2001.

47. Using OTSM-TRIZ for developing creative imagination. Children’s Educational Center “Pochemuchika”. Toronto, Canada. 2001.

48. Implementing OTSM-TRIZ Approach in software development. Presentation for top management of Galaxy Summit Company. Toronto, Canada. 2001.

49. Using OTSM-TRIZ in early education. Workshop for Japanese teachers. Seoul. Suwon, Korea. 2002.

50. OTSM-TRIZ as an interdisciplinary language for research and complicated problem solving. Presentation for CNRS representative. Strasbourg, France. 2002.

51. Using a system of Yes-No games for developing problem-solving skills. Children’s Educational Center “Pochemuchika”. Toronto, Canada. 2002.

52. Market for OTSM-TRIZ services, and groups of potential customers. Canada-India Chamber of Commerce. Toronto, Canada. 2002.

53. Fundamentals of OTSM-TRIZ education for the Kindergarten-School-University system. Presentation for professors of Sun Moon University (Kindergarten-School-University). Osan, South Korea. 2002.

54. Keynote speaker at TRIZ Future 2002 World conference organized by the European TRIZ association. Line of Solutions in the OTSM-TRIZ problem solving process.

55. Applying OTSM-TRIZ approach to bypass patents of competitors. Workshop for engineers of Peugeot-Citroen. 2003.

56. What is a complex problem and how can we handle it with the OTSM-TRIZ approach? Presentation for professors at the University of Toronto. August 28, 2003.

57. What are classical TRIZ and OTSM? Presentation for top management of European Institute for Energy research. Karlsruhe, Germany. 2003.

58. How OTSM-TRIZ could be used in consulting and coaching. Presentation for top management of Celerant Institute. Strasbourg, France. 2003.

59. The usefulness of OTSM-TRIZ for design and improvements of an engineering system. Presentation to top managers of R&D department of Thales Group. 2003.

60. New paradigms of knowledge management and other opportunities for using OTSM-TRIZ. Presentation for leaders of R&D and knowledge management departments of European Aerospace Agency. 2004.

61. Using OTSM-TRIZ for long-term technology forecasting for the participants of the international Project “Mixed Energy,” initiated by the French company Electricity De France. Karlsruhe. Germany. 2004.

62. Using OTSM-TRIZ for developing thinking skills in kids. Delivered at International Conference “Idea Frontier 2004”. Windsor, Canada. 2004.

63. Using OTSM-TRIZ for teaching other middle school subjects and developing thinking skills. Round table for the teachers of Russian School in Munich. Germany. 2004.

64. Application of OTSM and TRIZ in Six Sigma process. Presentation for Director of Six Sigma and project managers of the Ford Motors Company, Detroit USA. 2005, June.

65. Round table on the subject of innovation in Europe. Organized by European Organization for Quality and European Platform for Transformation. 2005, France. University of Compiegne.

66. Towards inventive design through management of contradictions. Delivered at the conference CIRP 2005. Shanghai, China. 2005.

67. Denis Cavalucci, Nikolai Khomenko et Roland De Guio. Tutorial of inventive problem solving theory. In Shanghai Jiao Tong University, éditeur, Proceedings of 15th International CIRP Design Seminar, Shanghai, China, 2005.

68. Using OTSM-TRIZ for engineering collaborative negotiations (ECN). Presentation for workshop on the further development of ECN. Shanghai. China. 2005.

69. Practical implementation of OTSM-TRIZ in European Institute for Energy Research; Opportunities for implementing OTSM-TRIZ in strategies and tactics of innovation. Presentation for top managers of R&D and Innovation Department of German company EnBW, 2005.

70. Using OTSM-TRIZ in solving complex engineering problems. Presentation for the top management of R&D department of Alstom Group. 2005.

71. Using OTSM-TRIZ models for developing thinking skills in kids. Presentation on the 3-d International conference about Intellectual development of kids. Moscow, Russia. 2005.

72. Round table on the subject of TRIZ education for kids. Milwaukee, USA, 2006, April.

73. Panel Discussion on Implementing TRIZ for Quality Divisions of a Company. Scientific Conference of American Society for Quality (ASQ). Milwaukee, USA, 2006.

74. Presentation “OTSM-based educational technologies for preschoolers” Presentation as part of the discussion and sharing experiences on the subject of quality of education. The presentation was organized by the committee of the international conference celebrating 60-th anniversary of American Society for Quality (ASQ). Milwaukee, USA, April, 2006.

75. Using OTSM Problem Networks for researching the history of German High Speed Train. Annual conference of ETRIA TRIZ-FUTURE-2006. October 2006.

76. Applying OTSM and TRIZ to problems of small and medium companies. Presentation as part of program “Dialogue of Experts,” which was organized by the Institute of Innovation and Technology Transfer, Monterrey, Nuevo Leon, Mexico. September 2006.

77. OTSM for Sustainable Innovative Company. Delivered at the conference celebrating 5th anniversary of European Institute for Energy Research (EIFER). Germany, Karlsruhe. September 2006.

78. OTSM and TRIZ: psychological aspects of both theories and their tools. Presentation for Professors of Psychology. Faculty of psychology of State University of Nuevo Leon, Monterrey. Mexico. 2007 February.

79. OTSM and TRIZ: psychological aspects of both theories and their tools. Presentation for students of Faculty of psychology of State University of Nuevo Leon, Monterrey. Mexico. 2007 February.

80. Round table on the subject of TRIZ education for kids. Louisville, USA, 2007, April.

81. Presentation of the “Jonathan Livingstone” Project for the members of the USA Project of TRIZ-education for kids. Louisville, USA, April, 2007.

82. OTSM Network of Problems for representing and analysing problem situations with computer support. Conference IFIP, Detroit, USA, October 8-9, 2007.

83. OTSM-TRIZ instruments for Sustainable innovation. Presentation for members of Italian network - Innovation Circus October, Milan, Italy.

84. Presentation “JL-Project and OTSM-TRIZ for Kids education” for participants of the conference on Creative Thinking Development for businesses and its other applications, “New Shoes Today”. Invited by the Organizing Committee of the conference. Utrecht, Netherlands, November 2007.

85. Leader of the Round Table “Application of OTSM-TRIZ in educational systems of various countries and some problems of implementation and further development”. Den Haag, Netherlands, November 2007.

86. Presentation “JL-Project and OTSM-TRIZ in early education” for professors at the University UNAM, Baja California, Mexico, February 2008.

87. N.Khomenko, N. Avci, I. Kaikov, L.Markl. Presentation “R&D Management of Interdisciplinary Teams: Contribution of OTSM Network of Problems approach”. International Conference: The R&D Management Conference 2008, June 17-20, Ottawa, Canada.

88. N.Khomenko. Using OTSM network of problems to manage innovation. Keynote Speech. International Conference on Management of Innovation. December 22, 2008

89. N.Khomenko. OTSM Models of the problem-solving process: “Funnel” Model, “Tongs” Model, “Hill” Model, Fractal model of the problem-solving process. Tutorial at International Conference on Management of Innovation. December 22, 2008.

90. N.Khomenko. Using OTSM-TRIZ-based tools in educational processes and developing thinking skills in students, starting from three years of age. Presentation in the Ministry of Education. December 19, 2008.

68. Nikolai Khomenko and Paul R. Rousseau. Improving Problem Solving and Solution Design Skills Using OTSM Problem Flow Coaches in Capstone Projects. The Sixth International Conference on Innovation and Practices in Engineering Design and Engineering Education. July 27-29, 2009. Hamilton, Ontario, Canada.

69. N.Khomenko. Key Note presentation. International conference on Education. July 2009

Patents

1. E.Agibalov, D.Bodilovsky, N.Khomenko.
   Automation control system for tools of harvest machine.
   USSR patent 1304775. USSR Patent bulletin N-15 1987

2. E.Agibalov, N.Khomenko, Y.Sidorenko
   Device for automation control for the engine of harvest machine.
   USSR patent 1412638. USSR Patent bulletin N-28 1988

3. I.Kaikov, L. Henkes, L.Lelait, N.Khomenko. Elektrogene Vorrichtung mit Stirling-motor. DE 10 2006 047 948 A1 2007.04.19.

4. I.Kaikov, L. Henkes, L.Lelait, N.Khomenko.Dispositif electrogen a moteur Stirling. FR 2 891 873 – A1.

5. I.Kaikov, L. Henkes, L.Lelait, N.Khomenko. Stirling engine with heat exchanger to replace regenerators. GB 2 430 980 A.

6. I.Kaikov, G Bourtourault, L.Lelait, N.Khomenko. Instalation de gazeification de biomasse avec dispositive de craquage des gudrons dan le gas de syntheses produit. EP 1 840 191 - A1.

7. I.Kaikov, G Bourtourault, L.Lelait, N.Khomenko. Instalation de gazeification de biomasse avec dispositive de craquage des gudrons dan le gas de syntheses produit. FR 2 899 238 - A1.

As a result of my training sessions delivered to professionals of various companies around the world and co-supervising of student final projects, every year several patents were filed by the companies or organizations which initiated the coaching sessions and final projects of students.

Awards

2001 Award of recognition by president of Samsung Electronics Advanced Institute of technology (SAIT) for work as coach and trainer. Suwon, South Korea.

2006 Award of recognition by the Jury of International Saloon of Creativity and Innovation for the textbook and educational program for pedagogical colleges. Ukraine, Sebastopol.


SAMSUNG
SAIT
Appreciation
Samsung Advanced Institute of Technology
President,
Wook Sun