

## **Application of Prof. Song**



**for the TRIZ Master Degree  
based on a set of scientific publications**

**Yong Won Song (Йонг-Вон Сонг)**

Professor of Korea polytechnic University

(Профессор Корейского политехнического университета)

Address: Korea Polytechnic University, Department of Nano-Optical Engineering, 2121,  
Jungwang-Dong, Siheung-City, Gyeonggi-Do, Korea

(Адрес: провинция Кёнги-до, город Сихын, Чонгванг-донг 2121, факультет Нано-оптики Корейского политехнического университета)

Telephon(Телефон) : +82-31-8041-0714

Fax(Факс) : +82-8014-0940

Email(Электронный адрес) : [ywsong@kpu.ac.kr](mailto:ywsong@kpu.ac.kr)

Skype(Скайп) : ywsong82

Certificate of level 4 specialist



## TRIZ Activities (Деятельность связанная с ТРИЗ)

1. Реализация проекта ТРИЗ Министерства экономики знания Республики Корея(с 2007г. до 2011 г.)

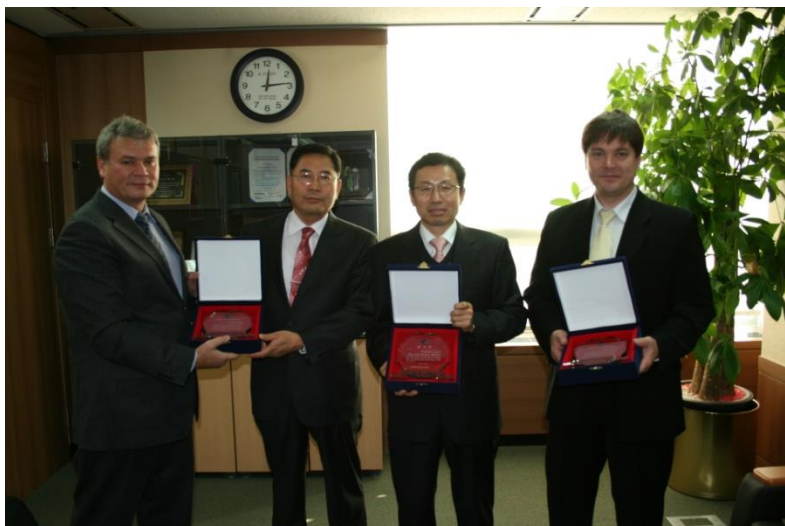
Приглашение российских специалистов ТРИЗ по гранту, полученному от Министерства экономики знания, с целью распространения ТРИЗа в Корее и для участия в проекте по решению технических задач на предприятиях малого и среднего бизнеса.

2. The Korea Technology Innovation Award received from the Minister of the Ministry of Knowledge and Economics in 2008 for the development of the new innovation technology(the results of Russian Technology Cooperation and TRIZ projects).



3. Реализация проекта по решению технических задач на предприятиях малого и среднего бизнеса совместно с Бизнес агенством г.Инчон(с 2009г. по настоящее время).

Решение технических задач на предприятиях малого и среднего бизнеса, расположенных на территории города Инчон по методике ТРИЗ. По отличным результатам работы получена почетная грамота Мэра города Инчон(см. прикрепленные документы).



4. Создание Инновационного института ТРИЗ. Директор.  
В 2010 году в Корейском политехническом университете создан Инновационный институт ТРИЗ с целью распространения ТРИЗа среди студентов и инженеров, а также для содействия развитию этой дисциплины.
5. Совместно с Корейской ассоциацией стандартизации(Korea Standards Association) реализация проекта по распространению ТРИЗа в Корее.
6. В результате совместной работы правительственной организации Корейской ассоциации стандартизации(Korea Standards Association) и Международной ассоциации ТРИЗ(MATRIZ), согласно программе сертификации MATRIZ ведется реализация проекта по распространению ТРИЗа в Корее.
7. Член президиума Корейской академической ассоциации ТРИЗ(Korea Academic TRIZ Association). (2010-настоящее время)
8. Член президиума Международной ассоциации ТРИЗ(MATRIZ). (2009-2013.7)
9. Обучение и сертификация ТРИЗ(см. прикрепленные документы)  
Реализация обучения ТРИЗ по получению сертификации MATRIZ 1, 2, 3 уровня (Level 3: совместно с Геннадием Ивановым(Мастер ТРИЗ)).

10. Обучение с целью распространения ТРИЗ: реализация обучения и консалтинга ТРИЗ в различных организациях:

Корейский политехнический университет

Корейский институт науки и технологий(Korea Institute of Science and Technology)

Университет Корё(Korea University)

Институт технологий и производства LG

Хёндай моторс

Hyundai HYSCO

Поско(POSCO)

SK Hynix

RSS Institute

Taekwang Company

Ministry of Science, ICT and Future Planning, Republic of Korea

Korea Foundation for the Advancement of Science and Creativity

The Korea Association of Creativity Education

Институт CJ

Лекции для малых и средних предприятий, курируемых Бизнес агенством г.Инчон

Корейская ассоциация стандартизации(Korea Standards Association)

Институт профессиональной стажировки персонала малых и средних предприятий

Inwha University

Hanyang University

Kumho Technincal University

Kyungbuk University

Kangwon University

Junbuk University

Korea education University

Chung-Ang University

11. Industrial Projects: (see the appending text: some reports were translated into Russian)

- A. Development of filter cleaning technology in Al casting process(2008, Wookwang Tech)
- B. Heat Sink Problem in LED lamp(2009, Noxs-Tech)
- C. Probe Card Tip(Needles) defects Problem(2009, Will Technology Ltd.)
- D. Heat treatment Process on the shaft in reducer(2009, SamYang Ltd.)
- E. Development of Filter Cover Process(2009, Ace Technology)

- F. Problem solving for gas regulator (2011, YongWon Corporation)
- G. PET film lamination process on Cu substrate(2011, Hanbi Metal Ltd.)
- H. Dog trainer kit problem(2012, Dogtra corporation)
- I. Incomplete combustion problem in gas heater(2012, Hebshiba Corporation)
- J. De-magnetizing problem in magnetic mixer(2012, Hado Corporation)
- K. Cost reduction project for X-ray protection equipment(2012, Dae-Sang Medical Devices Ltd.)
- L. Slag contamination problem on the heater surface(2013, Goots Ltd.)
- M. Carbon textile process defects(2013, Saenal Tech)
- N. Developing neutral buoyancy technology for gyroball in the water(2013, InnoTems Corporation)
- O. Noize reduction in Zn coation process(2013, HYSCO)
- P. Development of cutting technology for tempered glasses(2013, Zeus)
- Q. Make the future strategy and develop a new product(2013, AHA Corporation)

- 12. Teach 12 professors(Level 1 and 2) TRIZ in Inwha University for launching TRIZ education program(2011-2012)
- 13. Teach 13 Professors(Level 1 and 2) and 6 Professor(Level3 with Mr. Ivanov) in Kumho University and develop TRIZ education program for students(2012-2013)
- 14. Teach more than 1,300 engineers of small and medium size companies and give MATRIZ certification in the last 3 years(2011-2013)
- 15. Host Korea-Russia TRIZ international students on-line conference with Prof. Victor Berdonosov(Nov. 2011 and Nov. 2013)



16. Organize the 1st Korea Students TRIZ festival (Nov. 28, 2013)



17. Development of TRIZ education system in Korea Polytechnic University (teach all students TRIZ from 2014)

18. Organize a 'Creative Fusion Education Center' in Korea Polytechnic University and work as the director of this center (Training Professors, developing TRIZ education program, TRIZ projects and Entrepreneurship Education) 2014

19. Development of National Project «DHA» (Development of Human creActivity) based on TRIZ, sponsored by the Ministry of Science, ICT and Future Planning, Project leader, 2014-2016 (make the creative education program for primary, middle and high school students, and also for university students and ordinary person)

20. Organize «National TRIZ industrial competitive exhibition» (2014 ~) with the ministry of Trade, Industry and Energy and KSA (Korea Standards Association) 2013-2014

21. National Project for developing future strategy by TRIZ to help small and medium enterprises (2014-2015), sponsored by Ministry of Trade, Industry & Energy, Project leader

## Papers and conference (Публикации и Конференции) on TRIZ application:

1. Пилотный ТРИЗ-проект в Республике Корея: Опыт и перспективы ТРИЗ-консультирования корейских предприятий малого и среднего бизнеса. 2009 TRIZfest (27-28 июля 2009г.) Гафитулин М.С., Иванов И.Г., Keum-Young Chang, Yong-Won Song, Seung-Hyun Kang.
2. Ruthenium film growth from  $\text{Ru}(\text{CO})_3(\text{C}_6\text{H}_8)$  at low temperatures in sequentially pulsed deposition mode, V.Yu. Vasilyev, S.H. Chung, Y.W. Song, ISTC 2008(Proceedings of the 7th international conference on Semiconductor technology), 667-673 (2008) (TRIZ application: To get high density micro-chip we should make uniform Ru thin film with high step coverage. CVD process doesn't meet the requirement of high step coverage. So we applied the separation principle to the Ru thin film process. We used atomic layer deposition (ALD) instead of CVD and controlled the precursors, in other words we put them in time sequences. As a results we could get uniform Ru thin film with high step coverage)
3. Properties of thermally annealed ruthenium thin film grown on seed layers in low-temperature selective deposition region, Vladislav Yu. Vasilyev, Konstantin P. Mogilnikov, Yong Won Song, Current Applied Physics 9(2009) e148-e151. (TRIZ application: We solved contradiction in atomic layer deposition process, using separation of space – control the precursors sequences)
4. 1st Global TRIZ Conference 2010 (25 November 2010)  
Supporting Small and Medium-sized Businesses with TRIZ.  
Yong Won Song
5. 2nd Global TRIZ Conference 2011 (10-11 March 2011)  
Creative Thinking Education by TRIZ  
Yong Won Song.
6. The second ICSI & AITRI Innovation Conference, Chaina (26-28 May 2011)  
Teaching Creative Thinking and Problem Solving Skills by TRIZ.  
Yong Won Song, Seung Hun Kang
7. Japan TRIZ conference(8-10, September, 2011)  
Application of TRIZ in Korea Engineering Education.  
Yong Won Song
8. Can creative thinking be learned?

PU Journal, 2011, p14-17, Yong Won Song

9. Photosensitivities of thin film solar cells ZnO/CdS/Cu(In,Ga)SeMo, obtained on the different substrates, V. Y. Rud, Yu. V. Rud, V. F. Gremenok, E.I. Terukov, B. Kh. Bairamov and Yong Won Song, Semiconductor, 2012, Vol46, No.2, pp221-224.  
(TRIZ application: Mo is used contact electrode on the glass. Mo film should have good ohmic contact (good conductivity) with functional layer and good adhesion with glass. If the Ar gas pressure is high in the Mo film deposition process, the adhesion with glass is good, but conductivity is bad. If the Ar gas pressure is low, the opposite results come out. Separation principle – we controlled the Ar gas pressure: Ar gas pressure is high at first, then low in Mo film deposition process).
10. Global TRIZ conference 2013 (09-11 July, 2013)  
University TRIZ education program  
Yong Won Song, Seung Hun Kang
11. Korea Industrial Innovation Conference 2014(12-14 Feb. 2014)  
TRIZ as a Industrial Problem Solving Tool  
Yong Won Song
12. TRIZ as a creative thinking Tool  
J. of QC and Creativity, March 2014, p50-57  
Yong Won Song
13. Systematic Thinking(system operator) in practice  
J. of QC and Creativity, May 2014, p40-49  
Yong Won Song
14. Effect of electrolyte composition on Al oxide layer coated by Plasma Electrolytic Oxidation. Y. L. Lee, Yong Won Song, Korea Ceramic Society, 2014 (TRIZ application: It's hard to understand the plasma oxidation process, so we used the model of small smart people and explain the mechanism)
15. Creative Use of Resources  
J. of QC and Creativity, Jun 2014, p68-78  
Yong Won Song
16. Ideal Solution – Done by itself

J. of QC and Creativity, July 2014, p98-107

Yong Won Song

17. Global TRIZ conference 2014

Future strategy with TRIZ and Big-Data Technology

Yong Won Song, Jeong Joon Lee, B. Zlotin and A. Zusman

## Books

1. TRIZ Theory and Practical Results.

December, 2009.

(Теория и практика Теории решения изобретательских задач(ТРИЗ)(на основе реальных примеров решения производственных задач малых и средних предприятий. Декабрь 2009г.)

M. Gafitulin, I. Ivanov, Yong-Won Song, Seung Hun Kang

2. Theory of Inventive Problem Solving

August, 2009.

G. Ivanov, Yong-Won Song, A. Bistrestki, I. Ivanov

3. Algorithm of Inventive Problem Solving

November, 2009

G. Ivanov, Yong Won Song, A. Bistrestki, I. Ivanov

4. TRIZ textbook for beginner.

January, 2011.

G. Ivanov, Yong-Won Song, I. Ivanov, Seung Hun Kang, A. Bistrestki

5. Algorithm for engineering problem solving, ARIP

March, 2011

G. Ivanov, Yong Won Song

6. Development of Creative Thinking

August, 2011

Yong Won Song, V. Berdonosov

7. Development of Problem Solving Skill

September, 2011

Yong Won Song, V. Berdonosov

8. TRIZ for MATRIZ Level1

January, 2012

Yong Won Song

9. TRIZ for MATRIZ Level 2



**Patents** (see the appending text)

1. Bio materials structure and fabricating method thereof (Korea 10-0922686)
2. Titanium dioxide ceramics for implant and fabricating method thereof (Korea 10-10154620)
3. Atmospheric Pressure Plasma equipment, infrared filter of camera module in-line fabrication equipment including this, method for cleaning using this and method for in-line fabricating infrared filter of camera module (Korea 10-0844121)
4. Activating flux powder to be used for welding structural materials stainless steel, carbon steel and producing method thereof (Korea 10-0860556)
5. OLED(Organic Light Emitting Diodes) Panel Fabrication process (Korea 10-0783729)
6. The method for fabricating corrosion-resistance ceramics film on the Mg-alloys substrate and materials comprising corrosion-resistance ceramics film prepared therefrom (Korea 10-1213976)

Application for Invention

7. The method and system for fabricating corrosion-resistance ceramics film on the Mg-alloys substrate (Korea 10-2010-0113230)
8. Apparatus and method for manufacturing of OLED (Korea 10-2010-0087514)
9. Method of flux application at arc welding of structure metals and alloys (Uzbek Patent application # IP 20110463)
10. Production method of CIGS thin film (Korea 10-2013-0007188)
11. Torch for TIG welding self-feeding of flux and weld method (Korea 10-2013-0138459)

## **TRIZ Training Seminars (more than 40 hours long)**

1. TRIZ course for Korea Polytechnic University Students, Autumn Semester 2009
2. TRIZ course for Korea Polytechnic University Students, Autumn Semester 2010
3. TRIZ seminar for MATRIZ Level 2 certification in Korea Polytechnic University, August 2011
4. TRIZ course for Korea Polytechnic University Students, Autumn Semester 2011
5. TRIZ seminar for MATRIZ Level3 certification in Korea Polytechnic University, February 2011(with Mr. Ivanov)
6. Development of creative thinking, 40 hours seminar for engineers, July 2011
7. TRIZ seminar for MATRIZ Level2 certification in Korea Polytechnic University, August 2011
8. TRIZ seminar for Hanwha engineers, 40 hours course, September 2011
9. Problem Solving Practical course for POSCO engineers, October 2011
10. TRIZ seminar for MATRIZ level 2 in KSA(Korea Standard Association), November 2011
11. TRIZ seminar for MATRIZ level 3 in KSA(Korea Standard Association) with Mr. Ivanov, January 2012
12. TRIZ seminar for Inwha University 12 professors (MATRIZ level 1 and Level 2 certification) 2011-2012
13. TRIZ seminar for Korea Students, studying in Moscow, February 2012
14. Problem Solving Practical courses for POSCO engineers, March 2012
15. Inventive Problem Solving, TRIZ seminar for Hyundai HYSCO engineers, April 2012
16. Problem Solving Practical courses for POSCO engineers, Jun 2012
17. TRIZ seminar of Hanwha Chemical engineers, July 2012
18. TRIZ seminar for MATRIZ level2 in KSA(Korea Standard Association), August 2012
19. Inventive Problem Solving, TRIZ seminar for SK Hynix engineers, September 2012
20. TRIZ seminar for MATRIZ level2 in Kumho University, January 2013
21. Inventive Problem Solving, TRIZ seminar for SK Hynix engineers, April 2013
22. TRIZ seminar for SungWoo High-Tech engineers, May 2013
23. TRIZ seminar for MATRIZ level2 in KSA(Korea Standard Association), Jun 2013
24. Inventive Problem Solving, TRIZ seminar for SK Hynix engineers, July 2013
25. TRIZ seminar for MATRIZ level 2 in Kyung Buk University, August 2013
26. TRIZ seminar for MTRIZ level2 in KSA(Korea Standard Association), September 2013
27. TRIZ seminar for MTRIZ level2 in KSA(Korea Standard Association), October 2013
28. Inventive Problem Solving, TRIZ seminar for LG engineers, October 2013

29. Inventive Problem Solving, TRIZ seminar for SK Hynix engineers, November 2013
30. TRIZ seminar for MATRIZ level3 in KSA(Korea Standard Association), November-December 2013
31. TRIZ seminar for Kumho University professors (13 professors for MATRIZ level 1-2, 6 professors for MATRIZ Level 3) 2012-2013
32. TRIZ course for Korea Polytechnic University students, Spring Semester 2013
33. Inventive problem solving course for Korea Polytechnic University graduate students, Spring Semester 2013
34. Creative strategy course based on TRIZ for Korea Polytechnic University graduate students, Autumn Semester 2013
35. TRIZ seminar for MATRIZ level2 in Jun Buk University, January 2014
36. Development of Creative Thinking in Kumho University, February 2014
37. TRIZ seminar for Korea Polytechnic University professor (MATRIZ Level2 certification course) February 2014
38. Inventive Problem Solving, TRIZ seminar for SK Hynix engineers, March 2014
39. TRIZ seminar for MATRIZ level 2 in KSA(Korea Standard Association), April 2014
40. TRIZ seminar for MATRIZ level 2 in KSA(Korea Standard Association), May 2014
41. TRIZ course for Korea Polytechnic University students, Spring Semester 2014
42. TRIZ seminar for MATRIZ level 2 in KSA(Korea Standard Association), July 2014
43. TRIZ seminar for MATRIZ level 3 for SK Hynix engineers, August 2014