Contents

Part I Advances in Theory and Applications of TRIZ

Current Stage of TRIZ Evolution and Its Popularity
Oleg Abramov and Sergey Sobolev

Design for Change: Disaggregation of Functions in System Architecture by TRIZ-Based Design
Sebastian Koziolek

Systematic Innovation in Process Engineering: Linking TRIZ and Process Intensification
Pavel Livotov, Arun Prasad Chandra Sekaran, Richard Law, Ma's'udah, and David Reay

Heuristic Problems in Automation and Control Design: What Can Be Learnt from TRIZ?
Leonid Chechurin, Victor Berdonosov, Leonid Yakovis, and Vasili Kaliteevskii
The Adaptive Problem Sensing and Solving (APSS) Model and Its Use for Efficient TRIZ Tool Selection 71
Alexander Czinki and Claudia Hentschel

Case: Can TRIZ Functional Analysis Improve FMEA? 87
Christian Spreafico and Davide Russo

A TRIZ and Lean-Based Approach for Improving Development Processes 101
Jens Hammer and Martin Kiesel

A Method of System Model Improvement Using TRIZ Function Analysis and Trimming 115
Nikolai Eftimov-Soini and Kalle Elfvengren

Function Analysis Plus and Cause-Effect Chain Analysis Plus with Applications 133
Min-Gyu Lee

Part II Advances in Tools and Technologies for Creating New Innovations 149

Pavel Livotov, Mas'udah, Arailym Sarsenova, and Arun Prasad Chandra Sekaran

Control Design Tools for Intensified Solids Handling Process Concepts 167
Markku Ohenoja, Marko Paavola, and Kauko Leiviskä
Anticipatory Failure Determination (AFD) for Product Reliability Analysis: A Comparison Between AFD and Failure Mode and Effects Analysis (FMEA) for Identifying Potential Failure Modes
Renan Favarão da Silva and Marco Aurélio de Carvalho

Ivan Renev

Optimized Morphological Analysis in Decision-Making
Shqipe Buzuku and Andrzej Kraslawski

Engineering Creativity: The Influence of General Knowledge and Thinking Heuristics
Iouri Beiski, Anne Skiadopoulos, Guillermo Aranda-Mena, Gaetano Cascini, and Davide Russo

Part III Advances in Managing Innovations and the Innovation Process

Levelized Function Cost: Economic Consideration for Design Concept Evaluation
Mariia Kozlova, Leonid Chechurin, and Nikolai Efimov-Soini

Reflecting Emotional Aspects and Uncertainty in Multi-expert Evaluation: One Step Closer to a Soft Design-Alternative Evaluation Methodology
Jan Stoklasa, Tomáš Talášek, and Jana Stoklasová
Using Innovation Scorecards and Lossless Fuzzy Weighted Averaging in Multiple-criteria Multi-expert Innovation Evaluation
Mikael Collan and Pasi Luukka

Innovation Commercialisation: Processes, Tools and Implications
Mikko Pynnönen, Jukka Hallikas, and Mika Immonen

Index