

The 12<sup>th</sup> International Symposium on Operational Research  
in Slovenia

# SOR '13

Dolenjske Toplice, SLOVENIA  
September 25 - 27, 2013

## Scientific Program



Slovenian Society INFORMATIKA (SDI)

Section for Operational Research (SOR)

# SOR '13

The 12<sup>th</sup> International Symposium on Operational Research in Slovenia  
Dolenjske Toplice, SLOVENIA, September 25 - 27, 2013

<i>Wednesday</i> <i>September 25, 2013</i>	<i>Thursday</i> <i>September 26, 2013</i>	<i>Friday</i> <i>September 27, 2013</i>
8.15 – Registration	8.15 – Registration	8.30 – Registration
9.15 – 10.30 Opening ceremony	9.15 – 10.00 Plenary lecture II	9.15 – 10.00 Plenary lecture IV
<i>10.30 – 11.00</i> <i>Coffee break</i>	10.00 – 11.00 Work in parallel sections	10.00 – 11.00 Work in parallel sections
11.00 – 11.45 Plenary lecture I	<i>11.00 – 11.30</i> <i>Coffee break</i>	<i>11.00 – 11.30</i> <i>Coffee break</i>
11.45 – 12.45 Work in parallel sections	11.30 – 12.50 Work in parallel sections	11.30 – 12.30 Work in parallel sections
<i>12.45 – 14.00</i> <i>Lunch break</i>	<i>12.50 – 14.00</i> <i>Lunch break</i>	12.30 – 12.45 Closing ceremony
14.00 – 15.15 Work in parallel sections	14.00 – 15.20 Work in parallel sections	
15.30 – 22.30 <i>Excursion</i>	<i>15.20 – 15.50</i> <i>Coffee break</i>	
	15.50 – 16.35 Plenary lecture III	
	16.40 – 18.20 Work in parallel sections	
	18.30 <i>Cultural event</i>	

8.15 – Registration

9.15 – 10.30 Opening ceremony

- address given by SDI-SOR, FIS, CRORS, SDI,
- presentation of prof. ddr. V. Rupnik's monography (Globalizacijski izzivi)

10.30 – 11.00 Coffee break

11.00 – 11.45 *Plenary lecture I*

Chair: Lidija Zadnik Stirn

PL-I Dragan Jukić : On the  $l_p$  -norm Estimation in a Quasilinear Regression Model

11.45 – 12.45 Work in two parallel sections:

*Section I: Mathematical Programming and Optimization - 1*

Chair: Liljana Ferbar Tratar

- I.1 Marcin Anholcer : Algorithm for Stochastic Generalized Production-Transportation Problem with Concave Costs
- I.2 Vesna Bosilj Vukšić, Mirjana Pejić Bach, Katarina Tomičić-Pupek : Simulation Modeling for Process Performance Management in Higher Education: A Case Study of Collaboration Improvement
- I.3 Kristijan Cafuta, Igor Klep, Janez Povh : Optimizations of Free Polynomials

*Section II: Graphs and Their Applications - 1*

Chair: Janez Žerovnik

- II.1 Drago Bokal, Tadej Kolmanič, Andreja Smole , Sabina Šmigoc : Mathematical models of discrete Acyclic Decision Processes
- II.2 Sergio Cabello : Stackelberg Shortest Path Tree Game, Revisited
- II.3 Katarina Cechlarova, Tamas Fleiner, Eva Potpinkova : Practical Placement of Trainee Teachers to Schools

September 25, 2013

Wednesday afternoon

12.45 – 14.00 Lunch break

14.00 – 15.15 Work in two parallel sections:

*Section I: Mathematical Programming and Optimization - 2*

Chair: Dragan Jukić

- I.4 Marcello Dalpasso and Giuseppe Lancia How to Use Linear programming: Computing the Equity of a Poker Hand by Integer Linear Programming
- I.5 Liljana Ferbar Tratar, Ana Vehovec : The Improvement of the Holt-Winters Method for Intermittent Demand: A Case of Overnight Stays of Tourists for some Community in Republic of Slovenia
- I.6 Helena Gaspars-Wieloch : On a Decision Rule Supported by a Forecasting Stage Based on the Decision Maker's Risk Aversion

*Section II: Graphs and Their Applications - 2*

Chair: Sergio Cabello

- II.4 Banchongsan Charoensook : Network Formation with Nodewise Decay
- II.5 Rija Erveš, Janez Žerovnik : Fault Diameter of Cartesian Graph Bundles
- II.6 Darja Rupnik Poklukar, Janez Žerovnik : The Reliability Hosoya-Wiener Polynomial
- II.7 Rija Erveš, Petra Šparl : Different Graph Invariants and Hexagonal Graphs

15.30 – 22.30 Excursion, dinner

8.15 – Registration

9.15 – 10.00 *Plenary Lecture II*

Chair: Janez Žerovnik

PL-II Sandi Klavžar : Two Applicable Network Families: Fibonacci Cubes and Sierpinski Graphs

10.00 – 11.00 Work in two parallel sections:

### *Section V: Production and Inventory*

Chair: Marijana Zekić-Susac

V.1 Alenka Brezavšček, Alenka Baggia : Stochastic Queuing Models: A Useful Tool for a Call Centre Performance Optimization

V.2 Marko Jakšič : Dual Sourcing Inventory Model with an Unreliable Supplier

V.3 Slavko Šimundić, Danijel Barbarić : DRM in Digital Publication: Limiting Buyers' (Readers') Personal Freedoms or a Solution to the Problem of Online Piracy

### *Section II: Graphs and Their Applications - 3*

Chair: Damjan Škulj

II.8 Andrej Taranenko : On the Structure of Lucas Cubes

II.9 Aleksander Vesel : Efficient Recognition of Fibonacci Cubes

II.10 Petra Žigert Pleteršek : Fibonacci and Lucas Cubes in Chemical Graph Theory

11.00 – 11.30 Coffee break

11.30 – 12.50 Work in two parallel sections:

### *Section I: Mathematical Programming and Optimization - 3*

Chair: Mirjana Pejić-Bach

I.7 Marko Hell : How to Use Linear programming for Information System Performances Optimization

I.8 Jaroslav Janacek : Modelling and Handling Uncertain Utility in Public Service System Design

I.9 Michal Kohani : Zone Partitioning Problem with Given Prices and Number of Zones in Counting Zones Tariff System

I.10 Tomaž Kramberger, Tea Vizinger, Marko Intihar, Anthony Chin: Determination of the Port Attractiveness using Mixed Integer Linear Programming Method

### *Section III: Multiple Criteria Decision Making - 1*

Chair: Tadeusz Trzaskalik

III.1 Zoran Babić, Tunjo Perić : Volume Discounts in Multiproduct Supplier Selection Problem - Multi-Criteria Approach

III.2 Drago Bokal, Polona Pavlič, Janez Žerovnik : A Model for Object Evaluation Based on Users' Comments/Evaluations

III.3 Andrej Bregar : Convergence of Autonomous Group Decision-Making Procedures: Application to Ranking and Sorting

III.4 Vesna Čančer, Simona Šarotar Žižek : The Multiple-Criteria Model Based on Exploratory Factor Analysis and Practical Experience: The Case of Human Resource Management Application to Ranking and Sorting

12.50 – 14.00 Lunch break

September 26, 2013

Thursday afternoon

14.00 – 15.20 Work in two parallel sections:

*Section I: Mathematical Programming and Optimization - 4*

Chair: Renata Sotirov

- I.11 Mahdi Moeini : A Continuous Optimization Approach for Financial Portfolio Selection under Discrete Asset Choice Constraints
- I.12 Damjan Škulj : Efficient Calculation of Boundary Solutions of Linear Interval Differential Inclusions
- I.13 Simon Thevenin, Nicolas Zufferey, Marino Widmer : Tabu Search for a Single Machine Scheduling Problem with Discretely Controllable Release Dates
- I.14 Luka Tomat, Mirko Gradišar, Mitja Štiglic : A Threshold for Returning Usable Leftovers Back on Stock when Solving One-Dimensional Cutting Stock Problem with Usable Leftover

*Section III: Multiple Criteria Decision Making - 2*

Chair: Zoran Babić

- III.5 Petra Grošelj, Lidija Zadnik Stirn : Judgement on some Approaches for Deriving Interval Group Matrices in Analytic Hierarchy Process
- III.6 Maciej Nowak, Tadeusz Trzaskalik : Capacity Planning using Interactive Stochastic Dynamic Programming
- III.7 Tadeusz Trzaskalik, Sebastian Sitarz, Cezary Diminiak : Unified Procedure for Bipolar Method
- III.8 Marijana Zekić-Sušac, Sanja Pfeifer, Nataša Šarlija : Performance of Machine Learning Methods in Classification Models with High-Dimensional Data

15.20 – 15.50 Coffee break

15.50 – 16.35 *Plenary Lecture III*

Chair: Janez Povh

PL-III Renata Sotirov : Why Semidefinite Programming?

16.40 – 18.20 Work in two parallel sections:

*Section VIII: Creative core FIS - Simulations*

Chair: Janez Povh

- VIII.1 Jernej Agrež, Nadja Damij : Agent Approximation Modelling and Simulation: Missing Person Incident Case Study
- VIII.2 Jože Bučar, Janez Povh : A KNN Based Algorithm for Text Categorization
- VIII.3 Peter J. C. Dickinson, Janez Povh : Application of Polynomial Approximation Hierarchy to Quadratic Assignment Problem
- VIII.4 Andrej Dobrovoljc : Agent Based Vulnerability Discovery Model
- VIII.5 Grzegorz Majewski, Nadja Damij : Management of Business Processes in Highly Dynamic and Low-Structured Scenarios

*Section IV: Econometric Models and Statistics*

Chair: Vesna Čančer

- IV.1 Martina Basarac Sertić : The Determinants of Export Performance in Furniture Manufacturing: Evidence from 26 EU Countries
- IV.2 Draženka Čizmić : Unit Value Indices in National Accounts
- IV.3 Ksenija Dumičić, Anita Pavkovič, Irena Palić : Internet Banking Usage in Selected European Countries: Multiple Regression Analysis Approach
- IV.4 Kosovka Ognjenović : A Semiparametric Approach to the Analysis of Young Women's Participation in the Labour Force in Serbia
- IV.5 Željko Račić, Tamara Straživuk : Algorithms of Association as a Method of Data Mining

18.30

Cultural event

8.30 – Registration

9.15 – 10.00 *Plenary Lecture IV*

Chair: Sandi Klavžar

PL-IV Michel Petitjean: The Chiral Index: Applications to Multivariate Distributions and to 3D Molecular Graphs

10.00 – 11.00 Work in two parallel sections:

*Section VI: Finance and Investments - 1*

Chair: Snježana Pivac

VI.1 David Bogataj : Pensions and Home Ownership in the Welfare Mix for Older Persons

VI.2 David Bogataj, Robert Vodopivec, Marija Bogataj : The Adaptation of Extended Net Present Value Theory and Solvency II in Risk Management

VI.3 Ivan Horvat, Mirjana Pejić-Bach, Marjana Merkač Skok : Discovering Fraud in Leasing Agreements: Data Mining Approach

*Section VII: Location and Transport - 1*

Chair: Anka Lisec

VII.1 Karlo Bala, Nebojša Gvozdenović, Nenad Mirkov : Extracting a Transit Geopoint Set from Routing API

VII.2 Samo Drobne, Marija Bogataj : Impact of Population Aging on Migration to Regional Centres of Slovenia

VII.3 Samo Drobne, Marija Bogataj : Evaluating Functional Regions for Servicing the Elderly

11.00 – 11.30 Coffee break

11.30 – 12.30 Work in two parallel sections:

*Section VI: Finance and Investments - 2*

Chair: Lidija Zadnik Stirn

VI.4 Snježana Pivac, Tina Vuko, Marko Čular : Comparative Analysis of Annual Report Disclosure Quality for Slovenian and Croatian Listed Companies

VI.5 Jelena Vidović, Tea Poklepović, Zdravka Aljinović : On Illiquidity Measures on European Emerging Stock Markets

VI.6 Danijel Kovačič, Eloy Hontoria, Lorenzo Ros-McDonell : Price Sensitivity in Multi-Level Assembly Systems: Case Study of Spanish Baby Food Company

*Section VII: Location and Transport - 2*

Chair: Marija Bogataj

VII.4 Mahdi Moeini, Zied Jemai, Evren Sahin : An Integer Programming Model for the Dynamic Location and Relocation of Emergency Vehicles: A Case Study

VII.5 Rainer Graf, Michael Löffler, Gerhard Navratil : Assessment Methodology of the Radiation Load of Multilateration in Comparison to the Traditional Secondary Surveillance Radar for an Area Cell

VII.6 Polona Pavlovčič Prešeren, Bojan Stopar, Oskar Sterle : Application of ANFIS in the Vehicle Track Approximation

12.30 – 12.45 Closing ceremony

# SOR '13

## **Program Committee:**

L. Zadnik Stirn, University of Ljubljana, Biotechnical Faculty, Ljubljana, Slovenia, Chair  
J. Žerovnik, University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia, Chair  
E. D. Andersen, MOSEK ApS, Copenhagen, Denmark  
Z. Babić, University of Split, Faculty of Economics, Department for Quantitative Methods, Split, Croatia  
M. Bastič, University of Maribor, Faculty of Business and Economics, Maribor, Slovenia  
M. Bogataj, University of Ljubljana, Faculty of Maritime Studies and Transport, Portorož, Slovenia  
V. Čančer, University of Maribor, Faculty of Business and Economics, Maribor, Slovenia  
S. Drobne, University of Ljubljana, Faculty of Civil Engineering and Geodesy, Ljubljana, Slovenia  
L. Ferbar, University of Ljubljana, Faculty of Economics, Ljubljana, Slovenia  
W. Gutjahr, University of Vienna, Department of Statistics and Decision Support Systems, Vienna, Austria  
H. W. Hamacher, University of Kaiserslautern, Department of Mathematics, Kaiserslautern, Germany  
A. M.C.A. Koster, Lehrstuhl II für Mathematik, RWTH Aachen, Germany  
J. Kušar, University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia  
L. Lenart, Institute Jožef Stefan, Ljubljana, Slovenia  
A. Lisec, University of Ljubljana, Faculty of Civil Engineering and Geodesy, Ljubljana, Slovenia  
Z. Lukač, University of Zagreb, Faculty of Economics and Business, Zagreb, Croatia  
L. Neralić, University of Zagreb, Faculty of Economics & Business, Zagreb, Croatia  
I. Pesek, University of Maribor, Faculty of Natural Sciences and Mathematics, Maribor, Slovenia  
U. Pferschy, University of Graz, Department of Statistics and Operations Research, Graz, Austria  
J. Povh, Faculty of Information Studies, Novo mesto, Slovenia  
K. Šorić, University of Zagreb, Faculty of Economics & Business, Zagreb, Croatia  
D. Škulj, University of Ljubljana, Faculty of Social Sciences, Ljubljana, Slovenia  
P. Šparl, University of Maribor, Faculty of Organizational Sciences, Kranj, Slovenia  
B. Zmazek, University of Maribor, Faculty of Natural Sciences and Mathematics, Maribor, Slovenia

## **Organizing Committee:**

J. Povh, Faculty of Information Studies, Novo mesto, Slovenia, Chair  
S. Drobne, University of Ljubljana, Faculty of Civil Engineering and Geodesy, Ljubljana, Slovenia  
A. Lisec, University of Ljubljana, Faculty of Civil Engineering and Geodesy, Ljubljana, Slovenia  
B. Pavlakovič, Faculty of Information Studies, Novo mesto, Slovenia  
J. Gabrič, Faculty of Information Studies, Novo mesto, Slovenia  
L. Zadnik Stirn, University of Ljubljana, Biotechnical Faculty, Ljubljana, Slovenia  
J. Žerovnik, University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia

## **Donators:**

Krka, tovarna zdravil, d. d., Novo mesto, Slovenia  
Terme Krka, d. o. o., Novo mesto, PE Dolenjske Toplice, Dolenjske Toplice, Slovenia