

SOR'17 programme



Slovenian Society INFORMATIKA Section for Operational Research



Faculty of Organizational Sciences

Faculty of Organizational Sciences

University of Maribor



Partnership for Advance Computing in Europe

Wednesday September 27, 2017	Thursday September 28, 2017	Friday September 29, 2017
8.15 – Registration	8.15 – Registration	8.15 – Registration
9.00 – 9.45 Opening ceremony	9.00 – 9.50 Plenary lecture: (PL3) Ulrike Leopold-Wildburger University of Graz, Austria	9.00 – 9.50 Plenary lecture: (PL5) Serge Bogaerts PRACE, Belgium
9.50 – 10.40 Plenary lecture: (PL1) Matjaž Perc University of Maribor, Slovenia	10.00 – 11.00 Parallel sessions: (SS1) AMSR + (S5) ML + (S6) MP&O	10.00 – 11.15 Parallel sessions: (SS2) HPC&BD + (SS6) MRP&RSAIE + (SS2) GORT
10.45 – 11.15 Coffee break	11.00 – 11.30 Coffee break	11.15 – 11.45 Coffee break
11.15 – 12.45 Parallel sessions: (SS4) MCDM-S&A + (S2) E&HR + (S4) LTG&A	11.30 – 12.30 Parallel sessions: (SS1) AMSR + (S6) MP&O + (S8) ORP	11.45 – 12.45 Parallel sessions: (S3) F&I + (S7) MCDM + (SS8) OESGI
12.45 – 13.55 Lunch break	12.30 – 13.45 Lunch break	
14.00 – 14.50 Plenary lecture: (PL2) Luc Van Wassenhove INSEAD Humanitarian Research Group, France	13.50 – 14.40 Plenary lecture: (PL4) Marijana Zekić-Sušac J. J. Strossmayer University of Osijek, Croatia	13.00 – 13.30 Closing ceremony
15.30 – 22.30 Excursion with dinner	14.45 – 16.00 Parallel sessions: (SS3) L + (SS5) MO + (S1) EMS	
	16.00 – 16.30 Coffee break	
	16.30 – 17.45 Parallel sessions: (SS7) SO&CA + (S1) EMS	
	18.00 – 19.00 Social event	

Plenary lectures: 40 minutes for presentation plus 10 minutes for discussion. Contributed presentations: 14 minutes all together for presentation and for discussion.

Wednesday

September 27, 2017

8.15 – Registration

9.00 – 9.45 Opening ceremony (Hall I)

9.50 – 10.40 **Plenary lecture** (Hall I, Chair: Mirjana Kljajić Borštnar) PL1 – **Matjaž Perc:** Transitions towards Cooperation in Human Societies

10.45 - 11.15 Coffee break

11.15 – 12.45 Parallel sessions:

(\$\$4) Chairs: Marko Bohanec, Mirjana Kljajić Borštnar, Vladislav Rajković

MCDM – Software and Applications (Hall I)

- SS4.1 Marko Bohanec: Multi-Criteria Dex Models: An Overview and Analysis
- SS4.2 Borut Čampelj, Igor Karnet, Andrej Brodnik, Eva Jereb and Uroš Rajkovič: Decision Support Modelling for Efficient Implementation of Ict in Schools
- SS4.3 Gencer Erdogan, Atle Refsdal, Bjørn Nygård, Bernt Kvam Randeberg and Ole Petter Rosland: Experiences from Developing an Algorithm to Support Risk-Based Decisions for Offshore Installations
- SS4.4 Dorota Górecka: Using Bipolar Mix in the Process of Selecting Projects Applying for Co-Financing from the European Union
- SS4.5 Nikola Kadoić, Nina Begičević Ređep and Blaženka Divjak: Decision Making with the Analytic Network Process
- SS4.6 Iván Ligardo-Herrera, Tomás Gómez-Navarro and Hannia Gonzalez-Urango: Assessing Stakeholders' Influence on the Responsibility of Research Projects: Application of Analytic Network Process

(S2) Chair: Marijana Zekić-Sušac Environment and Human Resources (Hall II)

- S2.1 Josip Arnerić and Lana Kordić: Contribution of Private Sector to the Effectiveness of Health Care Provision
- S2.2 Renata Kožul Blaževski and Jelena Vidović:Contribution of Private Sector to the Effectiveness of Health Care Provision
- S2.3 Lorena Mihelač and Janez Povh: Predicting the Acceptability of Music with Entropy of Harmony
- S2.4 Phillips Edomwonyi Obasohan: Rural and Urban Disparities in Full Routine Immunization Coverage for Under-5 Children in Nigeria: A Markov Chain Analysis
- S2.5 Snježana Pivac, Željana Aljinović Barać and Ivana Tadić: Empirical Evidence(S) of Human Capital Investments and National Welfare in EU Countries
- S2.6 Sukran Seker: An Occupational Risk Assessment Method for Fiber Optic Cable Installation

(\$4) Chair: Janez Žerovnik Location and Transport, Graphs and their Applications (Hall III)

- S4.1 Sarah Fores: Bus Driver Scheduling – How the Problem has Changed with Improvements in Computing
- S4.2 Helena Gaspars-Wieloch: Innovative Projects Scheduling with Non-Renewable Resources on the Basis of Decision Project Graphs
- S4.3 Marta Janáčková and Alžbeta Szendreyová: Estimation of the Effective Number of Centers with Regard to the Distances in Municipalities
- S4.4 Morapitiye Sunil: Operational Research Model for Crew Scheduling and Application
- S4.5 Polona Pavlovčič Prešeren: Evaluation of the Influence of Different Parameters in GNSS Static Positioning
- S4.6 Aleksander Vesel: Dynamic Algorithm for Distance Constrained Labelings of Graphs

12.45 – 13.55 Lunch break

SOR'17 - The 14th International Symposium on Operational Research in Slovenia, Bled, SLOVENIA, September 27 - 29, 2017

Wednesday

September 27, 2017

14.00 – 14.50 Plenary lecture (Hall I, Chair: Vladislav Rajković)

PL2 - Luk N. Van Wassenhove: Humanitarian Operations: Past Achievements, Future Challenges and Research Opportunities

15.30 – 22.30 Excursion with dinner

Guided tour to the Planica Nordic Centre (http://www.planica.si/en), and dinner at the Guesthouse Martin (http://www.julijana.info/en/guest-house-martin) in Kranjska gora.

Thursday

September 28, 2017

8.15 – Registration

9.00 – 9.50 **Plenary lecture** (Hall I, Chair: Lidija Zadnik Stirn)
PL3 - **Ulrike Leopold-Wildburger**: Operations Research and Behavioral Economics

10.00 – 11.00 Parallel sessions:

(S5) Chair: Mirjana Kljajič Borštnar Machine Learning (Hall I)

S5.1 - Marko Bohanec, Mirjana Kljajič Borštnar and Marko Robnik-Šikonja: Sample Size for Assessment of New Feature Relevance in a Given Problem

- S5.2 Adela Has and Marijana Zekić-Sušac: Modelling Energy Efficiency of Public Buildings by Neural Networks and Its Economic Implications
- S5.3 Eloy Hontoria, Danijel Kovačić and Wim Van Grembergen: It Security Governance and Management Best Practices: Assesing Their Maturity in a Large Spanish Company
- S5.4 Engin Pekel, Muhammet Gul and Erkan Celik: Forecasting Daily Patient Visits in an Emergency Department by GA-ANN Hybrid Approach

(SS1) Chair: Blagica Novkovska AMSR of the WBC in the Times of Economic Crisis (Hall II)

SS1.1 - Anita Čeh Časni: A Note on Housing Wealth Effect in Selected Western Balkan Countries

- SS1.2 Ksenija Dumičić, Emina Resić and Jasmina Mangafić: Inter-Industry Differences in Capital Structure: The Evidence from Bosnia and Herzegovina
- SS1.3 Sasho Kjosev and Blagica Novkovska: Social Accounting Matrix -Methodological Basis for Sustainable Development Goals Analysis in the Western Balkans Countries
- SS1.4 Helena Nikolic: What Affects the Export Performance of Croatia in Eastern Europe?

(S6) Chair: Zrinka Lukać Mathematical Programming and Optimization (Hall III)

- S6.1 Zoran Babić, Tunjo Perić and Branka Marasović: Production Planning in the Bakery Via De Novo Programming Approach
- S6.2 Elif Garajová, Milan Hladík and Miroslav Rada: The Effects of Transformations on the Optimal Set in Interval Linear Programming
- S6.3 Tatiana V. Gruzdeva and Alexander S. Strekalovsky: Global Optimization for Sum-of-Ratios Problem Using D.C. Programming
- S6.4 Tibor Illés, Adrienn Csizmadia and Zsolt Csizmadia:Finiteness of the Quadratic Primal Simplex Method when s-Monotone Index Selection Rules are Applied

11.00 - 11.30 Coffee break

11.30 – 12.30 Parallel sessions:

(S8) Chair: Lidija Zadnik Stirn OR Perspectives: Where we have been, where we can go (Hall I)

S8.1 - Drago Bokal: Optimizing Enjoyment of Mathematics and OR Education with Introducing Psychological Concepts Flow and Grit Using Simulation-based Model of Emotional States of Learning

- S8.2 Jakob Krarup: EURO Per Aspera ad Astra
- S8.3 Blanka Škrabić Perić, Zdravka Aljinović and Hrvoje Mamić: Importance of Higher Education and Investment in Higher Education in Cesee Countries

(SS1) Chair: Ksenija Dumičić AMSR of the WBC in the Times of Economic Crisis (Hall II)

- SS1.5 Blagica Novkovska and Ksenija Dumicic: Modelling of Temporal Patterns of Hidden Economy in Connection with Energy Consumption
- SS1.6 Irena Palić: The Analysis of Domestic Balassa-Samuelson Effect in Croatia: Evidence from Long Run

Model

- SS1.7 Vanja Šimićević, Mirjana Pejić-Bach and Ana Aleksić: Antecedents of Entrepreneurial Behavior: Study of Slovenian and Croatian Economics and Business Students
- SS1.8 Berislav Žmuk: Impact of Pictures on Response Rates in Business Web Surveys: Croatian Case

(S6) Chair: Tibor Illés Mathematical Programming and Optimization (Hall III)

- S6.5 Jana Novotná, Milan Hladík and Tomáš Masařík: Duality Gap in Interval Linear Programming
- S6.6 Andrei Orlov: Finding the Nash Equlibria in Randomly Generated Hexamatrix Games
- S6.7 Petra Renáta Rigó, Zsolt Darvay and Tibor Illés: Infeasible Interior-point Algorithms for Linear Optimization Problems
- S6.8 Alexander S. Strekalovsky: Global Optimality Conditions for Problem with D.C. Equality and Inequality Constraints

12.30 - 13.45 Lunch break

Thursday

September 28, 2017

13.50 – 14.40 Plenary lecture (Hall I, Chair: Janez Žerovnik)

PL4 - Marijana Zekić-Sušac: Machine Learning in Energy Consumption Management

14.45 – 16.00 Parallel sessions:

(SS3) Chair: Roman Gumzej (S1) Chair: Vesna Čančer (SS5) Chairs: V. Vukašinović, J. Šilc: Logistics **Econometric Models and Statistics Metaheuristic Optimization** (Hall I) (Hall II) (Hall III) SS3.1 - Peter Czimmermann, Michal Koháni S1.1 - Jani Bekő and Alenka Kavkler: SS5.1 - Hemmak Allaoua: Fast Multi Purchasing Power Parity in Central and Descent for Earliness Tardiness Scheduling and Luboš Buzna: The Design of Charging Problem Infrastructure for Electric Vehicles and its Eastern European Countries: An Analysis **Properties** Based on Nonlinear Rolling KSS Unit Root SS5.2 - Valmir Ferreira da Cruz and Fabio SS3.2 - Roman Gumzej and Bojan Rosi: An Henrique Pereira: Study of Initial Guess SD-based DST for Solving a Volumes S1.2 - Ufuk Bolukbas and Ali Fuat Guneri: Influence on the Quality of Solutions on **Problem** Technology Competency Assessment of Binary Genetic Algorithm in Job Shop Enterprises by Using Different Types of Scheduling Problem SS3.3 - Jaroslav Janáček and Lýdia Clustering SS5.3 - Alev Taskin Gumus, Erkan Celik and Gábrišová: Collective Fairness in S1.3 - Samo Drobne and Mitja Lakner: Furkan Ömerustaoğlu: An ANN and GA **Emergency System Designing** Concept of SM -Measure to Compare Approach for Demand Forecasting and SS3.4 - Eren Özceylan, Süleyman Mete and **Routing for Cash Management Hierarchical Clusterings** Zeynel Abidin Çil: Optimizing the Location-Allocation Problem of Bike Sharing S1.4 - Gregory Gurevich, Yossi Hadad and SS5.4 - Mehmet Ulaş Koyuncuoğlu and Stations: A Case Study in Gaziantep Baruch Keren: Forecasting Accuracy and Leyla Demir: A Variable Neighbourhood **University Campus Change Point Detection** Search Based Heuristic for Buffer Allocation

16.00 - 16.30 Coffee break

S1.5 - Saša Jakšić and Nataša Erjavec: What

Drives Croatian Regional Export?

SS3.5 - Engin Pekel and Selin Soner Kara:

Routing Problem

The Future Customer Demand in Location-

Problem in Production Lines

Supply Chain Product Flow

SS5.5 - Tea Vizinger, Tomaž Kokolj and

Janez Žerovnik: A Robust Optimization Approach for Better Planing of a Retail

16.30 - 17.45 Parallel sessions:

(SS7) Chair: Davorin Kofjač Systems Optimization and Control with Applications (Hall I)	(S1) Chair: Snježana Pivac Econometric Models and Statistics (Hall II)	
SS7.1 - Anita Gudelj, Maja Krčum and Mirko Čorić: Multiobjective Optimization for Job Scheduling at Automated Container Terminals SS7.2 - Ľudmila Jánošíková, Peter Jankovič and Marek Kvet:	S1.6 - Vedran Kojić, Tihana Škrinjarić and Nidžara Osmanagić Bedenik: The Relationship between Sustainable Profit and Sustainable Business in Companies in Croatia	
Improving Emergency System Using Simulation and Optimization SS7.3 - Davorin Kofjač, Robert Rupnik and Alenka Brezavšček: Production Scheduling Optimization in the Steel Industry Using	S1.7 - Vedran Kojić and Zrinka Lukač: Technical Note: The Shape of the Macaulay's Duration as the Function of Coupon Bond Maturity Derived Without Derivatives	
Genetic Algorithms SS7.4 - Črtomir Rozman, Tatjana Unuk, Karmen Pažek, Stanislav Tojnko and Mario Lešnik: Multi Criteria Asessment of Apple Cultivars	S1.8 - Darja Rupnik Poklukar and Janez Žerovnik: On Definition of Sample Quartiles S1.9 - Nika Šimurina, Nataša Kurnoga and Blaženka Knežević:	
SS7.5 - Maja Škurić and Vladislav Maraš: Solving a Passenger Ferry Fleet Assignment Problem	Cluster Analysis of the Post-Transition Countries of European Union According to the Income Inequality and Social Spending	
	S1.10 - Živa Veingerl Čič, Simona Šarotar Žižek, Vesna Čančer: Nonlinear Connections in Structural Equation Modeling: The Case of Service Sector Companies in Slovenia	

18.00 - 19.00 **Social event**

We will meet us at the hotel lobby and have a presentation by Bled Tourist Board. After the presentation we will taste the »kremšnita« (vanilla–custard–cream cake), one of the best known Slovenian desserts that is coming from Bled (http://www.bled.si/en/what-to-see/symbols-of-bled/cream-cake).

Friday

September 29, 2017

8.15 - Registration

9.00 – 9.50 **Plenary lecture (**Hall I, Chair: Janez Povh)

PL5 - **Serge Bogaerts**: PRACE, the Research Infrastructure Supporting Science and Industry through Provision of High Performance Computing Resources

10.00 – 11.15 Parallel sessions:				
(SS2) Chair: Janez Povh High-Performance Computing and Big Data (Hall I)	(SS6) Chair: D. Battini, M. Bogataj MRP and Related Systems Approach to Industrial Engineering and Services (Hall II)	(SS2) Chair: Drago Bokal General OR Topics (Hall III)		
SS2.1 - Mircea Simionica and Janez Povh: A Parallel Implementation of the Boundary Point Method	SS6.1 - Danijel Kovačić: 50 Years of the MRP Theory SS6.2 - R. W. Grubbström: MRP Theory	SS2.5 - Drago Bokal and Anja Goričan: Operations Research as the Bridge over Technological Valley of Death		
SS2.2 - Martin Golasowski, Kateřina Slaninová, Jiří Ševčík, Vít Ptošek and David Vojtek: Server-Side Navigation	SS6.3 - Daria Battini, Martina Calzavara, Fabio Sgarbossa and Alessandro Persona: MRP Theory Supporting Trade-Off between Investments in Collaborative Robots and Production in Foreign Countries for a Water Pumps Supply Chain	SS2.6 - Igor Đukanović: Reductions of Group Symmetric Semidefinite Programs		
Service Benchmarking Tool SS2.3 - Ekaterina Grakova, Radim Sojka, Jan Martinovič, Kateřina Slaninová and Jan Vargovský: Comparison of Parallel Versions of ALNS, ACO and Branch and Cut Algorithms for Vehicle Routing		SS2.7 - Anja Goričan, Amadeja Bratuša and Drago Bokal: Knowledge Transfer Ontology of Photovoltaic Electricity Production Forecasting		
	SS6.4 - David Bogataj and Marija Bogataj: Age Management of Human Resources	SS2.8 - Baruch Keren and Yossi Hadad: Setting the Optimal Parking Price Using Queuing Models		
Problem SS2.4 - Klemen Kenda and Dunja Mladenić: Autonomous On-Line Outlier Detection Framework for Streaming Sensor Data	SS6.5 - Valerija Rogelj and Marta Kavšek: Contributions to the Long- Term Care Insurance Fund for Workers Who Hold Physically Demanding and Labour-Intensive Jobs in Supply Chains			
	SS6.6 - Domen Hudoklin: Measurement of Temperature and Humidity for Further Development of Smart Cold Supply Chains			

11.15 - 11.45 Coffee break

Friday
September 29, 2017

11.45 – 12.45 Parallel sessions:

11.45 – 12.45 Farallel Sessions.				
(S7) Chair: Mirjana Pejić-Bach Multiple Criteria Decision Making (Hall I)	(S3) Chair: Marija Bogataj Finance and Investments (Hall II)	(SS8) Chair: Janez Povh Students Section (Hall III)		
S7.1 - Vesna Čančer, Mirjana Pejić Bach and Jovana Zoroja: Complementary Usage of Multi- Criteria Decision Making and System Dynamics: Case Study of Human Resource Management S7.2 - Hannia Gonzalez-Urango and Mónica García-Melón: A Combined Social Network Analysis - Analytic Network Process Approach to Evaluate Sustainable Tourist Strategies S7.3 - Petra Grošelj and Lidija Zadnik Stirn: Consensus Model for Group Decision Problems with Interval Weights S7.4 - Domen Ocepek and Vladislav Rajkovič: Multilayer Evaluation Model for Project Team Competencies	S3.1 - Zdravka Aljinović and Andrea Trgo: Does CVaR Overcome VaR on the Croatian Stock Market S3.2 - Draženka Čizmić: Classifications in the System of National Accounts S3.3 - Mirjana Čižmešija, Petar Sorić and Marina Matošec: Zagreb Stock Exchange and the (A)Symmetric Effects of News S3.4 - Elza Jurun, Nada Ratković and Ivana Matić: Periodic Average National Reference Rate as a New Financial Standard S3.5 - I. P. Krommyda, K. Skouri and A. G. Lagodimos: An EOQ Model with Partial Backorders under Financial Constraints and Market Tolerance	SS8.1 - Fraud detection among subsidized student meals SS8.2 - Planning of sales territories and delivery routes SS8.3 - Optimization of retail supply chain of a product under stochastic demand SS8.4 - Predicting the quantity of meat sold		
:	13.00 – 13.30 Closing ceremony (Hall I)		



Program Committee:

L. Zadnik Stirn, University of Ljubljana, Biotechnical Faculty, Ljubljana, Slovenia, Chair M. Kljajić Borštnar, University of Maribor, Faculty of Organizational Sciences, Kranj, Slovenia, Co-Chair Z. Babić, University of Split, Faculty of Economics, Department for Quantitative Methods, Split, Croatia M. Bajec, University of Ljubljana, Faculty of Computer and Information Science, Ljubljana, Slovenia M. Bastič, University of Maribor, Faculty of Business and Economics, Maribor, Slovenia M. Bogataj, The Mediterranean Institute for Advanced Studies, Šempeter pri Gorici, Slovenia M. Bohanec, Jožef Stefan Institute, Department of Knowledge Technologies, Ljubljana, Slovenia D. Bokal, University of Maribor, Faculty of Natural Sciences and Mathematics, Maribor, Slovenia A. Brezavšek, University of Maribor, Faculty of Organizational Sciences, Kranj, Slovenia S. Cabello, University of Ljubljana, Faculty of Mathematics and Physics, Ljubljana, Slovenia K. Cechlarova, P. J. Šafarik University, Faculty of Science, Košice, Slovakia S. Cozzini, CNR/IOM and eXact-lab srl, Trieste, Italy T. Csendes, University of Szeged, Department of Applied Informatics, Szeged, Hungary V. Čančer, University of Maribor, Faculty of Business and Economics, Maribor, Slovenia S. Drobne, University of Ljubljana, Faculty of Civil and Geodetic Engineering, Ljubljana, Slovenia K. Dumičić, University of Zagreb, Faculty of Economics and Business, Zagreb, Croatia L. Ferbar Tratar, University of Ljubljana, Faculty of Economics, Ljubljana, Slovenia W. Gutjahr, University of Vienna, Department of Statistics and Decision Support Systems, Vienna, Austria N. Gvozdenović, University of Novi Sad, Faculty of Economics, Subotica, Serbia J. Jablonsky, University of Economics, Faculty of Informatics and Statistics, Prague, Czech Republic S. Klavžar, University of Ljubljana, Faculty of Mathematics and Physics, Ljubljana, Slovenia D. Kofjač, University of Maribor, Faculty of Organizational Sciences, Kranj, Slovenia J. Kušar, University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia A. Lisec, University of Ljubljana, Faculty of Civil and Geodetic Engineering, Ljubljana, Slovenia Z. Lukač, University of Zagreb, Faculty of Economics and Business, Zagreb, Croatia L. Neralić, University of Zagreb, Faculty of Economics and Business, Zagreb, Croatia M. Pejić Bach, University of Zagreb, Faculty of Economics and Business, Zagreb, Croatia U. Pferschy, University of Graz, Department of Statistics and Operations Research, Graz, Austria J. Povh, University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia V. Rajkovič, University of Maribor, Faculty of Organizational Sciences, Kranj, Slovenia M. S. Rauner, University of Vienna, Dept. of Innovation and Technology Management, Vienna, Austria B. Rodič, Faculty of Information Studies, Novo mesto, Slovenia R. Sotirov, Department of Econometrics and Operations Research, Tilburg University, The Netherlands K. Šorić, Zagreb School of Economics and Management, Zagreb, Croatia D. Škulj, University of Ljubljana, Faculty of Social Sciences, Ljubljana, Slovenia O. Tang, Linköping University, Department of Management and Engineering, Linköping, Sweden T. Trzaskalik, University of Economics, Department of Operational Research Katowice, Poland G. W. Weber, Middle East Technical University, Institute of Applied Mathematics, Ankara, Turkey M. Zekić Sušac, University of Osijek, Faculty of Economics, Croatia J. Žerovnik, University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia

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S. Drobne, University of Ljubljana, Faculty of Civil and Geodetic Engineering, Ljubljana, Slovenia, Chair P. Gorjanc, University of Maribor, Faculty of Organizational Sciences, Kranj, Slovenia, Co-Chair N. Fileš, Slovenian Society Informatika, Ljubljana M. Kljajić Borštnar, University of Maribor, Faculty of Organizational Science, Kranj, Slovenia J. Povh, University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia L. Zadnik Stirn, University of Ljubljana, Biotechnical Faculty, Ljubljana, Slovenia