

Euro-K Conference Dublin 2019

World's Leading Operational Research Professionals Meets at 30th European Conference on Operational Research in Dublin

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The 30th European Conference on Operational Research (EURO 2019; <https://www.euro2019dublin.com/>) was completed with great success in University College Dublin, Ireland (<https://www.ucd.ie/>), from June 23 to 26. It was organized by *The Association of European Operational Research Societies (EURO)* (<https://www.euro-online.org/>) and the *Analytics Society of Ireland* (<http://mis.ucd.ie/mssi/>). More than 2,500 of the world's leading OR professionals met at this important conference which gave all the participants a great motivation. Different aspects of OR topics were introduced in *EURO 2019*. Tremendous efforts and care was spent by Program Committee Chair Prof. Luis Gouveia, together with the local hosts, Organizing Committee Chair Prof. Seán McGarraghy along with Prof. Cathal MacSwiney Brugha, and their teams (cf. <https://www.euro2019dublin.com/committees/>).

The conference topics were divided into Areas:

- Analytics, Data Science and Data Mining; Artificial Intelligence, Fuzzy Systems and Computing; OR Education; Continuous Optimization, Control Theory and System Dynamics; Decision Analysis, DSS, DEA and Performance Measurement; Discrete Optimization, MIP and MINLP; Emerging Applications of OR; Energy, Environment, Natural Resources and Climate; Financial Modeling, Risk Management and Managerial Accounting; Game Theory and Mathematical Economics; Graphs and Networks; Metaheuristics; Multiple Criteria Decision Making and Optimization; OR History and OR Ethics; OR for Developing Countries and Humanitarian Applications; OR in Health, Life Sciences and Sports; OR in industry and software for OR; Practice of OR (Making an Impact); Production, Service and Supply Chain Management; Revenue Management; Routing, Logistics, Location and Transportation; Scheduling, Timetabling and Project Management; Simulation, Stochastic and Robust Optimization; Soft OR, Problem Structuring Methods and Behavioural OR.

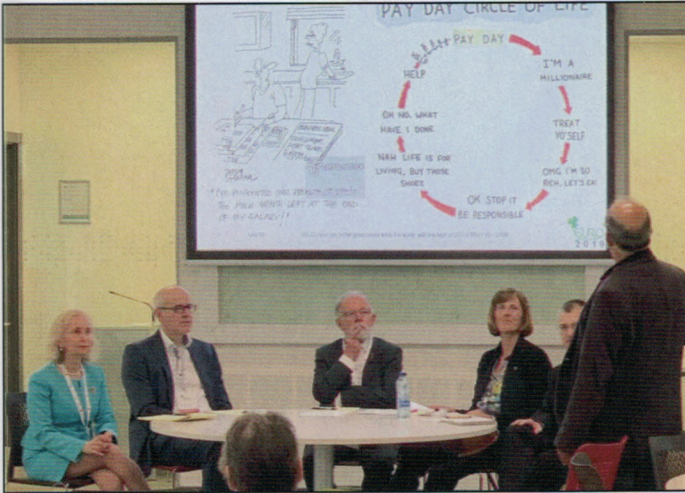
Moreover, under the responsibility of the Program Committee, the areas were subdivided into streams and sessions. Areas and streams were organized with the help of EURO Working Groups, international experts, and involved individuals. Every stream consisted of several sessions (including invited and contributed sessions, respectively). To recognize their valuable services, certificates were handed out to the Stream Organizers by EURO President Prof. Immanuel Bomze.

Prestigious Plenary Speakers gave their lectures at *EURO 2019*:

- Ulrike Reisach, Neu-Ulm University of Applied Sciences, »Artificial Intelligence – How Ethics and Governance Could Contain the Manipulation of Societies«;
- William Cook (IFORS Distinguished Lecturer), Johns Hopkins University, »The Traveling Salesman Problem: postcards from the edge of impossibility«;
- Dick den Hertog, Tilburg University, The Netherlands, »What every OR practitioner should know about Robust Optimization«.

Furthermore, *Tutorial speakers* included:

- Anna Nagurney, Isenberg School of Management at University of Massachusetts Amherst, USA, »Game Theory and Variational Inequalities: From Transportation and Supply Chains to Financial Networks and the Internet«
- Bernd Bischl, LMU Munich, Germany, »Bayesian Optimization and Automatic Machine Learning«
- Claudia D'Ambrosio, CNRS, LIX, Ecole Polytechnique, France, »Challenging Optimization Problems in Energy Production and Transportation«
- Holger Hoos, Universiteit Leiden, The Netherlands, »Programming by Optimisation: Automated algorithm configuration, selection and beyond«
- Ivana Ljubic, ESSEC Business School of Paris, France, »From Game Theory to Graph Theory: A Bilevel Journey«
- Leon Petrosyan, St. Petersburg University, Russia, »Time-Consistency Problem in Control Theory and Dynamic Games«
- Nico Vandaele, KU Leuven, Belgium, »Humanitarian Operations Modeling at the Interplay of Relief and Development«
- Nicole Adler, Hebrew University, Israel, »Applying game theory to analyze air transport markets«;
- Piotr Faliszewski, AGH University of Science and Technology Krakow, Poland, »Committee Elections: Applications, Axioms, and Algorithms«
- Roberto Cominetti, Universidad Adolfo Ibáñez, Chile, »Routing games in congested networks: convergence for large games and the Price-of-Anarchy«
- Sally Brailsford, University of Southampton, UK, »Introduction to hybrid simulation«;
- Sheetal Silal, University of Cape Town, South Africa, »Evidence-based tools to support decision making for malaria elimination«.



Panel »How can better governance save the world with the help of OR?« with participants: Anna Nagurney, Dick den Hertog, Cathal MacSwiney Brugha, Ulrike Reisach, Dennis Huisman and Joaquim Gromicho.



After plenary speech of Professor Cook on »The Traveling Salesman Problem: postcards from the edge of impossibility« with Gerhard-Wilhelm Weber, William Cook, Burcu Gürbüz and Malgorzata Spychala. Reisach, Dennis Huisman and Joaquim Gromicho.

»Women in OR Panel Session« in EURO 2019 gave opportunity to discuss the equality, diversity and inclusion of women researchers in the field. Furthermore, panelists recognized the historical contribution of many brilliant women. In addition to this, the difficulties of the gender gap in science were reflected from the side of women. In the same panel session, news on the improvement of the policies for women's rights was explained to the participants. Correspondingly, European Commission publishing its Horizon Europe proposal for 2023 was announced to the participants of the session with chances to figure out more on the issue. Besides, a limited number of topics and action proposals were discussed based on proposals of the participants.

Roundtable Panel »Can OR save the world?« investigated right that question; it was a joint session with the new *Governance Analytics* stream. The main idea of the panel was to discuss how OR can help to respond to the enormous challenges which mankind now faces. Additionally, Practitioners' stream was organized to present applications of OR in industry, business or public sector organizations.

During the three days of the event, »Editor Speed Review Sessions« were very informative for the scholars. For example, some important published works of *The European Journal of Operational Research (EJOR)* were presented by the authors which were carefully selected by the Editors of the official publications of EURO, the *Association of European Operational Research Societies: European Journal of Operational Research (EJOR)*, *EURO Journal on Computational Optimization (EJCO)*, *EURO Journal on Decision Processes (EDDP)*, and *EURO Journal on Transportation and Logistics (EJTL)*. The EURO journals are closely introduced at <https://www.euro-online.org/web/pages/106/publications>.

The conference presented a wide range of plenary presentations, panels, tutorials and other types of presentations by and for researchers, experts, academics. This variety and diversity of the presentations helped the participants to understand other aspects of contemporary and future OR studies, which provided a chance to discuss about further collaboration projects between the attendees.

Gala dinner was organized at *Aviva Stadium* of Dublin which is the oldest sports stadium in Europe. During the night Irish hospitality was shown to the participants and they enjoyed the excellent food with the traditional music and cultural entertainment at that unforgettable evening.

On Wednesday evening, attendees were invited to celebrate excellence in profession at EURO 2019 Awards and Closing Ceremony. Here, EURO presented some of its most prestigious awards to recognize leading contributions from OR practitioners, students, and academics:

- EURO Gold Medal (EGM 2019): Martine Labbé (*Université Libre de Bruxelles*)
- EURO Distinguished Service Medal Award (EDSM 2019): Paolo Toth, (*University of Bologna*)

- EURO Doctoral Dissertation Award (EDDA 2019): Martina Fischetti (*Technical University of Denmark*): »*Mathematical Programming Models and Algorithms for Offshore Wind Park Design*«
- EURO Excellence in Practice Award (EEPA 2019): Yves Lucet and Warren Hare (*University of British Columbia*);
- EURO Award for the Best EJOR Paper, Innovative Applications of OR (EABEP 2019): Jasper Schuijbroek (*Eindhoven University of Technology*), Robert Hampshire (*Transportation Research Institute, University of Michigan*), Willem van Hoeve (*Tepper School of Business, Carnegie Mellon University*): »*Inventory rebalancing and vehicle routing in bike sharing systems*«
- EURO Award for the Best EJOR Paper, Theory and Methodology (EABEP 2019): Adiel Almeida, Jonatas Araujo De Almeida, Ana Paula Costa and Adiel de Almeida-Filho (*Universidade Federal de Pernambuco*): »*A new method for elicitation of criteria weights in additive models: flexible and interactive trade-off*«
- EURO Award for the Best EJOR Paper, Review (EABEP 2019): Mika Marttunen (*Finnish Environment Institute (SYKE)*), Judit Lienert (*Swiss Federal Institute of Aquatic Science and Technology*), Valerie Belton, (*University of Strathclyde in Glasgow, Scotland*): »*Structuring problems for Multi-Criteria Decision Analysis in Practice: A literature review of method combinations*«.

To learn more please visit the Prizes & Awards page at <https://www.euro2019dublin.com/>. Sponsorships of our valuable event were given by Gurobi Optimization, Elsevier, AMPL, JMP and FICO.



Closing party of EURO-2019 in University College Dublin (UCD).

In the last day of *EURO 2019*, upcoming conferences were introduced to the attendees: *IFORS 2020* at Coex Convention Center in Seoul, South Korea, June 21-26, 2020, and *EURO 2021*, Athens, Greece, July 11-14, 2021. We are cordially invited to these and further valuable, exciting and sparking events in our OR family!



Hinweise für Autoren

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Grey System and Uncertain Analysis Meets Operational Research

2019 International Congress GSUA in Bangkok

JOANNA MAJCHRZAK, EWA WIĘCEK-JANKA, RAFAŁ MIERZWIAK,
ARKADIUSZ BOROWIEC & GERHARD-WILHELM WEBER, POZNAŃ

The 2019 International Congress of GSUA was held in Bangkok, Thailand, in August 8-11. It focused on current research on Grey System Theory, system sciences and engineering, rapidly advancing technologies in uncertainty analysis, complex equipment development, emergency and innovation management.

The Grey System Theory was developed during the past more than 20 years. More specifically, in 1982, Professor Deng Ju-Long published the first research paper, titled »Control Problems of Grey Systems«, in the international journal *Systems and Control Letters*, of North-Holland Co. the theory of grey systems has been widely applied to analyses, modeling, prediction, decision making, and control, with significant contribution to various systems including, e.g. social, economic, scientific and technological, agricultural, industrial, transportation, mechanical, petrological, meteorological, ecological, hydrological, geological, financial, medical, legal and military ones.

The 2019 International Congress of GSUA was opened by the welcome speeches of Professor Sifeng Liu and Professor Zhuo Zhang.

Professor Sifeng Liu has been devoted to the research of Grey System Theory for more than 30 years. In 1980s, he put forward a series of new models and new concepts of grey system such as sequence operator (Liu et al., 1986), absolute degree of grey incidence (Liu et al., 1988), and the positioned coefficient of grey number (Liu et al., 1989). Then, in the 1990s, he proposed the so-called buffer operator and its axiom system (Liu et al., 1991), generalized degree of grey incidence (Liu et al., 1992), grey clustering evaluation model with fixed weight (Liu et al., 1993), the measurement of information content of grey number (Liu et al., 1994), LGPG drifting and positioning solution (Liu et al., 1997), grey-econometrics model (Liu et al., 1996), etc. All of these achievements earned him a great attention and recognition by domestic and foreign counterparts; some results were specially introduced in many experts' monographs (see *Sifeng Liu, Yingjie Yang, Naiming Xie and Chaoqing Yuan, Institute for Grey System Studies at NUAA, The Journal of Grey System, vol. 30, no. 2, 2018*).

The 2019 International Congress of GSUA was organized by Institute for Grey Systems Studies (NUAA), Collage of Economics and Management (NUAA: www.nuaa.edu.cn) and Huawei Technologies (Thailand), CO., LTD. International Association of Grey System and Uncertain Analysis (IAGSUA), Grey System Society of China (GSSC), CSOOPEM and supported by China Association of Science and Technology co-sponsored the 2019 International Congress of GSUA. International Association of Grey System and Uncertain Analysis (IAGSUA: www.iagsua.org) is a worldwide, non-political organization for spreading the ideas and knowledge and promoting the application of Grey System. The congress gathered researchers to present current research findings and practical experiences from the wide community which is now involved in Grey Systems Theory and Applications, Uncertain Systems, Systems Analysis, Modeling and Simulation, Data Mining, Forecasting and Decision-making, Complex Equipment Development Management, Emergency Management, Technical Innovation and Emerging Industry Development, etc. The 2019 International Congress of GSUA was hosted by Nanjing University of Aeronautics and Astronautics (NUAA) and Huawei Technologies (Thailand), CO., LTD.

Topics which were considered during the congress included, but were not limited to: System Analysis, Data Mining and Processing, Grey Systems Modeling and Simulation, Grey Forecasting and Decision Making, Grey Control, Grey System Theory and Applications, Grey Numbers and their Operations, Grey Equation and Grey Matrix, Sequence Operator and Grey Data Mining, Grey Incidence Analysis Model, Grey Clustering Evaluation Model, Grey Programming, Grey Input-output, Grey Matrix Game Model, Uncertain Systems, Practical Applications of Grey Methods, Artificial Intelligence, Industrial Engineering, Complex Equipment Development Management, Quality and Reliability Management, Cost Management, Risk Management, Project Schedule Management, Supplier Management, Marketing Strategy, Business Process Management and ReEngineering, Emergency Management, Technical Innovation and Emerging Industry Development.



Plenary lectures during the 2019 International Congress of GSUA.

The keynote speeches were delivered by scientists such as Yingjie Yang, Yicha Zhang, Ling Xiao, Rafał Mierzwia, Ying Wang, Tao Liu, Wenping Wang, Naiming Xie, Yuhong Wang, R.M. Kapila Tharanga Rathnayaka, Chaoqing Yuan and Ehsan Javanmardi. The topics focused on the progress in grey systems theory and its application, challenges and the significant contribution to general system theory. Professor Yingjie Yang's (Centre for Computational Intelligence, De Montfort University, Leicester, Leicestershire, UK) and Professor Naiming Xie's (Nanjing University of Aeronautics & Astronautics, College of Economics and Management, Nanjing, China) speeches especially focused on the scientific background for appearance of Grey Systems Theory, characteristics of grey system, comparison of several uncertain systems models and challenges for its

further theoretical development and progress in its application.

During the 2019 International Congress of GSUA, plenary lectures took place, opening several fruitful discussions. International Association of Grey System and Uncertainty Analysis (GSUA) awarded the best PhD dissertation in Grey System and Uncertainty Analysis. Winners, Junjie Wang (supervisor: Yaoguo Dang, Nanjing University of Aeronautics and Astronautics), Liangyan Tao (supervisor: Sifeng Liu, Nanjing University of Aeronautics and Astronautics), Rafał Mierzwia (supervisors: Władysław Mantura and Ewa Wiecek-Janka, Poznań University of Technology), received a certificate, recognition at the 2019 Congress of GSUA, and publication of an abstract in the Grey Systems Theory and Application (GS: <http://www.iagsua.org/phd-dissertation-award-of-gsua/>). Furthermore, Best Papers of the 2019 International Congress of GSUA were distinguished and announced during the closing ceremony. More and more, models and techniques based on the grey number analysis are applied in Operational Research, Optimization and Information Science, where they constitute a crucial objective scope for the grey system theory community.

We are looking forward for the next event organized by International Association of Grey System and Uncertain Analysis. If you are interested in the next events organized by International Association of Grey System and Uncertain Analysis, please follow their website (www.iagsua.org).

The 2019 International Congress of GSUA was opened by



Participants of the 2019 International Congress of GSUA, among them: Professors Sifeng Liu, Yingjie Yang, Zhuo Zhang, Ying Wang, Yicha Zhang, Wenping Wang, Ling Xiao, Rafał Mierzwia, Tao Liu, Naiming Xie, Yuhong Wang, R.M.Kapila Tharanga Rathnayaka, Chaoqing Yuan, and Ehsan Javanmardi.

Management Meets Operational Research

Academic Talk and Conference, Poznan University of Technology, August 26, 2019

MAGDALENA GRACZYK-KUCHARSKA & GERHARD WILHELM-WEBER, POZNAN

In August 2019 Prof. Dr. Christopher S. Tang took a research and academic journey through Asia, Europe and America. One of his journey stops was Poznan University of Technology in Poland. The day started with a fruitful meeting with Prof. Dr. Roman Słowiński and us at Faculty of Computer Science, Institute of Computing, invited by Professor Słowiński. This more than one hour long productive research discussion focused on interdisciplinary subjects in the research areas of management, computer science, manufacturing, environmental protection, logistics and supply chain management, including Operational Research and mathematical models that help us to describe our environment and future perspectives for better life. This conversation may be summarized, that data- and value-supported models and solutions with *OR* became increasingly important nowadays. Designed distinctive and creative solutions should be applicable among our communities, helping us also in multi-criteria decision-making processes including our daily life. This is what should also be published in our premium journals of *OR*.

Prof. Dr. Christopher Tang is affiliated at University of California in Los Angeles as a University Distinguished Professor, and Edward Carter Chair in Business Administration, UCLA Anderson School Companies. On August 26, Professor Christopher gave an *Academic Talk* at the Faculty of Engineering Management of Poznan University of Technology. This conference topic was »*Making Supply Chain Transparent for a Better World: Information and Analysis*«. Professor Tang covered the »story« about giving more visibility to supply chain problems, reducing various supply chain risks, and sharing with the public what researchers know about state-of-the-art and future of supply



Fruitful research discussion in PUT Faculty of Computer Science with (from the left) Prof. Dr. Roman Słowiński, Prof. Dr. Christopher S. Tang, Dr. Eng. Magdalena Graczyk-Kucharska, and Prof. Dr. Gerhard- Wilhelm Weber

chains. He asked some more questions, such as: Should a firm disclose its supply chain information to the public? What are the risks and opportunities? Prof. Dr. Christopher Tang also presented his recent research and case-based studies to illustrate how supply chain transparency can improve our world: »planet, people and profit«. D. Sc. Dr. Arkadiusz Borowiec, Vice-Dean of Faculty of Engineering Management, welcomed our speaker and guests. This meeting was moderated by Willi – Prof. Dr., D.Sc. Gerhard Wilhelm Weber (FEM PUT Poznan, Poland), who introduced our guest, when both met first time and became friends (at *INFORMS International Taipei 2018*) and how they collaborated so far (e.g. related with *IFORS News* and *IFORS Developing Countries Online Resources*). During and after the academic talk, members of FEM asked several lively and interesting questions, leading to lively discussions between audience and our invited scholar. In fact, every member of the audience introduced him- or herself to *Professor Tang*, herewith giving chances to friendship and to future exchange and collaboration with our guest.

Indeed, the discussion after the inspiring and great talk by Prof. Dr. Christopher Tang created a solemn but also enthusiastic atmosphere that was extended by an official reception in Dean's Office at FEM with D.Sc. Dr. Arkadiusz Borowiec, D.Sc. Dr. Eng. Agnieszka Misztal and D.Sc. Dr.Eng. Katarzyna Ragin-Skorecka (who are the three Vice-Deans of FEM, PUT); the Dean of FEM, Prof. D.Sc. Eng. Magdalena Wyrwicka, had to be out of office at that day and extended her appreciation and support of this meeting.

Then, a pleasant lunch meeting of Professor Tang took place in the Old Town of Poznan with D.Sc. Dr. Eng. Agnieszka Misztal, Dr. Eng. Maciej Szafranski (PUT Rector's Representative for Technical Knowledge Accelerator), Dr. Eng. Mariusz Branowski, M.Sc. Arkadiusz Kalemba (Administrative Director of FEM), Willi (Prof. Dr., D.Sc. Gerhard Wilhelm Weber) and Magda (Dr. Eng. Magdalena Graczyk-Kucharska).



Group photo after productive discussions with FEM employees and research scientists

2nd International Conference on Intelligent Computing and Optimization

ICO 2019

Koh Samui, Thailand, October 3-4, 2019

JOSHUA THOMAS, PANDIAN VASANT & GERHARD-WILHELM WEBER, POZNAŃ

On Oct 3-4, 2019, the ICO organized its second International Conference on Intelligent Computing and Optimization in Koh Samui, Thailand (<https://www.icico.info/>). It was a two-day event, with more than 50 attendees from 12 countries. The conference chaired by Professor Pandian Vasant and Professor Ivan Zelinka, brought together renowned experts from all around the globe. The success of this ICO2019 conference was made possible because of the perseverance; great dedication and hard-work exerted by the Organizing Committee (<https://www.icico.info/committe>) headed by its co-chairs from Prof. Dr. Pandian Vasant, ICO committee members, TPC members and programme committee members.

The event combined parallel sessions, which focused on particular hot topics such as robotics, image recognition, Operation Research, machine learning, deep learning, medical engineering, learning analytics, Intelligent transportation, optimization algorithmic models, electronic digital farm, solar and renewable energy by presenters.

Prof. Dr. Ivan Zelinka states that «the scientific level was really outstanding throughout the whole conference», with all the speakers, senior and young, constantly keeping the interest of the audience, maintaining the momentum since the very first lecture by Prof. Dr. Vasant, and with all the Session Chairs and attendees nicely contributing to fruitful discussions after each talk.

The main theme of this event was the development of intelligent computational methods through innovative technologies with efficient optimization strategies. The session dedicated to this topic had to be split into two different days with six parallel sessions. This is a clear evidence of the importance of industry 4.0 research today. Professor Ivan Zelinka gave a remarkable talk on the recent progress in the self-organizing migration algorithm (SOMA) with applications in control and design of complex systems. He explained the use and development of new algorithms and their effective use in modern cyber security, computer commercial games.



Welcome: Professor Zelinka with his keynote speech, and Professor Vasant.

In addition, the conference organization, together with the sponsors, offered four prizes, one in best oral presentation and three for best papers, the latter elected by all the session chairs. The winners were announced at the award ceremony that was held on the last day by Prof. Pandian Vasant and one of the committee member, Dr. J. Joshua Thomas witnessed by Prof. Ivan Zelinka. The *best oral presentation* award have granted to Seong-Hyeong Lee, from the Dong-A University, Busan, South Korea, for his talk titled »Structural Design of an LMU using approximate model and satisfying Trade-off Method«. The three *Best Papers Awards* were granted to Hnin Aye Kwin from University of Information Technology, Yangon, Myanmar, for the paper »Neural Machine Translation on Myanmar Language«, to Tham Vo from Lac Hong University, Dong Nai, Vietnam, for the paper »A novel system for related keyword extraction over a text stream of articles«, and to Shyala Sharmin from Chittagong University of Engineering and Technology, Bangladesh, for the paper »Developing an empirical robotic framework to established bidirectional eye contact«.

To conclude the conference, the fervent Closing Session was held at the Bay Water Resort Koh Samui, Main Hall. It has been highlighted that there are offers to submit papers to special issues of excellent journals, chapters to a Book; here authors may further present their research works:

- https://www.mdpi.com/journal/applsci/special_issues/applied_optimization_clean_renewable_energy
- <https://www.springer.com/journal/40305>
- <https://cis.ieee.org/publications/t-fuzzy-systems/tfs-special-issues>
- <https://onlinelibrary.wiley.com/journal/14678640>
- <https://www.igi-global.com/publish/call-for-papers/call-details/4366>

There were given further information about ICO 2020 that will take place in Bangkok, Thailand, through presentations disseminated by the chairs; committee members received feedback for future improvement.

In addition, the members of the committees of ICO 2019 were greatly acknowledged. So much, we learned, so much fun, history, marvellous gala dinner (<https://bit.ly/31Oy85V>) we enjoyed with many wonderful humans. ICO 2019: an investment into the future and its service in building up our world of tomorrow in togetherness and friendliness.

