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Report from the 42nd National Scientific Conference named after him. Professor Władysław Bukietyński Methods and Applications of Operations Research MZBO

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The 42nd National Scientific Conference named after him. Professor Władysław Bukietyński Methods and Applications of Operations Research MZBO (Pol. Metody i Zastosowania Badań Operacyjnych) was held on 13th–15th October 2024, in Zieleniec, Poland. The conference was organised by the Department of Economics and Operational Research of Wroclaw University of Economics and Business. Basic information about the conference is available at: https://badania.uew.pl/konferencja-mzbo-2024/.

The organising committee included Grzegorz Tarczyński, PhD, DSc, Assoc. Prof. at the Wroclaw University of Economics and Business, and Piotr Peternek, PhD. The scientific committee was chaired by Marek Kośny, PhD, DSc, ProfTit.

The conference was held under the patronage of:

- His Magnificence the Rector of the Wroclaw University of Economics and Business;
- the Operations Research Section of the Polish Academy of Sciences;
- the Polish Section of INFORMS.

The conference topics focused on the methodological and application aspects of the mathematical modeling of decision problems, including:

- classical methods of operational research;
- soft and behavioural operational research;
- decision support systems and expert systems;
- optimisation models;

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- multi-criteria decision support;
- decision-making under risk and uncertainty;
- group decision-making and negotiations;
- data science and data mining;
- artificial intelligence and neural networks;
- evolutionary algorithms, fuzzy systems;
- applications of operational research;
- other related topics.

For over 40 years, the MZBO conference has been an important forum for the exchange of ideas and discussions on issues related to the theory and application of operational research. The main goal of the conference was to present the latest scientific achievements in the field of mathematical modeling of decision problems and to exchange experiences on the possibilities of applying methods and tools of the broadly-understood optimisation in economics, finance, management and other scientific disciplines.

The conference gathered 38 participants. This group consisted of faculty members or doctoral students of several universities and institutions, namely the AGH University of Krakow, Bialystok University of Technology, Krakow University of Economics, Maria Curie-Skłodowska University in Lublin, Nicolaus Copernicus University in Toruń, Poznań University of Economics and Business, Poznań University of Life Sciences, SGH Warsaw School of Economics, University of Economics in Katowice, University of Lodz, University of Szczecin, Wroclaw University of Economics and Business, and WSB Merito University Poznan.

During the conference, participants presented 29 papers on various topics, the main theme of which was optimisation and operational research. Additionally, two special sessions were held, organised by: the Operational Research Section of the Committee on Statistics and Econometrics of the Polish Academy of Sciences, chaired by Tadeusz Trzaskalik, PhD, DSc, ProfTit from the University of Economics in Katowice, who presented the current problems related to teaching operational research, and the Polish Section of INFORMS, where issues concerning the sharing economy were presented by Przemysław Szufel, PhD from the SGH Warsaw School of Economics. The sessions were chaired by Bogumił Kamiński, Józef Stawicki, Marcin Anholcer, Ewa Roszkowska, Marek Nowiński, Helena Gaspars-Wieloch, Artur Prędki, and Ewa Konarzewska-Gubała.

The following papers were presented during the thematic sessions o the conference:

- Tadeusz Trzaskalik, *Discussion panel on the teaching of operational research* (special session);
- Przemysław Szufel, *Optimizing task allocation and service technician routes in the sharing economy service model* (special session);
- Ewa Roszkowska, Dorota Górecka, The use of multi-criteria methods based on reference points to assess the degree of implementation of sustainable development goals by the European Union countries;
- Helena Gaspars-Wieloch, *AHP*, scenario approach and optimism coefficient as support for new and risky projects in the case of independent criteria;
- Marzena Filipowicz-Chomko, Ewa Roszkowska, The use of the linguistic multi-criteria method based on the GDM2 measure to assess negotiation offers;
- Dariusz Kacprzak *A hybrid method for determining objective weights of decision-makers based on the entropy method and TOPSIS*;
- Witold Orzeszko, Grzegorz Dudek, Piotr Fiszeder, Radosław Pietrzyk, Identification of determinants of bitcoin volatility using statistical models and machine learning;
- Małgorzata Just, Krzysztof Echaust, Agata Kliber, *Relationships between energy commodity* markets and energy sector stock markets in Europe;
- Maciej Bartkowiak, Selected criteria of the quality of a fair division of a set goods;
- Marcin Anholcer, On different perspectives on the problem of fair distribution;
- Michał Jakubczyk, Dominik Golicki, Study of preferences towards health states described by the EQ-5D-Y-3L system in children preliminary results of a nationwide study using the discrete choice method;
- Anna Łyczkowska-Hanćkowiak, Aleksandra Wójcicka-Wójtowicz, *Application of oriented fuzzy numbers in modeling student retention*;
- Aleksandra Łuczak, Sławomir Kalinowski, Multidimensional analysis of energy poverty of residents of territorial units;
- Michał Bernardelli, Optimization of airport management by minimizing risky air connections;
- Anna Gorczyca-Goraj, Marek Szopa, Piotr Frąckiewicz, Admissible quantum extensions, on four strategies, for classical games;
- Marek Szopa, Anna Gorczyca-Goraj, Piotr Frąckiewicz, *Application of quantum games to optimize strategic decisions*;
- Milena Bieniek, Optimal decisions in supply chain contracts;

- Konrad Kułakowski, Michał Strada, Sebastian Ernst, Jacek Szybowski, Detection of manipulations in the pairwise comparison method;
- Daniel Kaszyński, Algorithmic bias in creditworthiness assessment;
- Michał Stasiak, Application of state models of binary-time representation to build algorithmic trading systems for the cryptocurrency market;
- Piotr Miszczyński, Decision support in the banking sector in the context of ESG;
- Paweł Hanczar, Dariusz Wawrzyniak, Optimization of the municipal waste collection schedule;
- Krzysztof Dmytrów, Modification of the multi-criteria location selection method ensuring full implementation of the selected strategy;
- Grzegorz Tarczyński, Proposal of a model optimizing the locations of correlated goods in a warehouse taking into account distributed storage;
- Jerzy Michnik, Peyman Zandi, Proposal of a model for the assessment of operational risk based on sustainable development and the domino effect using fuzzy entropy and the fuzzy WINGS method;
- Kacper Zielak, Sustainable development in Poland in quantitative terms state as of 2022;
- Piotr Peternek, Izabela Dziaduch, *Evaluation of the importance of criteria assessing the quality of public transport services using the fuzzy AHP method*;
- Dorota Górecka, Ewa Chojnacka-Pelowska, Group multi-criteria decision-making in the field of transferring public funds: open tenders for non-governmental organizations in Poland;
- Adam Kucharski, *The impact of macro factors on achieving the position of a leader in the efficiency of implementing electromobility.*

In keeping with the long-standing tradition of the MZBO conference, its organisers held a competition for the best presentations delivered during the thematic sessions. The aim of the competition was to select the best papers discussing operational research methods and applications. The competition jury, consisting of Ewa Konarzewska-Gubała, Józef Stawicki, Artur Prędki and Grzegorz Tarczyński selected the winners:

- Michał Bernardelli, Optimization of airport management by minimizing risky air connections;
- Dorota Górecka, Ewa Chojnacka-Pelowska, Group multi-criteria decision-making in the field of transferring public funds: open tenders for non-governmental organizations in Poland;

- Małgorzata Just, Krzysztof Echaust, Agata Kliber, *Relationships between energy commodity markets and energy sector stock markets in Europe*;
- Konrad Kułakowski, Michał Strada, Sebastian Ernst, Jacek Szybowski, Detection of manipulations in the pairwise comparison method.

During the conference, the participants also discussed the current problems related to the promotion of operational research methods and tools in the scientific, business and academic environment.

The next MZBO conference will be organised by the Department of Decision Support and Analysis at the Institute of Econometrics, College of Economic Analysis at the SGH Warsaw School of Economics. The event will be held on 12th-14th October 2025. Information about the conference is available at: mzbo2025.sgh.waw.pl.