



Report from the 32nd Scientific Conference of the Classification and Data Analysis Section of the Polish Statistical Association

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The 32nd Scientific Conference of the Classification and Data Analysis Section of the Polish Statistical Association was held on 19-20 September 2023, in Katowice, Poland. The conference was organised by the Classification and Data Analysis Section (Pol. Sekcja Klasyfikacji i Analizy Danych – SKAD) of the Polish Statistical Association (PSA), and by the Department of Demography and Economic Statistics, and the Department of Economic and Financial Analysis of the University of Economics in Katowice. Basic information about the conference is available at: <https://skad2023.ue.katowice.pl/>.

The Organising Committee was chaired by Dominik Krężolek, PhD, DSc, professor at the University of Economics in Katowice, while Alicja Ganczarek-Gamrot, PhD, DSc, professor at the University of Economics in Katowice, Justyna Majewska, PhD, Joanna Trzęsiok, PhD, and Jakub Kubiczek, MSc, were the members of the committee.

The following topics were addressed during the conference:

- theoretical aspects (taxonomy, graphical methods, discriminant analysis, linear ordering methods, multivariate statistical analysis, methods of analysing continuous and discrete variables, symbolic data analysis, machine learning methods);

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- applications (financial data analysis, marketing data analysis, spatial data analysis, computer application of statistical methods, other areas of data analysis application – medicine, psychology, archaeology, etc.).

The main objective of the SKAD conference was to present the current research and create a platform for the exchange of ideas relating to theoretical and applied aspects of classification and data analysis. This annually held forum provides an opportunity for the presentation and promotion of state-of-the-art research and indicates possible development directions.

The conference featured 48 participants who are faculty members and doctoral students of the following universities and institutions: The Mazovian Academy in Płock, Statistics Poland, Gdańsk University of Technology, Silesian University of Technology, Warsaw University of Life Sciences, SGH Warsaw School of Economics, Universidade do Porto, University of Essex, University of Economics in Katowice, Cracow University of Economics, Poznań University of Economics and Business, Wrocław University of Economics and Business, University of Gdańsk, Adam Mickiewicz University in Poznań, Lodz University, Poznań University of Life Sciences, University of Szczecin, the Statistical Office in Poznań.

39 presentations introducing research results relating to the theory and application of classification and data analysis were presented during four plenary and five parallel sessions. The sessions were chaired by Grażyna Trzpiot, Krzysztof Jajuga, Paweł Lula, Marek Walesiak, Elżbieta Gołata, Joanna Landmesser-Rusek, Andrzej Dudek, Jacek Batóg, Krzysztof Najman, Grażyna Dehnel, Iwona Foryś, Jerzy Korzeniewski, Kamila Migdał-Najman, and Eugeniusz Gatnar.

Below is a list of all papers presented during the conference:

- Krzysztof Jajuga, Józef Pociecha, Marek Walesiak, *Wroclaw and Cracow scientific centers and our Masters: Professor Zdzisław Hellwig and Professor Kazimierz Zajac – contribution to the development of the classification and data analysis methods*;
- Berthold Lausen, *Data Science Challenges for Explainable Artificial Intelligence (AI)*;
- Andrzej Dudek, *Forecasting volatility in time series with deep neural networks – an overview of methods and algorithms*;
- Grażyna Trzpiot, Zuzanna Krysiak, *Application of the cluster analysis to describe the climatic phenomenon of internal migration for selected countries*;
- Katarzyna Stapor, *Reliable Evaluation of Classification Models*;
- Marta Kuc-Czarnecka, Andrea Saltelli, *Ranking the rankers. An analysis of the science-wide author databases of standardized citation indicators*;

- Eugeniusz Gatnar, *Methods of measuring the costs of using dwellings by owners in the measurement of inflation*;
- Iwona Foryś, Jacek Batóg, *Factors influencing the prices of land for residential development in areas of increased noise: a statistical analysis*;
- Ewa Putek-Szeląg, Anna Gdakowicz, *The time of exposure of the property on the market and the features influencing its sale*;
- Jacek Batóg, Barbara Batóg, *Analysis of the long-term relationship between the size of the city and the level of development*;
- Marek Walesiak, Grażyna Dehnel, *Assessment of the implementation of the SDG 7 goal in EU countries in the perspective of the target year 2030 with the application of dynamic relative taxonomy and cluster analysis*;
- Jarosław Lira, Feliks Wysocki, *The use of the relative taxonomy method in the analysis of the economic activity of EU countries*;
- Justyna Majewska, *Analysing patterns of changes in mortality using functional data clustering*;
- Agnieszka Orwat-Acedańska, *Classification of small area populations according to mortality forecast errors resulting from relational models*;
- Kamila Migdał-Najman, Krzysztof Najman, *The image of the Tri-City Agglomeration through the eyes of Twitter users*;
- Paweł Lula, *Spatial, Temporal and thematic diversity of publication activity in Poland in the field of economics, finance and management based on the OpenAlex database*;
- Mirosław Krzyśko, Marcin Szymkowiak, Waldemar Wołyński, *Tourist attractiveness of counties in Poland in the light of functional Principal Component Analysis*;
- Marcin Salamaga, *Study of the impact of socio-economic factors on the diffusion of mobile technologies in spatial terms in Poland*;
- Janusz Wywiiał, Tomasz Szkutnik, *Bootstrap tests for unbiasedness of predictors*;
- Paweł Kaczmarczyk, *The effectiveness analysis of econometric modelling of the compound cyclicity of hourly demand for telecommunications services with the use of selected orders of autoregression*;
- Stanisław Jaworski, *The Optimal Sample Size in Triangular Model for Sensitive Questions*;
- Jerzy Korzeniewski, *Two-stage algorithm for establishing the sentiment of text documents*;
- Joanna Landmesser-Rusek, *Influence of the measure used to calculate the distance between time series for exchange rates on the topological structure of the currency network*;

- Anna Zamojska, *Examination of the durability of indicators for assessing the effectiveness of investment portfolio management in the short and long-term*;
- Marcin Pełka, *Symbolic Data Analysis in Payment Card Fraud Detection*;
- Jakub Kubiczek, Marek Leśkiewicz, *Specificity of distributions and possibilities of tax data analysis*;
- Elżbieta Gołata, *Reflections after NSP 2021 – the quality of the census*;
- Wioletta Grzenda, *Working life expectancy in Poland and periods of unemployment – longitudinal analysis based on SHARE data*;
- Grażyna Trzpiot, *Redefinitions of demographic burden measures*;
- Marcin Pełka, Aneta Rybicka, *Analysis of preferences and behaviours during online shopping*;
- Aneta Ptak-Chmielewska, Małgorzata Grzywińska-Rapca, *Consumer Confidence Index (CCI) for European countries – link to the objective situation of households*;
- Andrzej Bąk, Tomasz Bartłomowicz, *Measuring consumer preferences using conjoint and radiant.multivariate packages of the R program*;
- Dominik Krężolek, *Semiparametric optimization of the investment portfolio in the metals and energy commodities market*;
- Dominik Krężolek, *Semiparametric Quantile Regression – Extreme Risk Analysis in the Metals Market*;
- Katarzyna Frodyma, *The DEA Method in Energy Efficiency Analysis*;
- Joanna Trzęsiok, *How do you colour black boxes? Comparison of selected solutions in the field of interpretability of nonparametric regression and discrimination models*;
- Michał Pietrzak, *The Idea of Economic Distance in the Potential Ratio Model*;
- Sylwia Filas-Przybył, Tomasz Klimanek, *Pupils' commuting to school – an analysis of selected aspects of mobility*;
- Dominik Rozkrut, *Ethical principles and data processing*.

The members of SKAD held an annual meeting on the first day of the conference. The meeting was chaired by Andrzej Dudek, President of SKAD, and its agenda included the following items:

- report on the SKAD activities;
- information on the planned domestic and international conferences;
- organisation of SKAD conferences in 2024 and 2025;
- elections of the representatives of SKAD to the International Federation of Classification Societies (IFCS) Council;

- other issues.

The Chairman of SKAD, Andrzej Dudek, PhD, DSc, Associate Professor, opened the meeting and reported on the activities of SKAD. He announced that SKAD currently has 235 members and is under review for information sharing resulting from the GDPR. He reminded the participants of the meeting that the SKAD website features regulations and a membership declaration. Then, a minute of silence was observed in memory of the members of SKAD who passed away in the last period.

Issue 3/2022 of *Przegląd Statystyczny. Statistical Review* contains a report from the conference held at the Warsaw University of Life Sciences: Jajuga K., Landmesser-Rusek J., Walesiak M. (2022), *Report from the 31st Scientific Conference of the Classification and Data Analysis Section of the Polish Statistical Association*, (Vol. 69, no. 3, pp. 63-67).

Prof. Andrzej Dudek announced that Prof. Krzysztof Jajuga has been elected President of the IFCS for the period of 2025-2026. From 2023 to 2024, he will serve as President-elect and from 2027 to 2028 as Past President. In addition, Dr Marcin Pełka has been elected member of the Election Committee of the IFCS (until 31 March 2027).

Prof. Andrzej Dudek announced that the participants from Poland presented in Polish three papers during the DSSV-ECDA 2023 Conference (5-7 July 2023). During the CLADAG 2023 conference (11-13 September 2023, Salerno), Prof. Barbara Pawełek was member of the Scientific Committee, and Prof. Paweł Lula, Prof. Barbara Pawełek, Prof. Agnieszka Wałęga, Prof. Paweł Ulman were the organisers of the invited scientific sessions. Participants from Poland presented eight papers during the conference.

In the years 2023-2025, the following conferences are planned: the 41st International Scientific Conference from the Multivariate Statistical Analysis (MSA 2023) series (6-8 November 2023, Łódź), the 17th International Scientific Conference on Modelling and Forecasting of Socio-Economic Phenomena (13-16 May 2024, Zakopane), ECDA 2023 (9-11 September 2024, University of Gdańsk, Sopot), German-Polish Seminar on Data Analysis and Applications (11 September 2024, University of Gdańsk, Sopot), IFCS 2024 (15-19 July 2024, San Jose, Costa Rica), and CLADAG (2025, Sardinia).

The next item on the agenda was the organisation of the subsequent SKAD conferences. Prof. Paweł Lula made a declaration that the conference will be held at the Cracow University of Economics in 2024. The conference will be part of the programme celebrating the 100th anniversary of the establishment of the Cracow University of Economics.

In the next part of the meeting, the representatives of SKAD were elected to the IFCS Council. Two vacancies became available due to the end of the term of office of Prof. Andrzej

Sokołowski and Prof. Krzysztof Jajuga's election as the IFCS president. Prof. Eugeniusz Gatnar (Chairman) and Dr Marcin Pełka (member) were appointed to the Returning Committee. Prof. Eugeniusz Gatnar asked the participants of the conference to propose candidates. Prof. Józef Pociecha proposed the candidacy of Paweł Lula (term of office until 2027) and Prof. Krzysztof Jajuga proposed the candidacy of Andrzej Dudek (term of office until 2025). The candidates confirmed their consent to stand as candidates. Subsequently, a motion was voted on to close the list of candidates, which was unanimously accepted. The Returning Committee held a secret ballot. 27 members of SKAD took part in the voting (27 valid votes were cast). The results of the votes were 27 and 26 in favour, respectively, which ultimately confirmed the election of the above-mentioned candidates.

At the end of the second day of the conference, the SKAD Chairman, Prof. Andrzej Dudek, thanked the organisers and participants of the conference and invited them to the next SKAD conference to be held in Kraków.