

Polskie Stowarzyszenie Naukowe Systemów Szarych **Polish Scientific Association of Grey Systems**

Polish Scientific Association of Grey Systems was set up in 2017. The founders of the association are:

Rafal Mierzwiak PhD, Eng

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A founding member of PSAGS (*Polish Scientific Association of Grey Systems*). He is a graduate of Poznan University of Technology in Poland in the faculty of Management and Marketing. In his professional career he specializes in implementing pro quality systems, innovative heuristic techniques and management methods in companies. He has an experience as an expert in such branches as production, construction, food industry, finances and IT. At present, he is an assistant in Chair of Marketing and Economics at Poznan University of Technology and a lecturer in WSB University of Banking



in Poznan and since 2017 a post-doc researcher at Nanjing University of Aeronautics and Astronautics. In his research work, he focuses on applications of grey systems theory in management. In this area, the most important are his publications in famous scientific magazines, for example, *Journal of Cleaner Production*, *Lecture Notes of Computer Science*, *Journal of Grey System*, and *Grey Systems: Theory and Application*. He received a prize for the best paper at the conference for young scientists in Cracow and was also awarded for his work in grey systems area at the grey system conference in Leicester. In 2016 he was chosen a Deputy Secretary General of the International Association of Grey Systems and Uncertainty Analysis. What is more, he managed two projects for young scientists at the Faculty of Management Engineering and he took part in projects supported by the European Social Fund and National Centre for the Research and Development. He regularly participates in national and international conferences.

Ewa Więcek-Janka PhD, Eng

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A founding member of PSAGS (*Polish Scientific Association of Grey Systems*), Member of IFR (*Family Business Initiative*), PTZP (*Polish Association of Production Management*) and PNTM (*Polish Scientific Marketing Association*). An employee in the Department of Marketing and Economic Control at the Faculty of Management Engineering at Poznan University of Technology. The author and co-author of 168 publications, including books on applied management tools, among others: *Industrial Marketing*, 2000; *Changes and conflicts in the organization*, 2006; *Decisions and Marketing Game*, 2010; *Mathematical Statistics*, 2010; *Designing marketing research* 2011, *Games and Decisions* 2011, *Marketing Services & Logistics*, 2011; *Wielkopolska monitoring and forecasting in vocational training*, 2011; *Organization of service activities*, 2011; *Leading value in the management of family businesses*, 2013; *The essential of marketing research*, 2015.



A coordinator or a member of 10 scientific projects. The most important are as follows *Codes value – effective succession in the Polish family businesses*, *AIM4IT - International research project "Mobility without barriers of virtual travel assistant"*, *Methodology research psychologist*; *Project Erasmus Plus: A method of accelerated development of transversal competences in the practical training*. She was also a participant in expert teams responsible for establishing the Polish government's position on family firms in drawing up the Economic and Social Committee in the European Parliament as well as in the expert team of specialists on studies opinion on family businesses for the Committee on Employment and Social Affairs in the European Parliament. She took part in an expert discussion on "*Family businesses. Opportunities and Challenges*" in the European Parliament in Brussels in 2015. She conducted an expert panel concerning "*Innovation in Companies Family*" at the Second International Congress of the Family Business in Poznań. She was an expert in the "*Employer of Tomorrow 2015*" organized by *Polityka Magazine* and the Polish Agency for Enterprise Development in Warsaw. In the association she is involved in preparing research processes and implementing GST tools for research processes.

Marcin Nowak PhD, Eng

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A founding member of PSAGS (*Polish Scientific Association of Grey Systems*). An employee in Department of Marketing and Economic Control at the Faculty of Management Engineering at Poznan University of Technology. His scientific interests include philosophical, praxeological and qualitological aspects of management science. In the association, he is responsible for a knowledge area connected with philosophical basics of Grey Systems Theory. Apart from a scientific and didactic activity, he is a management practitioner either in an advisory branch, where he occupied independent



specialized positions such as a senior consultant, a financial analyst, and an advisor of pro-innovative services; or in an active management of organizations (he was a chairman of the board in two partnerships, a financial and economic director, and a proxy).

Agnieszka Kujawińska PhD, Eng

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A founding member of PSAGS (*Polish Scientific Association of Grey Systems*) and a member PTZP (*Polish Association of Production Management*) and European Network for Business and Industrial Statistics (ENBIS). An employee in the Department of Management and Engineering Production at Poznan University of Technology. An author and co-author of 40 publications including books. She was a member of plenty of research projects such as *EFFRaWOOD - Improvement of raw wood efficiency in the industrial production processes*;



AIM4It - Accessible and inclusive mobility for all with individual travel assistance; *Time of Professionals - vocational training*; *A monitoring and forecasting system of working conditions in Wielkopolska region*; *Developing methods of certification and monitoring measurement systems in manufacturing processes*; *The adaptive methods for evaluation the state of the manufacturing process*; *The flow and quality of production control system for small and medium enterprises*; *The use of selected methods of pattern recognition in statistical process control*; and *WG-ECUA: European COTS User Working Group*. In the association she is involved in comparing classic statistical methods with new methods.

Joanna Majchrzak PhD, Eng

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A founding member of PSAGS (*Polish Scientific Association of Grey Systems*). An employee in the Department of Marketing and Economic Control at the Faculty of Management Engineering at Poznan University of Technology. She conducts research in the areas of marketing theory of companies and quality, applications of Grey System Theory methods, and Theory of Inventive Problem Solving.



The principal purposes of the Polish Scientific Association of Grey Systems activity are:

1. creating conditions for Grey System Theory's development and popularising knowledge in this area,
2. integrating the representatives of Grey System Theory in Poland,
3. identifying research areas and monitoring of conducted scientific research.

The activities of the Polish Scientific Association of Grey Systems are connected with scientific research and publishing the research results in the areas of:

- I. Application of Grey System Theory basics in various scientific disciplines e.g. management, quality, economic control.
1. Kijewska J., Mierzwiak R. (2014), The formula for quantitative and synthetic information quality evaluation based on the Grey System theory, Proceedings, 17th QMOD-ICQSS, Quality Management and Organizational Development Conference International Quality and Services, 3th-5th September 2014, Prague, Czech Republic, Dahlgaard-Park S.M., Dahlgaard J.J. (Eds.), Lund University Library Press, ISBN 978-91-7623-086-2.
2. Więcek-Janka E., Mierzwiak R., Kijewska J. (2015), Taxonomic approach to competencies in the succession process of family firms with the use of grey clustering analysis, Proceedings of 2015 IEEE International Conference on Grey Systems and Intelligent Services, IEEE Catalog Number: CFP15GSI-PRT, ISBN:978-1-4799-8374-2.
3. Więcek-Janka E., Mierzwiak R., Kijewska J. (2016), Bariery w procesach sukcesyjnych polskich firm rodzinnych – próba wykorzystania protokołu podobieństwa Grey System Analysis [*Barriers in the succession processes of Polish family businesses - an attempt to*

use the Gray System Analysis analysis protocol], *Przedsiębiorczość i zarządzanie*, Łódź-Warszawa, Tom XVII, Zeszyt 6, Część III, s. 9-22.

4. Więcek-Janka E., Mierzwiak R., Kijewska J. (2016), *The Analysis of Barriers in Succession Processes of Family Business with the Use of Grey Incidence Analysis (Polish Perspective)*, *Naše gospodarstvo/Our Economy*, 62(2), 33–41.
5. Więcek-Janka E., Contreras Loera M. R., Kijewska J. (2016), Tirado G., *Family and business in family enterprises in countries of low and high-context cultures – research conducted using grey system theory*, *Zeszyty Naukowe Politechniki Poznańskiej, Organizacja i Zarządzanie*, Nr. 70, Wydawnictwo Politechniki Poznańskiej, Poznań.
6. Więcek-Janka E., Mierzwiak R., Kijewska J. (2016), *Competencies' Model in the Succession Process of Family Firms with the Use of Grey Clustering Analysis*, *The Journal of Grey System*, Volume 28 No.2, 121-131, Nr ISSN 0957-3720.
7. Więcek-Janka, E. (2018). *Wykorzystanie Cluster of Grey Incidence w opracowaniu modelu celów sukcesorów polskich przedsiębiorstw rodzinnych [The use of Cluster of Gray Incidence in the development of a model of goals for the successors of Polish family enterprises]*, *Reserch Papers of Wrocław University of Economics* (in process).
8. Mierzwiak, R., Xie, N., & Nowak, M. (2018). *New axiomatic approach to the concept of grey information*. *Grey Systems: Theory and Application*.

II. Popularisation of theoretical basics and practical application of Grey System Theory methods and tools in scientific research and a practical activity of enterprises

1. Organising a lecture given by Professor Naiming Xie within Academic Poznan programme titled: “*Grey information, grey models and grey world*” (Poznan University of Technology, 16 March 2016),
2. Organising scientific workshops titled: “*Grey System Theory and Practical Application*” carried out by Professor Naiming Xie from the Institute of Grey System Theory (Poznan University of Technology, 17 March 2016).

III. Cooperation with other representatives of Grey System Community and realisation of common research projects

Among the activities which have been realised so far, we can distinguish:

1. Rafał Mierzwiak’s academic internship in Nanjing University of Aeronautics and Astronautics, Institute for Grey Systems Studies (February, 2015);

2. Joanna Majchrzak's academic internship in Nanjing University of Aeronautics and Astronautics, Institute for Grey Systems Studies (February, 2015);
3. Rafał Mierzwiak's academic internship in Nanjing University of Aeronautics and Astronautics, Institute for Grey Systems Studies (2017-2018).

IV. Participation of Polish Scientific Association of Grey Systems' members in international conferences

1. 2015 IEEE International Conference on Grey Systems and Intelligent Services, Leicester, UK, August 2015, a conference paper: *Taxonomic approach to competencies in the succession process of family firms with the use of grey clustering analysis*, Leicester;
2. 2016 IEEE International Conference on Grey Systems and Intelligent Services, Leicester, UK, August 2016, a conference paper: *Comparison of Grey Relation Analysis with statistical methods with the use of empirical data*;
3. International Congress of Grey Systems and Uncertainty Analysis (GSUA), Stockholm, Sweden, August 2017, a conference paper: *Epistemological and ontological assumptions of grey systems theory in the context of quality science*;
4. International Congress of Grey Systems and Uncertainty Analysis (GSUA), Nanjing, China, April 2018, a conference paper: *Application of the GDM Model in the Diagnosis of crises in Family Business*;
5. World Conference on Information Systems and Technologies, Porto Santo Island, Madeira, Portugal, April 11-13, a conference paper: *Application of the Grey Clustering Analysis Method in the Process of Taking Purchasing Decisions in the Welding Industry*;
6. 24th International Conference on Production Research Analysis, Poznań, Poland, July/August 2018, a conference paper: *Analysis of key production management quality factors with the use of Grey Systems Theory*.

Among actions planned by Polish Scientific Association of Grey Systems are:

1. Introduction of GST elements in didactic curricula at the Faculty of Management Engineering at Poznan University of Technology;
2. Organisation of recurring GST seminars;
3. Organisation of a recurring competition on the best BSc Thesis and MSc Thesis with the application of GST;
4. Formation of Grey Systems Laboratory;
5. Creation and publication of materials in Polish language which will popularise the application of GST.