

GREY GREY GREY

MODELS, THINKING, WORLD



Most of scientific research is carried out using uncertain, incomplete and scarce data. The grey systems theory gives the basis for considering complex technical, economic and social systems whose structure and functioning is not fully known. It was created in 1982 by the Chinese scientist Professor Deng Jilt-long. However, this theory remained obscure for a long time; its first systematic presentation in the English language was published in 1989 and the first English language textbook available to a larger number of readers appeared only in 2005. Despite the initial difficulties with its popularisation this theory has found many interesting applications, in particular, in technical sciences and economics. Currently, the main directions of the grey systems theory research include: algebra of gray numbers, numerical data sequences smoothing operators, grey analysis of relations, grey taxonomy methods, grey decision-making methods, forecast models, grey linear programming,

grey theory of games, hybrid models combining grey systems theory methods with other data analysis methods. The grey systems theory, apart from fuzzy logic, rough set theory and statistics is yet another method of information analysis taking into account the uncertainty of the surrounding world.

In March 2016, the Faculty of Engineering Management of Poznań University of Technology played host to Professor Naiming Xie from Nanjing University of Aeronautics and Astronautics. Professor Naiming Xie belongs to the youngest generation of scientists working on the development of the grey systems theory. He works at the prestigious Institute for Grey System Studies forming part of the Nanjing University of Aeronautics and Astronautics. He is the Secretary of the Grey Systems Society of China and deputy editor-in-chief of the "Grey Systems: Theory and Application" journal. He is the author of the most often quoted article published in "Grey Systems: Theory and Application" in the years 2011-2013 and

in "Applied Mathematical Modelling" in the years 2007-2011.

Professor Xie came to Poznań on the invitation of the academic community of the Faculty of Engineering Management and the municipal authorities as part of the "Academic and Scientific Poznań" programme. During his visit he delivered an open lecture entitled "Grey information, grey models and grey world". The lecture dealt with the basic theoretical assumptions and systematisation of the types of grey analytical models. The lecture proved very popular among students, post-graduate students and faculty of Poznań higher schools.

It should be stressed that the aforesaid visit was yet another step taken by the academics at the Faculty of Engineering Management towards gaining the opinion of the most important centre in Poland engaged in researching the economic applications of the grey systems theory. Until now, their scholarly activity in this area has included publications in prestigious journals and participation in international conferences. In addition, two faculty members went on a month-long internship at the Institute for Grey System Studies of China. A module concerning the grey systems theory has been added to the programme of doctoral studies as part of the "Intelligent Methods in Management" course. The Faculty of Engineering Management is also conducting a research project for young scholars covering the issues of decision-making using grey models. Moreover, academics from the faculty participate in projects funded by the National Research and Development Centre and the European Social Fund, successfully using methods and models of the grey systems theory to resolve scientific and practical problems.

There are plans to create a national scientific society for researchers interested in the theoretical and practical aspects of grey analysis at the Faculty of Engineering Management of Poznań University of Technology.

