

INSTITUTE OF COMPUTING SCIENCE
POZNAN UNIVERSITY OF TECHNOLOGY
LABORATORY OF INTELLIGENT DECISION SUPPORT SYSTEMS

Head: Professor Roman Slowinski; E-mail: Slowinski@poczta.v.tup.edu.pl

Research profile:

Methodology and techniques of decision support with an emphasis on multi-criteria decision aid (MCDA) and knowledge-based systems (KBS).

Within MCDA framework: preference modelling, interactive procedures for multi-criteria choice, sorting and ranking, multi-objective mathematical programming in deterministic or fuzzy environment.

Within KBS framework: knowledge acquisition and representation, approximate reasoning and management of uncertainty in KBS, rough set approach, fuzzy set approach, neural networks, image processing, classification.

Applications of MCDA and KBS in: water supply system programming, agriculture, regional planning, software engineering, vibroacoustic technical diagnostics, surgery, histopathology, chemistry and finance.

Research grants:

Grant KBN no. 8 0570 91 01/P2: Knowledge analysis using rough sets.

Grant KBN no. 3 0230 91 01: Interactive methods for multi-criteria decision aid.

CRIT Project V/92 IC 1010: Multi-criteria decision aid under vagueness.

Polish Project in IIASA: Methodology, techniques and applications of multicriteria decision analysis.

TEMPUS Project no. 3386: Education and training of students in the field of computers and management in engineering. In cooperation with Faculté Polytechnique de Mons (Belgique) and University of Coimbra (Portugal).

Academic and research staff:

Piotr Czyzak, Ph.D., Assistant Professor

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Faculty:

Roman Slowinski, Professor (Ph.D.1977, Dr. Habil. 1981), in years 1982-89 Associate Professor and then Professor at the Institute of Computing Science, Poznan University of Technology and at the Institute of Theoretical and Applied Computer Science, Polish Academy of Sciences. He held positions of Deputy Director of the Institute of Control Engineering, Poznan University of Technology (1984-87) and Deputy Dean of the Faculty of Electrical Engineering (1987-93). He has been visiting Professor at the Université de Paris Dauphine (France), Ecole Polytechnique Fédérale de Lausanne (Switzerland) and Università di Catania (Italy). Author and co-author of 6 monographs, 3 textbooks and more than 80 papers in major professional journals. Member of the Polish Information Processing Society, the Polish Cybernetical Society (president of Poznan Branch in 1987-92), Association of Polish OR Societies (vice-president since 1993), American Mathematical Society, AFCET and TIMS. Associate Editor of Foundations of Computing and Decision Sciences, Belgian J. of OR, Statistics and Computer Sci., J. of Multi-Criteria Decision Analysis, Revue des Systemes de Decision. Nominated Chairman of the Programme Committee of the EURO'95 Conference in Jerusalem. Co-laureate of the State Award (1988) and the EURO Gold Medal (1991).

Recent publications:

1. R. Slowinski, J.Teghem (Eds.): Stochastic versus Fuzzy Approaches to Multiobjective Mathematical Programming under Uncertainty, Kluwer Academic Publishers, Dordrecht, 1990, 426 pp.
2. R. Slowinski (Ed.): Intelligent Decision Support - Handbook of Applications and Advances of the Rough Sets Theory, Kluwer Academic Publishers, Dordrecht. 1992, 510 pp.
3. P. Czyzak, R. Slowinski: A visual interactive method for MOLP problems with fuzzy coefficients. In: R. Lowen, M. Roubens (eds.), Fuzzy Logic - State of the Art. Kluwer Academic Publishers, Dordrecht, 1993, pp. 321-332.
4. M. Hapke, R. Slowinski: A DSS for resource-constrained project scheduling under uncertainty, J. of Decision Systems 2, 1993, pp. 111-128.
5. A. Jaskiewicz, R. Slowinski: Cone contraction method with visual interaction for multiple objective nonlinear programming, J. of Multiple Criteria Decision Analysis 1, 1992, pp. 29-46.
6. E. Krusinska, R. Slowinski, J. Stefanowski: Discriminant versus rough sets approach to vague data analysis, J. of Applied Stochastic Models and Data Analysis 8, 1992, pp. 43-56.
7. R. Nowicki, R. Slowinski, J. Stefanowski: Rough sets analysis of diagnostic capacity of vibroacoustic symptoms, J. of Computers and Mathematics with Applications 24, 1992, pp. 109-123.

8. Z. Pawlak, R. Slowinski: Decision analysis using rough sets, *International Transactions in Operational Research* 1, 1994, pp. 107-114.
9. B. Roy, R. Slowinski: Criterion of distance between technical programming and socio-economic priority, *R.A.I.R.O. Operations Research* 27, 1993, pp. 45-60.
10. B. Roy, R. Slowinski, W. Treichel: Multicriteria programming of water supply systems for rural areas. *Water Resources Bulletin* 28, 1992, pp. 13-31.
11. R. Slowinski: A generalization of the indiscernibility relation for rough sets analysis of quantitative information. *Rivista di Matematica per le Scienze Economiche e Sociali* 15, 1993, pp. 65-78.
12. R. Slowinski: Rough set learning of preferential attitude in multi-criteria decision making. In: J. Komorowski, Z. Ras (eds.), *Methodologies for Intelligent Systems. Lecture Notes in Artificial Intelligence* 689, Springer-Verlag, Berlin. 1993 pp. 642-651.