Guest Editors' Note

This special issue contains extended versions of twelve selected papers presented at the Intelligent Information System Workshops (WIS'94, WIS'95) organized and chaired by Professor Mirosław Dąbrowski.

R. Michalski in his paper describes how knowledge-discovery operators are applied to databases, resulting in the discovery of knowledge, "buried" in the flood of facts. The paper belongs to the currently "hot" area of research - the field of KDD.

The paper by Mrózek presents an empirical comparison of two approaches to control system development, that is, fuzzy set approach and rough set approach. The comparison is centered around the problem of controlling inverted pendulum or "broom" in a balanced position. This is a fairly complex control problem which is often used as a "yardstick" to evaluate different approaches to control system development. The authors developed simulation software implementing both approches.

M. Druzdzel in his paper summarizes several perspectives on probabilistic knowledge representation in the form of Bayesian belief networks. This is done to make the point that probabilistic knowledge representations are useful for intelligent systems, can be qualitative, not difficult to understand and compute.

Paper by J. Grzymala-Busse combines qualities of a tutorial introduction to the field of machine learning with the presentation of some aspects of the author's system for rule induction called LERS. The presentation is particularly focused on learning from imperfect data and on using the learned knowledge to make decisions with imperfect information. While developing the presentation, the author introduces the relevant techniques of LERS system along with comparable techniques presented in other systems such as AQ15 and others. Because the methods of partial rule matching or rule evaluation are of empirical nature, the author also presents results of tests performed on some standard data collections.

A. Skowron in his paper presents some strategies for synthesis of adaptive decision algorithms. These strategies are used by systems of communicating agents and lead from the original input data table to a decision algorithm.

Paper by G. Kersten describes a formalism intended for representing a decision making agent functioning in a dynamic environment with other agents functioning in it. The representation is based on a finite linearly ordered set of situations being representations of the world possessed by the agent at a given moment. Each situation is determined by its predecessors.

S. Wierzchoń in his paper proposes a new method based on genetic algorithm for MPE problem which is generally NP-hard.

Paper by P. Clark shows how a combination of classification techniques, i.e., statistical and model-based, can be applied to image classification. First, a study of classification techniques is presented, followed by a description of a prototype system combining those techniques. An example of real-world application to the identification of crops in agricultural fields from radar image data is also presented.

Paper by W. Ziarko presents an approach to incremental and non-inductive concept learning in attribute-value systems. The main characteristic feature of this approach is adaptive creation of a complete classification table rather than classification rules.

J. Żytkow in his paper analyzes relationships between different forms of knowledge that can be discovered in the same data matrix: contingency tables, equations, concept definitions, concept hierarchies, and rules.

Paper by M. Rusinkiewicz presents a model for specifying and executing workflows of tasks in distributed environment. It first discusses the relationship of workflows to transactions, then presents a model and a specification language, and finally discusses a prototype implementation.

Paper by Z. Ras describes a strategy for discovering rules in an incomplete information system and provides a formal system for handling queries in DKBS where each site contains either an incomplete or a complete information system.

The Editors of this special issue would like to dedicate all twelve papers to the memory of Mirek Dąbrowski who died on October 8, 1995. He was the general chairman and organizer of all International Workshops on Intelligent Information Systems (WIS). The papers presented here have been chosen from his last two workshops. We would like to mention here that Mirek strongly promoted the international collaboration between Polish scientists working abroad in the area of intelligent systems and leading researchers in the same area in Poland. He loved people and many of us who loved him grieve his loss. All of us who attended WIS workshops and who were privileged enough to have known him should look inside our own hearts, and try to make a little more room for others, as Mirek did. We believe he would like that.

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