Scientific Programming

Special Issue on
Intelligent Decision Support Systems Based on Machine Learning and Multicriteria Decision-Making

Hindawi

CALL FOR PAPERS

Intelligent decision support systems (IDSSs) are widely used in various computer science applications for intelligent decision-making. To implement these IDSSs, machine learning algorithms and diverse programming paradigms and frameworks are required. Machine learning and prediction algorithms are abundant in nature and produce variable results. As such, practitioners and decision-makers require intelligent scientific methodologies, such as empirical evaluation and machine learning approaches using multilabel learning, statistical and information-theoretic, landmarking, and complexity methods, to enable them to pick the most appropriate learning and prediction algorithms.

Real-world decision support systems require a consideration and analysis of multiple criteria features which, in turn, affect the final decisions. Criteria are often conflicting in nature: for example, in the case of car selection, factors such as cost, comfort, safety, and fuel economy all come into consideration. Therefore, decision-makers need scientific approaches, such as filter, rapper, and embedded methods, to perform such complex evaluation. Researchers concerned with the design and development of IDSS seek to demonstrate innovative scientific techniques, tools, and models which improve the quality and accuracy of the intended decisions. A few examples of such techniques and tools include multiattribute decision-making (MADM), multiattribute utility theory (MAUT), outranking, sensitivity analysis, rough set exploration system (RSES), adaptive rough sets, and adaptive reasoning methods.

This Special Issue therefore aims to solicit high-quality original research and review articles that cover novel, cutting-edge technologies and methods concerned with the scientific design, development, and implementation of IDSSs. Research that combines the study of IDSSs with machine learning algorithms and multicriteria decision-making (MCDM) software and considers how to improve the quality and accuracy of the decisions generated by these systems across a range of diverse applications is particularly encouraged.

Potential topics include but are not limited to the following:

- Use of data mining and machine learning techniques and algorithms in the development of IDSSs across a wide range of sectors, such as business, education, and healthcare

- Comparison analysis, survey, and implementation of different IDSSs and MCDM methods (e.g., collaborative decision-making, knowledge-driven decision-making, (AHP), (ANP), TOPSIS, RSES,) in various application areas of computer science

- Use of aggregation operators, multiobjective/criteria optimization, fuzzy MCDM, weighting and ranking criteria, ranking, sorting, and their implementation in real-world application areas

- Use of MCDM in data mining and data analysis

- Use of knowledge-driven, data-driven, model-driven, and hybrid decision-making and MCDM

- Design and development of novel intelligent decision-making methods for social networks analysis, web mining, and crowdsourcing

- Intelligent decision-making systems for big data analysis

- Multicriteria-based user identity management

- Multicriteria-based access control, data curation, fusion, and context awareness

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