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Preface

The dynamics of telecommunication sector development and strong competition in this sector in most countries induce telecommunication operators to use new computerised tools for decision support. Such tools might help in planning network development, in assessing financial and economic standing, in network design and management, in corporate management including strategic decisions and negotiations of interconnection agreements. The intensive development and decreasing costs of information technology increase the availability of such tools. National Institute of Telecommunications organised *The First International Conference on Decision Support for Telecommunications and Information Society* DSTIS-2001 in Warsaw (11th – 14th July 2001). The aim of this conference was to bring together international experts and researchers working in decision support and related fields, in order to present diverse methods and tools, which are applied in telecommunications industry and information society. This issue presents the most interesting scientific papers presented at this conference.

The first paper presents the concept of AmI (ambient intelligence) and AmI scenarios of ISTAG (Information Society Technology Advisory Group of European Commission). The requirements of intelligence versus decision support are then discussed. Resulting challenges for decision support systems (DSS) in telecommunications are then outlined and conclusions presented. The second paper outlines the basic concepts of the rough sets theory and a simple tutorial example, concerning churn modeling in telecommunications. Rough set theory deals with imperfect knowledge and might be useful in modeling various telecommunications problems. The next paper shows how to use the data mining techniques to improve knowledge about customers of the operators. One of the main issues of telecommunication operators today is to be able not only to store and manage the huge amount of data generated by applications, but also to give value to this data. Further, there is a paper devoted to stochastic analysis of telecommunication networks. It presents analytical properties of a stochastic teletraffic system with MMPP (Markov modulated Poisson process) input and an access function.

The next three papers focus on intelligent systems. However, they do not present direct examples of applications in telecommunication industry but we decide to include them in this issue because developments of intelligent systems for this industry are very promising.

There is a paper that presents effectiveness of active forgetting in machine learning. In many telecommunications problems the situation changes very often over time. In machine learning, therefore, decision rules are needed to adapt for such changeable situations. Additional learning should be made on new data. On the other hand, since rules for classification becomes more complex with only additional learning, appropriate forgetting is also necessary. The next paper addresses a problem in the area of intelligent knowledge-based systems. Knowledge is a central component in any intelligent knowledge-based system. Results presented in this paper obtained from different investigations indicate the potential of the approach based on fuzzy control systems for generation of knowledge. Further, there is a paper that shows the application of multi-agent utility theory for ethical conflict resolution. This paper shows how to construct a two-attribute group disutility function for two conflicting decision makers, taking into account the property of utility independence and/or convex dependence between them.

We have also two papers that show the application of optimization methods. Telecommunication networks are expected to satisfy the increasing demand for various services. Hence, it becomes critical to allocate network resources to provide high level performance of all services. We have paper that introduce and analyze a solution concept of the conditional minimax as a generalization of the minimax solution concept extended to take into account the number of services related to worst performances. Namely, for a specified portion of demand authors take into account the corresponding portion of the maximum results and they consider their average as the worst conditional mean to be minimised. The authors show that the minimisation of the worst conditional mean can be defined by linear objective and a number of auxiliary linear inequalities. The second paper that uses optimization techniques exploit the partially linear structure of the nonlinear multicommodity flow optimization problem. At the end we have two application papers. The first one focus on web cache management. The second one presents the analytical system for testing a telecommunication network.

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Guest Editor