

## PREFACE

This special issue of *Zbornik Radova* intends to make several new topics accessible to professional mathematicians and doctoral students. It also points out and helps readers to understand the corresponding research challenges and future research directions in some applications of mathematical logic, which can be seen as the calculus of computation, to foundations of theoretical computer science.

Since the sixties, when systematic work in mathematical logic started in Belgrade, our researchers have been working and publishing important papers in many standard areas of logic: model theory, proof theory, set theory, recursion theory, non-standard analysis, non-classical logics etc. That work attracted a significant number of collaborators from all universities in Serbia, and former Yugoslavia. Today, it might be said that theoretical achievements of what we can informally call “Belgrade school in mathematical logic” have been widely recognized.

On the other hand, during the last twenty years, as the usefulness of mathematical logic in computer science and artificial intelligence became more and more obvious, our logicians, organized in several scientific projects supported by Serbian Ministry of Science, have been establishing intensive interactions with those fields. Currently, along this line of research two five years projects “Representations of logical structures and their application in computer science” and “Models, Languages, Types, and Processes in Computing” are under realization (see <http://www.mi.sanu.ac.yu/projects/projects.htm> for more information). This issue collects four articles of members of those projects.

The paper by K. Došen and Z. Petrić is a survey of results about coherence for categories with finite products and coproducts. The investigated categories formalize equality of proofs in classical and intuitionistic conjunctive-disjunctive logic without distribution of conjunction over disjunction. Z. Ognjanović, M. Rašković and Z. Marković present probabilistic logics as a formalism for representing and reasoning with uncertain knowledge. The paper contains the axiomatizations of a number of logics, proofs of the completeness theorems, and discusses their decidability. The paper by M. Mosurović, T. Stojanović, and A. Kaplarević-Mališić gives an overview of basic description logics as well as some related original results concerning temporal extensions of Description Logics. S. Ghilezan and S. Likavec summarise their work in the field of computational interpretation of intuitionistic and classical logic in lambda calculus and its extensions.

I, as a guest editor, am grateful to many people who helped me, in particular to the members of the editorial board, referees, and of course the authors of the papers. However, I would especially like to mention professor *Slaviša B. Prešić* (1933–2008) who is widely credited as one of the most important Serbian logicians, the founder of the Seminar for Mathematical Logic in Mathematical Institute of the Serbian Academy of Sciences and Arts, supervisor of many PhD and MSc theses, as a pioneer of applications of theoretical results from mathematical logic in computer science, etc. As a member of the editorial board, he strongly influenced work on writing this special issue, and I would like to thank him for that.

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