

Concurrency, Specification, and Programming: Special Issue of Selected Papers of CS&P 2017

Preface

This special issue of *Fundamenta Informaticae* is dedicated to papers selected from the 26th International Workshop on CONCURRENCY, SPECIFICATION, AND PROGRAMMING (CS&P 2017), which took place in Warsaw, Poland, in September 25 – 27, 2017.

The workshop was held on Professor Helena Rasiowa's 100th anniversary of birth. Professor Rasiowa initiated the meetings of researchers from Humboldt University and University of Warsaw in the mid-seventies, since 1993 as CS&P. Therefore, CS&P'2017 was enriched by a one-day special session followed by two days of regular papers presentations.

During the special session four invited talks were delivered: "The last 50 years of Logic and AI - Some Lessons for the Future" by Robert A. Kowalski, "What Are Justification Logics?" by Melvin Fitting, "Semantics and Controllability of Time-Aware Business Processes" by Alberto Pettorossi, and "Calculus of Programs - invention and contributions of Helena Rasiowa's team" by Andrzej Salwicki. The special session was concluded by a memorial meeting started by the presentation of Andrzej Jankowski and Andrzej Skowron "Personality and Scientific Achievements of Professor Helena Rasiowa" and continued by sharing personal memories about Helena Rasiowa by other participants.

After the workshop, Melvin Fitting and Alberto Pettorossi together with his co-authors submitted their papers to this special issue of *Fundamenta Informaticae*. Moreover, some authors of the papers presented at the workshop have been invited to submit a revised and extended version of their papers. All the papers underwent another reviewing process to guarantee that the revised papers meet the standards of *Fundamenta Informaticae*. Eventually, nine papers have been selected for publication in this special issue, giving a representative account of current issues and topics related to Concurrency, Specification, and Programming. Two papers by the invited speakers open this special issue.

Melvin Fitting in the article "What are Justification Logics?" presents the foundations of justification logics. The paper starts with a discussion of origins of justification logics in the search for arithmetic interpretation of intuitionistic logic. Then the idea of justification is presented on the example of LP logic, one of the justification logics, together with internalization and realization for LP formulas followed by a presentation of semantics for justification logics. The paper concludes with a discussion of the current state-of-the-art in justification logics.

The article “Semantics and Controllability of Time-Aware Business Processes” by Emanuele De Angelis, Fabio Fioravanti, Maria Chiara Meo, Alberto Pettorossi, and Maurizio Proietti, presents an operational semantics for time-aware business processes, modeling the execution of business activities with duration linearly constrained over the integers. The authors consider also controllability properties guaranteeing the completion of the execution of processes together with a presentation of two algorithms for solving weak and strong controllability problems.

In the paper “Experimental Study of Totally Optimal Decision Trees” by Abdulla Aldilajjan, Mohammad Azad, and Mikhail Moshkov, the authors present results of experimental studies related to the existence of totally optimal decision trees for nine decision tables from the UCI machine learning repository. They also study approximate decision trees based on five uncertainty measures: entropy, Gini index, misclassification error, relative misclassification error, and number of unordered pairs of rows with different decisions. Experimental results show that totally optimal decision trees exist in many cases.

The paper “A Classifier Based on a Decision Tree with Temporal Cuts” by Jan G. Bazan, Adam Szczur, Anrzej Skowron, Marian Rzepko, Paweł Król, Wojciech Bajorek, and Wojciech Czarny, deals with a new method for induction of decision trees from temporal data. A novelty of the proposed approach lies in the fact that temporal cuts are calculated on the basis of the discernibility of time windows labeled with different decision classes instead of those calculated on the basis of time points.

The article “Linking Reaction Systems with Rough Sets” by Soma Dutta, Andrzej Jankowski, Grzegorz Rozenberg, and Andrzej Skowron, deals with reaction systems, which abstract from the complex nature of the physical world where only partial, incomplete information is available. The authors establish a connection between reaction systems and rough sets, in a somewhat broader perspective of the relationship between “pure” mathematical models and “realistic models” that take into account the limitation of perceiving physical reality.

In the article “Studying Opacity of Reaction Systems through Formula Based Predictors” Roberta Gori, Damas Gruska, and Paolo Milazzo investigate causality properties of reaction systems by means of formula based predictors. In this context they introduce the notion of opacity to study information flow in reaction systems.

In the paper “Applying Modern SAT-solvers to Solving Hard Problems”, Artur Niewiadomski, Piotr Switalski, Teofil Sidoruk, and Wojciech Penczek evaluate several SAT-solvers and compare their running times on various problems. They provide nine problems with reduction to SAT. Some of those reductions are original. Authors also provide a comparison and discussion of experimental results for all nine reductions.

The paper “Towards Encoding of the Transition Relation in Dialogue Games Model Checking” by Anna Sawicka, Marta Kacprzak, and Andrzej Zbrzezny, deals with the formalization of argumentative dialogues held in natural language. The authors show how to formally verify properties of dialogue games with emotional reasoning, using an extension of computation tree logic (CTL).

Marcin Wolski and Anna Gomolińska in the paper “From Data to Pattern Structures: Near Set Approach” export the idea of pattern structures from formal concept analysis to rough set theory, a posteriori deriving pattern structures from information systems. They also present and discuss two methods of generating non-trivial pattern structures inspired by near set theory.

Once again, we would like to thank Piotr Wasilewski and his organizing team for hosting and organizing CS&P 2017. We would like to thank the authors of the papers for their additional effort in

extending and revising their conference papers. Moreover, we would like to thank the reviewers and PC members of CS&P 2017 for their comments during the selection process, and the reviewers of this special issue for their careful work and detailed reviews, which resulted in high-quality contributions. Finally, we would like to thank Damian Niwiński for giving us the opportunity to publish this special issue and the publishing team at *Fundamenta Informaticae* for their practical support.

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