
PCCR 2014 Report

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PCCR 2014, the 2nd Workshop on the Parameterized Complexity of Computational Reasoning, took place in Vienna, Austria, 17-18 July 2014, as part of FLoC and the Vienna Summer of Logic, which hosted 12 conferences and over 80 workshops and attracted over 2,000 researchers.

PCCR supports a fruitful exchange of ideas between the research on parameterized complexity on one side and the research on various forms of computational reasoning (such as nonmonotonic, probabilistic, and constraint-based reasoning) on the other.

Among the highlights of PCCR 2014, there were three fabulous invited talks:

- Georg Gottlob (University of Oxford, UK *and* Vienna University of Technology, Austria), Structural Decomposition Methods: How They Matter;
- Dániel Marx (Hungarian Academy of Sciences, Hungary), CSPs and fixed-parameter tractability;
- Stefan Szeider (Vienna University of Technology, Austria), Fixed-Parameter Algorithms for Reasoning Problems in NP and Beyond.

A range of interesting contributed talks by Robert Ganian, Jan Johannsen, Martin Kronegger, Johann Makowsky, Sebastian Ordyniak, Andreas Pfandler, and R. Ramanujam, spanned topics such as answer set programming, backdoors, computational social choice, constraint satisfaction, intuitionistic modal logic, new parameterized complexity hierarchies, planning, and the satisfiability of propositional formulas.

The program of PCCR 2014 also included a panel session, where the panelists Mike Fellows, Dániel Marx, and Stefan Szeider discussed questions about the interaction of practice and theory in the parameterized complexity of computational reasoning, organizational questions about PCCR, how to identify useful parameterizations of computational problems, and they outlined their favourite open problems and research directions in the field.

In the open problem session, Robert Ganian wanted to know the parameterized complexity of the following problem: for two graph classes α and β that are characterized by forbidden minors, the input is a graph G and an integer k , the parameter is k , and the question is whether k vertices can be deleted from G so that each connected component of the resulting graph is in $\alpha \cup \beta$. Sebastian

Ordyniak mentioned the problem of whether the planning problem Extended Causal Graph Evaluation is FPT with respect to the parameter “number of variables”. Mike Fellows expressed a new interest in reasoning about Multiple Choice Questions with background knowledge and properties of the solution and answer, and about gamifications of basic combinatorial problems, such as his “Minesweeper of Coloring” where the gamers are asked to uncover the colors of a graph’s vertices, knowing that one edge is badly colored, and the goal is to uncover an endpoint of that edge as the last vertex. R. Ramanujam proposed to study First-order model checking problems parameterized by the crossing number of the Hasse diagram of the formula, or related parameters. Several questions about backdoors also came up. Mike Fellows proposed a generalization of backdoors where certain variables are already forced to be in or not in the backdoor. Serge Gaspers proposed to study FPT-approximation for the base class UP+PL (formulas solved by the unit propagation and pure literal rules) more in detail, and to draw connections between weak and strong backdoor detection.



Figure 1: PCCR 2014 participants, Vienna, Austria

The workshop was hosted by CSL-LICS and was also affiliated with IJCAR and SAT. On behalf of the PCCR 2014 organizers Mike Fellows, Serge Gaspers, and Toby Walsh, I would like to thank all the speakers and participants of PCCR 2014, and the organizers of FLoC and VSL, who made the organization of this workshop effortless. <http://vs12014.at/pccr/>