

Preface

There are many constraint satisfaction problems that have a great deal of symmetry. For example, when colouring a graph, many of the solutions are related by rotating the colours. Similarly, when solving a tournament timetabling problem, it does not matter in which order the participants play the first games: many of the solutions are related by permuting the participants. Symmetry in constraint satisfaction problems can be exploited to increase the efficiency of search. This can be done by avoiding exploring paths that have already been shown to be a dead-end in a symmetrical part of the search tree, or by adding constraints so that (ideally) only one assignment per equivalence class is enumerated. This process is often referred to as *symmetry breaking* or *symmetry reduction*.

This workshop focuses on the analysis and development of techniques to detect and exploit symmetry in constraint satisfaction problems. It is the second workshop in a series that started with SymCon'01 at CP'01 in Paphos, Cyprus (see <http://www.csd.uu.se/~pierref/astra/SymCon01/>).

These proceedings bring together a number of recent papers, extended abstracts, and work-in-progress reports on the topic of symmetry. It is hoped that this snapshot of current research will act as a catalyst for further research. These proceedings are also on-line, at <http://www.csd.uu.se/~pierref/astra/SymCon02/>.

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Toby Walsh	Cork Constraint Computation Centre, Ireland

Accepted Papers and Schedule

Papers (to be presented at the workshop)

9:00 – 9:40		
Symmetry-Breaking Constraints for Matrix Models		
<i>Zeynep Kiziltan and Barbara M. Smith</i>		1
Constraint Programming with Multisets		
<i>Zeynep Kiziltan and Toby Walsh</i>		9
9:40 – 10:10		
Supersymmetric Modelling for Local Search		
<i>Steven Prestwich</i>		21
10:10 – 10:30		
Symmetry Breaking via Dominance Detection for Lookahead Constraint Solvers		
<i>Igor Razgon and Amnon Meisels</i>		29
10:30 – 11:00		
Refreshments		
11:00 – 11:30		
Symmetry Breaking for Boolean Satisfiability: The Mysteries of Logic Minimization		
<i>Fadi A. Aloul, Igor L. Markov, and Kareem A. Sakallah</i>		37
11:30 – 12:00		
Breaking All the Symmetries in Matrix Models: Results, Conjectures, and Directions		
<i>Pierre Flener and Justin Pearson</i>		47
12:00 – 12:30		
Group-Graphs Associated with Row and Column Symmetries of Matrix Models: Some Observations		
<i>Zeynep Kiziltan and Michela Milano</i>		55
12:30 – 14:00		
Lunch		
Statements of Interest (not to be presented at the workshop)		
(full papers and presentations at the CP'02 main conference)		
Breaking Row and Column Symmetries in Matrix Models		
<i>Pierre Flener, Alan M. Frisch, Brahim Hnich, Zeynep Kiziltan, Ian Miguel, Justin Pearson, and Toby Walsh</i>		64
Groups and Constraints: Symmetry Breaking During Search		
<i>Ian P. Gent, Warwick Harvey, and Tom Kelsey</i>		65
Partial Symmetry Breaking		
<i>Iain McDonald and Barbara Smith</i>		66
Symmetry Breaking Revisited		
<i>Jean-François Puget</i>		67