

16th International Conference on Integration of Artificial
Intelligence and Operations Research Techniques in Constraint
Programming
CPAIOR 2019

Thessaloniki, Greece

June 4 - 7, 2019

We are happy to welcome you to CPAIOR 2019. We look forward to a dynamic and successful conference and hope that you enjoy your time in Thessaloniki.

Nikolaos Samaras and Kostas Stergiou

Conference chairs

Sponsors

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Marathon Data Systems



TENTATIVE PROGRAM

Wednesday (June 5, 2019)

	<p>Master Class</p> <p>Optimization models for social justice <i>John Hooker</i></p> <p>Modeling equity in optimization of humanitarian operations <i>Sibel Salman</i></p> <p>Optimizing informal supply chains <i>Joann de Zegher</i></p> <p>AI and OR for conservation <i>Bistra Dilkina</i></p> <p>Robust active preference elicitation to learn the moral priorities of policy-makers at LAHSA <i>Phebe Vayanos</i></p> <p>AI and OR for social services engineering <i>J. Christopher Beck</i></p> <p>Applied network design problems to support humanitarian operations <i>Marie-Ève Rancourt</i></p> <p>Evacuation planning and mitigation measures for flood disasters <i>Pascal Van Hentenryck</i></p> <p>!!! Further details to be posted soon !!!</p>
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Wednesday (June 5, 2019)

8.00 – 8.20	Registration
8.20 – 8.30	Conference Opening
8.30 – 9.30	<p>Plenary (Chair: LM Rousseau)</p> <p>Bilevel optimisation, Stackelberg games and pricing problems <i>Martine Labbé</i></p>
9.30 – 9.45	Break
9.45 – 11.00	<p>Integer Programming (Chair D. Bergman)</p> <p>Some experiments with submodular function maximization via integer programming <i>Domenico Salvagnin</i></p> <p>Consistency for 0-1 programming <i>Danial Davarnia and John Hooker</i></p> <p>A status report on conflict analysis in mixed integer nonlinear programming <i>Timo Berthold, Jakob Witzig and Stefan Heinz</i></p>
11.00 – 11.30	Coffee break
11.30 – 12.45	<p>Decision Diagrams (Chair WJ van Hoeve)</p> <p>Lower bounds for uniform machine scheduling using decision diagrams <i>Pim van den Bogaerdt and Mathijs de Weerd</i></p> <p>Heat exchanger circuitry design by decision diagrams</p>

	<p><i>Nikolaos Ploskas, Christopher Laughman, Arvind Raghunathan and Nikolaos Sahinidis</i> Binary decision diagrams for bin packing with minimum color fragmentation <i>David Bergman, Carlos Cardonha and Saharnaz Mehrani</i></p>
12.45 – 14.00	<p>Lunch break</p>
14.00 – 15.15	<p>Constraint Programming (Chair P. Flener) The maximum weighted submatrix coverage problem: A CP approach <i>Guillaume Derval, Vincent Branders, Pierre Dupont and Pierre Schaus</i> Extending compact-MDD to basic smart multi-valued variable diagrams <i>Hélène Verhaeghe, Christophe Lecoutre and Pierre Schaus</i> Arc consistency revisited <i>Ruiwei Wang and Roland Yap</i></p>
15.15 – 15.30	<p>Break</p>
15.30 – 16.30	<p>Plenary (Chair K. Stergiou) Optimization in Graphical models <i>Thomas Schiex</i></p>
16.30 – 17.00	<p>Coffee break</p>
17.00 – 18.15	<p>Hybrid session (Chair D. Salvagnin) Metric hybrid factored planning in nonlinear domains with constraint generation <i>Buser Say and Scott Sanner</i> Generating compound moves in local search by hybridisation with complete search <i>Gustav Björdal, Pierre Flener and Justin Pearson</i> A computational survey of optimization methods for the golomb ruler problem <i>Burak Kocuk and Willem-Jan van Hoeve</i> Local rapid learning for integer programs <i>Timo Berthold, Peter J. Stuckey and Jakob Witzig</i></p>
18.15 –	<p>Welcome reception + posters Constrained programming optimization of multiple drones system with shortage of maintenance teams <i>Joseph Kreimer and Eduard Ivanovsky</i> Exact methods for a paint shop scheduling problem from the automotive supply industry <i>Felix Winter and Nysret Musliu</i> Hier-MUS: structure-guided MUS enumeration using hierarchy maps <i>Kevin Leo, Peter J. Stuckey and Guido Tack</i> A framework for predict+optimise with ranking objectives: learning linear functions for optimisation parameters in exhaustive search fashion <i>Emir Demirovic, Tias Guns, Peter J. Stuckey, James Bailey, Christopher Leckie, Jeffrey Chan and Ramamohanarao Kotagiri</i> LinSBPS: a novel incomplete MaxSAT approach based on the linear MaxSAT algorithm and local search style techniques <i>Emir Demirovic and Peter J. Stuckey</i> Loose hybridisation for the cyclic hoist scheduling problem <i>Neil Yorke-Smith</i> Radiation therapy patient scheduling <i>Sara Frimodig and Christian Schulte</i></p>

	<p>A hybrid branch-and-cut method for the inventory routing problem <i>Eleftherios Manousakis, Panagiotis Repoussis, Emmanouil Zachariadis and Christos Tarantilis</i></p> <p>A scatter search algorithm for large scale flexible job-shop scheduling problems with complex precedence constraints <i>Grigoris Kasapidis, Dimitris Paraskevopoulos, Panagiotis Repoussis and Christos Tarantilis</i></p> <p>Neural integer optimization <i>Elias Khalil, Rakshit Trivedi and Bistra Dilkina</i></p> <p>Combinatorial attacks against binarized neural networks <i>Elias Khalil, Amrita Gupta and Bistra Dilkina</i></p> <p>Dynamic programming for combinatorial optimization: a primal-dual approach based on decision diagrams <i>Michael Romer, Andre Augusto Cire and Louis-Martin Rousseau</i></p>
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Thursday (June 6, 2019)

8.00 – 8.30	Registration
8.30 – 9.30	<p>Plenary (Chair M. Milano)</p> <p>Leveraging optimization and convexity within deep learning <i>Zico Kolter</i></p>
9.30 – 9.45	Break
9.45 – 11.00	<p>Machine Learning I (Chair S. Gualandi)</p> <p>MILP-based repair of learned controllers: a case study <i>Dario Guidotti, Francesco Leofante, Armando Tacchella and Claudio Castellini</i></p> <p>Prediction + optimization for the knapsack problem <i>Emir Demirović, Tias Guns, Peter J. Stuckey, James Bailey, Rao Kotagiri, Chris Leckie and Jeffrey Chan</i></p> <p>Embedding decision diagrams into generative adversarial networks <i>Yexiang Xue and Willem-Jan van Hoeve</i></p>
11.00 – 11.30	Coffee break
11.30 – 12.45	<p>Machine Learning II (Chair T. Guns)</p> <p>Computing wasserstein barycenters via linear programming <i>Stefano Gualandi, Federico Bassetti, Marco Veneroni and Gennaro Auricchio</i></p> <p>Learning MILP resolution outcomes before reaching time-limit <i>Giulia Zarpellon, Martina Fischetti and Andrea Lodi</i></p> <p>Deep inverse optimization <i>Yingcong Tan, Andrew Delong and Daria Terekhov</i></p>
12.45 – 14.00	Lunch break
14.00 – 15.15	<p>Combinatorial Optimization I (Chair M. Romer)</p> <p>Modelling and solving the minimum shift design problem <i>Lucas Kletzander and Nysret Musliu</i></p> <p>A sampling-free anticipatory algorithm for the kidney exchange problem <i>Danuta Sorina Chisca, Michele Lombardi, Michela Milano and Barry O'Sullivan</i></p> <p>An approach to robustness in the stable roommates problem and its comparison with the stable marriage problem <i>Begum Genc, Mohamed Siala, Gilles Simonin and Barry O'Sullivan</i></p>
15.15 – 15.30	Break
15.30 – 16.45	Combinatorial Optimization II (Chair L. Michel)

	<p>Efficient solution methods for the cumulative-interference channel assignment problem using integer optimization and constraint programming <i>Paul Nicholas and Karla Hoffman</i></p> <p>Optimality clue for graph coloring problem <i>Alexandre Gondran and Laurent Moalic</i></p> <p>A hybrid approach for exact coloring of massive graphs <i>Emmanuel Hebrard and George Katsirelos</i></p>
16.45 – 17.15	Coffee break
17.15 – 18.30	<p>Combinatorial Optimization III (Chair G. Pesant)</p> <p>Constraint programming for dynamic symbolic execution of JavaScript <i>Roberto Amadini, Mak Andrlon, Graeme Gange, Peter Schachte, Harald Sondergaard and Peter J. Stuckey</i></p> <p>An improved subsumption testing algorithm for the optimal-size sorting network problem <i>Cristian Frasinaru and Madalina Raschip</i></p> <p>A counting-based approach to scalable micro-service deployment <i>Waldemar Cruz, Fanghui Liu and Laurent Michel</i></p>
19.30 –	Banquet

Friday (June 7, 2019)

8.00 – 8.30	Registration
8.30 – 9.30	<p>Plenary (Chair J. Hooker)</p> <p>Products in mixed integer programming <i>Tobias Achterberg</i></p>
9.30 – 9.45	Break
9.45 – 11.00	<p>Routing I (Chair A. Raghunathan)</p> <p>A constraint programming approach to electric vehicle routing with time windows <i>Kyle E. C. Booth and J. Christopher Beck</i></p> <p>Using cost-based solution densities from TSP relaxations to solve routing problems <i>Pierre Coste, Andrea Lodi and Gilles Pesant</i></p> <p>A study on the Traveling Salesman Problem with a drone <i>Ziye Tang and Willem-Jan van Hoeve</i></p>
11.00 – 11.30	Coffee break
11.30 – 12.45	<p>Routing II (Chair K. Booth)</p> <p>An optimization approach to the ordering phase of an attended home delivery service <i>Günther Cwioro, Philipp Hungerländer, Kerstin Maier, Jörg Pöcher and Christian Truden</i></p> <p>Last-mile scheduling under uncertainty <i>Thiago Serra, Arvind Raghunathan, David Bergman, John Hooker and Shingo Kobori</i></p> <p>A column generation for online ride-sharing services <i>Connor Riley, Antoine Legrain and Pascal Van Hentenryck</i></p>
12.45 – 14.00	Lunch break
14.00 – 15.15	<p>Scheduling (Chair C. Beck)</p> <p>Time table edge finding with energy variables <i>Moli Yang, Andreas Schutt and Peter J. Stuckey</i></p>

	<p>A new CP-approach for a parallel machine scheduling problem with time constraints on machine qualifications <i>Margaux Nattaf and Arnaud Malapert</i></p> <p>Investigating constraint programming for real-world industrial test laboratory scheduling <i>Tobias Geibinger, Florian Mischek and Nysret Musliu</i></p>
15.15 – 15.30	Break
15.30 – 16.45	<p>SAT (Chair M. Siala)</p> <p>Quadratization of nonlinear pseudo-boolean functions via the constraint composite graph <i>Ka Wa Yip, Hong Xu, Sven Koenig and T. K. Satish Kumar</i></p> <p>Core-boosted linear search for incomplete MaxSAT solving <i>Jeremias Berg, Emir Demirović and Peter J. Stuckey</i></p> <p>SAT encodings of pseudo-boolean constraints with at-most-one relations <i>Miquel Bofill, Jordi Coll, Josep Suy and Mateu Villaret</i></p>
16.45 – 17.15	Coffee break
17.15 – 18.30	<p>Computational (Chair N. Ploskas)</p> <p>Building optimal Steiner trees on supercomputers using up to 43,000 cores <i>Yuji Shinano, Daniel Rehfeldt and Thorsten Koch</i></p> <p>Sequential and parallel solution-biased search for subgraph algorithms <i>Blair Archibald, Fraser Dunlop, Ruth Hoffmann, Ciaran McCreesh, Patrick Prosser and James Trimble</i></p> <p>Revisiting integer programming for evaluating ising processing units <i>Carleton Coffrin, Harsha Nagarajan and Russell Bent</i></p>
18.30 –	Farewell