

**13th International Conference on Integration of
Artificial Intelligence and Operations Research Techniques
in Constraint Programming
CPAIOR 2016**

Banff

May 29-June 1

Program

Master Class on Decomposition Methods

Sunday, May 29th

Room KC203

8:00am - 8:00pm - Registration

9:00am-10:00am - Classical Benders Decomposition
Jean-François Cordeau, HEC Montréal

10:00am-10:15am - Coffee break

10:15am-11:15am - Logic-Based Benders Decomposition
John Hooker, Carnegie Mellon University

11:15am-12:15pm - Hybrid CP/MIP and Benders Decomposition Methods
Chris Beck, University of Toronto

12:15pm-1:30pm - Lunch

1:30pm-2:30pm - Lagrangian Relaxation in MIP
Bernard Gendron, Université de Montréal

2:30pm-3:30pm - Lagrangian Relaxation in CP
Willem-Jan van Hoes, Carnegie Mellon University

3-30pm-3:45pm Coffee break

3:45pm-4:45pm - Column Generation
Louis-Martin Rousseau, Polytechnique Montréal



<http://www.decisionbrain.com/>

Technical Program

Monday, May 30th

Room KC201

8:30 - 5:30 **Registration**

9:00 - 10:15 **Global Constraints I**

Session chair: Justin Pearson

A Reservoir Balancing Constraint with Applications to Bike-Sharing
Joris Kinable

The TASKINTERSECTION Constraint
Gilles Madi Wamba and Nicolas Beldiceanu

Revisiting Two-Sided Stability Constraints
Mohamed Siala and Barry O'Sullivan

10:15 - 10:45 **Health Break**

10:45 - 12:00 **Decomposition Methods**

Session chair: Louis-Martin Rousseau

Logic-Based Decomposition Methods for the Travelling Purchaser Problem
Kyle E. C. Booth, Tony T. Tran and J. Christopher Beck

Lagrangian Decomposition via Subproblem Search
Geoffrey Chu, Peter J. Stuckey and Graeme Gange

Scheduling home hospice care with logic-based Benders decomposition
Aliza Heching and John Hooker

12:00 - 1:30 **Welcome Luncheon and Reception**

1:30 - 2:30 **Plenary Session**

Health Care Analytics by Dimitris Bertsimas, Max Bell Auditorium

2:45 - 4:00 **Applications I**

Session chair: David Bergman

Non-linear Optimization of Business Models in the Electricity Market
Allegra De Filippo, Michele Lombardi and Michela Milano

Rail Capacity Planning With Constraint Programming
Daniel Harabor and Peter Stuckey

Optimal Flood Mitigation over Flood Propagation Approximations
Byron Tasseff, Russell Bent and Pascal Van Hentenryck

4:00 - 4:30 **Health Break**

4:30 - 5:45 **Symmetry & Semantic**

Session chair: Peter Stuckey

Computing the Ramsey Number $R(4,3,3)$ using Abstraction and Symmetry breaking
Michael Codish, Michael Frank, Avraham Itzhakov and Alice Miller

Breaking Symmetries in Graph Search with Canonizing Sets
Avraham Itzhakov and Michael Codish

Detecting semantic groups in MIP models
Domenico Salvagnin

Tuesday, May 31st

Room KC201

- 8:30 - 5:30** **Registration**
- 9:00 - 10:15** **Global Constraints II**
Session chair: Gilles Pesant
- A global Constraint for mining Sequential Patterns with GAP constraint
Amina Kemmar, Samir Loudni, Lebbah Yahia, Patrice Boizumault and Thierry Charnois
- Time-Series Constraints: Improvements and Application in CP and MIP Contexts
Ekaterina Arafailova, Nicolas Beldiceanu, Remi Douence, Pierre Flener, Maria Andreina Francisco Rodriguez, Justin Pearson and Helmut Simonis
- Weighted Spanning Tree Constraint with Explanations
Diego de Uña, Graeme Gange, Peter Schachte and Peter J. Stuckey
- 10:15 - 10:45** **Health Break**
- 10:45 - 12:00** **Decision Diagrams**
Session chair: John Hooker
- On CNF Encodings for Decision Diagrams
Ignasi Abío, Graeme Gange, Valentin Mayer-Eichberger and Peter J. Stuckey
- Decompositions Based on Decision Diagrams
David Bergman and Andre Cire
- Constructions and In-place Operations for MDDs Based Constraints
Guillaume Perez and Jean-Charles Regin
- 12:00 - 1:30** **Lunch**
- 1:30 - 2:30** **Plenary Session**
Optimization of Energy Systems by Pascal Van Hentenryck, Max Bell Auditorium
- 2:45 - 4:00** **Applications II**
Session chair: Willem-Jan van Hoeve
- Balancing Nursing Workload by Constraint Programming
Gilles Pesant
- Designing Spacecraft Command Loops Using Two-dimension Vehicle Routing
Elliott Roynette, Bertrand Cabon, Cédric Pralet and Vincent Vidal
- Optimal Upgrading Schemes for Effective Shortest Paths in Networks
Eduardo Álvarez-Miranda, Markus Sinnl and Martin Luipersbeck
- 4:00 - 4:30** **Health Break**
- 4:30 - 5:45** **Parallelization and Portfolios**
Session chair: Jean-Charles Régim
- Multi-Language Evaluation of Exact Solvers in Graphical Model Discrete Optimization
Barry Hurley, Barry O'Sullivan, David Allouche, George Katsirelos, Thomas Schiex, Matthias Zytnicki and Simon De Givry
- Parallelizing Constraint Programming with Learning
Thorsten Ehlers and Peter J. Stuckey
- Parallel Composition of Scheduling Solvers
Daniel Fontaine, Laurent Michel and Pascal Van Hentenryck
- 7:00 - 10:00** CPAIOR Delegate Dinner

Wednesday, June 1st

Room KC201

8:30 - 9:30 **Registration**

9:00 - 10:15 **Constraint Reasoning**

Session chair: François Fages

Finding a Collection of MUSes Incrementally
Fahiem Bacchus and George Katsirelos

A Bit-Vector Solver with Word Level Propagation
Wenxi Wang, Harald Sondergaard and Peter J. Stuckey

Forward-Checking filtering for Nested Cardinality Constraints: Application to an Energy
Cost Aware Production Planning Problem for Tissue Manufacturing
Cyrille Dejemeppe and Pierre Schaus

10:15 - 10:45 **Health Break**

10:45 - 12:00 **Vehicle Routing**

Session chair: Andre Augusto Cire

A Branch-and-Price-and-Check Model for the Vehicle Routing Problem with Location
Congestion
Edward Lam and Pascal Van Hentenryck

Cyclic Routing of Unmanned Aerial Vehicles
Nir Drucker, Michal Penn and Ofer Strichman

Optimization Models for a Real-World Snow Plow Routing Problem
Joris Kinable, Willem-Jan van Hoeve and Stephen Smith

12:00 - 1:30 **Lunch**

1:30 - 2:45 **Packing and Covering**

Session chair: Claude-Guy Quimper

A Stochastic Continuous Optimization Backend for MiniZinc with Applications to
Geometrical Placement Problems
Thierry Martinez, François Fages and Abder Aggoun

A New Solver for the Minimum Weighted Vertex Cover Problem
Hong Xu, T. K. Satish Kumar and Sven Koenig

Constraint Programming Approach for Spatial Packaging Problem
Abdelilah Sakti, Lawrence Zeidner, Tarik Hadzic, Brian St Rock and Giusi Quartarone