

Dagstuhl Seminar 18081

Designing and Implementing Algorithms for Mixed-Integer Nonlinear Optimization

February 19–23, 2018

Overview

	Monday	Tuesday	Wednesday	Thursday	Friday
09:00	Technical Session (30 minute talks and discussions)	Technical Session (30 minute talks and discussions)	Technical Session (30 minute talks and discussions)	Technical Session (30 minute talks and discussions)	Technical Session (30 minute talks and discussions)
10:00					
11:00					
12:00	Lunch	Lunch	Lunch	Lunch	Lunch
13:00					
14:00	Icebreaker	Breakout Sessions	Hike		
15:00	Technical Session (15 minute talks)				
16:00				Technical Session (15 minute talks)	
17:00		Joint Discussion			
18:00	Dinner	Dinner	Dinner	Dinner	
19:00					
20:00	Software Demo (optional)	Software Demo (optional)		Problem Solving/ Software Demo (optional)	

Monday, February 19

- 09:00 – 09:30 Santanu Dey
New SOCP relaxation and branching rule for bipartite bilinear programs
- 09:30 – 10:00 Aida Khajavirad
Stronger Polyhedral Relaxations for Polynomial Optimization Problems
- 10:00 – 10:15 Discussion
- 10:15 – 10:30 Coffee break
- 10:30 – 11:00 Kurt Anstreicher
Strengthened Semidefinite Relaxations for Quadratic Optimization with Switching Variables
- 11:00 – 11:30 Frauke Liers
Robust Treatment of Non-Convex Optimization Problems with Application to Gas Networks
- 11:30 – 11:45 Discussion
- 12:15 – 14:00 Lunch
- 14:00 – 15:30 Icebreaker
- 15:30 – 16:00 Coffee break
- 16:00 – 18:00 Technical Session
Radu Baltean-Lugojan, Timo Berthold, Fani Boukouvala, Andrea Callia D'Iddio, Sanjeeb Dash, Ignacio Grossmann, Amélie Lambert, Stefan Vigerske
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Tuesday, February 20

- 09:00 – 09:15 Sebastian Sager
CIA Decomposition
- 09:15 – 09:30 Leo Liberti
LP and SDP for kissing numbers
- 09:30 – 10:00 Ashutosh Mahajan
Minotaur: A Mixed-Integer Nonlinear Optimization Toolkit
- 10:00 – 10:15 Discussion
- 10:15 – 10:30 Coffee break
- 10:30 – 11:00 Benjamin Müller
Using 2D Projections for Stronger Separation and Propagation of Bilinear Terms
- 11:00 – 11:30 Sven Wiese
Mixed-integer conic optimization and MOSEK
- 11:30 – 11:45 Discussion
- 12:15 – 14:00 Lunch
- 14:30 – 17:00 Breakout sessions
Group 1 – Optimization & Machine Learning (Chair: A. Lodi)
Group 2 – Applications in Energy (Chair: F. Liers, A. Martin)
Group 3 – Sound experimentation with MINLP software (Chair: S. Vigerske)
- 15:30 – 16:00 Coffee break
- 17:00 – 18:00 Common discussion
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Wednesday, February 21

- 09:00 – 09:30 Mohit Tawarmalani
Product convexification: A new relaxation framework for nonconvex programs
- 09:30 – 10:00 Alberto del Pia
Cardinality-constrained linear regression with sparse matrices
- 10:00 – 10:15 Discussion
- 10:15 – 10:30 Coffee break
- 10:30 – 11:00 Akshay Gupte
Disjunctive cuts and extended formulations for bilinear functions
- 11:00 – 11:30 Juan Pablo Vielma
Mixed-integer convex representability
- 11:30 – 11:45 Discussion
- 12:15 – 14:00 Lunch
- 13:30 – 17:00 Hiking to Büschfeld <https://goo.gl/maps/zP122ap4nJ22>
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Thursday, February 22

- 09:00 – 09:30 Claire Adjiman
A deterministic global optimisation algorithm for mixed-integer nonlinear bilevel programs
- 09:30 – 10:00 Nikolaos V. Sahinidis
ALAMO: Machine learning from data and first principles
- 10:00 – 10:15 Discussion
- 10:15 – 10:30 Coffee break
- 10:30 – 11:00 Miten Mistry
Optimising with Gradient-Boosted Trees and Risk Control
- 11:00 – 11:30 Matteo Fischetti
Deep Learning and 0-1 Mixed Integer Linear Optimization
- 11:30 – 11:45 Jon Lee
Virtuous smoothing and more virtuous smoothing
- 11:30 – 11:45 Discussion
- 12:15 – 15:30 Lunch & free time
- 15:30 – 16:00 Coffee break
- 16:00 – 18:00 Technical Session
Pietro Belotti, Felipe Serrano, Robert Weismantel, Sanjeeb Dash, Carl D. Laird, Sven Leyffer
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Friday, February 23

09:00 – 09:30	Hassan Hijazi <i>SDP cuts in Gravity</i>
09:30 – 10:00	Angelika Wiegele <i>Combining ADAL with Factorizing the Dual to Solve SDP</i>
10:00 – 10:15	Discussion
10:15 – 10:30	Coffee break
10:30 – 11:00	Oktay Günlük <i>Binary extended formulations</i>
11:00 – 11:30	James Luedtke <i>External Intersection Cuts</i>
11:30 – 11:45	Discussion
12:15	Lunch & end of seminar
