



**19th Workshop on Advances in Continuous Optimization
29-30 July 2022**

NOVA School of Science and Technology
Universidade Nova de Lisboa, Portugal
<https://sites.fct.unl.pt/europt2022/>

Conference Program



Program Committee

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Stream organisers

Geovani Grapiglia, Yurii Nesterov: Complexity of convex optimization
Mathias Staudigl: Mathematical programming and computational game theory
Markus Gabl, Tatiana Tchemisova: Conic optimization
Juan Enrique Martínez-Legaz: Continuous optimization and variational analysis
Ana Luísa Custódio, Francesco Rinaldi: Derivative-free optimization
Sonia Cafieri, Eligius Hendrix, Frédéric Messine: Global optimization
Jan Kronqvist, Sourour Elloumi: Mixed integer nonlinear optimization
Gabriele Eichfelder: Multiobjective optimization
Ioannis Baltas, Diogo Pinheiro, Gerhard-Wilhelm Weber: Optimal control and optimization in economics and social sciences
Pilar Martínez Ortigosa: Optimization on health informatics
Stefano Cipolla, Jacek Gondzio: Proximal point algorithms and related numerical methods
Akhtar Khan, Christiane Tammer: Variational inequalities and optimization under uncertainty

Overview

Friday 29 July

8:30 – 9:00	opening
9:00 – 10:00	plenary – Marc Teboulle
10:00 – 10:25	coffee break
10:25 – 11:40	parallel sessions
11:45 – 13:00	parallel sessions
13:00 – 14:30	lunch
14:30 – 16:10	parallel sessions
16:15 – 17:30	parallel sessions
17:30 – 18:00	coffee break
18:00 – 19:00	plenary – Alper Yildirim

Saturday 30 July

8:30 – 10:10	parallel sessions
10:10 – 10:40	coffee break
10:40 – 11:55	parallel sessions
12:00 – 13:00	plenary – Dolores Romero Morales
13:00 – 14:30	lunch
14:30 – 16:10	parallel sessions
16:15 – 17:30	parallel sessions
17:30 – 18:00	coffee break
18:00 – 19:00	euopt fellowship lecture – Oliver Stein
19:00 – 19:15	closing

Plenaries, opening and closing: auditorium 1C

Parallel sessions: rooms 1.1, 1.2, 1.14, 1.15, 1.16, 1.17

Parallel sessions

Room 1.1 1.2 1.14 1.15 1.16 1.17

Friday 29 July

10:25 – 11:40	MINO 1	CGT 1	CO 1	COVA 1	VIU 1	OHI 1
11:45 – 13:00	MINO 2	CGT 2	CO 2	COVA 2	VIU 2	OHI 2
14:30 – 16:10	MO 1	CGT 3	DFO 1	MINO 3	VIU 3	-
16:15 – 17:30	MO 2	CCO 1	IO 1	COVA 3	VIU 4	OC 1

Saturday 30 July

8:30 – 10:10	MO 3	CGT 4	DFO 2	COVA 5	-	OC 2
10:40 – 11:55	MO 4	CO 3	PPA 1	COVA 4	-	OC 3
14:30 – 16:10	MO 5	CGT 5	DFO 3	GO 1	VIU 6	OC 4
16:15 – 17:30	MINO 4	CGT 6	PPA 2	GO 2	COVA 6	-

Streams

CCO – complexity of convex optimization
CGT – mathematical programming and computational game theory
CO – conic optimization
COVA – continuous optimization and variational analysis
DFO – derivative-free optimization
GO – global optimization
IO – interval optimization
MINO – mixed integer nonlinear optimization
MO – multiobjective optimization
OC – optimal control and optimization in economics and social sciences
OHI – optimization on health informatics
PPA – proximal point algorithms and related numerical methods
VIU – variational inequalities and optimization under uncertainty

Program

Friday 29 - 9:00-10:00

Auditorium 1C

Chair: *Sonia Cafieri, Giancarlo Bigi*

Plenary

Marc Teboulle: *Algorithms for structured nonconvex optimization*

Friday 29 - 10:25-11:40

Room: 1.1

Stream: *Mixed integer nonlinear optimization*

Session: *MINO 1 - Polynomial optimization with binary variables*

Chair: *Luca Mencarelli*

Sourour Elloumi: *Quadratization in the optimization of polynomials with binary variables*

Mathieu Verchère: *Improved linear and SDP-based quadratic convex reformulations*

Luca Mencarelli: *Outer approximation algorithms for binary nonlinear optimization programming*

Room: 1.2

Stream: *Mathematical programming and computational game theory*

Session: *CGT 1 - Intertwining optimization, variational problems and games I*

Chair: *Monica Milasi*

Giancarlo Bigi: *Robustness via generalized Nash games and saddlepoints*

Marta Faias: *Multiple private goods to finance a public good*

Domenico Scopelliti: *Variational methods to study energy market equilibrium problems*

Room: 1.14

Stream: *Conic optimization*

Session: *CO 1 - Duality, optimality conditions, and regularization in conic optimization*

Chair: *Tatiana Tchemisova*

Qinghong Zhang: *Strong duality for standard convex programs*

Tatiana Tchemisova: *Strong dual formulations for linear copositive optimization*

Room: 1.15

Stream: *Continuous optimization and variational analysis*

Session: *COVA 1 - Continuous optimization and variational analysis I*

Chair: *Juan Matías Sepulcre*

Miguel Goberna: *Relaxed Lagrangian duality in convex infinite optimization*

Margarita Rodríguez Álvarez: *Characterizations of the set of strong Slater points of a linear semi-infinite system*

Abelardo Jordán: *Duality between cost functions and multi-output production mappings*

Room: 1.16

Stream: *Variational inequalities and optimization under uncertainty*

Session: *VIU 1 - Some Aspects of Vector Optimization*

Chair: *Christian Günther*

Valerio Dose: *Active network and price of anarchy in multi-commodity routing games with variable demands*

Bekir Afsar: *Explaining trade-offs in interactive multiobjective optimization*

Ana Maria A.C. Rocha: *A penalty strategy embedded in the Tchebycheff scalarization method for multi-objective optimization problems*

Room: 1.17

Stream: *Optimization on health informatics*

Session: *OHI 1 - Optimization on health informatics I*

Chair: *Pilar Martínez Ortigosa*

Juan José Moreno Riado: *A new hybrid optimization algorithm to combine physical and biological criteria to compute IMRT planning*

N.C. Cruz: *A practical study of black-box and surrogate optimizers for tuning spiking neural models of striatum plasticity*

Marcos Lupion Lorente: *On the use of teaching-learning based optimization to train neural networks*

Friday 29 - 11:45-13:00

Room: 1.1

Stream: *Mixed integer nonlinear optimization*

Session: *MINO 2 - Mixed-integer nonlinear programming applications*

Chair: *Jan Rolfes*

Clemens Zeile: *A Gauss-Newton-based decomposition algorithm for nonlinear mixed-integer optimal control problems*

Hasan Sildir: *Simultaneous design and optimization of complex processes constrained by partial differential equations using mixed integer formulations*

Jan Rolfes: *Distributionally robust optimization with envelope and moment information*

Room: 1.2

Stream: *Mathematical programming and computational game theory*

Session: *CGT 2 - Intertwining optimization, variational problems and games II*

Chair: *Lorenzo Lampariello*

Monica Milasi: *Quasi-variational problems with non-self map on Banach spaces: existence and application*

Yura Malitsky: *Distributed methods for monotone inclusions*

Lorenzo Lampariello: *Addressing nested variational inequalities*

Room: 1.14

Stream: *Conic optimization*

Session: *CO 2 - Convex and nonconvex optimization and applications*

Chair: *Tatiana Tchemisova*

Miltiadis Poursandis: *Approximate solutions of convex semi-infinite optimization problems in finitely many iterations*

Philipp Seufert: *To the solution of constrained experimental design problems - extending an adaptive discretization approach*

Room: 1.16

Stream: *Variational inequalities and optimization under uncertainty*

Session: *VIU 2 - Vector Optimization with uncertainties*

Chair: *Akhtar Khan*

Christian Günther: *Computing robust efficient solutions of discrete vector optimization problems with uncertainties*

Christiane Tammer: *Optimality conditions in optimization under uncertainty*

Jinlu Li: *Set-valued vector optimizations in ordered Fell topological hyperspaces of partially ordered topological vector spaces*

Room: 1.17

Stream: *Optimization on health informatics*

Session: *OHI 2 - Optimization on health informatics II*

Chair: *Juana Lopez Redondo*

Luis F. Romero: *Drugs discovery by shape similarity using Deep Learning*

Giulia Di Teodoro: *Machine Learning for the prediction of retinopathy onset*

Savíns Puertas Martín: *Optimization method for maximizing the similarity in flexible molecules*

Friday 29 - 14:30-16:10

Room: 1.1

Stream: *Multiobjective optimization*

Session: *MO 1 - Continuous multiobjective optimization*

Chair: *Birgit Rudloff*

Bennet Gebken: *Treating nonsmooth regularization problems via multiobjective optimization*

Lisa Krügel: *A multiobjective model predictive control algorithm*

Pierluigi Mansueto: *A quasi-Newton approach for large scale multi-objective optimization*

Birgit Rudloff: *Multivariate dynamic programming*

Room: 1.2

Stream: *Mathematical programming and computational game theory*

Session: *CGT 3 - Mixed integer games*

Chair: *Tobias Harks*

Fabio Furini: *Submodular maximization of concave utility functions composed with a set-union operator*

Jannik Matuschke: *Pure Nash equilibria in resource graph games*

Marc Uetz: *Algorithmic solutions for almost core allocations*

Tobias Harks: *Generalized Nash equilibrium problems with mixed-integer variables*

Room: 1.14

Stream: *Derivative free-optimization*

Session: *DFO 1 - New algorithmic approaches in derivative-free optimization*

Chair: *Francesco Rinaldi*

Geovani Grapiglia: *Quadratic Regularization Methods based on finite-difference gradient approximations*

Evelin Heringer Manoel Krulikowski: *A derivative-free method for convex constrained minimization*

Andrea Brilli: *An interior point method for nonlinear constrained derivative-free optimization*

Room: 1.15

Stream: *Mixed integer nonlinear optimization*

Session: *MINO 3 - Mixed integer nonlinear optimization*

Chair: *Jan Kronqvist*

Katrin Teichert: *Combining discrete and continuous information for multi-criteria optimization problems*

Marianna De Santis: *Sequential penalty methods for mixed integer programs*

Bartosz Filipecki: *Semidefinite programming approach to security constrained optimal power flow with FACTS devices*

Jan Kronqvist: *On the use of regularization, trust regions, and Hessian information in outer-approximation for convex MINLP*

Room: 1.16

Stream: *Variational inequalities and optimization under uncertainty*

Session: *VIU 3 - Uncertainty quantification in inverse problems*

Chair: *Jinlu Li*

Miguel Sama: *Modelling uncertainty in thermal models for residential buildings*

Olalekan Babaniyi: *Inferring the basal sliding coefficient for the Stokes ice sheet model under rheological uncertainty*

Annamaria Barbagallo: *Inverse variational approach for a random time-dependent economic equilibrium problem*

Baasansuren Jadamba: *Stochastic approximation approach for the elastography inverse problem*

Friday 29 - 16:15-17:30

Room: 1.1

Stream: *Multi-objective optimization*

Session: *MO 2 - Convex multiobjective optimization*

Chair: *Firdevs Ulus*

Gabriela Kovacova: *A Benson algorithm for unbounded convex vector optimization problems*

Ina Lammel: *Convergence rate of sandwiching methods for convex multi-objective optimization*

Firdevs Ulus: *Direction-free primal and dual approximation algorithms for convex vector optimization problem*

Room: 1.2

Stream: *Complexity of convex optimization*

Session: *CCO 1 - Complexity of convex optimization*

Chair: *Geovani Grapiglia*

Nikita Doikov: *Affine-invariant contracting-point methods for Convex Optimization*

Konstantin Mishchenko: *Asynchronous SGD beats minibatch SGD under arbitrary delays*

Ion Necoara: *Stochastic minibatch subgradient projection methods for composite optimization with functional constraints*

Room: 1.14

Stream: *Interval optimization*

Session: *IO 1 - Interval optimization*

Chair: *Miroslav Rada*

Beatriz Hernández-Jiménez: *gh-differentiability for Interval-valued functions: an application to fuzzy environment*

Elif Garajová: *On the Properties of Interval Transportation Problems*

Miroslav Rada: *Maximization of sample variance over interval data is easy on average*

Room: 1.15

Stream: *Continuous optimization and variational analysis*

Session: *COVA 3 - Continuous optimization and variational analysis III*

Chair: *Abderrahim Hantoute*

Fabio Raciti: *A variational inequality approach to network games*

Cornel Pinteau: *Properties of the level sets of functions whose critical sets and Hess(+) complements are bounded*

Abderrahim Hantoute: *Tour on robust stability, duality and optimal conditions*

Room: 1.16

Stream: *Variational inequalities and optimization under uncertainty*

Session: *VIU 4 - Robust optimization*

Chair: *Annamaria Barbagallo*

Elena Molho: *On proper minimality in robust vector optimization: a set optimization approach*

Elisa Caprari: *Scalarization and robustness in uncertain vector optimization problems*

Lorenzo Cerboni Baiardi: *Scalarization and robustness in games with uncertain vector payoffs*

Room: 1.17

Stream: *Optimal control and optimization in economics and social sciences*

Session: *OC 1 - Optimal control and optimization in finance, commodity trade, insurance and pension fund systems I*

Chair: *Nuno Azevedo*

Andrei Pavlov: *Bilevel interior point differential dynamic programming*

Gerhard-Wilhelm Weber: *A dynamic programming approach for a nonzero sum stochastic differential game problem*

Nuno Azevedo: *Two-player zero-sum stochastic differential games with Markov-switching jump-diffusion dynamics and a random horizon*

Friday 29 - 18:00-19:00

Auditorium 1C

Chair: *Paula Amaral*

Plenary

Alper Yildirim: *Convex relaxations of nonconvex quadratic programs: a new perspective via convex underestimators*

Saturday 30 - 8:30-10:10

Room: 1.1

Stream: *Multiobjective optimization*

Session: *MO 3 - Mixed-integer multiobjective optimization*

Chair: *Gabriele Eichfelder*

Leo Warnow: *Solving multi-objective mixed-integer convex optimization problems by hybrid patch decomposition*

Moritz Link: *Multiobjective optimization of decentralized energy supply networks*

Erik Diessel: *Adaptive patch approximation algorithm for bicriteria mixed-integer problems*

Daniele Patria: *Using dual bounds for multiobjective mixed integer quadratic programming*

Room: 1.2

Stream: *Mathematical programming and computational game theory*

Session: *CGT 4 - Advances in conic optimization*

Chair: *Alice Calamita*

Filippo Zanetti: *A sparse interior point method for linear programs arising in optimal transport*

Alice Calamita: *Computational comparison of various formulations of MIQP problems*

Room: 1.14

Stream: *Derivative free-optimization*

Session: *DFO 2 - Derivative-free optimization for challenging problems*

Chair: *Ana Luisa Custodio*

Andrea Cristofari: *A derivative-free method for stochastic structured optimization problems*

Humberto Rocha: *Comparison of randomized direct-search approaches: application to beam angle optimization in intensity-modulated proton therapy*

Morteza Kimiaei: *Effective matrix adaptation strategy for noisy derivative-free optimization*

Dayana Savostianova: *Universal adversarial perturbation via generalised matrix norms*

Room: 1.15

Stream: *Continuous optimization and variational analysis*

Session: *COVA 5 - Continuous optimization and variational analysis V*

Chair: *Francisco Javier Aragón Artacho*

Juan Matías Sepulcre: *Exponential polynomials via convex hulls*

Juan Enrique Martínez-Legaz: *On farthest Bregman Voronoi cells*

Maria Dolores Fajardo: *Set-valued evenly convex functions: characterizations and c-conjugacy*

Bahareh Khazayel: *Duality assertions in vector optimization w.r.t. relatively solid convex cones in real linear spaces*

Room: 1.17

Stream: *Optimal control and optimization in economics and social sciences*

Session: *OC 2 - Optimal control and optimization in finance, commodity trade, insurance and pension fund systems II*

Chair: *Miguel Anjos*

Miguel Anjos: *An inexpensive machine learning approach for robust forecasting, or how to fix the forecasting models that the pandemic broke*

Bárbara Rodrigues: *Market integration of behind-the-meter residential energy storage*

Corrado Coppola: *Vehicle routing heuristics based on reinforcement learning*

Francesco Marchetti: *Adjoint state method for the trajectory optimization of a reentry vehicle*

Saturday 30 - 10:40-11:55

Room: 1.1

Stream: *Multiobjective optimization*

Session: *MO 4 - Global multiobjective optimization*

Chair: *Gabriele Eichfelder*

César Gutiérrez: *Conditions for the existence of weakly efficient solutions to vector optimization problems*

Frédéric Messine: *Numerical certification of Pareto optimality for biobjective nonlinear problems*

Gabriele Eichfelder: *Conic reformulations for quadratic multiobjective optimization*

Room: 1.2

Stream: *Conic optimization*

Session: *CO 3 - Advances in copositive and quadratic optimization*

Chair: *Markus Gabl*

Immanuel Bomze: *Scalable copositive methods for two-stage-stochastic StQPs*

Bo Peng: *Conic formulation of QPCCs applied to truly sparse QPs*

Markus Gabl: *Sparse conic reformulation of structured QCQPs based on copositive optimization*

Room: 1.14

Stream: *Proximal point algorithms and related numerical methods*

Session: *PPA 1 - Splitting and regularization*

Chair: *Stefano Cipolla*

Brecht Evens: *Convergence of Douglas–Rachford splitting for nonmonotone inclusions*

Silvia Villa: *Iterative regularization for low complexity regularizers*

Chee Khian Sim: *Relaxed Peaceman-Rachford splitting method to find the zero of the sum of two maximal strongly monotone operators: Convergence and its rate*

Room: 1.15

Stream: *Continuous optimization and variational analysis*

Session: *COVA 4 - Continuous optimization and variational analysis IV*

Chair: *Miguel Goberna*

Francisco Javier Aragón Artacho: *A primal-dual splitting algorithm for composite monotone inclusions with minimal lifting*

David Torregrosa-Belén: *Forward-backward methods with reduced dimensions*

Bethany Caldwell: *Splitting and projection methods for control-constrained linear-quadratic optimal control problems*

Room: 1.17

Stream: *Optimal control and optimization in economics and social sciences*

Session: *OC 3 - Optimal control and optimization in finance, commodity trade, insurance and pension fund systems III*

Chair: *Gerhard-Wilhelm Weber*

Petra Tomanová: *Optimization of trading signals in intraday pairs trading strategy*

Mindaugas Kepalas: *Facility locations on a network*

Saturday 30 - 12:00-13:00

Auditorium 1C

Chair: *Sonia Cafieri, Giancarlo Bigi*

Plenary

Dolores Romero Morales: *Transparent machine learning calls for more optimization*

Saturday 30 - 14:30-16:10

Room: 1.1

Stream: **Multiobjective optimization**

Session: **MO 5 - Multiobjective optimization and machine learning**

Chairs: *Gabriele Eichfelder, Julia Niebling*

Julia Niebling: *A multiobjective view on creating counterfactual explanations for explaining uncertainty in machine learning*

Zachary Feinstein: *Deep learning the efficient frontier of convex vector optimization problems*

Ross Clarke: *Series of Hessian-vector products for tractable saddle-free Newton optimisation of neural networks*

Katharina Bieker: *Training neural networks with L1 regularization via multiobjective continuation*

Room: 1.2

Stream: **Mathematical programming and computational game theory**

Session: **CGT 5 - Advances in operator splitting**

Chair: *Pontus Giselsson*

Maycon De Souza: *Double splitting preconditioner. A new class of preconditioners*

Puya Latafat: *Escaping limit cycles: Global convergence for constrained nonconvex-nonconcave minimax problems*

Juan Peypouquet: *Inertial Algorithms in optimization, variational inequalities and fixed point problems*

Pontus Giselsson: *Necessary and sufficient conditions for existence of quadratic Lyapunov functions for first-order methods*

Room: 1.14

Stream: **Derivative free-optimization**

Session: **DFO 3 - Global and multiobjective derivative-free optimization**

Chair: *Ana Luisa Custodio*

Aboozar Mohammadi: *A Derivative-free trust-region approach for computing Pareto fronts in multiobjective optimization*

M. Fernanda P. Costa: *A DIRECT exploratory-based hyper-rectangle evaluation for bound constrained global optimization problems*

Everton Silva: *A Direct multisearch filter method for biobjective optimization*

Bruno Baptista: *Incorporating radial basis functions in global and local direct search*

Room: 1.15

Stream: **Global optimization**

Session: **GO 1 - Advanced techniques for global optimization**

Chair: *Sonia Cafieri*

Claudia D'Ambrosio: *Comparing different methods for the configuration space search problem*

Gwenaël Samain: *Techniques for accelerating branch-and-bound algorithms dedicated to sparse optimization*

Laura Palagi: *On the convergence of controlled mini-batch gradient algorithms*

Sonia Cafieri: *Handling logical constraints by continuous optimization*

Room: 1.16

Stream: **Variational inequalities and optimization under uncertainty**

Session: **VIU 6 - Stochastic approximation**

Chair: *Christiane Tammer*

Akhtar Khan: *A variational inequality based stochastic approximation approach for stochastic inverse problems*

Hans-Jörg Starkloff: *Lp solutions of random differential equations using scales of Banach spaces*

Jürgen Dippon: *Randomized stochastic optimization with semi-martingales*

Georgia Fargetta: *A stochastic Nash equilibrium problem for medical supply competition*

Room: 1.17

Stream: *Optimal control and optimization in economics and social sciences*

Session: *OC 4 - Optimal control and optimization in finance and insurance*

Chair: *Fernanda Cipriano*

Carlos Oliveira: *Mitigating the impact of negative occurrences in investment projects through insurance*

José Carlos Dias: *Finite maturity caps and floors on continuous flows under the CEV process*

Manuel Guerra: *On randomized solutions for optimization problems*

Paulo Rocha: *Portfolio problem with consumption under the α -hypergeometric stochastic volatility model*

Saturday 30 - 16:15-17:30

Room: 1.1

Stream: *Mixed integer nonlinear optimization*

Session: *MINO 4 - Decomposition and MINLP for machine learning*

Chair: *Laura Palagi*

Marta Monaci: *Maximum margin optimal classification trees*

Andrea Manno: *On multivariate randomized classification trees*

Antonio Consolo: *Randomized regression trees: a model variant and a decomposition training algorithm*

Room: 1.2

Stream: *Mathematical programming and computational game theory*

Session: *CGT 6 - Recent advances in projection free methods*

Chair: *Francesco Rinaldi*

Pavel Dvurechensky: *Generalized self-concordant analysis of Frank-Wolfe algorithms*

Francesco Rinaldi: *Projection-free methods for structured problems*

Juan Jose Torres Figueroa: *Convergent mixed-integer derivative-free optimization*

Room: 1.14

Stream: *Proximal point algorithms and related numerical methods*

Session: *PPA 2 - Primal Dual Methods and related numerical issues*

Chair: *Jacek Gondzio*

Antonin Chambolle: *Non-linear primal-dual descent for optimal transport and barycenter problems*

Stefano Cipolla: *Primal-dual regularized Interior point methods (IPMs): a proximal point perspective*

Oliver Hinder: *Faster first-order primal-dual methods for linear programming using restarts and sharpness*

Room: 1.15

Stream: *Global optimization*

Session: *GO 2 - Simplicial branch and bound*

Chair: *Frédéric Messine*

Eligius M.T. Hendrix: *The face graph in simplicial branch and bound*

Leocadio G. Casado: *Heuristic directional derivatives in simplicial branch and bound*

Boglárka G.-Tóth: *Monotone directions by linear programming in simplicial B&B*

Room: 1.16

Stream: *Continuous optimization and variational analysis*

Session: *COVA 6 - Continuous optimization and variational analysis VI*

Chair: *Cornel Pinte*

Rossana Riccardi: *A single leader Radner equilibrium problem: industrial symbiosis in an eco-industrial park*

Giorgia Oggioni: *Emission trading system and border carbon adjustment: a spatial equilibrium problem for the European pulp and paper industry*

Marcel Bogdan: *Fan-hemicontinuity for the gradient of the norm in Banach space*

Saturday 30 - 18:00-19:00

Auditorium 1C

Chairs: *Gabriele Eichfelder, Giancarlo Bigi*

EUROPT Fellowship Lecture

Oliver Stein: *Branch-and-bound for continuous and mixed-integer multiobjective optimization*