



4th International Conference and Summer School "Numerical Computations: Theory and Algorithms 2023 (NUMTA 2023)", Pizzo Calabro, Italy													
Main room													
Thursday, June 15		Friday, June 16		Saturday, June 17		Sunday, June 18		Monday, June 19		Tuesday, June 20			
09:00	Registration	09:00	Regular Session 19 (see page 28)	09:00	Special Session 15 (see page 23)	09:00	Special Session 12 (see page 19)	09:00	Special Session 11 (see page 17)	09:00	Meeting of the "Young Researcher Prize" Commission		
09:20	Opening									10:00	Sponsor E4	10:00	Closing Ceremony and Round Table
09:40	Plenary Lecture Brugnano									10:20	Conference Photo	10:40	Coffee Break
10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break		
11:00	Plenary Lecture Pedrycz	11:00	Plenary Lecture Mazzia	11:00	Plenary Lecture Pardalos	11:00	Special Session 12 (see page 19)	11:00	Special Session 11 (see page 17)				
12:00	Tutorial Sergeyev	12:00	Plenary Lecture D'Alotto	12:00	Tutorial Toropov	12:00	Plenary Lecture Deb	12:00	Plenary Lecture Le Thi				
13:00	Lunch												
14:30	Special Session 10 (see page 16)	14:30	Special Session 15 (see page 22)	14:30	Special Session 9 (see page 15)	15:00	Excursion (Sanctuary of San Francesco di Paola and village of Fiumefreddo Bruzio)	14:30	Special Session 11 (see page 18)				
16:30	Coffee Break	16:30	Coffee Break	16:30	Coffee Break			15:30	Special Session 11 (see page 18)				
16:50	Special Session 4 (see page 10)	16:50	Special Session 15 (see page 22)	16:50	Special Session 9 (see page 15)			16:30	Coffee Break				
17:50	Special Session 4 (see page 10)							16:50	Plenary Lecture Trefethen				
19:10	Dinner	19:10	Dinner	19:10	Dinner	19:30	Conference Dinner	17:50	Plenary Lecture De Leone				
								18:50	Dinner				

NUMTA 2023 talks related to the grossone-based numerical infinities and infinitesimals are collected on page 35



4th International Conference and Summer School "Numerical Computations: Theory and Algorithms 2023 (NUMTA 2023)", Pizzo Calabro, Italy											
Second room											
Thursday, June 15		Friday, June 16		Saturday, June 17		Sunday, June 18		Monday, June 19		Tuesday, June 20	
	Plenary lecture (main room)	09:00	Regular Session 21 (see page 30)	09:00	Regular Session 22 (see page 31)	09:00	Special Session 13 (see page 20)	09:00	Regular Session 23 (see page 32)	09:00	Discussions
			Sponsor's lecture (main room)							10:20	
10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break
	Plenary lectures (main room)		Plenary lectures (main room)		Plenary lectures (main room)		11:00	Special Session 13 (see page 20)	11:00	Discussions	
									Plenary lecture (main room)		
13:00	Lunch										
14:30	Special Session 17 (see page 25)	14:30	Special Session 14 (see page 21)	14:30	Special Session 1 (see page 7)	15:00	Excursion (Sanctuary of San Francesco di Paola and village of Fiumefreddo Bruzio)	14:30	Special Session 17 (see page 26)		
16:30											
16:50	Regular Session 20 (see page 29)	16:50	D. Rizza's book	16:50	Special Session 1 (see page 7)		Conference Dinner at "La Torretta" Restaurant (Fiumefreddo Bruzio)		Plenary lectures (main room)		
		17:10	Special Session 14 (see page 21)								
19:10	Dinner	19:10	Dinner	19:10	Dinner	19:30	Conference Dinner				

NUMTA 2023 talks related to the grossone-based numerical infinities and infinitesimals are collected on page 35



4th International Conference and Summer School "Numerical Computations: Theory and Algorithms 2023 (NUMTA 2023)", Pizzo Calabro, Italy											
Third room											
Thursday, June 15		Friday, June 16		Saturday, June 17		Sunday, June 18		Monday, June 19		Tuesday, June 20	
	Plenary lecture (main room)	09:00	Discussions	09:00	Regular Session 24 (see page 33)	09:00	Special Session 3 (see page 9)	09:00	Regular Session 25 (see page 34)	09:00	Discussions
			Sponsor's lecture (main room)							10:20	Conference Photo
10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break	10:40	Coffee Break
	Plenary lectures (main room)		Plenary lectures (main room)		Plenary lectures (main room)		11:00	Special Session 3 (see page 9)	11:00	Special Session 2 (see page 8)	
									Plenary lecture (main room)		Plenary lecture (main room)
13:00	Lunch										
14:30	Special Session 8 (see page 14)	14:30	Special Session 18 (see page 27)	14:30	Special Session 6 (see page 12)	15:00	Excursion (Sanctuary of San Francesco di Paola and village of Fiumefreddo Bruzio)	14:30	Special Session 16 (see page 24)		
					15:30					Special Session 6 (see page 12)	
16:30	Coffee Break	16:30	Coffee Break	16:30	Coffee Break			16:30	Coffee Break		
16:50	Discussions	16:50	Special Session 5 (see page 11)	16:45	Special Session 7 (see page 13)	19:30	Conference Dinner at "La Torretta" Restaurant (Fiumefreddo Bruzio)		Plenary lectures (main room)		
19:10								Dinner		19:10	Dinner

NUMTA 2023 talks related to the grossone-based numerical infinities and infinitesimals are collected on page 35



NUMTA 2023 Plenary Lectures

Time	Speaker	Country	Title
June 15, 2023: Main Room			<i>Chair: Yaroslav Sergeyev</i>
9:40-10:40	Luigi Brugnano	Italy	Spectral solution in time of evolutionary problems
June 15, 2023: Main Room			<i>Chair: Luigi Brugnano</i>
11:00-12:00	Witold Pedrycz	Canada	Society-oriented developments of machine learning: Challenges and opportunities
June 16, 2023: Main Room			<i>Chair: Renato De Leone</i>
11:00-12.00	Francesca Mazzia	Italy	Computing derivatives on the Infinity Computer
June 16, 2023: Main Room			<i>Chair: Renato De Leone</i>
12:00-13.00	Louis D'Alotto	USA	Infinite computations and Büchi automata using Grossone
June 17, 2023: Main Room			<i>Chair: Yaroslav Sergeyev</i>
11:00-12.00	Panos Pardalos	USA	Computational approaches for solving general systems of nonlinear equations in the cloud
June 18, 2023: Main Room			<i>Chair: Vassili Toropov</i>
12:00-13.00	Kalyanmoy Deb	USA	Evolutionary multi-criterion optimization: An emerging computational problem-solving tool
June 19, 2023: Main Room			<i>Chair: Panos Pardalos</i>
12:00-13.00	Hoai An Le Thi	France	DC Learning: Recent advances and ongoing developments
June 19, 2023: Main Room			<i>Chair: Francesca Mazzia</i>
16:50-17.50	Nick Trefethen	UK	Smooth random functions and smooth random ODEs
June 19, 2023: Main Room			<i>Chair: Francesca Mazzia</i>
17:50-18.50	Renato De Leone	Italy	Use of Grossone in optimization, classification, and feature selection problems

NUMTA 2023 Tutorials

Time	Speaker	Country	Title
June 15, 2023: Main Room			<i>Chair: Luigi Brugnano</i>
12:00-13:00	Yaroslav Sergeyev	Italy	Infinity computing: Foundations and practical computations with numerical infinities and infinitesimals
June 17, 2023: Main Room			<i>Chair: Hoai An Le Thi</i>
12:00-13.00	Vassili Toropov	UK	Multidisciplinary topology optimisation: Where we are and where we aim to be

NUMTA 2023 Sponsor's Presentation

Time	Speaker	Country	Title
June 16, 2023: Main Room			<i>Chair: Witold Pedrycz</i>
10:00-10:40	Filippo Marchetti	Italy	E4 Computer Engineering S.p.A. : Exploit Innovative Computer Architecture with Molecular Dynamics



NUMTA2023 Special Sessions

num.	Special Session Title	Special Session Organizers
1	Advanced numerical methods for global optimization	D. Kvasov, M.C. Nasso
2	Advances in DC programming and DC Learning	H.A. Le Thi, T. Pham Dinh
3	Application of computational systems, AI, machine learning and classification methods in engineering	P. Piro, M. Turco, B. Pirouz, S.A. Palermo
4	Approximation theory and algorithms with applications to AI/ML	A. De Rossi, E. Cordero
5	Bioinformatics and health informatics: Methods and applications	M. Cannataro, M. Milano
6	Computational aspects of dynamic geometry and applications	D. Andrica, O. Bagdasar
7	Computational tools and new trends in math and science education	A. Astorino, F. Caldarola
8	Data-driven numerical analysis of complex and multiscale dynamical systems	C. Siettos, L. Russo
9	High performance computing in modelling and simulation	W. Spataro, D'Ambrosio, R. Rongo, A. Giordano
10	Local and global polynomial approximation with applications and beyond	F. Dell'Accio, D. Occorsio, W. Themistoclakis
11	Numerical optimization and machine learning	A. Astorino, A. Fuduli
12	Optimization for data-driven methods	G. Franchini, S. Rebegoldi, F. Porta
13	Optimization of marine prospects and sustainability of water resources under climate changes	F. Caldarola, M. Carini, M. Maiolo
14	Pythagorean stream: From numbers to mathematical models, blockchain, and distributed AI	F. Caldarola, M. Carini, G. d'Atri
15	Quantum computing algorithms for science and industry	J. Settino, A. Giordano, C. Mastroianni, F. Plastina, A. Vinci
17	Recent trends on ODEs methods, low-rank approximations, and image-processing techniques	A. Falini, F. Mazzia
18	Variational analysis and optimization methods with applications in finance and economics	D. Barilla, T. Ciano



NUMTA2023 Regular Sessions

num.	Regular Session Title	Session Chair
19	Numerical methods based on interval analysis	J. Žilinskas
20	Numerical optimization and applications	G. Fasano
21	Route optimization	L. Di Puglia Pugliese
22	Optimal resource allocation	D. Kvasov
23	Numerical methods for combinatorial optimization problems	I. Chernykh
24	Foundations of numerical analysis	L. D'Alotto
25	Dynamical systems and applications	J. Bajārs



Special Session #1: Advanced numerical methods for global optimization (D.Kvasov, M.C.Nasso)

June 17, 2023: 14.30-18.50, Second Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 17, 2023: Second Room						
				<i>Chair: Dmitri Kvasov</i>		
14:30-14:50	Daniela Lera	Italy	In-person	Global minimization in N dimensions with Peano space-filling curves	Daniela Lera, Yaroslav D. Sergeyev	183
14:50-15:10	Vladimir Norkin	Ukraine	Online	Constrained Global Optimization by Smoothing	Vladimir Norkin, Alois Pichler, Anton Kozyrev	120
15:10-15.30	Maria Chiara Nasso	Italy	In-person	Nonlinear Inequalities, Space-filling Curves and Robots	Daniela Lera, Maria Chiara Nasso, Mikhail Posypkin and Yaroslav D. Sergeyev	132
15:30-15:50	Ider Tseveendorj	France	In-person	Global Optimality Condition for the Convex Maximization Problem by Dimensionality Reduction	Ider Tseveendorj	111
15:50-16:10	Dmitri Kvasov	Italy	In-person	On the Use of Local Information to Accelerate Global Optimization Methods	Dmitri E. Kvasov, Yaroslav D. Sergeyev	215
16:10-16:30	Michael Hirsch	USA	Online	High Performance Local Search for Global Optimization on Large Nonlinear Systems of Equations	Michael J. Hirsch, William Trevena, Alex Semenov, Panos Pardalos	219
16:30-16:50	Coffe-break					
June 17, 2023: Second Room				<i>Chair: Julius Žilinskas</i>		
16:50-17:10	Gintautas Dzemyda	Lithuania	In-person	Geometric MDS: New Insights	Gintautas Dzemyda, Martynas Sabaliauskas	16
17:10-17:30	Konstantin Barkalov	Russia	Online	Application of Machine Learning to Increase the Efficiency of the Global Search Algorithm for Solving Multicriterial Problems	Konstantin Barkalov, Vladimir Grishagin, Evgeny Kozinov	40
17:30-17:50	Francesco Archetti	Italy	In-person	Multi-objective and multiple information source optimization for Fair and Green Machine Learning	Antonio Candelieri, Andrea Ponti, Francesco Archetti	69
17:50-18:10	Andrea Ponti	Italy	In-person	The unreasonable effectiveness of optimal transport distance in the design of multi-objective evolutionary optimization algorithms	Andrea Ponti, Antonio Candelieri, Francesco Archetti	89
18:10-18:30	Ramzi Jafar	Germany	In-person	The combined Global-local method for Box Constraint Optimization	Ramzi Jafar, Tobias Seidel, Karl-Heinz Kuefer	67
18:30-18:50	Maria Chiara Nasso	Italy	In-person	Using Infinity Computer in Global Optimization	Maria Chiara Nasso, Yaroslav D. Sergeyev	131



Special Session #2: Advances in DC programming and DC Learning (H.A. Le Thi, T. Pham Din)

June 19, 2023: 11.00-12.00, Third Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 19, 2023: Third Room			<i>Chair: Tao Pham Din</i>			
11:00-11:20	Hoai Minh Le	France	In-person	DCA-Like for solving Gaussian mixture model combined with dimension reduction via t-SNE	Hoai Minh Le, Hoai An Le Thi, Viet Anh Nguen	199
11:20-11:40	Thi Tuyet Trinh Nguyen	France	In-person	A DCA-Like approach for solving the problem of constructing Merkle tree in Blockchain transaction system	Thi Tuyet Trinh Nguyen, Hoai An Le Thi, Xuan Vinh Doan	208
11:40-12.00	Van Tuan Pham	France	In-person	Cost-sensitive weighted bagging DCA based method for imbalanced financial data	Van Tuan Pham, Hoai An Le Thi and Pascal Damel	209



**Special Session #3: Application of computational systems, AI, machine learning and classification methods in engineering
(P. Piro, M. Turco, B. Pirouz, S.A. Palermo) June 18, 2023: 9.00 - 12.00, Third Room**

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 18, 2023: Third Room						
<i>Chairs: Behrouz Pirouz / Stefania Anna Palermo</i>						
9:00-9:20	Seyed Navid Naghib	Italy	In-person	Numerical Analysis of Sedimentation Tanks Efficiency Using CFD Simulation	Michele Turco, Anna Chiara Brusco, Salvatore Falco, Seyed Navid Naghib	150
9:20-9:40	Ludovica Presta	Italy	In-person	Optimization Method Development for Water Management of Green Roof Systems	Behrouz Pirouz, Giovanna Grossi, Ludovica Presta, Umberto Sanfilippo, Gianfranco Becciu	144
9:40-10:00	Hana Javadi Nejad	Italy	In-person	Multi-Objective Support Vector Machine Classification Algorithm for Estimation of the Potential Atmospheric Water Harvesting	Hana Javadi Nejad, Stefania Anna Palermo, Michele Turco, Angelafrancesca De Stefano, Behzad Pirouz	145
10:00-10:20	Mohammed Saleh	Italy	In-person	IoT and Artificial Intelligence integration for a stormwater Monitoring and Management System	Patrizia Piro, Stefania Anna Palermo, Mauro Tropea, Mohammed M. Saleh, Floriano De Rango	151
10:20-10:40	Nadia Penna	Italy	In-person	The scaling behavior of high-order structure functions for a turbulent jet induced by a rotating propeller	Nadia Penna, Giuseppe Curulli, Roberto Gaudio	135
10:40-11:00	Coffe-break					
June 18, 2023: Third Room						
<i>Chairs: Patrizia Piro / Michele Turco</i>						
11:00-11:20	Sabine Upnere	Latvia	In-person	Numerical simulation of crack propagation in oil shale ash concrete	Sabine Upnere, Normunds Jekabsons	179
11:20-11:40	Behrouz Pirouz	Italy	In-person	Analysis of Computational Fluid Dynamics Approaches for the Development of Microfluidic Devices	Behrouz Pirouz, Patrizia Piro	143
11:40-12:00	Monica Moroni	Italy	In-person	Plastic litter sorting using hyperspectral sensing and Linear Discriminant Analysis	Marco Balsi, Soufyane Bouchelaghem, Monica Moroni	207



Special Session #4: Approximation theory and algorithms with applications to AI/ML (A. De Rossi, E. Cordero)

June 15, 2023: 16.50-19.10, Main Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 15, 2023: Main Room				<i>Chair: Alessandra De Rossi</i>		
16:50-17:10	Diego Ruiz-Antolín	Spain	Online	Computation of the confluent hypergeometric function $M(a,b,x)$	Diego Ruiz-Antolín, Amparo Gil, Javier Segura, Nico M. Temme	56
17:10-17:30	Diana Carbajal	Austria	In-person	Systems by Iterations of Two Commuting Operators: a Frame Characterization	Diana Carbajal, Alejandra Aguilera, Carlos Cabrelli, Victoria Paternostro	133
17:30-17:50	Elena Cordero	Italy	In-person	Metaplectic Gabor frames of Wigner-decomposable distributions	Elena Cordero, Gianluca Giacchi	114
June 15, 2023: Main Room				<i>Chair: Elena Cordero</i>		
17:50-18:10	Franz Luef	Norway	Online	Local structures in time-series	Franz Luef	163
18:10-18:30	Gianluca Giacchi	Italy	In-person	A mathematics-driven approach to detect the optimal tuning parameter for LASSO problem	Gianluca Giacchi, Bastien Milani, Benedetta Franceschiello	21
18:30-18:50	Roberto Cavoretto	Italy	In-person	Choosing Kernel Shape Parameters in Partition of Unity Methods by Univariate Global Optimization Techniques	Roberto Cavoretto, Alessandra De Rossi, Yaroslav D. Sergeyev	165
18:50-19:10	Sandro Lancellotti	Italy	Online	Node-Binded Communities for Interpolation on Graphs	Sandro Lancellotti, Roberto Cavoretto, Alessandra De Rossi, Federico Romaniello	27



Special Session #5: Bioinformatics and health informatics: Methods and applications (M. Cannataro, M. Milano)

June 16, 2023: 16.50-19.10, Third Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 16, 2023: Third Room			<i>Chairs: Mario Cannataro / Marianna Milano</i>			
16:50-17:10	Barbara Calabrese	Italy	Online	Snoring sound processing for OSAS screening	Barbara Calabrese, Mario Cannataro	210
17:10-17:30	Maria Chiara Martinis	Italy	In-person	Evaluation of healthcare structures in Italy through Sentiment Analysis.	Maria Chiara Martinis, Chiara Zucco	98
17:30-17:50	Ilaria Lazzaro	Italy	In-person	Analysis and Visualization of Multilayer Networks	Ilaria Lazzaro, Marianna Milano, Mario Cannataro	96
17:50-18:10	Lorella Bottino	Italy	In-person	Deep learning for scoliosis diagnosis: methods and databases	Lorella Bottino, Marzia Settino	128
18:10-18:30	Rosarina Vallelunga	Italy	Online	Named Entity Recognition to extract knowledge from clinical texts	Ileana Scarpino, Rosarina Vallelunga, Francesco Luzza	51
18:30-18:50	Luca Barillaro	Italy	Online	Deep learning methods for fMRI classification	Luca Barillaro, Giuseppe Agapito	164
18:50-19:10	Elio Masciari	Italy	In-person	An Innovative Sentiment Analysis Model for COVID-19 Tweets	Areeba Umair, Elio Masciari	210



Special Session #6: Computational aspects of dynamic geometry and applications (D. Andrica, O. Bagdasar)

June 17, 2023: 14.30-16.30, Third Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 17, 2023: Third Room			<i>Chair: Dorin Andrica</i>			
14:30-14:50	Dorin Andrica	Romania	In-person	On Kasner polygons defined for a sequence of complex parameters	Dorin Andrica, Ovidiu Bagdasar	218
14:50-15:10	Ovidiu Bagdasar	UK	In-person	Dynamic geometries generated by sequences of nested triangles	Dorin Andrica, Ovidiu Bagdasar	38
15:10-15:30	George Turcas	Romania	Online	The search for pairs of arithmetic triangles. Computational aspects	George C. Turcas	217
June 17, 2023: Third Room			<i>Chair: Ovidiu Bagdasar</i>			
15:30-15:50	Kasamsuk Ungchittrakool	Thailand	Online	Accelerated Mann-type algorithm via two-step inertial points for solving a fixed point problem of a nonexpansive mapping and application to image restoration problems	Kasamsuk Ungchittrakool, Yeol Je Cho, Somyot Plubtieng and Purit Thammasiri	197
15:50-16:10	Armen Bagdasaryan	Kuwait	Online	Optimal Transport Flow Distributions on Congested Dynamic Networks	Armen Bagdasaryan, Antonios Kalampakas, Mansoor Saburov	108
16:10-16:30	Sani Salisu	Thailand	Online	Variational Inequality Problems Beyond Convex Settings	Sani Salisu, Songpon Sriwongsa, Poom Kumam	191



Special Session #7: Computational tools and new trends in math and science education (A. Astorino, F. Caldarola)

June 17, 2023: 16.45-19.10, Third Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 17, 2023: Third Room				<i>Chair: Fabio Caldarola</i>		
16:45-16:50	Introduction: Special session dedicated to the memory of a young mathematics teacher, Giovanni Bozzolo					
16:50-17:10	Fabio Caldarola	Italy	In-person	Infinite computing and unimaginable numbers at school: Some class experimentations in Italy	Fabio Caldarola, Annabella Astorino, Luigi Antoniotti, Fausto Stranges	148
17:10-17:30	Francesco Ingarozza	Italy	Online	Unimaginable numbers: A case of study in Italian High School	Francesco Ingarozza, Rosanna Iembo, Luigi Antoniotti	137
17:30-17:50	Corrado Mariano Marotta	Italy	Online	Game theory presented to Italian high school students in connection with infinite computing	Corrado Mariano Marotta, Fabio Caldarola, Manuela Carini, Gianfranco d'Atri, Andrea Melicchio	80
17:50-18:10	Davide Rizza	UK	In-person	The Arithmetic of Infinity and Reflective Enquiry	Davide Rizza	13
18:10-18:30	Layla Nasr	Lebanon	Online	A Numerical Approach to Basic Calculus	Layla Nasr	5
18:30-18:50	Annarosa Serpe	Italy	Online	Applied mathematical modelling in the Physics problem-solving classroom	Annarosa Serpe	11
18:50-19:10	Antonella Montone	Italy	Online	Meta Discussion Pedagogical Model to foster Mathematics Teacher's professional development	Antonella Montone, Michele Giuliano Fiorentino, Giuditta Ricciardiello	100



Special Session #8: Data-driven numerical analysis of complex and multiscale dynamical systems
(C. Siettos, L. Russo) June 15, 2023: 14.30-16.30, Third Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 15, 2023: Third Room			<i>Chairs: Constantinos Siettos / Lucia Russo</i>			
14:30-14:50	Dimitris Patsatzis	Italy	Online	Numerical Approximation of Invariant Manifolds for Singularly Perturbed Systems with Machine Learning	Dimitris Patsatzis, Gianluca Fabiani, Lucia Russo, Constantinos Siettos	196
14:50-15:10	Gianluca Fabiani	Italy	Online	Numerical solution of stiff ODEs and DAEs with Adaptive Physics-Informed Random Projection Neural Networks	Gianluca Fabiani, Lucia Russo, Constantinos Siettos	190
15:10-15:30	Hector Vargas Alvarez	Italy	Online	Feedback Linearization of Discrete Nonlinear Systems with Machine Learning	Hector Vargas Alvarez, Gianluca Fabiani, Nikolas Kazantzis, Ioannis G., Kevrekidis, Constantinos Siettos	193
15:30-15:50	Konstantinos Spiliotis	Germany	Online	Data-driven numerical bifurcation analysis of complex systems using sparse identification of dynamical systems	Konstantinos Spiliotis, Jens Starke	198
15:50-16:10	Lucia Russo	Italy	Online	Numerical Bifurcation Analysis of Symmetry Breaking Turing Instabilities	Lucia Russo, Konstantinos Spiliotis, Francesco Giannino, Constantinos Siettos	205
16:10-16:30	Constantinos Siettos	Italy	In-person	Equation-free, Variable Free Numerical Bifurcation Analysis and Control of Complex Systems via Manifold Learning	Constantinos Siettos, Dimitris Patsatzis, Lucia Russo, Ioannis Kevrekidis	202



Special Session #9: High performance computing in modelling and simulation
(W. Spataro, D. D'Ambrosio, R. Rongo, A. Giordano) June 17, 2023: 14.30-18.50, Main Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 17, 2023: Main Room						
<i>Chair: William Spataro</i>						
14:30-14:50	Enrico Bertolazzi	Italy	In-person	Parallel Cyclic Reduction of Bordered Almost Block Diagonal Matrices	Enrico Bertolazzi	17
14:50-15:10	Alberto Falcone	Italy	In-person	pyICL: A Python library for the Infinity Computer	Alberto Falcone, Alfredo Garro, Yaroslav D. Sergeev	20
15:10-15:30	Deborah Falcone	Italy	Online	Understanding spreading dynamics of COVID-19 by mining human mobility patterns	Carmela Comito, Deborah Falcone, Agostino Forestiero	166
15:30-15:50	Agostino Forestiero	Italy	Online	AIR SAFE: leveraging IoT sensors and AI models to foster optimal indoor conditions	Mariangela Viviani, Simone Colace, Daniele Germano, Sara Laurita, Giuseppe Papuzzo, A. Forestiero	167
15:50-16:10	Andrea Giordano	Italy	In-person	Transparent Execution of Cellular Automata Models on a Multi-GPU Architecture	W. Spataro, A. Giordano, Alessio De Rango, Rocco Rongo, Donato D'Ambrosio, Giuseppe Mendicino, Gladys Utrera, Marisa Gil, X. Martorell	85
16:10-16:30	Pasquale De Luca	Italy	In-person	Towards a parallel code for cellular behavior in vitro prediction	Pasquale De Luca, Ardelio Galletti, Livia Marcellino	123
16:30-16:50	Coffe-break					
June 17, 2023: Main Room						
<i>Chair: Andrea Giordano</i>						
16:50-17:10	Igor Chernykh	Russia	In-person	The Impact of Vectorization on The Efficiency of a Parallel PIC Code for Numerical Simulation of Plasma Dynamics in Open Trap	Igor Chernykh, Igor Kulikov, Vitaly Vshivkov, Anna Efimova, Weins Dmitry, Ivan Chernoshtanov, Marina Boronina	58
17:10-17:30	Elio Masciari	Italy	In-person	Dossier classification to support workflow management optimization	Simona Fioretto, Elio Masciari, Enea Vincenzo Napolitano	76
17:30-17:50	Bruno Silva	Portugal	Online	GPU Acceleration of the Enhanced Jaya Optimization Algorithm for Solving Large Systems of Nonlinear Equations	Bruno Silva, Luiz Guerreiro Lopes	129
17:50-18:10	Bruno Silva	Portugal	Online	An Improved Modified Jaya Optimization Algorithm: Application to the Solution of Nonlinear Equation Systems	Bruno Silva, Luiz Guerreiro Lopes	138
18:10-18:30	Gladys Utrera	Spain	Online	Exploring hierarchical MPI reduction collective algorithms targeted to multicore node clusters	G. Utrera, Marisa Gil, Xavier Martorell, W. Spataro, A. Giordano, Alessio De Rango, Giuseppe Mendicino	107
18:30-18:50	Gianluigi Folino	Italy	In-person	Self-sovereign identification of IoT Devices by using Physically Unclonable Functions and Blockchain	Gianluigi Folino, Agostino Forestiero, Giuseppe Papuzzo	154



**Special Session #10: Local and global polynomial approximation with applications and beyond
(F. Dell'Accio, D. Occorsio, W. Themistoclakis) June 15, 2023: 14.30-16.30, Main Room**

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 15, 2023: Main Room			<i>Chair: Francesco Dell'Accio</i>			
14:30-14:50	Nadaniela Egidi	Italy	In-person	A fast algorithm for numerical differentiation from scattered data	Nadaniela Egidi, Josephin Giacomini, Pierluigi Maponi	62
14:50-15:10	Domenico Mezzanotte	Italy	Online	A Galerkin-type method for 2-nd kind FIEs over equally spaced nodes	Domenico Mezzanotte, Francesco Dell'Accio, Federico Nudo, Donatella Occorsio	212
15:10-15:30	Federico Nudo	Italy	In-person	A general strategy for enriching simplicial linear finite elements	Federico Nudo, Francesco Dell'Accio, Filomena Di Tommaso, Allal Guessab	213
15:30-15:50	Filomena Di Tommaso	Italy	In-person	Multinode Shepard method for the numerical solution of some elliptic PDEs with Neumann boundary conditions	Filomena Di Tommaso, Francesco Dell'Accio, Elisa Francomano	214
15:50-16:10	Federico Romaniello	Italy	Online	A Bayesian Approach for Simultaneously Radial Kernel Parameter Tuning in the Partition of Unity Method	Federico Romaniello, Roberto Cavoretto, Alessandra De Rossi, Sandro Lancellotti	28
16:10-16:30	Josephin Giacomini	Italy	In-person	Preconditioning strategies for RBF interpolation	Josephin Giacomini, Nadaniela Egidi, Pierluigi Maponi	75



Special Session #11: Numerical optimization and machine learning (A. Astorino, A. Fuduli)

June 19, 2023: 9.00-16.30, Main Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 19, 2023: Main Room				<i>Chair: Manlio Gaudio</i>		
9:00-9:20	Giovanni Giallombardo	Italy	In-person	Models and Algorithms for Multiple Instance Regression	Giovanni Giallombardo, Giovanna Miglionico, Marcello Sammarra	187
9:20-9:40	Giovanni Fasano	Italy	In-person	From regression models to Machine Learning approaches for long term crypto-assets price forecast	Marco Corazza, Giovanni Fasano	83
9:40-10:00	Federica Porta	Italy	In-person	Variable metric proximal stochastic gradient algorithms for deep learning optimization	Federica Porta, Pasquale Cascarano, Giorgia Franchini, Erich Kobler, Andrea Sebastiani	162
10:00-10:20	Massimo Guarascio	Italy	In-person	Data-Efficient Deep Learning Approach for Explainable Process Deviance Discovery	Francesco Folino, Gianluigi Folino, Massimo Guarascio, Luigi Pontieri	32
10:20-10:40	Cesare Molinari	Italy	In-person	Stochastic zeroth order optimization via finite differences	Cesare Molinari, Marco Rando, Lorenzo Rosasco, Silvia Villa	35
10:40-11:00 Coffe-break						
June 19, 2023: Main Room				<i>Chair: Antonio Fuduli</i>		
11:00-11:20	Francesca Maggioni	Italy	Online	Robust and Distributionally Robust Optimization Models for Support Vector Machine	Francesca Maggioni, Daniel Faccini, Andrea Spinelli, Florian A. Potra	125
11:20-11:40	Kaisa Joki	Finland	Online	Optimal subset selection using the L0-pseudonorm with an application to prognostic modelling of prostate cancer	Kaisa Joki, Anni S. Halkola, Tuomas Mirtti, Marko M. Makela, Tero Aittokallio, Teemu D. Laajala	54
11:40-12:00	Matteo Avolio	Italy	Online	A nonlinear semiproximal SVM approach for Multiple Instance Learning	Matteo Avolio, Antonio Fuduli	153
12:00-13:00 Plenary Lecture: Hoai An Le Thi "DC Learning: Recent advances and ongoing developments"						
13:00-14:30 Lunch						

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Special Session #11: Numerical optimization and machine learning (A. Astorino, A. Fuduli)

June 19, 2023: 9.00-16.30, Main Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
13:00-14:30	Lunch					
June 19, 2023: Main Room			<i>Chair: Annabella Astorino</i>			
14:30-14:50	Marcello Sammarra	Italy	In-person	Machine learning techniques for Branch-and-Cut methods: the selection of cutting planes	Marcello Sammarra, Giovanni Giallombardo, Giovanna Miglionico	157
14:50-15:10	Manlio Gaudio	Italy	In-person	Optimization for Machine Learning: the role of DC (Difference of Convex) algorithms	Manlio Gaudio	142
15:10-15:30	Enrico Gorgone	Italy	In-person	DC Optimization in Adversarial Support Vector Machine (SVM)	Enrico Gorgone, Annabella Astorino, Massimo Di Francesco, Manlio Gaudio, Benedetto Manca	181
June 19, 2023: Main Room			<i>Chair: Giovanni Fasano</i>			
15:30-15:50	Giovanni Fasano	Italy	In-person	Exploiting the Bunch and Kaufman factorization for the efficient computation of Negative Curvature Directions	Giovanni Fasano, Christian Piermarini, Massimo Roma	52
15:50-16:10	Matteo Magnani	Italy	In-person	A machine learning approach to speed up the solution of distributor's loading problems	Matteo Magnani, Giorgia Franchini, Mauro Dell'Amico, Luca Zanni	99
16:10-16:30	Aleksandar Poleksic	USA	In-person	Numerical Optimization in Hyperbolic Space - Applications to Systems Biology	Aleksandar Poleksic	2



Special Session #12: Optimization for data-driven methods
(G. Franchini, S. Rebegoldi, F. Porta) June 18, 2023: 9.00-12.00, Main Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 18, 2023: Main Room						
<i>Chairs: Giorgia Franchini / Federica Porta</i>						
9:00-9:20	Natasa Krklec Jerinkic	Serbia	In-person	SLiSeS: Subsampled Line Search Spectral Gradient Method for Finite Sums	Natasa Krklec Jerinkic, Stefania Bellavia, Natasa Krejic, Marcos Raydan	6
9:20-9:40	Ambra Catozzi	Italy	In-person	Neural architecture search in Deep Image Prior for image denoising	Ambra Catozzi, Alessandro Benfenati, Giorgia Franchini, Federica Porta	43
9:40-10:00	Elena Morotti	Italy	In-person	Increasing noise robustness of deep learning-based image processing with model-based approaches	Elena Morotti, Davide Evangelista, Elena Loli Piccolomini	73
10:00-10:20	Ilaria Trombini	Italy	In-person	Line search techniques within stochastic methods for deep learning applications	Ilaria Trombini, Giorgia Franchini, Federica Porta, Valeria Ruggiero	22
10:20-10:40	Danilo Pezzi	Italy	In-person	Unsupervised learning of a variational model via a quality measure score predictor.	Danilo Pezzi, Silvia Bonettini, Giorgia Franchini, Marco Prato	70
10:40-11:00	Coffe-break					
June 18, 2023: Main Room						
<i>Chairs: Giorgia Franchini / Federica Porta</i>						
11:00-11:20	Greta Malaspina	Italy	In-person	Distributed Inexact Newton method with Adaptive Step Size	Greta Malaspina, Dusan Jakovetic, Natasa Krejic	33
11:20-11:40	Serena Crisci	Italy	Online	Bilevel learning for model parameters estimation in imaging problems	Serena Crisci, Monica Pragliola, Gerardo Toraldo	130
11:40-12:00	Francesco Mezzadri	Italy	In-person	A framework for shape-parameterized neural networks: An overview from surrogate modeling to shape optimization	Francesco Mezzadri	44



Special Session #13: Optimization of marine prospects and sustainability of water resources under climate changes
(F. Caldarola, M. Carini, M. Maiolo) June 18, 2023: 9.00-12.00, Second Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 18, 2023: Second Room			<i>Chair: Fabio Caldarola</i>			
9:00-9:20	Fabio Caldarola	Italy	In-person	Mathematical modeling of water networks, local indices and invariance problems	Fabio Caldarola, Manuela Carini, Mario Maiolo	106
9:20-9:40	Maria Antonietta Scarcella	Italy	In-person	Shallow water 1D vs. 2D models: Analytical and numerical study for simulating coastline evolution over time	Maria Antonietta Scarcella, Manuela Carini, Vittorio Zampoli	60
9:40-10:00	Guglielmo Brunetti	Italy	In-person	Optimizing the reuse of building demolition materials for coastal dunes reestablishment	Guglielmo Federico Antonio Brunetti, Marida Bevacqua, Maria Rita Maiolo, Maristella Amisano	101
10:00-10:20	Gilda Capano	Italy	In-person	Aspects of optimization in domestic drinking water purification systems	Daniele Basta, Gilda Capano, Efrem Curcio, Mario Maiolo, Vincenzo Repaci, Sergio Santoro, Alessio Siciliano, S. Straface	95
10:20-10:40	Luca Furnari	Italy	In-person	Application of Deep Learning for wildfire risk management: Preliminary results	Alessio De Rango, Luca Furnari, Donato D'Ambrosio, Alfonso Senatore, Giuseppe Mendicino	103
10:40-11:00	Coffe-break					
June 18, 2023: Second Room			<i>Chair: Guglielmo Brunetti</i>			
11:00-11:20	Umair Yousaf	Italy	In-person	Applying Machine Learning to improve weather forecasting in a Mediterranean area: Preliminary experiments	Umair Yousaf, Alessio De Rango, Luca Furnari, Donato D'Ambrosio, Alfonso Senatore, G. Mendicino	50
11:20-11:40	Luca Furnari	Italy	In-person	The effects of different mesh size on a Cellular Automata based Hydrological Model	Luca Furnari, Alfonso Senatore, Giuseppe Mendicino	86
11:40-12:00	Jessica Castagna	Italy	In-person	Scalability of Saharan Dust Outbreak modelling with the Advanced Weather Research and Forecasting model coupled with Chemistry (WRF-Chem)	Jessica Castagna, Alfonso Senatore, Giuseppe Mendicino	87



Special Session #14: Pythagorean stream: From numbers to mathematical models, blockchain, and distributed AI
(F. Caldarola, M. Carini, G. d'Atri) June 16, 2023: 14.30-19.10, Second Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 16, 2023: Second Room						
<i>Chair: Ernestas Filatovas</i>						
14:30-14:50	Enrico Zanardo	Cyprus	Online	Chronostamp, a general-purpose runtime for data-flow computing in a distributed environment	Enrico Zanardo, Elias Iosif, Gianfranco d'Atri	173
14:50-15:10	Gianfranco d'Atri	Italy	In-person	ChronoCode cloud programming	Gianfranco d'Atri, Enrico Zanardo, Elias Iosif	174
15:10-15:30	Elias Iosif	Cyprus	Online	A New Blockchain-Based Meritocratic Marketplace for Distributed Machine Learning Model Training	Enrico Zanardo, Elias Iosif	175
15:30-15:50	Ernestas Filatovas	Lithuania	In-person	Towards Reproducible Research in AI via Blockchain	Ernestas Filatovas, Linas Stripinis, Francisco Orts, Remigijus Paulavičius	31
15:50-16:10	Francesco Demarco	Italy	In-person	Circuit-based numerical solutions of transmission lines: application to KdV equations	Giuseppe Ali, Francesca Bertacchini, Eleonora Bilotta, Francesco Demarco, Pietro Pantano, Stefano Vena	121
16:10-16:30	Pierpaolo Antonio Fusaro	Italy	In-person	New probabilistic methods for generating risk maps	Arrigo Bertacchini, Pierpaolo Antonio Fusaro, Pietro Salvatore Pantano, Massimo Zupi	74
16:30-16:50	Coffe-break					
16:50-17:10	Presentation of D.Rizza's book "Primi passi nell'aritmetica dell'infinito" (Bonomo Editore, 2023)					
June 16, 2023: Second Room						
<i>Chair: Davide Rizza</i>						
17:10-17:30	Fabio Caldarola	Italy	Online	Infinite computing, fractals and space-filling curves	F. Caldarola, Luigi Antoniotti, Manuela Carini, d'Atri Gianfranco, Corrado M. Marotta, Andrea Melicchio	152
17:30-17:50	Claudio Ternullo	Spain	Online	The Theory of Grossone and the Continuum Problem	Claudio Ternullo, Yaroslav Sergeyev	159
17:50-18:10	Francesco La Regina	Italy	Online	Introducing Nondum, a mathematical notation for computation with approximations	Francesco La Regina, Gianfranco d'Atri	64
18:10-18:30	Domenico Cortese	Italy	In-person	Legal systems and fractals	Domenico Cortese, Maria Rita Maiolo	169
18:30-18:50	Francesco Ingarozza	Italy	Online	A new class of octagons. Differences and similarities between "Carboncettus octagons" succession and "Carboncettus-like octagons" class.	Francesco Ingarozza, Rosanna Iembo, Aldo Piscitelli	141
18:50-19:10	Francesco Demarco	Italy	In-person	Algorithms for design with CNC machines: the case study of wood furniture	Francesco Demarco, Francesca Bertacchini, Eleonora Bilotta, Carmelo Scuro, Pietro Pantano	122



Special Session #15: Quantum computing algorithms for science and industry
(J. Settino, A. Giordano, C. Mastroianni, F. Plastina, A. Vinci)
First day: June 16, 2023: 14.30-18.50, Main Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 16, 2023: Main Room						
<i>Chair: Francesco Plastina</i>						
14:30-14:50	Gian Luca Giorgi <i>(session invited)</i>	Spain	In-person	Quantum associative memory with a single driven-dissipative non-linear oscillator	Gian Luca Giorgi, Adria Labay-Mora, Roberta Zambrini	160
14:50-15:10	Guillem Llodrà	Spain	In-person	Benchmarking the Role of Particle Statistics in Quantum Reservoir Computing	Guillem Llodrà, Christos Charalambous, Gian Luca Giorgi, Roberta Zambrini	161
15:10-15:30	Luca Innocenti <i>(session invited)</i>	Italy	In-person	State reconstruction with quantum extreme learning machines	Luca Innocenti, Salvatore Lorenzo, Ivan Palmisano, Alessandro Ferraro, Mauro Paternostro, Massimo G. Palma	203
15:30-15:50	Carlo Mastroianni	Italy	In-person	Variational Quantum Algorithms for Energy Optimization in Prosumer Communities	Carlo Mastroianni, Francesco Plastina, Luigi Scarcello, Jacopo Settino, Andrea Vinci	63
15:50-16:10	Raffaele Guarasci	Italy	In-person	Applying Variational Quantum Classifier on Acceptability Judgements: a QNLP experiment	Raffaele Guarasci, Giuseppe Buonaiuto, Giuseppe De Pietro, Massimo Esposito	57
16:10-16:30	José Morales	USA	Online	DG schemes for transformed master equations modeling open quantum systems	Jose Morales Escalante, Gaby Boada	192
16:30-16:50						
Coffe-break						
June 16, 2023: Main Room						
<i>Chair: Jacopo Settino</i>						
16:50-17:10	Walter Talarico <i>(session invited)</i>	Finland	In-person	An efficient implementation of a multireference perturbation method for near-term quantum devices	N. W. Talarico, A. Fitzpatrick, S. Maniscalco, G. Garcia-Perez, S. Knecht	178
17:10-17:30	Mirko Consiglio	Malta	In-person	Variational Gibbs State Preparation on NISQ Devices	Mirko Consiglio	59
17:30-17:50	Antonio Policicchio <i>(session invited)</i>	Italy	In-person	A variational quantum soft actor-critic algorithm for continuous control tasks	Alberto Acuto, Paola Barillà, Ludovico Bozzolo, Matteo Conterno, Mattia Pavese, Antonio Policicchio	211
17:50-18:10	Ilaria Siloi <i>(session invited)</i>	Italy	In-person	Applications of tensor network methods to quantum emulators and optimization problems	Ilaria Siloi, Marco Ballarin, Marco Tesoro, Daniel Jaschke, Pietro Silvi, Simone Montangero	224
18:10-18:30	Zhao Sun	USA	Online	An improved QPSO based Algorithm for USV Path Planning	Zhao Sun	9
18:30-18:50	Zhao Sun	USA	Online	A Review on Quantum-like Approach to Human Cognition and Decision Making	Zhao Sun	139

Session continues the next morning (see next page)



Continuation of the session from the previous day

Special Session #15: Quantum computing algorithms for science and industry
(J. Settino, A. Giordano, C. Mastroianni, F. Plastina, A. Vinci)
Second day: June 17, 2023: 9:00-10:20, Main Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 17, 2023: Main Room				<i>Chair: Andrea Vinci</i>		
09:00-09:20	Luca Salatino	Italy	In-person	The advantages of hyperentanglement in quantum telecommunications processes	Luca Salatino, Luca Mariani, Carmine Attanasio, Sergio Pagano, Roberta Citro	110
09:20-09:40	Andrea Giordano	Italy	In-person	A Classical-Quantum Approach to Speed-up Reinforcement Learning	Andrea Giordano, Antonio Sannia, Nicolino Lo Gullo, Carlo Mastroianni, Francesco Plastina	92
09:40-10:00	Chengran Yang	Singapore	In-person	Dimension reduction in quantum sampling	Chengran Yang, Marta Florido Llinas, Mile Gu, Thomas J. Elliott	113
10:00-10:20	Valeria Repetto	Italy	Online	Exploring Quantum kernel methods for breast cancer subtyping: a real-world experiment	Valeria Repetto, Elia Giuseppe Ceroni, Romina D'Aurizio	201



**Special Session #16: Recent advances in numerical computations for control theory
(E. Shmalko, A. Zhukova, A. Diveev) June 19, 2023: 14.30-16.30, Third Room**

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 19, 2023: Third Room			<i>Chair: Elizaveta Shmalko</i>			
14:30-14:50	Andranik Akopov	Russia	Online	Optimal Control for Stochastic Multi-agent Systems with the Use of Parallel Hybrid Genetic Algorithms	Andranik S. Akopov, Armen L. Beklaryan	12
14:50-15:10	Elizaveta Shmalko	Russia	Online	Adaptive Synthesized Optimal Control for Quadrocopter	Elizaveta Shmalko, Askhat Diveev	77
15:10-15:30	Aleksandra Zhukova	Russia	Online	Numerical Analysis of Optimal Control of Assets and Liabilities by a Bank	Aleksandra Zhukova, Anna Flerova, Alexey Chernov	170
15:30-15:50	Askhat Diveev	Russia	Online	Extended Optimal Control Problem for Practical Application	Askhat Diveev, Elizaveta Shmalko	78
15:50-16:10	Konstantin Yamshanov	Russia	Online	Improving Feasibility of Optimal Control via Obtaining High-precision Models	Konstantin Yamshanov, Igor Prokopiev, Askhat Diveev, Elizaveta Shmalko	79
16:10-16:30	Dmitry Karamzin	Russia	Online	Some remarks on second-order necessary optimality conditions in optimal control problems with state constraints	Dmitry Karamzin	90



**Special Session #17: Recent trends on ODEs methods, low-rank approximations, and image-processing techniques
(Antonella Falini, Francesca Mazzia)**

First day: June 15, 2023: 14.30-16.30, Second Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 15, 2023: Second Room		<i>Chairs: Antonella Falini / Francesca Mazzia</i>				
14:30-14:50	Antonella Falini	Italy	In-person	Matrix Factorization algorithms and Error Functions for the task of Change Detection in HyperSpectral Images	Antonella Falini, Francesca Mazzia	134
14:50-15:10	Cristiano Tamborrino	Italy	In-person	Clustering based on Copulas Families and empirical density estimation with Spline Quasi-Interpolation.	Cristiano Tamborrino, Antonella Falini, Francesca Mazzia	81
15:10-15.30	Felice Iavernaro	Italy	In-person	Maximal entropy weighted least squares approximation	Luigi Brugnano, Domenico Giordano, Felice Iavernaro, Giorgia Rubino	177
15:30-15:50	Lorella Fatone	Italy	In-person	An Alternative Nonlinear Diffusion Algorithm for Image Denoising and Deblurring	Lorella Fatone, Daniele Funaro	49
15:50-16:10	Pierluigi Amodio	Italy	In-person	On the numerical solution of BVPs with discontinuities	Pierluigi Amodio	147
16:10-16:30	Jānis Bajārs	Latvia	In-person	Dimensionality Reduction with Proper Symplectic Decomposition for Learning Hamiltonian Dynamics	Jānis Bajārs	109

Session continues on June 19th (see next page)



Continuation of the session from June 15th

**Special Session #17: Recent trends on ODEs methods, low-rank approximations, and image-processing techniques
 (Antonella Falini, Francesca Mazzia)**

Second day: June 19, 2023: 14.30-16.30, Second Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 19, 2023: Second Room			<i>Chair: Francesca Mazzia</i>			
14:30-14:50	Francesco Biral	Italy	Online	A Direct/Indirect Approach to Optimal Control Problems	Enrico Bertolazzi, Francesco Biral	19
14:50-15:10	Gianluca Frasca-Caccia	Italy	In-person	Efficient Solution of a Pitting Corrosion Model	Gianluca Frasca-Caccia, Dajana Conte	88
15:10-15.30	Marco Caliori	Italy	Online	A μ -mode BLAS approach for tensor-structured problems, with an application to ODEs	Marco Caliori, Fabio Cassini, Franco Zivcovich	61
15:30-15:50	Davide Stocco	Italy	In-person	A Mixed Symbolic/Numeric Approach to DAEs Index Reduction	Davide Stocco, Enrico Bertolazzi	18
15:50-16:10	Vladimir Aristov	Russia	Online	Computer Analogy Method and its Application for Solving Complex Systems of Differential Equations	Vladimir Aristov, Andrey Stroganov	184
16:10-16:30	Serife Faydaoglu	Turkey	Online	An Application of Frequency Formulation for Nonlinear Oscillators	Serife Faydaoglu	115



Special Session #18: Variational analysis and optimization methods with applications in finance and economics

(D. Barilla, T. Ciano) June 16, 2023: 14.30-16.10, Third Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 16, 2023: Third Room			<i>Chairs: David Barilla / Tiziana Ciano</i>			
14:30-14:50	Martin Bohner	USA	In-person	Multiplicity results for discrete fractional boundary value problems involving p-Laplacian operator	Martin Bohner, David Barilla, Shapour Heidarkhani	36
14:50-15:10	Shapour Heidarkhani	Iran	Online	Multiple solutions for the fractional p-LAPLACIAN elliptic Dirichlet problems	Shapour Heidarkhani, Martin Bohner, Giuseppe Caristi	29
15:10-15:30	Massimiliano Ferrara	Italy	In-person	Multi Criteria Decision Analysis, Hesitant Fuzzy Methodology and Expert Systems: some potential applications to financial markets dynamics	Massimiliano Ferrara, Tiziana Ciano	71
15:30-15:50	Nader Kanzi	Iran	In-person	A first-order optimality condition in nonsmooth generalized semi-infinite optimization	Nader Kanzi, Zahra Jafariani, David Barilla, Giuseppe Caristi	46
15:50-16:10	Giuseppe Caristi	Italy	In-person	Variational approaches for discrete partial mean curvature problems	Giuseppe Caristi, David Barilla, Shapour Heidarkhani	72



Regular Session #19: Numerical methods based on interval analysis
June 16, 2023: 9:00-10:00, Main Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 16, 2023: Main Room			<i>Chair: Julius Žilinskas</i>			
09:00-09:20	Milan Hladík	Czech Republic	In-person	Solvability issues of the absolute value equations in case of interval data	Milan Hladík	48
09:20-09:40	Miroslav Rada	Czech Republic	In-person	On the worst-case RSS in linear regression with interval outputs	Miroslav Rada	140
09:40-10:00	Elif Garajová	Czech Republic	In-person	Inside the Box: 0-1 Linear Programming under Interval Uncertainty	Elif Garajová, Milan Hladík	127



Regular Session #20: Numerical optimization and applications
June 15, 2023: 16.50-18.50, Second Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 15, 2023: Second Room			<i>Chair: Giovanni Fasano</i>			
16:50-17:10	Noureddine Kouaissah	Morocco	In-person	Designing an Optimal Offshore Wind Farm Location System with De Novo Programming and Simon's Satisficing Theory: Techniques and Practical Implementation	Noureddine Kouaissah, Amin Hocine	206
17:10-17:30	Angelo Lucia	USA	Online	Liver Machine Perfusion Policy Iteration Using Monte Carlo Optimization	Angelo Lucia, Jacob Cultrera, Alexandra Vasta, Korkut Uygun	25
17:30-17:50	Mahsa Yousefi	Italy	Online	A Stochastic Algorithm with Combined Search Directions in Deep Neural Network Training	Mahsa Yousefi, Angeles Martinez, Marco Viola	116
17:50-18:10	Lucia Cavallaro	Italy	In-person	Miniaturisation of Binary Classifiers through Sparse Neural Networks	Lucia Cavallaro, Tommaso Serafin, Antonio Liotta	55
18:10-18:30	Modestas Motiejuskas	Lithuania	Online	Optimization of EfficientNetV2 Models for Predicting Sadness Emotion	Modestas Motiejuskas, Gintautas Dzemyda	37
18:30-18:50	Paolo Lindia	Italy	In-person	How to deal with different densities of urban spatial data? A comparison of clustering approaches to detect city hotspots	Eugenio Cesario, Paolo Lindia, Andrea Vinci	188



Regular Session #21: Route optimization
June 16, 2023: 9:00-10:00, Second Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 16, 2023: Second Room			<i>Chair: Luigi Di Puglia Pugliese</i>			
09:00-09:20	Sara Mallah	Morocco	In-person	A heuristic solution approach for bulk port routing optimization	Sara Mallah, Oulaid Kamach, Malek Masmoudi, Ahmed Chebak	126
09:20-09:40	Luigi Di Puglia Pugliese	Italy	In-person	Crowd-shipping with uncertain travel times	Luigi Di Puglia Pugliese, Daniele Ferone, Macrina Giusy, Paola Festa, Francesca Guerriero	194
09:40-10:00	Renan Spencer Trindade	France	In-person	A comparison of formulations for aircraft deconfliction	Renan Spencer Trindade, Claudia D'Ambrosio	158



Regular Session #22: Optimal resource allocation
June 17, 2023: 9:00-10:20, Second Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 17, 2023: Second Room			<i>Chair: Dmitri Kvasov</i>			
09:00-09:20	Antonio Candelieri	Italy	In-person	Resource Allocation via Bayesian Optimization: an efficient alternative to Semi-Bandit Feedback	Antonio Candelieri, Andrea Ponti, Francesco Archetti	68
09:20-09:40	Ana Maria Rocha	Portugal	In-person	A genetic algorithm to optimize the dispatch of firefighting resources	Marina A. Matos, Ana Maria A. C. Rocha, Lino A. Costa, Filipe Alvelos	200
09:40-10:00	Roberto Battiti	Italy	In-person	Sequential Decision Modeling for Dynamic Pricing and Revenue Management in Hotels	Roberto Battiti	14
10:00-10:20	Julius Žilinskas	Lithuania	In-person	Discrete Facility Location with Ranking of Location Candidates Using High-Performance Computing Systems	Julius Žilinskas, Algirdas Lančinskas, Pascual Fernández, Blas Pelegrín	155



Regular Session #23: Numerical methods for combinatorial optimization problems
June 19, 2023: 9:00-10:20, Second Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 19, 2023: Second Room				<i>Chair: Igor Chernykh</i>		
09:00-09:20	Maria Sakhno	Russia	Online	Heuristics with Local Improvements for Two-processor Scheduling Problem with Energy Constraint and Parallelization	Maria Sakhno, Yulia Zakharova	45
09:20-09:40	Yulia Zakharova	Russia	Online	Population Local Search for Single Processor Energy Efficient Scheduling Problem	Yulia Zakharova	53
09:40-10:00	Aleksey Zakharov	Russia	Online	Optimal Recombination Problem in Genetic Programming for Boolean Functions	Aleksey Zakharov	104
10:00-10:20	Annalisa Socievole	Italy	In-person	Effective Resistance based Community Detection in Complex Networks	Annalisa Socievole, Clara Pizzuti	97



Regular Session #24: Foundations of numerical analysis
June 17, 2023: 9:00-10:00, Third Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 17, 2023: Third Room			<i>Chair: Lou D'Alotto</i>			
09:00-09:20	Qinmeng Zou	China	Online	Concentration inequalities and martingale inequalities for rounding error analysis	Qinmeng Zou	186
09:20-09:40	Daisuke Takahashi	Japan	In-person	On Dividing Fractions in Binary BBP-type Formulas for Mathematical Constants	Daisuke Takahashi	156
09:40-10:00	Gianluca Caterina	United States	In-person	Combinators as Observable Presheaves: a Characterization in the Grossone Framework.	Rocco Gangle, Fernando Tohmè, Gianluca Caterina	42



Regular Session #25: Dynamical systems and applications
June 19, 2023: 9:00-10:40, Third Room

Time	Speaker	Country	Mode	Title	Authors	#EquinOCS
June 19, 2023: Third Room				<i>Chair: Jānis Bajārs</i>		
09:00-09:20	Rizavel Addawe	Philippines	Online	Spatiotemporal Analysis of Influenza-like Illness in Baguio City	Rizavel C. Addawe	124
09:20-09:40	Joseph Ludwin Marigmen	Philippines	Online	Identifying Dengue Hotspots in Baguio City, Philippines through Spatiotemporal Analysis	Joseph Ludwin DC. Marigmen, Criselda P. Libatique, Jhun Paul T. Viernes, Junley L. Lazaga, Jean Milnard S. Punzalan, Rizavel C. Addawe	119
09:40-10:00	Boleslovas Dapkūnas	Lithuania	In-person	Influence of Bacterial Growth Rate on Pattern Formation in Aqueous Suspensions	Boleslovas Dapkūnas	105
10:00-10:20	Viktor Rukavishnikov	Russia	Online	Weighted finite element method and body of optimal parameters for one problem of the fracture mechanics	Viktor Rukavishnikov	3
10:20-10:40	Kirti Beniwal	India	Online	Gradient Fractional Physics Informed Neural Network for Solving Fractional Partial Differential Equation	Kirti Beniwal, Vivek Kumar	185



NUMTA 2023 plenary lectures and regular talks related to the grossone-based numerical infinities and infinitesimals

Time	Speaker	Room	Title
June 15, 12:00-13:00	Yaroslav Sergeyev	Main Room	Infinity computing: Foundations and practical computations with numerical infinities and infinitesimals
June 16, 11:00-12:00	Francesca Mazza	Main Room	Computing derivatives on the Infinity Computer
June 16, 12:00-13:00	Louis D'Alotto	Main Room	Infinite computations and Büchi automata using Grossone
June 16, 16:50-17:10	Davide Rizza	Second Room	Presentation of the book "Primi passi nell'Aritmetica dell'Infinito" Bonomo Editore, 2023
June 16, 17:10-17:30	Fabio Caldarola	Second Room	Infinite computing, fractals and space-filling curves
June 16, 17:30-17:50	Claudio Ternullo	Second Room	The Theory of Grossone and the Continuum Problem
June 16, 18:30-18:50	Francesco Ingarozza	Second Room	A new class of octagons
June 17, 09:40-10:00	Gianluca Caterina	Third Room	Combinators as Observable Presheaves: a Characterization in the Grossone Framework
June 17, 14:50-15:10	Alberto Falcone	Main Room	pyICL: A Python library for the Infinity Computer
June 17, 16:50-17:10	Fabio Caldarola	Third Room	Infinite computing and unimaginable numbers at school: Some class experimentations in Italy
June 17, 17:10-17:30	Francesco Ingarozza	Third Room	Unimaginable numbers: A case of study in Italian High School
June 17, 17:30-17:50	Corrado Mariano Marotta	Third Room	Game theory presented to Italian high school students in connection with infinite computing
June 17, 17:50-18:10	Davide Rizza	Third Room	The Arithmetic of Infinity and Reflective Enquiry
June 17, 18:10-18:30	Layla Nasr	Third Room	A Numerical Approach to Basic Calculus
June 17, 18:30-18:50	Maria Chiara Nasso	Second Room	Using Infinity Computer in Global Optimization
June 19, 17:50-18:50	Renato De Leone	Main Room	Use of Grossone in optimization, classification, and feature selection problems