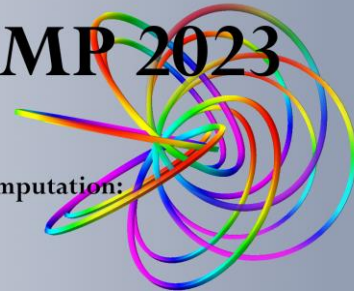




SYMCOMP 2023



6th International Conference on Numerical and Symbolic Computation:
Developments and Applications
30-31 March, Évora, Portugal

6th International Conference on Numerical and Symbolic Computation Developments and Applications

PROGRAM

March, 30 - 31,
UE – Universidade de Évora
Évora, Portugal





6th International Conference on Numerical and Symbolic Computation: Developments and Applications.

March 30- 31, 2023, UE, Évora, Portugal, @ECCOMAS.

SYMCOMP 2023 – 6th International Conference on Numerical and Symbolic Computation:
Developments and Applications

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Edited by APMTAC – Associação Portuguesa de Mecânica Teórica, Aplicada e Computacional

Editors: Maria Amélia Loja (IDMEC, ISEL-CIMOSM), Mourad Bezzeghoud (UEvora), Joaquim Infante
Barbosa (IDMEC, ISEL-CIMOSM), José Alberto Rodrigues (ISEL-CIMOSM, CIMA-UE)

March 2023





1 – Introduction

The Organizing Committee of SYMCOMP2023– 6th International Conference on Numerical and Symbolic Computation: Developments and Applications, welcomes all the participants and acknowledge the contribution of the authors to the success of this event.

This sixth International Conference on Numerical and Symbolic Computation, is promoted by APMTAC - Associação Portuguesa de Mecânica Teórica, Aplicada e Computacional and it was organized in the context of IDMEC - Instituto de Engenharia Mecânica, Instituto Superior Técnico, Universidade de Lisboa. With this ECCOMAS Thematic Conference it is intended to bring together academic and scientific communities that are involved with Numerical and Symbolic Computation in the most various scientific areas

SYMCOMP 2023 elects as main goals:

To establish the state of the art and point out innovative applications and guidelines on the use of Numerical and Symbolic Computation in the numerous fields of Knowledge, such as Engineering, Physics, Mathematics, Economy and Management, Architecture, ...

To promote the exchange of experiences and ideas and the dissemination of works developed within the wide scope of Numerical and Symbolic Computation.

To encourage the participation of young researchers in scientific conferences.

To facilitate the meeting of APMTAC members (Portuguese Society for Theoretical, Applied and Computational Mechanics) and other scientific organizations members dedicated to computation, and to encourage new memberships.

We invite all participants to keep a proactive attitude and dialoguing, exchanging and promoting ideas, discussing research topics presented and looking for new ways and possible partnerships to work to develop in the future.

The Executive Committee of SYMCOMP 2023 wishes to express his gratitude for the cooperation of all colleagues involved in various committees, the Scientific Committee, the Local Organizing Committee, the Mini-Symposia Organizers, the Executive Committee and the Secretariat. We hope everyone has enjoyed helping to consolidate this project, which we are sure will continue in the future. Our thanks to you all.

- Amélia Loja, Chairperson (IDMEC/LAETA, CIMOSM/ISEL)
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Registration on SYMCOMP2023

Until Thursday, 20/03/2023

PLACE OF THE EVENT

Instituto de Investigação e Formação Avançada (IIFA), Universidade de Évora, Palácio do Vimioso, Largo Marquês de Marialva, Apart. 94, 7002 - 554 Évora.

<https://www.google.com/maps/place/38.571588,-7.90718>



Coffee break

Coffee break will take place at the Conference hall and is open to all the participants. We ask you please to use always your identification.



6th International Conference on Numerical and Symbolic Computation: Developments and Applications.

March 30- 31, 2023, UE, Évora, Portugal, @ECCOMAS.

Lunches

The lunch will take place at restaurant located at Universidade de Évora, Colégio do Espírito Santo, Largo dos Colegiais, 2, Apartado 94, 7002-554 - Évora.

<https://www.google.com/maps/place/38.5731,-7.9044083>



Conference dinner

The Conference dinner will take place at the restaurant Cantares de Évora, Thursday, 20:00h.

Wolfram/Alpha Pro Awards will be delivered during the dinner.

Participants should arrive there by their own.

Further details will be provided during the conference.



Oral – In-person presentation

Online – Online live

THURSDAY, MARCH, 30 2023

IIFA - Institute for Research and Advanced Training - University of Évora

OPENING CEREMONY: 08:00 – 08:05 – (Room A)

SP 01 Online	PLENARY SESSION I (Room A) – CHAIR: Prof. Mourad Bezzeghoud <i>Overcoming Data Scarcity with Machine Learning Tools in Medical, Chemical, Energy, and Archaeology Applications</i> <i>Prof. Stéphane Bordas - Université du Luxembourg</i>	08:05 08:45
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SESSION I (Room A): Candidates to Young Researcher Award		08:45 – 09:30
CHAIR: Prof. Carlos Mota Soares		
ID	COMMUNICATION TITLE	AUTHORS
A01 Oral	Dynamic Analysis of Second Strain Gradient Nano-Waveguides	Bo Yang, M Bacciocchi, N Fantuzzi, R Luciano, F Fabbrocino
A29 Online	Remarks on Zeros of Paraorthogonal Polynomials	Kenier Castillo (MS4)
A05 Online	Symbolic Computation Applied to Some Operator Theory Problems	Jéssica Pires and Ana C. Conceição

SESSION II (Room A): Simulation and Optimization of Fluid Flow, Heat, and Mass Transfer I		09:30–10:30
CHAIR: Prof. Isabel Malico		
ID	COMMUNICATION TITLE	AUTHORS
A15 Oral	Simulation of a Recuperative Heat Exchanger Integrated in a Thermal Incinerator With the e-NTU Model	F Zdanowski, I Malico, P Canhoto, F Pécurto, P Lima
A17 Oral	Simulation of an Offset Wall Turbulent Jet Flow	F Zdanowski, Isabel Malico
A53 Oral	Lattice Boltzmann Modeling of Rotating Channel Flows	G Silva, V Semião
A32 Oral	On The Enhancement of Heat Transfer in a Backward-Facing Step Using Porous Baffles	S C Costa, F M. Janeiro, I Malico

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SESSION III (<i>Room B</i>): Numerical and Symbolic Computation in Mathematics and Engineering CHAIR: <i>Prof. Ana C. Conceição</i>		09:30–10:30
ID	COMMUNICATION TITLE	AUTHORS
A23 Online	Two Implementing Approaches for Singular Integrals: The SINT Case	P Martins, Ana C. Conceição, J Pires, T O Correa
A37 Online	Solving Nonlinear Regression Problems with Gauss-Newton's Method	Sara Domingos, C Coelho, Clara Cordeiro
A38 Online	A Hierarchical Matrix Approach to Compute Polynomial Approximation of Smooth Two-Dimensional Functions	N J. Lima, J M. A. Matos, Paulo B. Vasconcelos

ID	Invited Lecture I (<i>Room A</i>) – CHAIR: <i>Prof. Pedro Areias</i>	10.45 - 11.15
IL03 Oral	High Performance Computing Ecosystem <i>Prof. Miguel Avillez (University of Évora)</i>	

SESSION IV (<i>Room A</i>): Mini-Symposium in Applications Using Symbolic Computations CHAIR: <i>Prof. Rui Ruben and Prof. Eugénio Garção</i>		11.15–12.30
ID	COMMUNICATION TITLE	AUTHORS
A43 Oral	Universal Return Mapping from Homogenized Yield Functions Using a Regularized~Eikonal Equation	P Areias, R Melício, J M Guedes, H Rodrigues
A18 Oral	An Extended Piecewise Functions Formalism for Computing the Internal Forces and Deflections of Beams	José Garção, J I Barbosa
A09 Online	Introductory Truss and Beam Finite Element Solutions Using Symbolic Computation	Rui Ruben, Jorge Siopa
A16 Online	Numerical Methods at Biomechanics Degree from Polytechnic of Leiria	Carlos Campos
A24 Online	Neural Networks Under Design	A Ruiz, P Morales, A J. Tallón-Ballesteros, Luís Correia

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SESSION V (Room B): Orthogonal Polynomials, Special Functions, and Applications		11.15–12.30
CHAIR: Prof. Zélia da Rocha and Prof. Teresa Mesquita		
ID	COMMUNICATION TITLE	AUTHORS
A25 Online	Some Locations of Zeros of Perturbed Chebyshev Polynomials of Second Kind	Zélia da Rocha
A50 Online	Orthogonal Polynomials, Special Functions and Applications: Certain Extensions of a Result of Siegel	Pedro Ribeiro
A40 Oral	Some New Results on 2-Orthogonal Polynomial Solutions of a Third Order Differential Equation	Teresa A Mesquita
A51 Oral	Some Appell-Type Orthogonal Polynomials on Lattices	D. Mbouna

SP 02 Oral	PLENARY SESSION II (Room A) – CHAIR: Prof. Mouhaydine Tlemçani <i>Powerful Tool for Diagnostic of NLO Properties of Specific Multifunctional Materials for Nonlinear Optics and Nanophotonics Applications</i> <i>Prof. Bouchta Sahraoui - Université d'Angers</i>	14:00-14:45
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ID IL05 Oral	Invited Lecture II (Room A) – CHAIR: Prof. Isabel Malico Simulations of Nanoplastics in Water. Interactions with Water Pollutants <i>Prof. Alfredo Palace Carvalho (University of Évora)</i>	14.45 - 15.15
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SESSION VI (Room A): Computation Models in Mathematics, Finance and Economics		15.15–16.30
CHAIR: Prof. José Alberto Rodrigues		
ID	COMMUNICATION TITLE	AUTHORS
A46 Oral	A Credibility Framework for Extreme Value-At-Risk	Peter Mitic
A03 Online	Solving Partial Differential Problems with Tau Toolbox	N J. Lima, José M. A. Matos, Paulo B. Vasconcelos
A06 Oral	Maximum Value-At-Risk: Quantile Estimation	Peter Mitic

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SESSION VII (<i>Room B</i>): Signals, Instrumentation, and Measurement I		15.15–16.30
CHAIR: <i>Prof. Mouhaydine Tlemçani</i>		
ID	COMMUNICATION TITLE	AUTHORS
A42 <i>Oral</i>	The Role of Image Processing Application in the Determination of the Coseismic Deformation(3-D): A Case Study of the Orléansville Earthquake 9 September 1954 (Ms6.7, Chelif, Algeria)	Souhila Chabane, J Hollingsworth, H P Perfettini, M Bezzeghoud, M Tlemçani
A19 <i>Oral</i>	Forecasting of Forest Fires Through Machine Learning Model	M R Rashel, Md T Ahmed, Md S Ali, M Tlemçani, H M Ashfaque
A04 <i>Oral</i>	A Study of Thermal Regulations and Efficiency Analysis in Hybrid PVT Panel	Md Tofael Ahmed, M R Rashel, Md J Ahmed, M Tlemçani
A41 <i>Online</i>	The Effect of Environmental Parameters on the PV Material Structure	Mina Nezamisavojbolaghi, O Mesbahi, Amal Bouich, M Tlemçani

SESSION VIII (<i>Room A</i>): Simulation and Optimization of Fluid Flow, Heat and Mass Transfer II		16.45–18.00
CHAIR: <i>Prof. Isabel Malico</i>		
ID	COMMUNICATION TITLE	AUTHORS
A22 <i>Oral</i>	Modelling and Optimization of the Thermal Equipment Network of an Industrial Automotive Paint-Shop	F Alvarez, Paulo Canhoto, Isabel Malico, Rui Lima
A02 <i>Online</i>	Stabilization Of Fluid Flow Oldroyd-B Simulations Based on Eigenvalues of Conformation Tensor	Marília Pires and Tomás Bodnár
A28 <i>Online</i>	A General Methodology for Symbolically Generating Manufactured Solutions Satisfying Prescribed Conditions - Application to Two-Phase Flows Equations	D Henneaux, P Schrooyen, P Chatelain, T Magin

THURSDAY, MARCH, 30 2023

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SESSION IX (<i>RoomB</i>): Signals, Instrumentation, and Measurement II		16.45–18.00
CHAIR: Prof. Mouhaydine Tlemçani		
ID	COMMUNICATION TITLE	AUTHORS
A14 <i>Oral</i>	Analysis Of Geometric Algorithms and Their Implementation for Navigation Purposes	L Andrade, M Tlemçani, J Lourenço Saúde
A20 <i>Oral</i>	Probabilistic Cellular Automata and Binary Image Processing	Nada El Bouziani, C C Ramos, M Tlemçani, S Fernandes
A39 <i>Oral</i>	An Optimized Approach for Photovoltaic Parameters Extraction	O Mesbahi, M Tlemçani, F Janeiro
A12 <i>Oral</i>	Optimisation And Analysis of The Effect of Perovskite Solar Cell Degradation	Daruez Afonso, Oumaima Mesbahi, Amal Bouich and Mouhaydine Tlemçani

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ID	PLENARY SESSION III (Room A) – CHAIR: Prof. Sara Fernandes	
SP 03 Oral	<i>Numerical Tools In The Study Of Low Dimension Nonlinear Maps Prof. Daniele Fournier-Prunaret – INSA Toulouse, Université de Toulouse</i>	08.00 - 08.45

ID	Invited Lecture III (Room A) – CHAIR: Prof. Carlos Mota Soares	
IL02 Oral	<i>Uncertainty Quantification for Advanced Progressive Damage Models for Composites by Means of Efficient Emulators and Bootstrapping Prof. Giuseppe Catalanotti (University of Évora)</i>	08.45 - 09.15

SESSION X (Room A): Symbolic and Numerical Techniques and Applications		09.15 - 10.30
CHAIR: Prof. Mikhail Itskov and Prof. Eugénio Garção		
ID	COMMUNICATION TITLE	AUTHORS
A36 Oral	Symbolic Regression for Automated Hyperelastic Material Modelling	R Abdusalamov, Mikhail Itskov
A30 Oral	New Method of Finding Gaussian-Type Cubature Rules for Higher-Order Finite Elements	Weizhu Wang, S Papanicolopoulos
A35 Online	The Generalized Differential Quadrature for the Static and Dynamic Analysis Of Anisotropic Shells With General Boundary Conditions	M Viscoti, F Tornabene, Rossana Dimitri
A47 Online	Suitability of Microwave Photonic Mixer for the Suppression of Spurs in High Speed Optical Communication Systems	Anu Sheetal, H Singh, Harjit Singh, A Grover, and Meet Kumari
A49 Online	Design And Fabrication of Clean and Green Electrical Energy Generation Device	H Singh, A Sheetal, Jaspreet Kaur

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SESSION XI (Room B): Statistical Modelling in Mechanical Applications I		09.15 - 10.30
CHAIR: Prof. Alda Carvalho and Prof. Tiago Silva		
ID	COMMUNICATION TITLE	AUTHORS
A31 Oral	Free Vibration of Inplane FGM Plates: A Spatial Statistical Approach	Gonçalo Maia, Alda Carvalho
A21 Oral	A Bayesian Approach to Model Velocity Fields And Mass Flow Rates	R Cardoso, S C Costa, Cláudia Casaca, I Malico, Alda Carvalho
A11 Oral	Spatial Statistical Methods to Predict FGM Plates' Static Deflections	Ana Mota, Eugénio Garção. A Carvalho
A08 Oral	Data Expansion Towards Virtual Sensing	Ana Pereira, A Mendes, T Silva
A13 Oral	An Application of Time Series Clustering Using a Combined Distance	A Martins, D Vaz, T Silva, M Cardoso, Alda Carvalho

ID	<i>Invited Lecture IV (Room A) - CHAIR: Prof. Mouhaydine Tlemçani</i>	
IL01 Online	<i>Design and Modelling of an Intelligent System Based on Piezoelectric Materials for the Dual Control of the Load and the Gas Emissions of a Vehicle in Motion</i> <i>Prof. Madiha Yessari, Prof. Hajjaji Abdelwahed (Laboratory of Engineering Sciences for Energy, National School of Applied Sciences El Jadida,UCD, 24000 El Jadida, Maroc)</i>	10.45 - 11.15

SESSION XII (Room A): Computational Mechanics and Optimization Applications I		11.15 - 12.30
CHAIR: Prof. Inês Barbosa and Prof. Hugo Santos		
ID	COMMUNICATION TITLE	AUTHORS
A34 Online	A Dual Finite Element Formulation for the Dynamic Analysis of Euler-Bernoulli Beams Under Moving Loads	Hugo Santos
A52 Online	Numerical Analysis of Flatwise Two-Layer Composite Beams in Three Point Bending	Afonso Leite, Hugo Santos
A33 Oral	Mechanical Behavior of I-Shaped Beams Built from Functionally Graded Materials	André Carvalho, Inês Barbosa

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ID SP 04 Oral	PLENARY SESSION IV (Room A) – CHAIR: Prof. Carlos Mota Soares <i>The European Data Economy, High Performance Computing, Data Access And Sharing</i> <i>Prof. Maria da Graça Carvalho - Member of the European Parliament</i> <i>IST, University of Lisbon</i>	14.00 - 14.45
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ID IL04 Oral	Invited Lecture V (Room A) – CHAIR: Prof. Sara Fernandes <i>Nonlinear Phenomena - Symbolic Dynamics and Natural Computing</i> <i>Prof. Carlos Ramos (University of Évora)</i>	14.45 - 15.30
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SESSION XIV (Room A): Computational Methodologies in Health Applications CHAIR: Prof. R Natal Jorge and José Alberto Rodrigues		15.30 - 16.30
ID	COMMUNICATION TITLE	AUTHORS
A45 Online	The Effect of Different Environment Conditions in Tumour Proliferation: A Meshless Study	Maria I Barbosa, J Belinha, R Natal Jorge, A Carvalho
A48 Online	Multiscale Analysis of Gyroid and Primitive Structures	Ana Pais, Jorge Lino Alves and Jorge Belinha
A07 Oral	Wavelets Continuous Transform for ECG Classification	José A. Rodrigues, Beatriz Godinho
A26 Oral	Characterization of the Movement Associated with the Manipulation of a Microtome	Inês Barbosa, Cátia Carrajola, P Mendonça



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SESSION XV (Room B): Computational Mechanics and Optimization Applications II		15.30 - 16.30
CHAIR: Prof. Amélia Loja		
ID	COMMUNICATION TITLE	AUTHORS
A44 Oral	Bio-Inspired Optimization of Functionally Graded Truss and Frame Structures	Joana Gaspar, Amélia Loja, J I Barbosa
A10 Oral	Optimization of Discrete Functionally Graded Piezoelectric Structures Using Jellyfish Search	Pedro Marques, Amélia Loja
A27 Online	Study of the Influence of Convection Boundary Condition on the Damping Factor in a Thermoelastic Beam Using Solid Elements	André Carvalho

17:00 – 17:30 - Information about Submissions to Special Issues

**Mathematical and Computational Applications (MCA)
Mathematics in Computer Science (MCS) (in connection with SYMCOMP2023)**

17:30 – CLOSURE