



UNIVERSITAT
POLITÈCNICA
DE VALÈNCIA

im²

Instituto Universitario
de Matemática Multidisciplinar

MATHEMATICAL MODELLING IN ENGINEERING & HUMAN BEHAVIOUR 2022

July 13th-15th, 2022

ETS Informática, Rooms 1E.11 and 1E.12 , Building 1E,

Universitat Politècnica de València, València, Spain

Webpage: <https://imm.webs.upv.es/jornadas/2022/home.html>



Schedule

- Communications: 15 min (exposition) + 5 min (for questions).
- Plenary conference: 45 min (exposition) + 15 min (questions).

Wednesday, July 13th - Morning

08:00 - 09:30	REGISTRATION AND COLLECTION OF DOCUMENTATION	
09:30 - 10:00	OFFICIAL INAUGURATION Salón de Actos ETSINF Building 1E	
10:00 - 11:00	Plenary Conference: Leonardo Fernández-Jambrina Universidad Politécnica de Madrid Developable surface patches bounded by NURBS curves Chairman: <i>Juan Carlos Cortés</i> <u>Abstract</u>	
11:00 - 11:30	COFFEE BREAK Cafetería La Vella	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Parallel Session:</p> <p>MATRICES AND LINEAR ALGEBRA</p> <p>Room: 1E.11 <i>Antoni Vidal</i></p> </div> <div style="text-align: center;"> <p>Parallel Session:</p> <p>POPULATIONS MODELS</p> <p>Room: 1E.12 <i>Dolors Roselló</i></p> </div> </div>		
11:30 - 11:50	<p>José Mas Universitat Politècnica de València Pivoting in ISM factorization. <u>Abstract</u></p>	<p>Òscar Garibo i Orts VRAIN - Universitat Politècnica de València Inferring the nature of fractional Wu Baleanu trajectories. <u>Abstract</u></p>
11:50 - 12:10	<p>Emilio Defez Candel Universitat Politècnica de València On an accurate method to compute the matrix logarithm. <u>Abstract</u></p>	<p>Antonio Hervás Universitat Politècnica de València Detection of border communities using convolution techniques. <u>Abstract</u></p>
12:10 - 12:30	<p>Francisco Pedroche Universitat Politècnica de València A generalization of subdirect sums of matrices. <u>Abstract</u></p>	<p>Javier Díaz-Carnicero Universitat Politècnica de València Predictive model of the risk of hospital readmission to all-cause hospitalization using machine learning algorithms. <u>Abstract</u></p>

12:30 - 12:50	Begoña Cantó Universitat Politècnica de València Jordan structures of an upper block echelon matrix. Abstract	José Juan Cortes Plana University of Alicante A Computational Model to Aid Decision Making to Address the Spread of Xylella Fastidiosa. Abstract
12:50 - 13:10	Rafael Bru Universitat Politècnica de València Combined matrix of different types of matrices. Abstract	Susana Camacho Torregrosa Universitat Politècnica de València Mathematical modelling of frailty and dependency in basic activities of daily living in general population aged 70. Abstract
13:10 - 13:30	Cristina Jordan Universitat Politècnica de València A new iterative inverse display model. Abstract	Cristina Pérez Diukina Universitat Politècnica de València A reaction-diffusion system to model the population of Candida Auris in an Intensive Care Unit. Abstract
13:30 - 13:50	Antoni Vidal Ferrándiz Universitat Politècnica de València Preconditioning of real-valued formulations for complex linear systems applied to neutron noise equations. Abstract	Imanol Miguez Universitat Politècnica de València Model-free vs. model-based reinforcement learning: the quest for a mechanism of task-set inference. Abstract
13:50 - 14:10		Ikram Medjahdi University of Alicante Bifurcation analysis in dryland vegetation models with discrete and distributed delays. Abstract



Wednesday, July 13th - Afternoon

Parallel Session: MATHEMATICAL MODELLING IN CIVIL ENGINEERING Room: 1E.11 <i>Teresa Real</i>		Parallel Session: STOCHASTIC DIFFERENTIAL EQUATIONS I Room: 1E.12 <i>Juan Carlos Cortés</i>	
16:00 - 16:20	Laura Andrés López Catholic University of Murcia (UCAM) Relative research contributions towards the application and materialization of Wenner four-point method on concrete curing. Abstract	Roberto Ku-Carrillo Universidad Autónoma de Aguascalientes Analysis of a non-homogenous linear differential equation with Dirac's delta impulses using the Karhunen-Loève expansion. Abstract	ONLINE
16:20 - 16:40	Miriam Labrado Palomo Universitat Politècnica de València Performance analysis of the constructive optimization of railway stiffness transition zones by means of vibration studies. Abstract	Sandra E. Delgadillo-Alemán Universidad Autónoma de Aguascalientes A new distribution rule for allocation problems with priority agents using the least squares method. Abstract	ONLINE
16:40 - 17:00	Salvador Mateo Villalba Catholic University of Murcia (UCAM) Relative research contributions towards the characterization of scour in bridge piers based on operational modal analysis techniques. Abstract	Ioan-Lucian "1 Decembrie 1918" University of Alba Iulia A Linear Quadratic Tracking Problem for Impulsive Controlled Stochastic Systems. The Infinite Horizon Time Case. Abstract	
17:00 - 17:20	Eliseo Gómez Miralles Catholic University of Murcia (UCAM) Relative research contribution towards railways superstructure quality determination from the vehicles inertial response. Abstract	Lourdes Gómez-Valle Universidad de Valladolid The effect of memory on stochastic commodity futures pricing models. Abstract	
17:20 - 17:40	Juan Ramón Sánchez Vicedo Universitat Politècnica de València Inertial profilometer based on quarter-car model for predictive maintenance of roads by means artificial. Abstract	Sergio Blanes Universitat Politècnica de València Positivity-preserving methods for ordinary differential equations. Abstract	

<p>17:40 - 18:00</p>	<p>Alejandro Laignère Weber IDVIA 2020 Horizonte 2020 SL Application of mathematical models and multicriteria analysis to establish an optimized prioritization for the maintenance of bridges in a network. <u>Abstract</u></p>	<p>Bruno Brentan Federal University of Minas Gerais Clustering of rehabilitation alternatives for large intermittent water distribution systems. <u>Abstract</u> ONLINE</p>
<p>18:00 - 18:30</p>	<p>COFFEE BREAK Cafetería La Vella</p>	



Thursday, July 14th - Morning

Parallel Session: NUMERICAL METHODS I		Parallel Session: STUDENT'S PROJECTS I	
Room: 1E.11 <i>Alicia Cordero</i>		Room: 1E.12 <i>Joan Carles Micó</i>	
08:50 - 09:10	Fiza Zafar Bahauddin Zakariya University, Pakistan A Seventh Order Jarratt type Iterative Method for Solving Systems of Nonlinear Equations and Applications. Abstract	A. Bono, I. Cánovas, E. Gómez, R. Marco, A. Pérez, A. Sánchez and M. Valero Universitat Politècnica de València Predicting PDA battery health using machine learning method. Abstract	ONLINE
09:10 - 09:30	Puneet Sharma Goswami Ganesh Dutta Sanatan Dharma College Approximating Fixed Points by New and Fast Iterative Schemes. Abstract	Alejandro Ibáñez Peña Universitat Politècnica de València MIRNN (Multi-Instance Recommender Neural Net) for bin packaging problems. Abstract	ONLINE
09:30 - 09:50	Saima Yaseen Bahauddin Zakariya University, Pakistan A Seventh Order Family of Jarratt Type Iterative Methods for Solving Systems of Nonlinear Equations and its Application on Electrical Power System. Abstract	Carlos Gallego and Daniel Romero Universitat Politècnica de València Evaluating the sudden change in flight cancellations in Paris during November 2015. Abstract	ONLINE
09:50 - 10:10	Sana Sultana Bahauddin Zakariya University, Pakistan A Seventh Order Family of Steffensen Type Iterative Methods for Solving Systems of Nonlinear Equations and Application to Global Positioning Systems. Abstract	José Gellida Bayarri Universitat Politècnica de València City simulations in extraordinary circumstances. Abstract	ONLINE
10:10 - 10:30	Sonia Bhalla Chandigarh University, India A Multiplicative calculus approach to solve nonlinear equations. Abstract	X. Huang, L. Sebastián, D. Yaser and J. Zhang Universitat Politècnica de València Car accidents, how and why? Abstract	ONLINE
10:30 - 11:00	COFFEE BREAK Cafetería La Vella		

11:00 - 12:00	Plenary Conference: Changbum Chun Sungkyunkwan University Towards finding of the best methods for solving nonlinear equations <u>Abstract</u> Chairman: <i>Juan Ramón Torregrosa</i> Room 1E.01 ONLINE	
Parallel Session: NUMERICAL METHODS II Room 1E.11 <i>Francisco Chicharro</i>		Parallel Session: MULTIVARIATE MATHEMATICAL MODELS Room 1E.12 <i>Emilio Defez</i>
12:00 - 12:20	Daniel Pérez Palau Universidad Internacional de la Rioja Application of a polynomial algebra to non-linear equation solvers. <u>Abstract</u>	Javier Martínez Torres University of Vigo Can any side effects be detected as a result of the COVID-19 pandemic? A study based on social media posts from a Spanish Northwestern-region. <u>Abstract</u>
12:20 - 12:40	Eva García Villalba Universitat Politècnica de València Newton-Steffensen type methods obtained from operator decomposition. <u>Abstract</u>	Javier Martínez Torres University of Vigo Multivariate functional data analysis for outlier detection in environmental data. <u>Abstract</u>
12:40 - 13:00	Paula Triguero Navarro Universitat Politècnica de València Modifying Kurchatov's method to find multiple roots. <u>Abstract</u>	Regino Criado Universidad Rey Juan Carlos New tools and structures for linguistic pattern analysis: From multilayer networks to hypergraphs. <u>Abstract</u>
13:00 - 13:20	Óscar Angulo Universitat de Valladolid Numerical simulation of a consumer model with delayed resource. <u>Abstract</u>	Eva Primo Universidad Rey Juan Carlos A new model for the spread of cyberepidemics. <u>Abstract</u>
13:20 - 13:40	Gurjeet Singh Chandigarh University, India Higher-order multiplicative derivative iterative scheme to solve the nonlinear problems. <u>Abstract</u>	Paulino José García Nieto University of Oviedo Modelling energy performance of residential dwellings by using the MARS technique, SVM-based approach, MLP neural network and M5 model tree. <u>Abstract</u>
13:40 - 14:00		Gonzalo Contreras Aso Universidad Rey Juan Carlos The geometry behind PageRank rankings. <u>Abstract</u>

Thursday, July 14th - Afternoon

Parallel Session: NUMERICAL METHODS III Room: 1E.11 <i>Juan Ramón Torregrosa</i>		Parallel Session: GRAPH THEORY'S STUDENTS Room: 1E.12 <i>Cristina Jordán</i>	
16:00	Neus Garrido Sáez Universitat Politècnica de València Dynamical analysis of a family of Traub-type iterative methods for solving nonlinear problems. Abstract		
16:20	José Javier Padilla Abellán Catholic University of Murcia (UCAM) Higher order numerical methods for addressing an embedded steel constitutive model. Abstract	Hugo Albert and Pablo Sánchez Universitat Politècnica de València Infecting a cluster network with graph theory. Abstract	ONLINE
16:40	Ángel Alberto Magreñán Ruiz Universidad de La Rioja A modification of the secant method using a symmetric divided difference. Abstract	Damián O. Vaño and Reyes Fornas Universitat Politècnica de València Harry Potter and the relics of the graphs. Abstract	ONLINE
17:00	Marlon Ernesto Moscoso Universitat Politècnica de València Dynamical analysis of a new sixth-order parametric family for solving nonlinear systems of equations. Abstract	Iván Arcos and Jaime Pérez Universitat Politècnica de València An approach to the optimization of a new transport service using graph and network theory. Abstract	ONLINE
17:20	Giro Candelario Instituto Tecnológico de Santo Domingo Multidimensional extension of conformable fractional iterative methods for solving nonlinear problems. Abstract	Lucia López and Elsa Blasco Universitat Politècnica de València Solving a crime with graphs. Abstract	ONLINE
17:40	Amanda Patrick University of Texas at Arlington Uncovering dynamics of a wound: A model of the inflammation response. Abstract		ONLINE
18:00			COFFEE BREAK Cafetería La Vella
18:30			

Friday, July 15th - Morning

Parallel Session: STOCHASTIC DIFFERENTIAL EQUATIONS II Room: 1E.11 <i>Rafael Villanueva</i>		Parallel Session: MECHANICS AND OTHER MODELS Room: 1E.12 <i>Francisco Pedroche</i>	
8:40 - 9:00	Elena López Navarro Universitat Politècnica de València Probabilistic analysis of a cantilever beam with load modelled via Brownian motion. Abstract	Carlos Velásquez University of Alicante Mathematical model for heat transfer and stabilization of LED lamps for measurements in a laboratory. Abstract	ONLINE
9:00 - 9:20	Jesús Martín-Vaquero Universidad de Salamanca Extrapolated alternate direction implicit-explicit for nonlinear parabolic PDEs. Abstract	Daniel Villalibre Universitat Politècnica de València Basins of Convergence in a Modified CR3BP. Abstract	
9:20 - 9:40	Clara Burgos Simón Universitat Politècnica de València Random Fractional Hermite Differential Equation: A full study in mean square sense. Abstract	Michael M. Tung Universitat Politècnica de València The Relativistic Anharmonic Oscillator within a Double-Well Potential. Abstract	
9:40 - 10:00	Vicente J. Bevia Escrig Universitat Politècnica de València Probabilistic analysis of scalar random differential equations with state-dependent impulsive terms via probability density functions. Abstract	Joan C. Micó Universitat Politècnica de València First Order Hamiltonian Systems. Abstract	
10:00 - 10:20	Jorge Herrera de la Cruz Universidad CEU San Pablo A computational stochastic dynamic model to assess the risk of breakup in a romantic relationship. Abstract	Tomáš Náhlík Institute of Technology and Business Model of Whole Cardan Mechanism. Abstract	
10:20 - 10:40	Sorina Madalina Sferle Universitat Politècnica de València Probabilistic analysis of a randomized general random kinetic model: Theory and Application to a real case. Abstract	Màrius Josep Fullana i Alfonso Universitat Politècnica de València Computational Tools in Cosmology. Abstract	

10:40 - 11:00	Jiaohui Xu Universitat de Sevilla Time fractional 2D-Navier-Stokes equations with colored noise and delay. <u>Abstract</u>	Joan Carles Micó Universitat Politècnica de València Short term happiness dynamics as a consequence of an alcohol or caffeine intake. <u>Abstract</u>
11:00 - 11:30	COFFEE BREAK Cafetería La Vella	
Parallel Session: MATEMATICAL MODELLING Room: 1E.12 <i>Juan Carlos Cortés</i>		
Parallel Session: MATEMATICAL MODELS IN MEDICINE Room: 1E.11 <i>Alicia Herrero</i>		
11:30 - 11:50	Juan Ángel Aledo Universidad de Castilla-La Mancha Aggregating Partial Rankings: The Optimal Bucket Order Problem. <u>Abstract</u>	Fabio Pasin Instituto de Biología Molecular y Celular de Plantas (IBMCP), CSIC-UPV Modeling replication and immune evasion dynamics of a picorna-like RNA virus. <u>Abstract</u>
11:50 - 12:10	Silvia Jerez CIMAT, México Degenerate parabolic conservation laws: Entropy stable schemes. <u>Abstract</u>	Carlos Andreu-Villarraig Universitat Politècnica de València Impact of antibiotic consumption on the dynamic evolution of antibiotic resistance: the colistin-resistant <i>Acinetobacter baumannii</i> case. <u>Abstract</u>
12:10 - 12:30	Francisco Solís CIMAT, México Polyhedrons generation by mechanisms of Repulsion. <u>Abstract</u>	Bárbara Latorre Scilingo Universitat Politècnica de València Application of Data Envelopment Analysis to the evaluation of biotechnological companies. <u>Abstract</u>
12:30 - 13:30	Plenary Conference: Tomás Caraballo Universidad de Sevilla A nonlocal reaction-diffusion problem with memory <u>Abstract</u> Chairman: <i>Juan Carlos Cortés</i> Room: 1E.11	
13:30 - 14:00	CLOSING OF THE CONGRESS	
14:00	LUNCH OF THE CONFERENCE Cafeteria La Vella	