



GENERALITAT
VALENCIANA



MATHEMATICAL MODELLING IN ENGINEERING & HUMAN BEHAVIOUR 2015

September 9th-11th, 2015

Instituto Universitario de Matemática Multidisciplinar, (*)

Universitat Politècnica de València, 46022 Valencia, Spain

Building 8G, 2º Floor, access A and C

Webpage: <http://jornadas.imm.upv.es>

Schedule

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

Wednesday 9th

10:00-13:00	REGISTRATION (Venue: IMM)	
	Parallel session: MATHEMATICAL MODELLING OF COMBUSTION ENGINES (Venue: RED CUBE) <i>Chairman: A. J. Torrerosa</i>	Parallel session: MATHEMATICAL MODELLING IN TRANSPORTATION I (VENUE: YELLOW CUBE) <i>Chairman: J. Real</i>
15:30-15:50	David Jaramillo, CMT, Computational study on the influence of convergent-divergent orifices on the inner flow and cavitation development in diesel injector nozzles.	Silvia Morales, IMM, Assessment of train derailment risk in ballasted and slab tracks with failed fasteners.
15:50 - 16:10	Pedro Martí-Aldaraví, CMT-Motores Térmicos, Numerical simulation of nozzle flow coupled with spray for a diesel injector using an Eulerian spray atomization model.	José Luis Velarte, IMM, Vibrations induced on the railway structure by the vehicle passage on a turnout. Study of mitigation measures.
16:10 - 16:30	Manuel Hernández, CMT-Motores Térmicos, Implementation/adaptation of a total variation diminishing scheme to a non-linear 1D finite volume method for engine gas-exchange modelling.	Teresa Real, IMM, Finite element analysis of transitions between ballasted tracks and slab tracks in a tram line.
16:30 - 16:50	Daniel Tarí, CMT-Motores Térmicos, An approach for extrapolating turbocharger compressor performance maps for engine simulations.	Fran Ribes, IMM, Comparison between analytical and numerical models to predict vibrations in railway tunnels.

16:50 – 17:10	Javier Martínez, Politecnico di Milano , Study of the influence of momentum interpolation methods in the SIMPLE algorithm for incompressible flows by an open-source CFD code	Regino Criado, Univ. Rey Juan Carlos , Nodes vs. Links: some relationships between a network and its linegraph.
17:10 – 17:30	COFFEE BREAK	
	Parallel session: NUMERICAL & ANALYTICAL METHODS (Venue: RED CUBE) <i>Chairman: J. C. Cortés</i>	Parallel session: MATHEMATICAL MODELLING IN TRANSPORTATION II (Venue: YELLOW CUBE) <i>Chairman: T. Real</i>
17:30 – 17:50	José Luis Hueso, IMM , New iterative splitting methods for partial differential equations.	Julia Real, IMM , Influence of rail corrugation on the vibrations induced by traffic loads.
17:50- 18:10	Néstor Thome, IMM , The inverse problem associated to $\{K, s+1\}$ -potent matrices.	José Martínez-Casas, UPV , Improved railway wheelset-track interaction model in the high-frequency domain.
18:10- 18:30	José Marín, IMM , A two-level LU preconditioner for electromagnetism applications.	Alberto Fraile, University of Zaragoza , Factors affecting the choice modal of transportation in an urban environment. Hierarchical multi-criteria analysis.
18:30- 18:50	Alicia Cordero, IMM , Dynamical tools for better understanding the stability of high-order methods for solving multidimensional problems.	Beatriz Royo, University of Zaragoza , Mixed truck delivery systems with both Hub-and-Spoke and direct shipment.
18:50- 19:10	Ángel Alberto Magreñán, Univ.	Lucia Hilario, Univ. CEU Cardenal Herrera , A tensor

	Internacional de La Rioja , On the convergence of a higher order family of methods and its dynamics.	Bézier shape deformation for cluttered and uncertain spaces.
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Thursday 10th

9:00-9:15	OPENING (Venue: RED CUBE)	
9.15-9:45	Catherine E. Powell, University of Manchester, UK , Stochastic Galerkin Finite Element Methods for PDEs with Uncertain Parameters: fast solvers and accurate error estimation.	
	Parallel session: MATHEMATICAL MODELLING OF WATER DISTRIBUTION (Venue: RED CUBE) <i>Chairman: D. Ginestar</i>	Parallel session: MATHEMATICAL MODELS IN BUSINESS I (Venue: YELLOW CUBE) <i>Chairman: R. Company</i>
9:45 – 10:05	Enrique Campbell, Fluing-IMM , A novel framework to sectorize water supply networks considering uncertainties.	Antoni Falcó, Univ. CEU Cardenal Herrera , Pricing American bond options using a Cranck-Nicholson method.
10:05-10:25	Bruno Melo, University of Campinas, Brazil , Real-time water demand forecasting using adaptive Fourier series.	Vera Egorova, IMM , Computing American options in regime switching model using front-fixing transformation.
10:25-10:45	Amilkar E. Ilaya-Aiza, Fluing-IMM , Schedule management in intermittent water supply systems using multi-criteria optimization.	Vicent Caballer, INECO, UPV , Modeling of health care costs and expenditures for risk adjustment.
10:45-	Joaquín Izquierdo, Fluing-	Daniel Castelló, UPV , Efficient

11:05	IMM , Particle swarm optimization applied to optimal management of pumps and pressure control valves for real-time control in water supply systems.	investment program in the chain holding wine-winery.
11:05-11:25	Rafael Pérez-García, Fluing-IMM , Heuristic framework to jointly calibrate leakages and pressure in water distribution systems.	Raúl G. Sanchís, Carlos III University , Pricing strategy versus shopping behavior under market price dispersion.
11:30-12:00	COFFEE BREAK	
	Parallel Session: MATHEMATICAL MODELS IN ENGINEERING I (Venue: RED CUBE) <i>Chairman: J. L. Hueso</i>	Parallel session: MATHEMATICAL MODELS IN MEDICINE & BIOLOGY I (Venue: YELLOW CUBE) <i>Chairman: F. J. Solis</i>
12:00-12:20	Pedro Alonso, DSIC , Efficient and accurate algorithms for computing matrix trigonometric functions.	M. V. Sebastián, Centro Universitario de la Defensa, Zaragoza , Evaluation of brain activity during military simulation tasks by means of electroencephalographic quantification.
12:20-12:40	Muaz Seydaoglu, Muş Alparslan University, Turkey , On the matrix Hill's equation and its application to engineering models.	Paulino J. García-Nieto, Univ. of Oviedo , Hybrid wavelet support vector machine and artificial bee colony for predicting the cyanotoxin content from experimental cyanobacteria concentrations in the Trasona reservoir.
12:40-13:00	Cristina Santamaría, IMM , Managing dependence in flowgraph models. An application to reliability engineering.	Karina Gibert, Univ. Politècnica de Catalunya , On the profiling of borderline personality disorder with clustering based on rules and clusters post-conceptualization.
	Plenary Talk	

	<p align="center">(Venue: RED CUBE)</p> <p align="center"><i>Chairman: J. C. Cortés</i></p>	
15:45-16:15	<p>Laura Villafuerte, Univ. Autónoma de Chiapas, Mexico, Solving the Bessel random differential equation: A mean square approach.</p>	
	<p align="center">Parallel Session:</p> <p align="center">RANDOM DIFFERENTIAL EQUATIONS</p> <p align="center">(Venue: RED CUBE)</p> <p align="center"><i>Chairman: J. C. Cortés</i></p>	<p align="center">Parallel Session:</p> <p align="center">MATHEMATICAL MODELS IN MEDICINE & BIOLOGY II</p> <p align="center">(Venue: YELLOW CUBE)</p> <p align="center"><i>Chairman: B. M. Chen-Charpentier</i></p>
16:15 - 16:35	<p>Ana Navarro, IMM, Bernoulli differential equation: Probabilistic analysis and computing.</p>	<p>Óscar Angulo, Univ. of Valladolid, A second order numerical method for a size-structured cell population model with asymmetric division.</p>
16:35 - 16:55	<p>David Escuín, Aragon Institute of Technology, A stochastic capacitated lot sizing problem under vendor managed inventory for the paper industry.</p>	<p>Roberto A. Ku-Carrillo, Univ. Autónoma de Aguascalientes, Mexico, An optimal control model for the effect of the obesity in an immunogenic cancer.</p>
16:55-17:15	<p>María A. Castro, Univ. of Alicante, Mean square solutions of vegetation models with random and delay effects.</p>	<p>Štěpán Papáček, Univ. of South Bohemia, Closed-form formulae vs. PDE based numerical solution for the FRAP data processing: Theoretical and practical comparison.</p>
17:15 - 17:45		

COFFEE BREAK		
	<p>Parallel Session:</p> <p>MATHEMATICAL MODELS IN ENGINEERING II</p> <p>(Venue: RED CUBE)</p> <p><i>Chairman: D. Ginestar</i></p>	<p>Parallel Session:</p> <p>MATHEMATICAL MODELS IN BUSINESS II</p> <p>(Venue: YELLOW CUBE)</p> <p><i>Chairman: E. de la Poza</i></p>
17:45 - 18:05	<p>Antoni Vidal, IMM, A Schwarz preconditioner for the neutron diffusion equation.</p>	<p>David Ciprés, Aragon Institute of Technology, A resource-constrained scheduling problem to optimize the use of resources in a distribution center with genetic algorithms.</p>
18:05- 18:25	<p>Álvaro Bernal, ISIRYM, UPV, A polynomial expansion method based on Helmholtz equation for the neutron diffusion equation discretized by the Finite Volume Method.</p>	<p>Mohamed Fakharany, IMM, Positive numerical solution of two asset jump-diffusion partial-integro differential models.</p>
18:25- 18:45	<p>Fidel Aznar, Univ. of Alicante, Microscopic and macroscopic models for gas leak detection.</p>	<p>Isabel Barrachina, UPV, Modelling the survival of the Spanish construction SME in a crisis environment.</p>
18:45- 19:05	<p>Pedro J. Blázquez, UNIR, La Rioja, Adaptability of the acoustics of a room by varying the height of the acoustic ceiling.</p>	<p>Lourdes Gómez-Valle, Univ. of Valladolid, Valuation of commodity derivatives under jump-diffusion processes.</p>
19:05- 19:25	<p>Francisco Moreno, Univ. Nacional de Colombia, An algorithm for</p>	<p>Paulino J. García, Univ. of Oviedo, An algorithm for quasi-linear control problems in the economics of renewable resources.</p>

	trajectory semantic similarity.	
19:25-19:45	Celestino Ordóñez, Univ. of Oviedo , Missing data imputation of questionnaires by means of genetic algorithms	Nicolás Montes, Univ. CEU Cardenal Herrera , A new mathematical model for automated production lines based on probabilistic subcycle times.

Friday 11th

	Session: Plenary Talks (Venue: RED CUBE) <i>Chairman: J. C. Cortés</i>	
9:15-9:45	Benito M. Charpetier, Univ. of Texas at Arlington , Modeling plant virus propagation with delays.	
9:45-10:15	Francisco J. Solis, CIMAT, Mexico , A numerical approach for a model of the precancer lesions by the Human Papillomavirus.	
	Session: SOCIAL MODELS (Venue: RED CUBE) <i>Chairman: E. de la Poza</i>	Session: MATHEMATICAL MODELS IN MEDICINE & BIOLOGY III (Venue: YELLOW CUBE) <i>Chairman: J. C. Cortés</i>
10:15 - 10:30	Agustín Peralt, Univ. Europea de Valencia , Applying structural equation model at co-creation in degree programs in Ecuatorian University.	Rafael J. Villanueva, IMM , Classifying epidemiological behaviour using the ROC method.
10:30-10:45	Antonio Hervás, IMM , Applying a graph model for the Spanish public university	Guillermo Ayala, Univ. of Valencia , Internal lubricant content in inhalation capsules.

	system.	
10:45-11:00		Ismael Baeza, Univ. de Valencia, Capturing the Subjacent Risk of Death from a Population: The Wavelet Approximation.
11:00-11:30	COFFEE BREAK	
	Session: SOCIAL MODELS (Venue: RED CUBE) <i>Chairman: R. J. Villanueva</i>	Session: MATHEMATICAL MODELS IN MEDICINE & BIOLOGY IV (Venue: YELLOW CUBE) <i>Chairman: L. Villafuerte</i>
11:30-11:50	Tanja Deutsch, Bergische Univ. Wuppertal, Mathematical modeling of radicalization processes: the example of right-wing extremism in Germany	Miguel A. Piqueras, IMM, A front-fixing numerical method for a free boundary nonlinear diffusion logistic model.
11:50-12:10	Elena de la Poza, UPV, Modelling the spread of gender violence in Spain.	Begoña Cantó, IMM, Analysis of a class of discrete SIR epidemic models.
12:10-12:30	Pedro J. Gutiérrez, Univ. of Valladolid, An agent-based model of rational optimism.	Francisco Reyes Santías, Univ. Vigo, Calculated forecast for technical obsolescence in computerized tomography equipment.
	Session: MATHEMATICAL MODELS IN CELESTIAL MECHANICS	Session: COMPUTATIONAL MODELS (Venue: YELLOW CUBE) <i>Chairman: L. Villafuerte</i>

	<p>(Venue: RED CUBE)</p> <p><i>Chairman: S. Blanes</i></p>	
12:30-12:45	<p>José A. López-Ortí, Univ. Jaume I, Analysis of the efficiency of a new one-parametric family of geometric transformations for the study of the orbital motion.</p>	<p>Francisco J. Mora, Univ. of Alicante, Formalization of a multi-agent system using Z notation: Application to a system for oil spill location.</p>
12:45-13:00	<p>Luis Acedo, IMM, Modeling planetary and spacecraft anomalies in the Solar System.</p>	<p>Higinio Mora, Univ. of Alicante, Mathematical model and implementation of rational processing.</p>
<p>LUNCH OF THE CONFERENCE</p>		