MATHEMATICAL MODELLING IN ENGINEERING & HUMAN BEHAVIOUR 2013

September 4th-6th, 2013

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 4th

10:00-13:00	**REGISTRATION (Venue: IMM)**	
	Parallel session: Mathematical Models in Engineering I **(Venue: RED CUBE)** *Chairman: J. R. Torregrosa*	**Parallel session: Numerical Methods I (VENUE: YELLOW CUBE)** *Chairman: M. Ehrhardt*
16:00-16:20	**Manuel Abad (IMM, UPV),** Eight-order iterative methods for solving nonlinear systems.	**Óscar Angulo (Univ. of Valladolid)**, Efficient integrator for a size-structured cell population

(*) Some parts of this Conference are an event of ITN Research Project STRIKE - Novel Methods in Computational Finance, supported by the European Union in FP7-PEOPLE-2012 Marie Curie Action under Number 304617.

	Application to the Global Positioning System.	model.
16:20 - 16:40	**Gabriel López (Univ. of Alicante)**, A formal model for the design of integrated virtual worlds.	**José Luis Sánchez-Romero (Univ. of Alicante)**, Comparing the results of applying shift-add methods on engineering calculations.
16:40 - 17:00	**Francisco Moreno (Univ. Nacional de Colombia)**, A formal model to identify patterns of movement in sets of moving objects.	**Emilio Defez (Instituto de Matemática Multidisciplinar)**, Solving engineering models which use hyperbolic sine and cosine matrix functions.
17:00 - 17:20	**José Antonio López-Ortí (Univ. Jaume I de Castellón)**, A study about the numerical integration of the elliptical orbital motion based on a special one-parametric family of anomalies.	**Carles Teruel (Instituto de Matemática Multidisciplinar)**, Efficiently increasing the order of an iterative method for nonlinear equations.
17:30 - 18:00	COFFEE BREAK	
	Parallel session: Mathematical Models in Engineering I **(Venue: RED CUBE)** *Chairman: J. R. Torregrosa*	**Parallel session: Numerical Methods I** **(Venue: YELLOW CUBE)** *Chairman: M. Ehrhardt*
18:00 - 18:20	**Álvaro Bernal (UPV, Spain)**, Resolution of the generalized eigenvalue problem in the neutron diffusion equation discretized by the Finite Volume Method.	**María de los Ángeles Castro (IMM,UPV)**, Exact and analytic-numerical solutions of lagging models of heat transfer in a semi-infinite medium.

Thursday 5th

	Session: Social Models I (Venue: RED CUBE) *Chairman: J. C. Cortés*
8.45-9:05	**Antonio Hervás (Instituto de Matemática Multidisciplinar)**, A model of structural equations for the analysis of the factors related to the choice of Engineering grades at the UPV.

9:05-9:25	**Raúl Sanchís (Univ. Complutense de Madrid)**, Maximizing and satisficing in a choice model based on time allocation.
9:25 - 9:45	**Francisco Pedroche (Instituto de Matemática Multidisciplinar)**, A model of weighted average consensus in multiplex networks.
9:45-10:05	**Adriana Pricop (Instituto de Matemática Multidisciplinar)**, How long the two-party system last in Spain ?.
10:05-10:25	**Juan Alegre (Instituto de Matemática Multidisciplinar)**, Agent-based model to study the evolution of Android malware infection.
10:25-10:45	**Francisco Reyes-Santías (Instituto Universitario de Ciencias Neurológicas)**, Hospital performance evaluation in an EU region: A super-efficiency data envelope analysis model.
11:00-11:30	COFFEE BREAK
	Session: Novel Methods in Computational Finance I **(Venue: RED CUBE)** *Chairman: R. Company*
11:30-11:50	**Paulino García-Nieto (Univ. of Oviedo)**, The operation of Infimal/Supremal convolution in mathematical economics.
11:50-12:10	**Roberto Cervelló (Dpt. Economics and Social Sciences, UPV)**, Forecasting Latin America's country risk scores by means of a dynamic diffusion model.
12:10-12:30	**Karina Gibert (Univ. Politècnica de Catalunya)**, Data mining and post-processing tools to extract comprehensible patterns from Venezuelan Financial Assets.
12:30-12:50	**Benito Chen-Charpentier (Univ. of Texas at Arlington)**, A fractional order financial model for awareness and trial advertising decisions.
12:50-13:10	**Francisco Guijarro (Facultad de ADE, UPV)**, Predicting insolvency in Spanish companies applying multivariate analysis.
13:10-13:30	**Lourdes Gómez-del-Valle (Univ. of Valladolid)**, Jump-diffusion term structure models: some results.

	Session: Novel Methods in Computational Finance II **(Venue: RED CUBE)** *Chairman: M. Ehrhardt*	**Session: Mathematical Models in Engineering II** **(Venue: YELLOW CUBE)** *Chairman: K. Gibert*
15:30 - 15:50	**Carlos Vázquez (University A Coruña)**, New numerical methods for pricing fixed-rate mortgages with prepayment and default options.	**Manuel Herrera (Univ. Libre de Bruxelles)**, Kernel spectral clustering for identifying vulnerable areas of biofilm development in drinking water

		distribution systems.
15:50 - 16:10	**Matthias Ehrhardt (Univ. Wuppertal)**, A general approach for stochastic correlations using hyperbolic functions.	**Cristina Jordán (Instituto de Matemática Multidisciplinar)**, A method to set tube zones for maximizing benefits.
16:10-16:30	**Maria do Rosàrio Grossinho (Technical University of Lisbon)**. Approximation of a Black-Scholes type equation in unbounded domains.	**David Ayala (Instituto de Matemática Multidisciplinar)**, Error analysis of some demand simplifications in hydraulic models of water supply systems.
16:30-16:50	**Ljudmila Bordag (University of Applied Sciences Zittau/Görlitz)**, Optimal allocation-consumption problem for a portfolio with an illiquid asset.	**María José Rúa Aguilar (Instituto de Matemática Multidisciplinar)**, Using the energy rating software for Mathematical modelling of the costs of construction and energy in a simulated home.
16:50-17:10	**Mohamed Fakharany (Instituto de Matemática Multidisciplinar)**, Numerical valuation of infinite activity Lévy option pricing models.	**Sofia Carlos (Dpt. Nuclear and Chemical Engineering, UPV)**, Dynamic prediction of failures. A comparison of methodologies for a wind turbine.
17:30 - 18:00	COFFEE BREAK	
	Session: Novel Methods in Computational Finance II **(Venue: RED CUBE)** *Chairman: C. Vázquez*	**Session: Mathematical Models in Engineering II** **(Venue: YELLOW CUBE)** *Chairman: D. Roselló*
18:00 - 18:20	**Radoslav Valkov (Universityof Sofia, Bulgaria)**, American option pricing problem transformed on finite interval.	**José Vicente Romero (Instituto de Matemática Multidisciplinar)**, Study of two different types of diesel injector nozzles by CFD: Internal flow comparison of microsac and VCO nozzle in cavitating and non-cavitating conditions.
18:20-18:40	**Lubin Valkov (Ruse University, Bulgaria)**, Splitting numerical schemes for non-linear models of mathematical finance.	**Andrea Montorfano (Politecnico di Torino)**, Implementation of a fully parallel algorithm for topologically changing mesh to apply to LES simulation of IC engines.

18:40-19:00	**Sona Kilianova (Comenius University, Slovakia),** Dynamic Worst Case Portfolio Optimization via a Hamilton-Jacobi-Bellman Equation	**Ramón Rizo (Univ. of Alicante)**, Modelling oil-spill detection with swarm drones.
19:00-19:20		**Celestino Ordóñez (Univ. of Oviedo)**, Forecasting SO_2 pollution incidents by means of Elman artificial neural networks and ARIMA models.

Friday 6th

	Session: Medicine Models I (Venue: RED CUBE) *Chairman: B.M. Chen-Charpentier*
8:45-9:05	**Amadeo Iborra (Instituto de Matemática Multidisciplinar)**, Analysis of noise for the Sparse Givens method in CT medical image reconstruction.
9:05-9:25	**Cristina Santamaría (Instituto de Matemática Multidisciplinar)**, Modelling the evolution of non muscle invasive bladder carcinoma using flowgraphs.
9:25 - 9:45	**José Luis Hueso (Instituto de Matemática Multidisciplinar)**, Semi-automatic segmentation of IVUS images for the diagnosis of cardiac allograft vasculopathy.
9:45 - 10:05	**Carla Sancho (Centro de Investigación en Economía y Gestión de la Salud, UPV)**, Mathematical modelling for cost-effectiveness analysis of extracorporeal shockwave lithotripsy versus intracorporeal flexible ureteroscopic laser lithotripsy in ureteral litiasis treatment.
10:05-10:25	**Mohammed Alkasadi (Instituto de Matemática Multidisciplinar)**, A mathematical model to forecast the female plastic surgery consumption in Spain.
10:30-11:00	COFFEE BREAK
	Session: Medicine Models II (Venue: RED CUBE) *Chairman: B. M. Chen-Charpentier*
11:00-11:20	**José Antonio Moraño (Instituto de Matemática Multidisciplinar)**, Epidemic random network simulations in a distributed computing environment.
11:20-11:40	**Rafael Villanueva (Instituto de Matemática Multidisciplinar),** Pertinence of a change in the meningococcal C vaccine schedule in the

	Valencian Community. Agent-based modeling.
	Session: Numerical Methods II (Venue: RED CUBE) *Chairman: J. L. Hueso*
11:40-12:00	**J. Benítez (Instituto de Matemática Multidisciplinar),** Characterization of consistent completion of reciprocal comparison matrices.
12:00-12:20	**Antoni Vidal (Instituto de Matemática Multidisciplinar)**, Solution of the Lambda modes problema of a nuclear power reactor using an h-p finite element method.
12:20-12:40	**Carlos Andreu (Instituto de Matemátia Multidisciplinar)**, Vectorial iterative methods for calculating orbits of artificial satellites.
12:40-13:00	**Noelia Cambil (Instituto de Matemática Multidisciplinar)**, Derivative-free iterative methods for determining orbits of artificial satellites.
LUNCH OF THE CONFERENCE	

Friday 6th

STRIKE Fellow Report Session

	STRIKE Progress Report Session (Venue: YELLOW CUBE) *Chairman: Matthias Ehrhardt*
9:00-9:10	**Zuzana Zíková (BU Wuppertal, Germany, Talk by M. Ehrhardt)**, Compact FDMs on Special Meshes.
9:10-9:20	**José Pedro Campos Moreira da Silva (BU Wuppertal, Germany)**, MOR Techniques for Energy Derivatives.
9:20 - 9:30	**Pedro Polvora (CU Bratislava, Slovakia)**, Modelling of Nonlinear Black-Scholes Equations.
9:30 - 9:40	**Vera Egorova (UP Valencia, Spain)**, Numerical Analysis of FDMs for nonlinear Black-Scholes models.
9:40-9:50	**Walter Mudzimbabwe (Univ. Rousse, Bulgaria)**, Fitted operator methods in computational finance.
9:50-10:00	**Nicola Cantarutti (ISEG Lisbon, Portugal)**, Analysis of Lévy Market Models and PIDE.
10:00-10:10	**Ivan Yamshchikov (UA Zittau/Görlitz, Germany)**, Lie Group Analysis of Nonlinear Black-Scholes Equations.

10:10-10:20	**Lara Trussardi (TU Vienna, Austria)**, Herding and Contagion Effects in Financial Markets and possible Counteractions proposed by optimal control techniques.
10:20-10:30	**Álvaro Leitao (TU Delft, The Netherlands)**, Modelling and Numerical Techniques for Credit Valuation Adjustment.
10:30-11:00	COFFEE BREAK
	STRIKE Progress Report Session II (Venue: YELLOW CUBE) *Chairman: L. Jódar*
11:00-11:10	**Hoang Giang (Univ. Greenwich, London, UK)**, Newton-like methods for the commodity market.
11:10-11:20	**Beatrice Gaviraghi (Univ. Würzburg, Germany),** Optimal control tools in Computational Finance.
11:20-11:30	**t. b. a. (Univ. Antwerp, Belgium),** ADI Schemes for nonlinear multi-dimensional Black-Scholes equations.
11:30-13:00	**Come-together of ESR, head-less discussions**.
LUNCH OF THE CONFERENCE	
16:30-19:00	**STRIKE ESRs head-less come-together.**