

# **28th European Modeling and Simulation Symposium (EMSS 2016)**

Held at the 13th International Multidisciplinary Modeling and  
Simulation Multiconference (I3M 2016)

Larnaca, Cyprus  
26-28 September 2016

## **Editors:**

**Agostino G. Bruzzone  
Francesco Longo**

**Emilio Jimenez  
Loucas S. Louca  
Lin Zhang**

ISBN: 978-1-5108-3077-6

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2016) by CAL-TEK S.r.l.  
All rights reserved.

Printed by Curran Associates, Inc. (2016)

For permission requests, please contact CAL-TEK S.r.l.  
at the address below.

CAL-TEK S.r.l.  
Via Umberto Nobile 80  
87036 Rende (CS)  
Italy

Phone: +39 333 7042 612  
Fax: +39 0984 937849

info@cal-tek.eu

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: curran@proceedings.com  
Web: www.proceedings.com

## Index

<b>Using pipeline and binary-tree as CPANS for solving the sorting problem. A comparative study</b>	1
M. Rossainz-López, M. I. Capel, O. Carrasco-Limón, B. Sánchez-Rinza	
<b>Dual use bicycle path network designing and exploitation environment - velorouter</b>	10
E. Ginters, M. Baltruks, I. Sakne, Y. Merkuryev	
<b>Development and simulation-based evaluation of an algorithm for the retrieval-in-sequence for shuttle systems</b>	15
T. Lienert, W. A. Günthner	
<b>Scalable simulation models of railway traffic</b>	25
R. Novotny, A. Kavicka	
<b>HLA listener – A GUI driven mapping of HLA standard services</b>	32
M. Ali, Y. Mohamed	
<b>Forecasting construction duration of watermain upgrade project by using discrete event simulation</b>	39
D. Kim, Y. Zong, Y. Mohamed, S. AbouRizk	
<b>A flexible and graphical operational effectiveness evaluation tool</b>	48
W. Li, S. Lin, Z. Liu, P. Ma, M. Yang	
<b>A tree-search based heuristic for a complex stacking problem with continuous production and retrieval</b>	56
S. Raggl, B. Andreas, F. Tricoire, M. Affenzeller	
<b>Optimization of paint shop department using discrete event simulation</b>	62
P. Raska, Z. Ulrych	
<b>No more conflicts: the development of a generic airport model in a sequence-optimization framework</b>	67
P. Scala, M. Mujica Mota, D. Delahaye	
<b>High-performance web simulation</b>	73
J. Voracek	
<b>Interactive distributed simulation realised as a web application</b>	78
S. Kartak	
<b>Process simulation as support in learning theoretical-practical within the lean manufacturing laboratory of UTFV</b>	87
C. Q. Aviles, W. Guerrero Coronel, O. A. González Manzanares	
<b>Radio frequency safety device applied to chair children in cars</b>	94
R. da Cunha Santos, K. Barros de Oliveira, M. A. Cruz Moreira, S. J. Correia Neto, G. Gomes Cunha	
<b>The method of nested simulations supporting decision-making process within a mesoscopic railway simulator</b>	100
R. Diviš, A. Kavička	

<b>Analysis of uncertainty in engineering design optimization problems</b>	107
P. Fleck, M. Kommenda, M. Affenzeller, T. Prante	
<b>Generation of dispatching rules for job sequencing in single-machine environments</b>	117
J. Karder, A. Scheibenpflug, S. Wagner, M. Affenzeller	
<b>Simulating the assorting planning process to support the decision-making of grocery wholesalers: the mexican market case</b>	122
S. Flores Monroy	
<b>Use of web services for the localization of rolling stock with utilization technology oracle spatial</b>	128
J. Fikejz, J. Merta, J. Oborník	
<b>Emulation as part of an integrated logistics learning environment</b>	134
S. Langer, W. Hofmann, S. Lang, T. Reggelin, D. Weigert	
<b>An advanced approach to simulation of super-wide bandwidth information and communication systems combining microwave and photonic industrial technologies</b>	141
M.E. Belkin, V. Iakovlev, A. Sigov, Y. Tyschuk, V. Golovin	
<b>A simulation model of human decision making in emergency conditions</b>	148
F. De Felice, D. Falcone, A. Petrillo, A. G. Bruzzone, F. Longo	
<b>Performance of FDS versions 5 and 6 in passenger car fire computer simulation</b>	155
P. Weisenpacher, J. Glasa, V. Sipkova	
<b>Two time steps predictive control application to a bioprocess simulator</b>	162
S. Altuntaş, H. Hapoğlu	
<b>Simulation and optimization of the manufacturing process of e- bicycles: the case of innovaunam</b>	168
P. González-Hernández, A. Huerta-Barrientos	
<b>Simulation optimization of pedestrian evacuation in mexican subway: the case of Pino Suarez station</b>	175
A. Vera-Morales, A. Huerta-Barrientos	
<b>Preserving and managing heritage buildings in a sustainable way with integration of BIM – a review</b>	183
L. Seduikyte, A. Kylili, J. Sadauskiene, P. Fokaides	
<b>Discrete event simulation to improve cutting-welding workshop in a shipyard</b>	191
M. Rouco-Couzo, D. Crespo-Pereira, A. Garcia-del-Valle, M. Cebal-Fernandez, R. Rios-Prado	
<b>Improving planning and resource utilization of a shipbuilding process based on simulation</b>	197
M. Cebal-Fernandez, D. Crespo-Pereira, A. Garcia-del-Valle, M. Rouco-Couzo	
<b>A simulation-based tool to support decision-making in logistics design of a cans packaging line</b>	204
V. G. Achkar, V. Bär, F. Cornú, C. A. Méndez	

<b>Simulation of longwall coal mining technologies</b>	212
V. V. Okolnishnikov, S. V. Rudometov, S. S. Zhuravlev, V. V. Sinoviev	
<b>Simulation-optimization of schedules with sequence dependent setup times based on Petri net models</b>	216
G. Mušič	
<b>Minimizing the impact of escalator failures in metro tacubaya subway station on user's mobility</b>	224
H. O. I. Bautista-Martínez, A. Huerta-Barrientos, G. de Jesús Portillo-Villasana	
<b>Automatic simulation models generation of warehouses with milkruns and pickers</b>	231
A. Vieira, L. S. Dias, G. B. Pereira, J. A. Oliveira, M. Sameiro Carvalho, P. Martins	
<b>A simulation model for assigning secure waiting areas on subway platforms to minimize accidents</b>	242
G. de Jesús Portillo-Villasana, A. Huerta-Barrientos	
<b>Paysim: a financial mobile money simulator for fraud detection</b>	249
E. A. Lopez-Rojas, A. Elmir, S. Axelsson	
<b>Analysis and evaluation of performance issues of parallel software on multi-core processors</b>	256
F. Wiesinger, M. Tunca, M. Bogner	
<b>Balancing of a manufacturing workstation, using a simulation and optimization model</b>	263
F.D. Chaves Almanza, A. Wellens	
<b>Service level definition from forecast error cost evaluation</b>	270
A. Sosa, A. Wellens	
<b>Supplier selection: single sourcing vs. dual sourcing with sustainability considerations</b>	277
M. Accorsi, R. Montanari, M. Rinaldi, P. Centobelli, E. Bottani	
<b>A proposal for optimizing urban mobility in Mexico City based on the public transport network</b>	282
I. Flores De La Mota, A. Huerta Barrientos	
<b>Simulation optimization for an age-based vaccines distribution strategy against the spread of influenza epidemic</b>	288
J. Lara de Paz, I. Flores	
<b>Modelling a biomass boiler using an artificial neural network</b>	296
P. Ruiz, G. Sorrosal, C. E. Borges, A. M. Macarulla	
<b>Comparison of PSO and DE in the task of optimal control of chaotic Lozi map</b>	303
R. Senkerik, M. Pluhacek, I. Zelinka, A. Viktorin	
<b>Mesoscopic simulation models for the automotive industry</b>	309
A. Hennig, T. Reggelin, D. Wolff	
<b>Modeling and simulation of the effects of thermal expansion mismatch and temperature on thermal induced stresses in modern nano pMOS</b>	314
A. El Boukili	

<b>Simulation system of mining works</b>	323
A. N. Starodubov, V. V. Sinoviev, V. V. Okolnishnikov	
<b>Intelligent simulation for tourism and cultural heritage management</b>	328
G. Merkurjeva, V. Bolshakov, J. Martins, R. Gonçalves, G. Bueno Benito	
<b>Using NodeJS for discrete simulation in a web-based environment</b>	334
T. Wiedemann	
<b>A comparative study of hyperelastic constitutive models for an automotive component material</b>	338
R. Tobajas, D. Elduque, C. Javierre, E. Ibarz, L. Gracia	
<b>An intelligent, interactive and interoperable platform for the 21st century museums</b>	348
F. Longo, L. Nicoletti, A. Padovano, A. Solis, A. Monzon	
<b>Augmented reality and mobile technologies for maintenance, security and operations industrial facilities</b>	355
A. G. Bruzzone, F. Longo, L. Nicoletti, M. Vetrano, L. Bruno, A. Chiurco, C. Fusto, G. Vignali	
<b>Virtual and augmented reality as enablers for improving the service on distributed assets</b>	361
A. G. Bruzzone, M. Massei, G. Maglione, M. Agresta, G. Franzinetti, A. Padovano	
<b>Author's Index</b>	367