

Editorial

It is our pleasure to introduce this volume of *Computación y Sistemas*, which includes 6 thematic issue articles and 6 regular papers.

The topic of the thematic issue is Topic Trends in Computing Research. It aims to promote the latest developments and key topics in the field of computing and its applications, performed by Mexican researchers supported by CONACyT grants. Special issue's papers mainly present improved versions of works presented and discussed at the 3rd Jornadas de Cooperación CONACyT-Catalunya (JCCC) held at the Universitat Politècnica de Catalunya (UPC) in Barcelona, Spain; in June 2016. In addition, the invitation was open to all contributions from the Computing arena made by Mexican researchers supported by CONACyT grants.

Although it is impossible to cover every aspect of the research performed by Mexican researchers supported by CONACyT grants, these thematic papers aim to provide a good and representative sample of this research. We hope to provide the readers some representative and exciting snapshots of the actual research performed by Mexican researchers supported by CONACyT grants, especially in Spain.

The contributions related to the thematic issue are summarized below.

Alberto Ochoa, Isaac Rudomin, Genoveva Vargas-Solar, Javier A. Espinosa-Oviedo, Hugo Pérez, and José-Luis Zechinelli-Martini, in their article entitled "Humanitarian Logistics and Cultural Diversity within Crowd Simulation" use computational science, data processing and visualization techniques to perform simulations for eventually supporting critical decision making on the impact of anthropometry and cultural diversity in the behaviour of crowds in panic situations.

Cristian Barrué, Atia Cortés, Ulises Cortés, Frédéric Tétard, and Xavier Gironès present their work "CAREGIVERSPRO-MMD: community services, helping patients with dementia and caregivers connect with others for evaluation, support and to improve the care experience". This work details the design of a software application that provides value-added services based on social networks, tailored interventions, clinical strategies and gamification for improving the quality of life for people living with dementia and their caregivers, allowing them to live in the community for as long as possible.

Sergio Natan González-Rocha, Fredy Juárez-Pérez, Armando Aguilar-Meléndez, Alfredo Cristóbal Salas, Celia Calderón-Ramón, Jesús E. Escalante-Martínez and José M. Baldasano Recio in their paper "PBL parameterization in WRFv3.5: Assessment of performance in High Spatial Resolution simulations in complex topography of Mexico" present the application of a Numerical Weather Prediction model and four Planet Boundary Layer schemes to the study of the complex topography of a Mexican region.

Marisol Monterrubio Velasco and Denis Boyer, in their paper "Simulación del crecimiento fractal de las cuevas subacuáticas de Quintana Roo con el modelo de agregación limitada por la difusión" use simulation processes based on the diffusion limited aggregation model to study the fractal patterns observed in subaquatic caves in Quintana Roo.

Isaac Rudomín, Genoveva Vargas-Solar, Javier A. Espinosa-Oviedo, Hugo Pérez, and José-Luis Zechinelli-Martini presented "Modelling Crowds in Urban Spaces" present an approach for simulating crowd behaviour for supporting crowd behaviour control in public spaces. They visualize and predict the

behaviour of individuals and groups moving and evolving within real environments by means of the use of geo located data produced by mobile devices and other sources of information (e.g., security cameras, DRONES) to predict individual and crowd behaviour and detect abnormal situations in presence of specific events.

Armando Aguilar-Meléndez, Mario G. Ordaz Schroeder, Josep De la Puente, Sergio N. González-Rocha, Héctor E. Rodríguez-Lozoya, Alejandro Córdova-Ceballos, Alejandro García-Elías, Celia Calderón-Ramón, Jesús E. Escalante-Martínez, Juan R. Laguna-Camacho, and Amelia Campos-Rios discuss probabilistic seismic hazard assessment as a fundamental step to generate information that can contribute to reduce the seismic risk in cities in their paper entitled “Development and validation of software CRISIS to perform probabilistic seismic hazard assessment, with emphasis in the recent CRISIS2015”. The paper focuses on the evaluation of a specific software tool that aims to cover such assessment needs.

Regular articles cover a diverse range of computer science subfields, approaching problems in the borders of knowledge, thus advancing the state of the art. The diversity of regular papers included in this number of *Computación y Sistemas* are summarized below.

J.J. Camacho-Escoto, Rolando Menchaca-Méndez, Mario E. Rivero-Angeles, Ricardo Menchaca-Méndez, and J.E. Martínez-Castillo present their work “Energy-Efficient Medium Access Control Using Distributed Hash-based Elections”. This work introduces the Energy-Efficient Multiple Access (EE-MA) protocol for wireless networks where nodes participate in a distributed election to gain interference-free access to the wireless channel. Furthermore, they present a simulation-based performance analysis that shows that EE-MA outperforms a state of the

art election-based channel access protocol in terms of energy efficiency with no cost in terms of network capacity.

Víctor Ferman, Dieter Hutter, and Raúl Monroy in their article entitled “A Model Checker for the Verification of Browser Based Protocols” developed a model checker for web browser protocols (WebMC). It is a model checker especially designed to consider web standards, with the aim of analyzing browser based protocol execution, as encompassed by the interactions of a typical user, a browser, and active attacker playing the role of the network, and one or more servers. In addition, they validate and show how to use WebMC in the design and the development of browser based protocols.

Claudia Becerra, Fabio A. Gonzalez, and Alexander Gelbukh present “LinearTag Models: Recommendations Using Linear User Profiles Based on Tags”. In this work, they propose a family of methods called LinearTag recommenders, which infer users’ preferences for tags to formulate recommendations for them. In addition, they perform experiments using TagProfiles as an interaction artifact that allows users to receive new recommendations as they delete, add or reorder tags in their profiles. These studies show that TagProfiles are easier to understand and modify by users, allowing them to discover new movies as they interact with their profiles.

Jorge Castro-López, T. Córdoba-Fraga, and Rafael Guzmán-Cabrera present the work “Obtaining the Dicrotic Notch by Numerical Simulation Using the Ogden Model”. In this work, they propose a model based on the premise that the dicrotic notch on the cardiac cycle is the result to the stimulus of a hyperelastic material. This proposal is sustained by the numerical study of the interaction between the blood flow and the arterial walls. Computational results are verified by available experimental data for

tensile tests of the ascending aorta. Realistic parameters for both the isotropic hyperelastic Ogden and neo-Hookean models were obtained.

Elieser E. Gallego, Angel Correa, Alexei Blanco, Jessica Cuador, and Raúl P. Álvarez tackle the application of speech compression to speech recognition technics in IP nets in their work “The Lineal Prediction Applied to Distributed Speech Recognition in IP Nets”. In this work, they integrate three fundamental areas: the voice compression, the transmission channels simulation and the speech recognition, to achieve an application developed in MATLAB, able to carry out a remote speech recognition by means of the transmission of compressed voice. The special characteristic of this proposal is that it considers the probability of occurrence of losses of information in the transmission channels.

Last but not least, Valerii V. Chikovani and Hanna V. Tsiрук present the paper “Digital rate MEMS Vibratory Gyroscope Modeling, Tuning and Simulation results”. In this work, they deal with with modeling, tuning and simulation of standing wave control and information processing algorithm for rate MEMS ring-type vibratory gyroscope. They present a standing wave control algorithm in the form allowing transition from rate to rate integrating and to differential modes of MEMS gyro operation by simple switching command. Simulation results in case of measurement of a constant and variable angle rates are also presented.

We hope all these articles will be valuable contributions to the development of the Computing field in México. All of them underwent a strict peer review process made by experts in their corresponding areas.

We want to thank all people involved in this undertaking, from the authors to the reviewers for their effort and work, and JCCC 2016 steering committee and CyS editors in chief

for offering us the opportunity of preparing this number of CyS.

Finally, we hope that readers will enjoy the topics presented here and perhaps find the inspiration to push these fields a step further; or it opens the door for new collaborations.

Claudia P. Ayala
Sergio Natan González-Rocha

Guest Editors
Barcelona, Spain