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Advances in Computational Intelligence

17th Mexican International Conference
on Artificial Intelligence, MICAI 2018
Guadalajara, Mexico, October 22–27, 2018
Proceedings, Part II

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ISSN 0302-9743 ISSN 1611-3349 (electronic)
Lecture Notes in Artificial Intelligence
ISBN 978-3-030-04496-1 ISBN 978-3-030-04497-8 (eBook)
<https://doi.org/10.1007/978-3-030-04497-8>

Library of Congress Control Number: 2018958467

LNCS Sublibrary: SL7 – Artificial Intelligence

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The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

The Mexican International Conference on Artificial Intelligence (MICAI) is a yearly international conference series that has been organized by the Mexican Society of Artificial Intelligence (SMIA) since 2000. MICAI is a major international artificial intelligence forum and the main event in the academic life of the country's growing artificial intelligence community.

MICAI conferences publish high-quality papers in all areas of artificial intelligence and its applications. The proceedings of the previous MICAI events have been published by Springer in its *Lecture Notes in Artificial Intelligence* series, vol. 1793, 2313, 2972, 3789, 4293, 4827, 5317, 5845, 6437, 6438, 7094, 7095, 7629, 7630, 8265, 8266, 8856, 8857, 9413, 9414, 10061, 10062, 10632, and 10633. Since its foundation in 2000, the conference has been growing in popularity and improving in quality.

The proceedings of MICAI 2018 are published in two volumes. The first volume, *Advances in Soft Computing*, contains 33 papers structured into three sections:

- Evolutionary and nature-inspired intelligence
- Machine learning
- Fuzzy logic and uncertainty management

The second volume, *Advances in Computational Intelligence*, contains 29 papers structured into three sections:

- Knowledge representation, reasoning, and optimization
- Natural language processing
- Robotics and computer vision

This two-volume set will be of interest for researchers in all areas of artificial intelligence, students specializing in related topics, and for the public in general interested in recent developments in artificial intelligence.

The conference received 149 submissions for evaluation from 23 countries: Argentina, Australia, Brazil, Canada, Colombia, Costa Rica, Cuba, Czech Republic, Finland, France, Hungary, Iran, Italy, Mexico, Morocco, Pakistan, Peru, Poland, Russia, Spain, Thailand, Turkey, and USA. Of these submissions, 62 papers were selected for publication in these two volumes after a peer-reviewing process carried out by the international Program Committee. Therefore, the acceptance rate was 41%.

The international Program Committee consisted of 113 experts from 17 countries: Azerbaijan, Brazil, Canada, Colombia, Cuba, France, Greece, India, Israel, Italy, Japan, Mexico, Portugal, Singapore, Spain, UK, and USA.

MICAI 2018 was honored by the presence of renowned experts who gave excellent keynote lectures:

- Alexander S. Poznyak Gorbach, CINVESTAV-IPN Campus Mexico City, Mexico
- Jeff Clune, Uber AI Labs, University of Wyoming, USA

- David J. Atkinson, Silicon Valley Research & Development Center Continental AG, USA
- Gregory O’Hare, School of Computer Science, University College Dublin, Ireland
- Srinivas V. Chitveli, Offering Manager & Master Inventor, IBM PowerAI Vision, USA

The technical program of the conference also featured 11 tutorials:

- Smart Applications with FIWARE, by Miguel Gonzalez Mendoza
- Intelligent Management of Digital Data for Law Enforcement Purposes, by Jesus Manuel Niebla Zatarain
- Introduction to Data Science: Similarity, Correlation, and Association Measures, by Ildar Batyrshin
- Brain–Computer Interface (BCI) and Machine Learning, by Javier M. Antelis, Juan Humberto Sossa Azuela, Luis G. Hernandez, and Carlos D. Virgilio
- New Models and Training Algorithms for Artificial Neural Networks, by Juan Humberto Sossa Azuela
- Intelligent Chatbots Using Google DialogFlow, by Leonardo Garrido
- Spiking Neural Models and Their Applications in Pattern Recognition: A beginner’s Tutorial, by Roberto A. Vazquez
- Introduction to Quantum Computing, by Salvador Venegas
- Deep-Learning Principles and Their Applications in Facial Expression Recognition with TensorFlow-Keras, by Luis Eduardo Falcón Morales and Juan Humberto Sossa Azuela
- Introduction to Natural Language Human–Robot Interaction, by Grigori Sidorov
- Knowledge Extraction from Fuzzy Predictive Models, by Félix A. Castro Espinoza

Three workshops were held jointly with the conference:

- HIS 2018: 11th Workshop of Hybrid Intelligent Systems
- WIDSSI 2018: 4th International Workshop on Intelligent Decision Support Systems for Industry
- WILE 2018: 11th Workshop on Intelligent Learning Environments

The authors of the following papers received the Best Paper Awards based on the paper’s overall quality, significance, and originality of the reported results:

- First place: “Universal Swarm Optimizer for Multi-Objective Functions,” by Luis Marquez and Luis Torres Treviño, Mexico
- Second place: “Topic-Focus Articulation: A Third Pillar of Automatic Evaluation of Text Coherence,” by Michal Novák, Jiří Mirovský, Kateřina Rysová and Magdaléna Rysová, Czechia
- Third place: “Combining Deep Learning and RGBD SLAM for Monocular Indoor Autonomous Flight,” by José Martínez Carranza, L. Oyuki Rojas Pérez, Aldrich A. Cabrera Ponce and Roberto Munguia Silva, Mexico

The cultural program of the conference included a tour of Guadalajara and the Tequila Experience tour.

We want to thank everyone involved in the organization of this conference. In the first place, the authors of the papers published in this book: It is their research effort that gives value to the book and to the work of the organizers. We thank the track chairs for their hard work, the Program Committee members, and additional reviewers for their great effort in reviewing the submissions.

We would like to thank the Tecnológico de Monterrey Campus Guadalajara for hosting the workshops and tutorials of MICA 2018, with special thanks to Dr. Mario Adrián Flores, Vice President of the University, and Dr. Ricardo Swain, Dean of the Engineering and Sciences School, for their generous support. We also thank Dr. José Antonio Rentería, Divisional Director of the Engineering and Sciences School, for his kind support. We also want to thank Erik Peterson from Oracle, Rodolfo Lepe and Leobardo Morales from IBM, Oscar Reyes from SinergiaSys, and Luis Carlos Garza Tamez from Grupo ABSA, for their support in organization of this conference. The entire submission, reviewing, and selection process, as well as the preparation of the proceedings, were supported free of charge by the EasyChair system (www.easychair.org). Finally, yet importantly, we are very grateful to the staff at Springer for their patience and help in the preparation of this volume.

October 2018

Ildar Batyrshin
María de Lourdes Martínez-Villaseñor
Hiram Eredín Ponce Espinosa

Conference Organization

MICAI 2018 was organized by the Mexican Society of Artificial Intelligence (SMIA, Sociedad Mexicana de Inteligencia Artificial) in collaboration with the Tecnológico de Monterrey Campus Guadalajara, the Tecnológico de Monterrey CEM, the Centro de Investigación en Computación of the Instituto Politécnico Nacional, the Facultad de Ingeniería or the Universidad Panamericana, and the Universidad Autónoma del Estado de Hidalgo.

The MICAI series website is www.MICAI.org. The website of the Mexican Society of Artificial Intelligence, SMIA, is www.SMIA.org.mx. Contact options and additional information can be found on these websites.

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