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22nd Mexican International Conference
on Artificial Intelligence, MICAI 2023
Yucatán, Mexico, November 13–18, 2023
Proceedings, Part II

2 Part II



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Hiram Calvo · Lourdes Martínez-Villaseñor ·
Hiram Ponce
Editors


Advances in Soft Computing

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Editors

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Preface

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

This year, MICAI 2023 was graciously hosted by the Instituto de Investigaciones en Matemáticas Aplicadas y en Sistemas (IIMAS) and the Universidad Autónoma del Estado de Yucatán (UAEY). The conference presented a cornucopia of scientific endeavors. From incisive keynote lectures and detailed paper presentations to hands-on tutorials, thought-provoking panels, and niche workshops, the spectrum of activities aimed to cater to a wide audience. Moreover, we continued the legacy of announcing the José Negrete Award, the SMIA Best Thesis in Artificial Intelligence Contest's results. This year, the historic and culturally rich city of Mérida, Yucatán was our chosen rendezvous.

MICAI conferences publish high-quality papers in all areas of AI and its applications. The proceedings of the previous MICAI events have been published by Springer in its Lecture Notes in Artificial Intelligence (LNAI) series (volumes: 1793, 2313, 2972, 3789, 4293, 4827, 5317, 5845, 6437, 6438, 7094, 7095, 7629, 7630, 8265, 8266, 8856, 8857, 9413, 9414, 10061, 10062, 10632, 10633, 11288, 11289, 11835, 12468, 12469, 13067, 13068, 13612, and 13613). Since its foundation in 2000, the conference has grown in popularity and improved in quality.

The proceedings of MICAI 2023 are published in two volumes. The first volume, *Advances in Computational Intelligence*, contains 24 papers structured into three sections:

- Machine Learning
- Computer Vision and Image Processing
- Intelligent Systems

The second volume, *Advances in Soft Computing*, contains 25 papers structured into three sections:

- Natural Language Processing
- Bioinformatics and Medical Applications
- Robotics and Applications

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

The conference received for evaluation 115 submissions from 17 countries: Bolivia, Brazil, Colombia, Cuba, Denmark, Ecuador, Spain, USA, France, The Netherlands, Italy, Kazakhstan, Mexico, Peru, UK, Russia, and Sweden. Gender representation also echoed with 90 male authors and 21 female authors adding their voice. From these

submissions, 49 papers were selected for publication in these two volumes after 3 reviews per submission in a double-blind peer-reviewing process carried out by the international Program Committee. The acceptance rate was 43%.

The international Program Committee consisted of 80 experts from 10 countries: Australia, Brazil, France, Germany, Japan, Kazakhstan, Mexico, Russia, Spain, and UK.

Three workshops were held jointly with the conference:

- WILE 2023: 16th Workshop on Intelligent Learning Environments
- HIS 2023: 16th Workshop of Hybrid Intelligent Systems
- CIAPP 2023: 5th Workshop on New Trends in Computational Intelligence and Applications

We want to thank all the people involved in the organization of this conference: the authors of the papers published in these two volumes –it is their research work that gives value to the proceedings– and the organizers for their work. We thank the reviewers for their great effort spent on reviewing the submissions and the Program and Organizing Committee members.

A special acknowledgment goes to the local committee led by Antonio Neme, whose meticulous coordination has been instrumental in realizing MICAI 2023 in Mérida, Yucatán, Mexico. Our thanks extend to IIMAS’s director, Ramsés Mena, and its academic secretary, Katya Rodríguez. We are also indebted to Anabel Martín from the Faculty of Mathematics at the UADY for her invaluable assistance in securing the university facilities.

The entire submission, reviewing, and selection process, as well as preparation of the proceedings, was supported by Microsoft’s Conference Management Toolkit (<https://cmt3.research.microsoft.com/>). Last but not least, we are grateful to Springer for their patience and help in the preparation of these volumes.

In conclusion, MICAI 2023 is more than just a conference. It is a confluence of minds, a testament to the indefatigable spirit of the AI community, and a beacon for the future of Artificial Intelligence. As you navigate through these proceedings, may you find inspiration, knowledge, and connections that propel you forward in your journey.

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

November 2023

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