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Kok Wai Wong (Eds.)

Multi-disciplinary Trends in Artificial Intelligence

13th International Conference, MIWAI 2019
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Preface

The Multi-disciplinary International Conference on Artificial Intelligence (MIWAI), formerly called the Multi-disciplinary International Workshop on Artificial Intelligence, is a well-established scientific venue in the field of artificial intelligence (AI). The MIWAI series started in 2007 in Thailand as the Mahasarakham International Workshop on Artificial Intelligence and has been held every year since then. It has emerged as an international workshop with participants from around the world. In 2011, MIWAI 2011 was held outside of Thailand for the first time, in Hyderabad, India, so that it became the "Multi-disciplinary International Workshop on Artificial Intelligence." Then the event took place in various Asian countries: Ho Chi Minh City, Vietnam (2012); Krabi, Thailand (2013); Bangalore, India (2014); Fuzhou, China (2015); Chiang Mai, Thailand (2016); Brunei Darussalam (2017); and Hanoi, Vietnam (2018). In 2018, MIWAI was renamed to the "Multi-disciplinary International Conference on Artificial Intelligence."

The MIWAI series of the conferences serve as a forum for AI researchers and practitioners to discuss and deliberate cutting-edge AI research. It also aims to elevate the standards of AI research by providing researchers and students with feedback from an internationally renowned Program Committee.

AI is a broad research area. Theory, methods, and tools in AI sub-areas such as cognitive science, computational philosophy, computational intelligence, game theory, multi-agent systems, machine learning, multi-agent systems, natural language, representation and reasoning, data mining, speech, computer vision, and the Web. The above methods have broad applications in big data, bioinformatics, biometrics, decision supports, knowledge management, privacy, recommender systems, security, software engineering, spam filtering, surveillance, telecommunications, Web services, and IoT. Submissions received by MIWAI 2019 were wide-ranging and covered both theories as well as applications.

This year's 13th edition of MIWAI was held in Kuala Lumpur, Malaysia, during November 17–19, 2019. This volume contains papers selected for presentation at MIWAI 2019. MIWAI 2019 received 53 full papers from 23 countries including Australia, Bangladesh, Brazil, Brunei Darussalam, China, France, Georgia, Hungary, India, Indonesia, Japan, Malaysia, Nigeria, Pakistan, Philippines, Romania, Slovakia, South Africa, South Korea, Sri Lanka, Thailand, Tunisia, and Vietnam. Following the success of previous MIWAI conferences, MIWAI 2019 continued the tradition of a rigorous review process.

At the end, a total of 25 papers were accepted with an acceptance rate of 47%. Among 25 papers, 19 papers received positive reviews and were accepted as regular papers and the rest were deemed suitable for publication as short papers. Each submission was carefully reviewed by at least two members from a Program Committee consisting of 82 AI experts from 23 countries, some papers received up to five reviews when necessary. The reviewing process was double-blind. Many of the papers

that were excluded from the proceedings showed promise but the quality of the proceedings had to be maintained. We would like to thank all authors for their submissions. Without their contribution, this conference would not have been possible.

In addition to the papers published in the proceedings, the technical program included a keynote talk and we thank the keynote speakers for accepting our invitation. We are also thankful to the local organizers in Kuala Lumpur for the excellent hospitality and for making all the necessary arrangements for the conference. Special thanks to Artificial Intelligence Association of Thailand (AiAT) and the Faculty of Informatics, Mahasarakham University for supporting this conference.

We acknowledge the use of the EasyChair conference system for the paper submission, review, and compilation process. Last but not least, our sincere thanks to Alfred Hofmann, Anna Kramer, and the excellent LNCS team at Springer for their support and cooperation in publishing the proceedings as a volume of the *Lecture Notes in Computer Science*.

November 2019

Rapeeporn Chamchong
Kok Wai Wong

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Algorithms to Find Interesting and Interpretable High Utility Patterns in Symbolic Data (Keynote Abstract)

Philippe Fournier-Viger

Harbin Institute of Technology, Shenzhen, China

Abstract. Discovering interesting and useful patterns in symbolic data has been the subject of numerous studies. It consists of extracting patterns from data that meet a set of requirements specified by a user. Although early research work in this domain have mainly focused on identifying frequent patterns (e.g. itemsets), nowadays many other types of interesting patterns have been proposed and more complex data types and pattern types are considered. Mining patterns have applications in many fields as they provide glass-box models that are generally easily interpretable by humans either to understand the data or support decision-making. This talk will first highlight limitations of early work on frequent pattern mining and provide an overview of state-of-the-art problems and techniques related to identifying interesting patterns in symbolic data. Topics that will be discussed include high utility patterns, locally interesting patterns, periodic patterns, and statistically significant patterns. Lastly, the SPMF open-source software will be mentioned and opportunities related to the combination of pattern mining techniques with traditional artificial intelligence techniques.

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