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Information Processing and Management of Uncertainty in Knowledge-Based Systems


19th International Conference, IPMU 2022
Milan, Italy, July 11–15, 2022
Proceedings, Part II

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ISSN 1865-0929 ISSN 1865-0937 (electronic)
Communications in Computer and Information Science
ISBN 978-3-031-08973-2 ISBN 978-3-031-08974-9 (eBook)
<https://doi.org/10.1007/978-3-031-08974-9>

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

Preface

We are very pleased to present you with the proceedings of the 19th International Conference on Information Processing and Management of Uncertainty in Knowledge-Based Systems (IPMU 2022). The conference was held during July 11–15, 2022, in Milan, Italy. The IPMU conference is organized every two years with the aim of bringing together scientists working on methods for the management of uncertainty and aggregation of information in intelligent systems. Since 1986, the IPMU conference has been providing a forum for the exchange of ideas between theoreticians and practitioners working in these areas and related fields.

Following the IPMU tradition, the Kampé de Fériet Award for outstanding contributions to the field of uncertainty and management of uncertainty was presented. Past winners of this prestigious award are Lotfi A. Zadeh (1992), Ilya Prigogine (1994), Toshiro Terano (1996), Kenneth Arrow (1998), Richard Jeffrey (2000), Arthur Dempster (2002), Janos Aczel (2004), Daniel Kahneman (2006), Enric Trillas (2008), James Bezdek (2010), Michio Sugeno (2012), Vladimir N. Vapnik (2014), Joseph Y. Halpern (2016), Glenn Shafer (2018) and Barbara Tversky (2020). In this 2022 edition, the award was given to Tomaso Poggio for his interdisciplinary work on human and machine intelligence and his fundamental research in computational neuroscience, in particular concerning the computational analysis of vision and learning.

The program included the keynote talk of Tomaso Poggio, as recipient of the Kampé de Fériet Award, and keynote talks by Cesar Hidalgo (Artificial and Natural Intelligence Toulouse Institute, France), Marianne Huchard (Laboratory of Informatics, Robotics, and Microelectronics, France) and Andrzej Skowron (University of Warsaw, Poland).

To celebrate the 40th anniversary of the seminal paper “Rough Sets” by Z. Pawlak, a panel session on rough sets was organized. The panel session witnessed the participation and discussion of renowned researchers on rough sets, including Salvatore Greco, Ernestina Menasalvas, and Andrzej Skowron, to whom we are grateful for their contribution. The participants shared their memories and experiences related to rough set-based decision making, applications of rough set approximations, and rough set contributions to machine learning, emphasizing the strong points of rough sets and the ways of using them in hybrid solutions.

The IPMU 2022 program consisted of 14 special sessions and 124 papers authored by researchers from 38 different countries. The conference followed a single-blind review process, respecting the usual conflict-of-interest standards. All submitted papers were judged by at least two reviewers and in most cases by three or more – even up to five – referees. Furthermore, all the papers were examined by the program chairs. As a result of the reviewing process, 124 submissions were accepted as full papers, which are included in the two volumes of the proceedings.

The organization of the IPMU 2022 conference was possible with the assistance, dedication, and support of many people and institutions. We are particularly thankful to the organizers of special sessions. Such sessions, dedicated to a variety of topics and organized by experts, have always been a characteristic feature of IPMU conferences. We

would like to pass on our special thanks to Célia Da Costa Pereira, who helped evaluate all special session proposals. We would like to acknowledge all members of the IPMU 2022 Program Committee, as well as the additional reviewers who played an essential role in the reviewing process, ensuring a high-quality conference. Thank you very much for all your work and efforts. We gratefully acknowledge the technical co-sponsorship of the IEEE Computational Intelligence Society and the European Society for Fuzzy Logic and Technology (EUSFLAT).

We also acknowledge the support received from the University of Milano-Bicocca, and in particular from the Department of Information, Systems and Communications; from the Springer team who managed the publication of these proceedings; and from the EasyChair platform used to handle submissions and the review process. Our very special and greatest gratitude goes to the authors who submitted the results of their work and presented them at the conference. Without you this conference would not take place. Thank you!

We hope that these proceedings provide the readers with multiple ideas leading to numerous research activities, significant publications, and intriguing presentations at future IPMU conferences.

July 2022

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