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Proceedings, Part I

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Preface

This volume constitutes the proceedings of the 19th International Conference on Artificial Intelligence and Soft Computing (ICAISC 2020), held in Zakopane, Poland, during October 12–14, 2020. The conference was held virtually due to the COVID-19 pandemic and was organized by the Polish Neural Network Society in cooperation with the University of Social Sciences in Łódź, the Department of Intelligent Computer Systems at the Częstochowa University of Technology, and the IEEE Computational Intelligence Society, Poland Chapter. Previous conferences took place in Kule (1994), Szczyrk (1996), Kule (1997), and Zakopane (1999, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2013, 2014, 2015, 2016, 2017, 2018, and 2019) and attracted a large number of papers and internationally recognized speakers: Lotfi A. Zadeh, Hojjat Adeli, Rafal Angryk, Igor Aizenberg, Cesare Alippi, Shun-ichi Amari, Daniel Amit, Plamen Angelov, Albert Bifet, Piero P. Bonissone, Jim Bezdek, Zdzisław Bubnicki, Andrzej Cichocki, Swagatam Das, Ewa Dudek-Dyduch, Włodzisław Duch, Adel S. Elmaghraby, Pablo A. Estévez, João Gama, Erol Gelenbe, Jerzy Grzymala-Busse, Martin Hagan, Yoichi Hayashi, Akira Hirose, Kaoru Hirota, Adrian Horzyk, Eyke Hüllermeier, Hisao Ishibuchi, Er Meng Joo, Janusz Kacprzyk, Jim Keller, Laszlo T. Koczy, Tomasz Kopacz, Jacek Koronacki, Zdzisław Kowalczyk, Adam Krzyżak, Rudolf Kruse, James Tin-Yau Kwok, Soo-Young Lee, Derong Liu, Robert Marks, Ujjwal Maulik, Zbigniew Michalewicz, Evangelia Micheli-Tzanakou, Kaisa Miettinen, Krystian Mikołajczyk, Henning Müller, Ngoc Thanh Nguyen, Andrzej Obuchowicz, Erkki Oja, Witold Pedrycz, Marios M. Polycarpou, José C. Príncipe, Jagath C. Rajapakse, Šarunas Raudys, Enrique Ruspini, Jörg Siekmann, Andrzej Skowron, Roman Słowiński, Igor Spiridonov, Boris Stilman, Ponnuthurai Nagaratnam Suganthan, Ryszard Tadeusiewicz, Ah-Hwee Tan, Dacheng Tao, Shiro Usui, Thomas Villmann, Fei-Yue Wang, Jun Wang, Bogdan M. Wilamowski, Ronald Y. Yager, Xin Yao, Syozo Yasui, Gary Yen, Ivan Zelinka, and Jacek Zurada. The aim of this conference is to build a bridge between traditional artificial intelligence techniques and so-called soft computing techniques. It was pointed out by Lotfi A. Zadeh that “soft computing (SC) is a coalition of methodologies which are oriented toward the conception and design of information/intelligent systems. The principal members of the coalition are: fuzzy logic (FL), neurocomputing (NC), evolutionary computing (EC), probabilistic computing (PC), chaotic computing (CC), and machine learning (ML). The constituent methodologies of SC are, for the most part, complementary and synergistic rather than competitive.” These proceedings present both traditional artificial intelligence methods and SC techniques. Our goal is to bring together scientists representing both areas of research. This volume is divided into six parts:

- Neural Networks and Their Applications
- Fuzzy Systems and Their Applications
- Evolutionary Algorithms and Their Applications
- Pattern Classification

- Bioinformatics, Biometrics and Medical Applications
- Artificial Intelligence in Modeling and Simulation

The conference attracted a total of 265 submissions from 32 countries, and after the review process, 112 papers were accepted for publication.

I would like to thank our participants, invited speakers, and reviewers of the papers for their scientific and personal contribution to the conference. The following reviewers were very helpful in reviewing the papers:

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Finally, I thank my co-workers Łukasz Bartczuk, Piotr Dziwiński, Marcin Gabryel, Marcin Korytkowski, and Rafał Scherer, for their enormous efforts in making the conference a very successful event. Moreover, I would like to acknowledge the work of Marcin Korytkowski who was responsible for the Internet submission system.

October 2020

Leszek Rutkowski

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ICAISC 2020 was organized by the Polish Neural Network Society in cooperation with the University of Social Sciences in Łódź and Department of Intelligent Computer Systems at Częstochowa University of Technology.

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