

# Preface

This volume constitutes the proceedings of 16th International Conference on Artificial Intelligence and Soft Computing ICAISC 2017, held in Zakopane, Poland, during June 11–15, 2017. The conference was organized by the Polish Neural Network Society in cooperation with the University of Social Sciences in Łódź, the Institute of Computational Intelligence 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, and 2016) and attracted a large number of papers and internationally recognized speakers: Lotfi A. Zadeh, Hojjat Adeli, Rafal Angryk, Igor Aizenberg, Shun-ichi Amari, Daniel Amit, Piero P. Bonissone, Jim Bezdek, Zdzisław Bubnicki, Andrzej Cichocki, Swagatam Das, Ewa Dudek-Dyduch, Włodzisław Duch, Pablo A. Estévez, 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, Zdzisław Kowalczyk, Adam Krzyżak, James Tin-Yau Kwok, Soo-Young Lee, Derong Liu, Robert Marks, 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, Roman Słowiński, Igor Spiridonov, Boris Stilman, Ponnuthurai Nagaratnam Suganthan, Ryszard Tadeusiewicz, Ah-Hwee Tan, Shiro Usui, Thomas Villmann, Fei-Yue Wang, Jun Wang, Bogdan M. Wilamowski, Ronald Y. Yager, Xin Yao, Syozo Yasui, Gary Yen, 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 soft computing techniques. Our goal is to bring together scientists representing both areas of research. This volume is divided into five parts:

- Data Mining
- Artificial Intelligence in Modeling, Simulation and Control
- Various Problems of Artificial Intelligence
- Special Session: Advances in Single-Objective Continuous Parameter Optimization with Nature-inspired Algorithms
- Special Session: Stream Data Mining

The conference attracted a total of 274 submissions from 33 countries and after the review process, 133 papers were accepted for publication.

The ICAISC 2017 scientific program included the following special sessions:

1. “Granular and Human-Centric Approaches in Data Mining and Analytics” – Special session devoted to the 70th anniversary of Prof. Janusz Kacprzyk, organized by:
  - Witold Pedrycz, University of Alberta, Edmonton, Canada and Systems Research Institute, Polish Academy of Sciences, Warsaw, Poland
  - Rudolf Kruse, Otto von Guericke University, Magdeburg, Germany
  - Leszek Rutkowski, Czestochowa University of Technology, Poland
  - Jacek Żurada, University of Louisville, USA
  - Ronald R. Yager, Hagan School of Business, Iona College, New Rochelle, NY, USA
  - Sławomir Zadrozny, Systems Research Institute, Polish Academy of Sciences, Warsaw, Poland
2. “Biology as a Source of Technical Inspirations” — Special session devoted to the 70th anniversary of Prof. Ryszard Tadeusiewicz, organized by:
  - Krzysztof Cios, Virginia Commonwealth University, USA
  - Leszek Rutkowski, Czestochowa University of Technology, Poland
  - Jacek Żurada, University of Louisville, USA
  - Bogdan M. Wilamowski, Auburn University, USA
3. “Advances in Single-Objective Continuous Parameter Optimization with Nature-inspired Algorithms” organized by:
  - Swagatam Das, Indian Statistical Institute, India
  - P.N. Suganthan, Nanyang Technological University, Singapore
  - Janez Brest, University of Maribor, Slovenia
  - Roman Senkerik, Tomas Bata University in Zlin, Czech Republic
  - Rammohan Mallipeddi, Kyungpook National University, Republic of Korea
4. “Stream Data Mining” organized by:
  - Piotr Duda, Czestochowa University of Technology, Poland
  - Maciej Jaworski, Czestochowa University of Technology, Poland

I would like to thank our participants, invited speakers, and reviewers of the papers for their scientific and personal contribution to the conference.

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

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