



## To the special issue dedicated to the 3rd international conference “Numerical Computations: Theory and Algorithms—NUMTA 2019” June 15–21, 2019, Isola Capo Rizzuto, Italy

Renato De Leone<sup>1</sup> · Yaroslav D. Sergeyev<sup>2,3</sup> · Gerardo Toraldo<sup>4</sup>

Published online: 21 October 2020

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This special issue of *Soft Computing* includes 23 high-quality peer-reviewed research papers (Caldarola et al. 2020; D’Alotto 2020; Pepelyshev and Zhigljavsky 2020; Falcone et al. 2020; Folino et al. 2020; Agapito and Cannataro 2020; Franchini et al. 2020; Amodio et al. 2020; Žilinskas and Litvinas 2020; Nesterov 2020; Gangle et al. 2020; Posypkin et al. 2020; Shao et al. 2020; De Leone et al. 2020; Capuano et al. 2020; Gao et al. 2020; Lančinskas et al. 2020; Sergeyev et al. 2020; Crisci et al. 2020; Cavallaro et al. 2020; Caldarola and Maiolo 2020; Astorino and Fuduli 2020; Candelieri et al. 2020) dealing with a number of important areas in modern applied mathematics and computer science. Most of the articles presented in this special issue come from the Third Triennial International Conference and Summer School NUMTA-2019 “Numerical Computations: Theory and Algorithms” held in the small village of Isola Capo Rizzuto in the South of Italy in June 15–21, 2019. The NUMTA-2019 conference has continued the previous successful editions of NUMTA that took place in 2013 and 2016 in Italy in the beautiful Calabria region.

The NUMTA-2019 conference has been organized by the University of Calabria, Department of Computer Engineering, Modeling, Electronics and Systems Science, Italy, in cooperation with the Society for Industrial and Applied Mathematics, USA. The place of the event, Isola Capo Rizzuto, belongs to the province of Crotona—the city of Pythagoras where he has established the first

Pythagorean community in the sixth century B.C. It was a very special feeling for the participants of the NUMTA-2019 conference dedicated to numerical mathematics and computer science to visit these holy for any mathematician places.

The goal of the series of NUMTA Conferences is to create a multidisciplinary round table for an open discussion on numerical modeling by using traditional and emerging computational paradigms. More than 200 participants of the NUMTA-2019 conference discussed multiple aspects of numerical computations and modeling starting from foundations and philosophy of mathematics and computer science to advanced numerical techniques. Among the topics discussed during the conference, there were also problems regarding teaching mathematics and results related to the legacy of Pythagoras. A special attention has been dedicated to numerical optimization techniques, approximation, and ordinary differential equations. A variety of issues related to theory and practice of the usage of infinities and infinitesimals in numerical computations were studied intensively during the event. In particular, there was a substantial bunch of plenary lectures and regular talks dedicated to a new promising methodology allowing one to execute numerical computations with finite, infinite, and infinitesimal numbers on a new type of supercomputer patented in several countries.

This edition of the NUMTA Conference was dedicated to the 80th birthday of Professor Roman Strongin who during the past 50 years was an undiscussed leader in the field of global optimization. His book on global optimization published in 1978 was one of the first in the world on this subject. Since that time, Roman has published numerous books and more than 400 papers in several scientific fields and has been rewarded with many national and international honors. For decades Roman served as Dean, First Vice-Rector, and Rector of the Lobachevsky State University of Nizhniy Novgorod. Since 2008, he is President of this university. He is also Chairman of the

✉ Yaroslav D. Sergeyev  
yaro@dimes.unical.it

<sup>1</sup> Università di Camerino, Camerino, Italy

<sup>2</sup> Università della Calabria, Rende, Italy

<sup>3</sup> Lobachevsky State University of Nizhni Novgorod,  
Nizhni Novgorod, Russia

<sup>4</sup> Università della Campania “L. Vanvitelli”, Caserta, Italy

Council of Presidents of Russian Universities, Vice-President of the Union of the Rectors of Russian Universities, and Chairman of the Public Chamber of the Nizhny Novgorod Region.

This special issue reflects well the topics discussed during the conference. Two main partially overlapping groups of papers can be distinguished within it. The first group discusses optimization problems and algorithms including local, global, and multi-criteria optimization (see Franchini et al. 2020; Žilinskas and Litvinas 2020; Nesterov 2020; Posypkin et al. 2020; Shao et al. 2020; De Leone et al. 2020; Capuano et al. 2020; Lančinskas et al. 2020; Sergeev et al. 2020; Crisci et al. 2020; Cavallaro et al. 2020; Astorino and Fuduli 2020; Candelieri et al. 2020). The second group of papers (see D'Alotto 2020; Pepelyshev and Zhigljavsky 2020; Falcone et al. 2020; Amodio et al. 2020; Gangle et al. 2020; De Leone et al. 2020; Caldarola and Maiolo 2020; Astorino and Fuduli 2020) deals with problems and algorithms using the already mentioned recent computational framework allowing one to work with different infinities and infinitesimals numerically. It can be seen from these articles that, in addition to its already known applications, the new computational methodology can be successfully used in such fields as optimization, ordinary differential equations, game theory, classification, logic, and fractals.

In conclusion, the Guest Editors hope that this special issue will find its numerous readers and would like to thank the Editors-in-Chief of *Soft Computing*, Professors Antonio Di Nola and Raffaele Cerulli, as well as the technical staff of Springer, for their valuable support.

## Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical standard** This article does not contain any studies with human participants or animals performed by any of the authors.

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