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# Swarm, Evolutionary, and Memetic Computing

4th International Conference, SEMCCO 2013  
Chennai, India, December 19-21, 2013  
Proceedings, Part II



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# Preface

This LNCS volume contains the papers presented at the 4th International Conference on Swarm, Evolutionary and Memetic Computing (SEMCCO 2013) held during December 19–21, 2013, at SRM University, Chennai, India. SEMCCO is regarded as one of the prestigious international conference series that aims at bringing together researchers from academia and industry to report and review the latest progresses in the cutting-edge research on swarm, evolutionary, memetic and other computing techniques such as neural and fuzzy computing, to explore new application areas, to design new nature-inspired algorithms for solving hard problems, and finally to create awareness about these domains to a wider audience of practitioners.

SEMCCO 2013 received 350 paper submissions from 20 countries across the globe. After a rigorous peer-review process involving 1,100 reviews, 126 full-length articles were accepted for oral presentation at the conference. This corresponds to an acceptance rate of 36% and is intended to maintain the high standards of the conference proceedings. The papers included in this LNCS volume cover a wide range of topics in swarm, evolutionary, memetic, fuzzy, and neural computing algorithms and their real-world applications in problems from diverse domains of science and engineering.

The conference featured distinguished keynote speakers: Prof. Marios M. Polycarpou, President, IEEE Computational Intelligence Society and Director, KIOS Research Center for Intelligent Systems and Networks Department of Electrical and Computer Engineering, University of Cyprus; Prof. Ferrante Neri, Professor of Computational Intelligence Optimization, De Montfort University, UK; Dr. M. Fatih Tasgetiren, Associate Professor of Industrial Engineering, Yasar University, Turkey; Dr. Dipti Srinivasan, Associate Professor, Department of Electrical and Computer Engineering, National University of Singapore. The other prominent speakers were Dr. P.N. Suganthan, NTU, Singapore; Dr. Adel Nasiri, Department of Electrical Engineering and Computer Science, University of Wisconsin-Milwaukee, USA; Dr. Ravipudi Venkata Rao, NIT, Surat, India; and Dr. Swagatam Das, ISI, Kolkata, India.

We take this opportunity to thank the authors of the submitted papers for their hard work, adherence to the deadlines, and patience with the review process. The quality of a referred volume depends mainly on the expertise and dedication of the reviewers. We are indebted to the Program Committee/Technical Committee members, who produced excellent reviews in short time frames.

We would also like to thank our sponsors for providing all the logistical support and financial assistance. First, we are indebted to SRM University Management and Administration for supporting our cause and encouraging us to organize the conference at SRM University, Chennai, India. In particular, we would like to express our heartfelt thanks for providing us with the necessary

financial support and infrastructural assistance to hold the conference. Our sincere thanks to Thiru T.R. Pachamuthu, Chancellor, Shri P. Sathyanarayanan, President, Dr. M. Ponnavaikko, Vice-Chancellor, Dr. N. Sethuraman, Registrar, and Dr. C. Muthamizchelvan, Director (E&T) of SRM University, for their encouragement and continuous support. We thank Prof. Carlos A. Coello Coello, Prof. Nikhil R. Pal, and Prof. Rajkumar Roy for providing valuable guidelines and inspiration to overcome various difficulties in the process of organizing this conference.

We would also like to thank the participants of this conference. Finally, we would like to thank all the volunteers who made great efforts in meeting the deadlines and arranging every detail to make sure that the conference could run smoothly. We hope the readers of these proceedings find the papers inspiring and enjoyable.

December 2013

Bijaya Ketan Panigrahi  
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