

Computational Intelligence Techniques in Earth and Environmental Sciences

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Editors

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 Springer

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Preface

Computational intelligence (CI) techniques have garnered considerable interest in recent decades within the earth and environmental science research communities because of its capacity to solve and understand various complex problems achieving a sustainable planet. This book is a collection of recent developments and applications of the computational intelligence techniques in earth and environmental sciences. Topics addressed in this volume include meteorology, atmospheric modeling, climate change, environmental engineering, water resources, and hydrological modeling. The editors hope that this volume will promote increased collaboration of scientists with backgrounds in computer sciences with earth and environmental scientists.

The main focus of the contents are divided into three broad categories—classical intelligence techniques, probabilistic and transforms intelligence techniques, and hybrid intelligence techniques. Part I of the volume serves as an overview of computational intelligence techniques and their application in earth and environmental sciences. In Part II, which covers classical intelligence techniques, the contributions related to the classical methods applied to earth and environmental sciences are gathered. Part III concerns probabilistic and transforms intelligence techniques, more specifically, the application of Markov analysis and wavelet transforms to the earth and environmental sciences. Lastly, the analyses of problems that cannot be adequately solved with traditional techniques are addressed in Part IV. Hybrid approaches are highlighted.

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Greenbelt, MD, USA
Delhi, India
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Following his Ph.D., he joined the University of Tokyo as a visiting scientist, more specifically, as part of the NASA/JAXA precipitation measurement missions (PMM) algorithm development team, which was supported by JAXA. Since 2013, he has been with the NOAA/NESDIS Center for Satellite Applications and Research, as a CIRA/CSU fellow, working on the development of satellite remote sensing algorithms with an emphasis on microwave variational inversion techniques. Currently, he is the scientific algorithm developer for the NOAA's Microwave Integrated Retrieval System (MiRS), where he is leading a number of efforts to enhance the performance of geophysical retrievals and extend the capability of the system to new passive microwave sensors.

Dr. Tanvir was the recipient of the Faculty of Engineering Commendation from the University of Bristol for his outstanding Ph.D. thesis (nominated for a University Prize) in 2012, the JAXA visiting fellowship award in 2012, and the CIRA postdoctoral fellowship award in 2013. He has been a member of the American Geophysical Union (AGU), International Association of Hydrological Sciences (IAHS), and American Society of Civil Engineers (ASCE). His primary research interests include satellite retrieval algorithms, cloud and precipitation system, radiative transfer modeling, data assimilation, radar polarimetry, mesoscale modeling, and artificial intelligence techniques applied to remote sensing and hydrometeorology.

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