

## Foreword

As a relatively new research field in computer science and engineering, natural computing (NC) deals with intelligent methods inspired from nature, especially biological and physical systems, and has made great progress in both theory and applications over recent years, as evidenced by the large number of publications in books, journals, and conferences. In particular, the joint International Conference on Natural Computation (ICNC) and the International Conference on Fuzzy Systems and Knowledge Discovery (FSKD), which I founded in 2005, has been attracting over 3,000 submissions world-wide every year since the very beginning. New ideas and methods continue to emerge.

The artificial immune system (AIS) is a new branch within NC. Professor Hongwei Mo, the Editor of the present book, has previously published two books on the AIS (in Chinese). What is different in the present book is that he combines the AIS with other NC methods by cooperating with experts in NC from different countries and the present book is published as a handbook, thereby providing a good tool for NC researchers.

The book is divided into two parts. The first part is a collection of achievements from researchers, some being quite famous, mainly on AIS theory and applications in optimization, agent, scheduling, data processing, spatio-temporal, internet, image processing, and control. It embodies the richness of AIS research, such as internet and control theory inspired by the immune network and immune multi-objective optimization algorithms, with characteristics which are different from other NC methods. In the second part, many kinds of nature inspired computing methods or theories are presented, including evolutionary computing, ant colony, artificial life, social theory, ethology, nature-inspired parallel computing, and artificial neural networks. Applications of these methods are mainly on optimization. This part shows how diverse nature phenomena have inspired researchers to develop theories and methods for solving engineering problems.

These research results will help readers not only understand many approaches in the AIS and other NC methods, but also compare the AIS with other NC methods.

In conclusion, it is a good book full of new ideas and recent developments in NC, especially the AIS. It should motivate researchers to cultivate new theories and methods, and thus advance the field even further. The book can also arouse beginners' interests and bring many young minds into this field.

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*1998, he has been associate professor at the School of Electrical and Electronic Engineering, Nanyang Technological University (Singapore). Wang's research interest is in natural computation with applications to data mining, bioinformatics, multimedia, and optimization. He has published over 200 papers in journals and conferences. He holds a U.S. patent in neural networks. Dr. Wang has authored two monographs and edited 20 books. He was keynote/plenary/panel speaker for several international conferences. Dr. Wang is associate editor for IEEE Transactions on Neural Networks (since 2002), IEEE Transactions on Evolutionary Computation (since 2003), IEEE Transactions on Knowledge and Data Engineering (since 2005). He is area editor of the Soft Computing journal (since 2002). He serves on the editorial board of 12 additional international journals and was on the editorial board of three other journals. Dr. Wang was vice president for technical activities (2006-2007) and chair of the Emergent Technologies Technical Committee (2004-2005), IEEE Computational Intelligence Society. He has been on the governing board of the Asia-Pacific Neural Network Assembly (APNNA) since 1999 and served as its president in 2002/2003. He won the 2007 APNNA Excellent Service Award. He was founding chair of both the IEEE Engineering in Medicine and Biology Chapter Singapore and IEEE Computational Intelligence Chapter Singapore. Dr. Wang serves/served as general/program/steering committee chair for 15 international conferences and as a member of steering/advisory/organizing/program committees of over 150 international conferences.*