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Quantitative Logic and Soft Computing 2010

Volume 2

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Foreword

Admittedly, the notion "intelligence or intelligent computing" has been around us for several decades, implicitly indicating any non-conventional methods of solving complex system problems such as expert systems and intelligent control techniques that mimic human skill and replace human operators for automation. Various kinds of intelligent methods have been suggested, phenomenological or ontological, and we have been witnessing quite successful applications. On the other hand, "Soft Computing Techniques" is the concept coined by Lotfi Zadeh, referring to "a set of approaches of computing which parallels the remarkable ability of the human mind to reason and learn in an environment of uncertainty, imprecision and partial truth." Such a notion is well contrasted with the conventional binary logic based hard computing and has been effectively utilized with the guiding principle of "exploiting the tolerance for uncertainty, imprecision and partial truth to achieve tractability, robustness and low solution cost." The soft computing techniques are often employed as the technical entities in a tool box with tools being FL, ANN, Rough Set, GA etc. Based on one's intuition and experience, an engineer can build and realize human-like systems by smartly mixing proper technical tools effectively and efficiently in a wide range of fields. For some time, the soft computing techniques are also referred to as intelligent computing tools.

Though these intelligent and soft computing techniques have been found to be very effective in describing and handling relatively simple human-related systems, we find that the existing theories and related conceptual foundations on soft and intelligent techniques need to be further improved and advanced to cope with the very complex nature of "human," the crux of the human in the loop system. We observe that the characteristics of "human", in view of human robot interaction, for example, is time varying, inconsistent, high dimensional, susceptive to noise, ambiguous, subjective and local. In particular, we find that the notion of "approximation" needs to be made more precise as we use those soft computing tools in a mixed way. One of the powerful directions is suggested by those scholars working on "quantitative logic." As a logic that is more mathematical than verbal, the quantitative logic combines the mathematical logic and the probability computation in a way to provide a graded approach to many-valued propositional logic and predicate logic

systems as well explained in a seminal paper by G. J. Wang and H. J. Zhou in Information Sciences. I am very glad to learn that this edited volume is intended to include research results on quantitative logic and other theoretical studies on soft computing, especially including several important theoretical expeditions by renowned scholars such as G. J.Wang and H. J. Zhou, E. P. Klement, R. Mesiar and E. Pap, V. Novak, I. Perfilieva, W. K. Ho, D. S. Zhao and W. S. Wee, Paul P. Wang and C. H. Hsieh, etc.

It has been my honor to review of the volume and comment on this important contribution to the area of intelligent and soft computing. I am very sure that this edition will be a valuable addition to your list of references.

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School of Electrical and Computer Engineering
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Preface

This book is the proceedings of the 2nd International Conference on Quantitative Logic and Soft Computing (QL & SC 2010) from Oct. 22-25, 2010 in Xiamen, China. The conference proceedings is published by Springer-Verlag (Advances in Intelligent and Soft Computing, ISSN: 1867-5662).

This year, we have received more than 165 submissions. Each paper has undergone a rigorous review process. Only high-quality papers are included. The 2nd International Conference on Quantitative Logic and Soft Computing (QL & SC 2010), built on the success of previous conferences, the QL & QS 2009 (Shanghai, China), is a major symposium for scientists, engineers and practitioners in China to present their updated results, ideas, developments and applications in all areas of quantitative logic and soft computing. It aims to strengthen relations between industry research laboratories and universities, and to create a primary symposium for world scientists in quantitative logic and soft computing fields as follows:

1) Quantitative Logic.
2) Fuzzy Sets and Systems.
3) Soft Computing.

This book contains 83 papers, divided into five main parts:

In Section I, we have 7 papers on "Keynote Speakers".

In Section II, we have 24 papers on "Quantitative Logic".

In Section III, we have 25 papers on "Fuzzy Sets and Systems".

In Section IV, we have 27 papers on "Soft Computing".

In addition to the large number of submissions, we are blessed with the presence of seven renowned keynote speakers and several distinguished panelists and we shall organize workshops.

On behalf of the Organizing Committee, we appreciate Jimei University and Shanxi Normal University in China, and International Fuzzy Mathematics Institute in USA. We are grateful to the supports coming from the international magazines published by Springer-Verlag GmbH. We are showing gratitude to the members of the Organizing Committee and the Program Committee for their hard work. We wish to express our heartfelt appreciation to the keynote and panel speakers, workshop organizers, session chairs, reviewers, and students. In particular, we are thankful to

the sponsors of the conference, namely, Xiamen Ropeok Science and Technology Co., Ltd, Xiamen Smart Technology Development Co., Ltd, Xiamen Feihua Environment Protective Material Co., Ltd., ChinaSoft International Limited and Pay Seng Koon Mathematics Science Activities Fund. Meanwhile, we thank the publisher, Springer, for publishing the QL & SC 2010 proceedings as J. Advances in Intelligent and Soft Computing (AISC). Finally, we appreciated all the authors and participants for their great contributions that made this conference possible and all the hard work worthwhile.

October 2010
Xiamen, P.R. China

Bing-yuan Cao
Guo-jun Wang
Shui-li Chen
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