Call for Book Chapters

Quantum Inspired Computational Intelligence
Research and Applications

Editors

Dr. Siddhartha Bhattacharyya (RCC Institute of Information Technology, Kolkata, India)
Prof. (Dr.) Ujjwal Maulik (Jadavpur University, Kolkata, India)
Prof. (Dr.) Paramartha Dutta (Visva-Bharati University, Santiniketan, India)

Important Dates

Proposal Submission: 15th August 2015
Notification of Acceptance of Proposals: 31st August 2015
Full Chapter Submission: 30th November 2015
Notification of Acceptance of Chapters: 31st January 2016
CRC Submission: 31st March 2016

Editorial Advisory Board

Prof. Carlos Coello Coello, CINVESTAV-IPN, Mexico
Prof. Cesare Alippi, Politecnico di Milano-DEIB, Italy
Prof. Chin-Teng Lin, National Chiao Tung University, Taiwan
Prof. Gary Yen, Oklahoma State University, USA
Prof. Kalyanmoy Deb, Michigan State University, USA
Prof. Kazumi Nakamatsu, University of Hyogo, Japan
Prof. Nikhil R. Pal, Indian Statistical Institute, Kolkata, India
Prof. Stephane Ploix, Grenoble Institute of Technology, France
Prof. Tan Kay Chen, National University of Singapore, Singapore
Prof. Witold Pedrycz, University of Alberta, Canada

Purpose

Imparting intelligence has become the focus of various computational paradigms. Thanks to evolving soft computing and artificial intelligent methodologies, scientists have been able to explain and understand real life processes and practices which formerly remained unexplored by dint of their underlying imprecision, uncertainties and redundancies, as well as the unavailability of appropriate methods for describing the inexactness, incompleteness and vagueness of information representation. Computational intelligence tries to explore and unearth intelligence embedded in the system under consideration.

Although computational intelligence stemmed from needs in image processing and pattern recognition, lately scientists and researchers working on engineering, science, business and financial applications have turned to computational intelligence for better research throughputs and end results. In fact, it is very difficult, if not impossible, to identify a current computation-intensive application that is devoid of the influence of "Intelligent" approaches. No longer limited to computing-related disciplines, computational intelligence models may be applied to any endeavor which handles complex and meaningful information.

Quantum computing as a discipline to evolve computationally intelligent systems came into existence in the late 1990s. Quantum inspired computational intelligence refers to an emergent field of research that concentrates on applying the principles of quantum computing characterized by certain principles of quantum mechanics such as standing waves, interference, quantum bits (*qubits*), coherence, decoherence, superposition of states, entanglement and concept of interference to develop more efficient and robust intelligent systems. Conventional computational intelligence or soft computing approaches, such as artificial neural networks, fuzzy systems, evolutionary computing, swarm intelligence and hybrid soft computing methods are thereby conjoined with quantum computing principles to achieve the objective. This volume would offer a wide spectrum of research work developed using soft computing combined with quantum computing systems.

Description and Scope of the Book

This book will aim to discuss quantum inspired computational intelligent approaches, initiatives and applications in engineering, science and business fields (including Mechanical Engineering, Power Control and Optimization, Total Quality Management, Machine Intelligence, Nanoscience and Nanoengineering, Mining Engineering, Modeling and Simulation, Signal Processing, Civil Engineering, Computer, Communication, Networking and Information Engineering, Optical Engineering, Bioinformatics and Biomedical Engineering, Ecology and Environmental Engineering, Engineering Management and Service Sciences, Systems Engineering, Innovative Computing Systems, Adaptive Technologies for Sustainable Growth, and Theoretical and Applied Sciences). This

collection should inspire various scholars to contribute research on intelligent principles and approaches in their respective research communities, while enriching the body of research on quantum inspired computational intelligence.

Recommended Topics:

This book solicits contributions that also include the basics, fundamentals of the quantum computational intelligence supported by practical examples and case studies apart from in-depth analysis of real life applications of quantum computational intelligence.
Recommended topics include, but are not limited to, the following:

1. **Quantum Inspired Computational Intelligence**
   a. foundations and principles;
   b. neural networks;
   c. evolutionary computation and swarm intelligence;
   d. hybrid intelligent systems

2. **Applications and Case Studies of Quantum Inspired Computational Intelligence in:**
   a. Mechanical Engineering - Production planning; scheduling and coordination; expert system design; cooperative control; dynamic system analysis; renewable energy systems; robotics and robotic vision engineering problems; process automation
   b. Power Control and Optimization - Power control; future energy planning and environment; industrial Informatics and planning; scheduling and assignment problems; optimization
   c. Total Quality Management - TQM intelligent methods; business excellence models; intelligent and virtual CMM
   d. Machine Intelligence - Data processing, analysis and applications; intelligent systems; emerging computing paradigms
   e. Nanoscience and Nanoengineering - Artificial intelligence and soft computing techniques; parallel and distributed computing; grid computing and pervasive computing; adaptive reconfigurable architectures
   f. Mining Engineering - Mine planning and modeling; mine safety methods using intelligent VR and HCI techniques
   g. Modeling and Simulation - Modeling paradigms; simulation techniques; high performance computing
   h. Signal Processing – Algorithms, architectures and applications; multidimensional signal processing; radar signal and data processing; adaptive QoS provisioning; VLSI for network processing; embedded reconfigurable architectures; evolvable systems; spread spectrum and CDMA systems; antennas and propagation; mobile ad hoc networking; sensor networks

i. Civil Engineering - Modeling and optimization of manufacturing systems and processes; computational fluid dynamics; flood forecasting; analysis of processing of GIS, GPS, remote sensing data; automated inspection

j. Computer, Communication, Networking and Information Engineering - Intelligent network management; antenna design, information security; cross-layer optimized wireless networks; pervasive/ ubiquitous computing MEMS systems characterization; Intelligent compiler and interpreter design; expert systems; pattern recognition; image processing

k. Optical Engineering - Optical computing; optical image processing; optical testing; optical communication systems and networks; intelligent photonics

l. Bioinformatics and Biomedical Engineering - Bio-molecular and phylogenetic databases; Biomedical engineering; biomedical robotics and mechanics; bio-signal processing and analysis; biometrics and bio-measurements

m. Ecology and Environmental Engineering - Green energy engineering; environmental pollution and remediation; environmental sustainability and restoration; hazardous substances and detection techniques; air pollution and control; solid waste management

n. Engineering Management and Service Sciences - Engineering management; portfolio management; emergency management system; supply chain management; service sciences; converged network and services; e-commerce and e-governance

o. Systems Engineering - Industrial automation and robotics; intelligent photonics and lighting systems; computer assisted medical diagnostic systems; unmanned aerospace systems; intelligent control systems; intelligent approaches in system identification/modeling

p. Innovative Computing Systems - Intelligent manufacturing systems; quantum inspired soft computing methodologies for signal, image and information processing; medical innovative technologies

q. Adaptive Technologies for Sustainable Growth - Soft computing based power systems; bio-medical engineering systems; trends and development in nano technology; wireless sensors and networks

r. Theoretical and Applied Sciences - Optimization and analysis of mathematical functions; statistical time series analysis; characterization of chaos theory; theory of fractals and applications to uncertainty management; applications of computational intelligence to atmospheric sciences

Submission Deadlines

The book is to be published by **Morgan Kaufmann, an imprint of Elsevier**. It is expected to be published in 2016.

PROPOSAL SUBMISSION: Prospective authors should submit a 2-3 page proposal by **15th August 2015** clearly explaining the mission and concerns of the proposed chapter. Authors will be notified by **31st August 2015** about the status of their proposals.

FULL CHAPTER SUBMISSION: Chapters have to be 30-35 pages length and will be reviewed by two expert reviewers to ensure the quality of the volume. The deadline of submission is **30th November 2015.**

NOTIFICATION: Authors of submitted chapters will be notified by **31st January 2016** about their acceptance.

CRC SUBMISSION: Camera-ready version of accepted chapters incorporating revisions (if any) is expected to be submitted by **31st March 2016**.

Inquiries and submissions can be forwarded to:

Dr. Siddhartha Bhattacharyya
Associate Professor and Head,
Department of Information Technology
Dean (R & D)
RCC Institute of Information Technology
Canal South Road, Beliaghata, Kolkata – 700 015, India
Mobile: +919830354195
Email: dr.siddhartha.bhattacharyya@gmail.com

Prof. (Dr.) Ujjwal Maulik
Professor,
Department of Computer Science and Engineering
Jadavpur University
Kolkata – 700 032, India
Mobile: +919477158220
Email: ujjwal_maulik@yahoo.com

Prof. (Dr.) Paramartha Dutta
Professor,
Department of Computer and System Sciences
Visva-Bharati University
Santiniketan – 721 325, India
Mobile: +919433155116
Email: paramartha.dutta@gmail.com