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Special Issue on Denotational Mathematics for Cognitive Informatics and Knowledge Engineering

Editors: Yingxu Wang and Yiyu Yao

Many branches of mathematics have been created in sciences and engineering in order to meet their abstract, rigor, and expressive needs. These phenomena may be conceived as that new problems require new forms of mathematics. *Cognitive Informatics* (CI) is a transdisciplinary enquiry that encompasses a wide range of contemporary science and engineering disciplines related to information and knowledge processing in the brain and mind, which may not be described by conventional analytic mathematics. Therefore, new forms of mathematics are sought, collectively known as *denotational mathematics*, to deal with the unique mathematical entities and abstract objects emerged in the field of CI, such as information, concepts, knowledge, processes, behaviors, systems, fuzzy/rough sets, complex relations, granules, and distributed objects.

This special issue on *Denotational Mathematics for Cognitive Informatics and Knowledge Engineering* in *IJCINI* will focus on novel mathematical forms and structures, new mathematical entities, applications of descriptive mathematics, and comparative studies on descriptive and analytic mathematics. Original papers are solicited for this special issue. Suggested topics include, but are not limited to:

- Novel mathematical forms and structures
 - Process algebra
 - Concept algebra
 - System algebra
 - Rough set theory
 - Category theory
 - Descriptive vs. analytic mathematics
- New mathematical entities
 - Information
 - Concepts
 - Knowledge
 - Processes
 - Behaviors
 - Systems
 - Fuzzy/rough sets
 - Complex relations
 - Granules
 - Distributed objects
- New expressive needs in mathematics
 - System architectures
 - System behaviors
 - Series of actions
 - Series of decisions
 - Knowledge representation
 - Pattern description
- Application areas of descriptive mathematics
 - CI
 - Computing
 - Software engineering
 - Knowledge engineering
 - Information engineering
 - Autonomic computing
 - Autonomic agent systems
 - Computational intelligence
 - Machine learning
 - Neural informatics

Prospective authors may check the *Guidelines for Authors* of *IJCINI* at <http://www.enel.ucalgary.ca/IJCINI/>. Submitted papers must not have been previously published or be currently under consideration for publication elsewhere, except those being declared as presented conference papers. All papers will be rigorously refereed. Complete manuscripts in both Word and PDF formats should be submitted to the Editors before **February 1, 2007**.

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