



ISSN: 1752-8909

Vol.4 (2010) No.1

February

England, UK
www.JUS.org.uk
editor@JUS.org.uk

Graphic Designer:

Miss Li

Journal of Uncertain Systems

Edited by *International Committee of Uncertain Systems, WAU*

Published by *World Academic Union (World Academic Press)*

Academic House, 113 Mill Lane, Wavertree Technology Park, Liverpool, L13 4AH, UK
www.WorldAcademicUnion.com; www.WorldAcademicPress.com

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ISSN: 1752-8909 (print), 1752-8917 (online), Quarterly
Edited by International Committee of Uncertain Systems, WAU
Published by World Academic Union (World Academic Press)
Publisher Contact: Academic House, 113 Mill Lane
 Wavertree Technology Park
 Liverpool L13 4AH, England, UK
 Email: publishing@wau.org.uk
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Preface to the Special Issue on “Global Optimization and Intelligent Algorithm”

Frank to say, the seven papers to be published in this special issue, most of selected papers are devoting to the theme: “*Global Optimization and Intelligent Algorithm*”.

Ding *et al.*, in their paper “Disjoint Programming in Computational Decision Analysis”, discuss a series of imprecise decision models, which result in non-convex optimization problems under the principle of maximizing expected utility. The Authors take advantage of polar cuts and the disjoint structural property of the imprecise decision models to develop new generalized cutting plane methods. The spirit of new intelligent is demonstrated although the conventional expected utility criterion is under challenge recently.

Fuchs and Neumaier, in “A splitting technique for discrete search based on convex relaxation”, present a branching strategy for the case that the integer constraints are associated with a finite set of points in a possibly multidimensional space. Authors use the knowledge about this discrete set represented by its minimum spanning tree and find a splitting based on convex relaxation.

Cui *et al.*, in the paper “Lambda Algorithm”, propose a new global optimization algorithm inspired by an abstract harmony biological model. The new algorithm utilizes strings of element from member set $\{0, 1, 2, 3, 4\}$ to represent the values of candidate solutions typically represented as vectors in n -dimensional Euclidean space. Except the mathematical operations for evaluating the objective function, sort procedure, and the creation of initial population randomly, lambda algorithm utilizes only “if-else” logical operator, consequently, the algorithm engages the simplest mathematics but reaches the highest global searching efficiency.

Chen *et al.*, in “Uncertainty and Risk Analysis in Information System Projects Development”, propose an identification-evaluation framework to identify causes of shortfalls in previously implemented information system projects. Authors engage cognitive maps, reflecting the different stakeholders’ involvement in risk analysis, toward the identification of potential risks and their interrelationships throughout the information system project lifecycle.

Schjær-Jacobsen, in the paper “Numerical Calculation of Economic Uncertainty by Intervals and Fuzzy Numbers”, emphasizes that the numerically correct calculation of economic uncertainty with intervals and fuzzy numbers requires implementation of global optimization techniques in contrast to straightforward application of interval arithmetic. In this paper, author highlights the difference between the probabilistic and the possibilistic approach on the railway data.

Bisserier *et al.*, in their paper “Linear Fuzzy Regression Using Trapezoidal Fuzzy Intervals”, engage a new modified fuzzy linear model, in which the output can envelop all the observed data and ensure a total inclusion property with any kind of spread tendency. In this framework, the identification problem is reformulated according to a new criterion that assesses the model fuzziness independently of the collected data.

Doria, in “Different types of convergence for random variables with respect to separately coherent upper probabilities defined by Hausdorff outer measures”, proves that the given upper conditional previsions satisfy the Monotone Convergence Theorem and on the class of all Borel-measurable random variables convergence in distribution is equivalent to the pointwise convergence of the expectation functionals on all bounded continuous functions in terms of Hausdorff outer measures.

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