
Preface

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Biographical notes: Da Ruan (PhD in Mathematics, 1990, Ghent University) is a Principal Research Scientist at the Belgian Nuclear Research Centre (SCK-CEN). His major research interests lie in the areas of computational intelligence methods, uncertainty analysis, decision support systems to information management, safety and security-related fields. He is a Guest Professor of Applied Mathematics and Computer Science at Ghent University and at the Department of Applied Economics at Hasselt University, both in Belgium, and an Adjunct Professor in the Faculty of Information Technology at University of Technology, Sydney, Australia.

For the past two decades, the international FLINS forum (fuzzy logic and intelligent technologies in nuclear science) has actively promoted applications of artificial intelligence and computational intelligence in nuclear fields.

This special issue of the seven selected papers, generated from the 9th International FLINS Conference on Computational Intelligence – Foundations and Applications (FLINS10), Emei, Chengdu, China, 2–4 August 2010, covers a small set of nuclear control and decision-making applications from Australia, Belgium, Hungary, India, Mexico, Norway, Romania, Spain, the UK and the USA.

The first paper, by Rojas-Ramírez et al., applies computational intelligence techniques for an identification of a research nuclear reactor. The second paper, by Precup et al., presents a stable design of Takagi-Sugeno fuzzy controllers for a laboratory three tank system. The third paper, by Gola et al., introduces a model-based ensemble approach to plant-wide online sensor monitoring. The fourth paper, by Purba et al., discusses failure possibilities for nuclear safety assessment by fault tree analysis. The fifth paper, by Rao, proposes a nature-inspired camouflaging approach to protect nuclear secrets. The sixth paper, by Rodriguez et al., deals with missing values in nuclear safeguards evaluation. And the last paper, by Deshpande and Jain, reports computing with words on energy options with decision under risk and uncertainty.

This special issue is an on-going progress report of FLINS activities and especially the result of FLINS10. Special thanks are due to all contributors and all referees for their kind cooperation in helping to prepare this volume, and to Professor André Maisseu (Editor-in-Chief) of *International Journal of Nuclear Knowledge Management* for his kind consideration, help and advice to publish this special issue.