PREFACE

The 16th Annual UK Workshop on Computational Intelligence

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The 16th Annual UK Workshop on Computational Intelligence (UKCI2016) took place in Lancaster on September 7–9, 2016. The UKCI workshop series is the premier UK event for presenting leading research and development on all aspects of computational intelligence. The aim of UKCI2016 was to provide a forum for the academic community and industry to share experiences of advancing and utilising computational intelligence techniques, to discuss new trends and to exchange views and ideas.

UKCI2016 was hosted by the Lancaster University, UK, with the support of the workshop's organizing and programme committees, the network of reviewers and volunteers, and the contribution of authors and keynote speakers. The workshop attracted solid interest from prospective authors from all around the world: 32 papers on recent progress in computational intelligence techniques and applications were selected and presented. From these, authors of nine top-ranked papers, selected by the international program committee and reviewers, were invited for submission of substantially extended versions to be considered for publication in a special issue of soft computing, dedicated to recent advances in computational intelligence algorithms and applications. From these papers, six are finally accepted for inclusion in this special issue. They jointly reflect both the most recent advances in computational intelligence and their applications as progressed from the initial scientific contributions, and also the emerging computational intelligence concepts, algorithms and applications.

In the paper entitled "Improving fuzzy rule interpolation performance with information gain-guided antecedent weighting", Fangyi Li et al. present a novel inference system where an information gain-guided fuzzy rule interpolation method is embedded. They confirm that the relative significance of the individual rule antecedent variables can indeed be captured by the information gains, forming the weights on the variables to guide fuzzy rule interpolation. Research reported in "An extended Takagi–Sugeno–Kang inference system (TSK+) with fuzzy interpolation and its rule base generation" by Jie Li et al. presents a novel fuzzy interpolation approach that extends the TSK inference and proposes a data-driven rule base generation method to support the extended TSK inference system. Azliza Mohd Ali et al. present in the paper, entitled "Anomalous behaviour detection based on heterogeneous data and data fusion," a new approach to identifying anomalous behavior based on heterogeneous data and a data fusion technique. They demonstrate that the new approach can assist human experts in processing huge amount of heterogeneous data to detect anomalies. Osman Ali Sadek Ibrahim and D. Landa-Silva propose in the paper "An evolutionary strategy with machine learning for learning to rank in information retrieval", an effective and efficient Learning-to-Rank method combining a list-wise evolutionary technique with point-wise and pair-wise machine learning techniques. In the contribution entitled "Hardening against adversarial examples with the smooth gradient method", Alan Mosca and George Magoulas explore how input gradients may be related to input perturbations used to generate adversarial examples. They also show how the deep neural networks that are trained with this technique are more robust to attacks generated with the fast gradient sign method. In the paper "Fuzzy cerebellar model articulation controller network optimization via self-adaptive global best harmony search algorithm", Fei Chao et al. propose to apply harmony search algorithm to find optimal network parameters, so as to improve the performance of fuzzy cerebellar model articulation controller network. The experimental results demonstrate that the networks optimized by self-adaptive global best harmony search algorithm are of faster convergence speed while offering better accuracy.

This exciting collection of such excellent work could not have been possible to be shared with the research community without the active and encouraging support of Professor Vincenzo Loia, the Editor-in-Chief, and Springer's Soft Computing journal team to deliver this special Issue. It would

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not have been possible without the hard work and professional support of the UKCI 2016 programme committee and the peer-reviewers of papers presented at the workshop and in this special issue. We are very grateful to them all. We would also like to acknowledge the continuous support of the authors who have contributed to this special issue. We hope that this special issue brings to readers a great selection of research contributions that mark the progress and promote scientific excellence in computational intelligence and applications.

Compliance with ethical standards