Preface

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Biographical notes: Nadjet Kamel is a Full Professor at the Department of Computer Science of the University Ferhat Abbes of Setif 1 (UFAS1), Algeria since 2011. She received her Magister and PhD in Computer Science from the University of Science and Technology Houari Boumediene (USTHB), Algeria, respectively in 1995 and 2007. She has been a Postdoctoral Researcher at the University of Moncton, in Canada from August 2007 to August 2009. She has been involved in many research projects (CMEP, PNR and CNEPRU). Since 2011, she is the Head of the research team Data Mining and Machine Learning at the Laboratory of Research in Artificial Intelligence (LRIA) at USTHB. She organised and served as program committee member of many international conferences. Her main interests are related to computational intelligence and data mining.

Gayo Diallo is an Associate Professor in Computer Science, University of Bordeaux, France since 2009. Prior to taking this position, he was a Postdoctoral Researcher at the LISI Laboratory of Applied Computer Science, Poitiers in France, and Research Assistant at City University of London, UK. He received his PhD from the University of Grenoble 1 Joseph Fourier in 2006. He is actively pursuing his research in knowledge intelligence (including large-scale ontologies matching, knowledge representation and reasoning), DB&IR integration and ICT4D where he has contributed to several national and international projects and authored or co-authored more than 40 peers reviewed papers.

Sadok Ben Yahia is a Full Professor at the Computer Sciences Department of the Faculty of Sciences of Tunis (University Tunis El Manar) since October 2009. He obtained his Habilitation to lead researches in Computer Sciences from the University of Montpellier in April 2009. Currently, he is leading the research laboratory LIPAH and his main research interests include formal concept analysis, minimal transversal extraction and ontology engineering.

The papers in this special issue are extended and revised versions of best papers from the Track on Computational Intelligence presented in the 5th IFIP International Conference on Computer Science and its Application (CIIA'2015) held in Saida (Algeria).

Computational intelligence (CI) emerged as a field in artificial intelligence. It aims to find methodologies and approaches to address difficult and complex problems using nature inspired approaches such as genetic algorithms, particle swarm intelligence and ant colony.

These approaches showed their contributions in various broad research areas (computer science, engineering, finance, economic, decision making, etc.). However, in the last years, the development of information technology helped the production of a huge amount of data in scientific fields, industry, and internet, so called 'big data'. These big data introduce new issues and challenges at each step of their processing including data collection, analysis, aggregation and privacy management.

Traditional computational methodologies are not adapted to these new challenges. Therefore, new CI techniques are needed.

The aim of this special issue is to discuss challenges and opportunities in the application of CI techniques to big data processing.

Seven papers were selected among the 16 accepted and presented papers within the track on CI of CIIA2015. Their extended versions were submitted for this special issue. After a carefully peer reviewing process, three papers were accepted. Each paper was reviewed by at least two reviewers.

The first paper entitled 'Rotation-invariant method for texture matching using model-based histograms and GLCM' deals with the problem of image processing and particularly with texture analysis. The authors propose a new texture analysis method. This method focuses on the problem of rotation of image and proposes a robust method against rotation. The approach starts by constructing a model from each texture in the image, and then classifies the query texture based on the extracted texture models. The feature extraction method called rotation invariant neighbourhood-based binary pattern (RINBP) is used. The approach is experimented using Brodats album database, which is a reference texture database. The results illustrate the efficiency and the robustness of the proposed system against rotation.

The second paper entitled 'An improved HBA metaheuristic' proposes an enhanced homogeneity based-algorithm (HBA) called improved homogeneity-based algorithm (IHBA). This algorithm uses the computational complexity of a classifier as the objective function. In addition, clustering approaches (K-means, FCM, and EM) are used to find optimal number of hyper spheres that cover the inferred pattern obtained by applying a classification method. The proposed method is tested on a set of benchmarks data sets from the UCI repository. The results are compared to other algorithms (LVQ, PMC, and ANFIS) and show the effectiveness of the proposed algorithm.

The third paper entitled 'A 0-1 bat algorithm for cellular network optimisation: a systematic study on mapping techniques' presents a study on discretising continues metaheuristics. The study is performed through five proposed binary variants of the bat algorithms (BBAs). The proposed algorithms are evaluated on two optimisation problems in cellular networks, the antenna positioning problem (APP) and the reporting cell problem (RCP). Experimentations are conducted on the proposed algorithms using several types, sizes and complexities of data. The results are compared to the population-based incremental learning (PBIL) and the differential evolution (DE) algorithm. The obtained results show that the proposed BBAs outperform the PBIL in some APP instances and achieve results as good as the ones obtained by the DE in some the RCP instances.

We would like to take this opportunity to acknowledge the tireless cooperation and support of the reviewers, even if deadlines were tight. The pre-eminent panel of reviewers composing the program committee, that worked diligently to guarantee a thorough review of each paper, was as follows: Saliha Aouat (USTHB, Algiers, Algeria), Hajer Baazaoui (ISAMM, Tunisia), Mohamed Batouche (University of Constantine 2, Algeria), Hanan Brahmi (ESIG-Kairouan, Tunisia), Imen Brahmi (FST, Tunisia), Maher Ben Jemaa (University of Sfax, Tunisia), Habiba Drias (USTHB, Algeria), Siyamalan Manivannan (School of Science and Engineering, University of Dundee, UK), Mohamed El Bachir Menai (King Saud University, Saudi Arabia), Souham Meshoul (University of Constantine 2, Algeria), Ahmed Samet (University of Lille Nord de France Artois, France), Chiraz Trabelsi (FST, Tunisia), Taoufik Yeferny (ISAMM, Tunisia).

In closing, we would like to thank all the authors for their submissions to this special issue and we hope it will be of great interest for researchers in the field of CI. Last but not least, we are grateful to the *IJRIS* Editor-in-Chief, Kazumi Nakamatsu who provided continuous support and advice during the preparation of this special issue.