
Preface

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Biographical notes: Abdellah Idrissi is graduated PhD in Artificial Intelligence. He is currently a member of the IPSS team where he leads a research group on Artificial Intelligence and Its Applications. He is the author of three books and co-author of several publications in international journals and conferences. He is also the co-author of two patents and others are pending. He is a member of the editorial board of several international journals and a member of the TPC of several international conferences. He is the founder and general chair of the *International Conference on Modern Intelligent Systems Concepts (MISC'18)*, and has chaired numerous international conferences and workshops. He has supervised five doctoral theses, which have been defended with excellence, and many more are in progress. He is founder and coordinator of the Master in Artificial Intelligence and Data Science. He was a partner of the MOSAIC project (FP7 612076), leader in the implementation of the technology platform in the Maghreb region.

Ahlem Ben Hassine is graduated PhD in Computer Science, specialty Artificial Intelligence from the Japan Advanced Institute of Science and Technology (JAIST) Japan, in 2005. Then, she had two years of research fellow at the Computational Linguistics Group, Language Grid project at the Knowledge Creating Communication Research Center (NICT) Kyoto-Japan. She was an Assistant Professor at the National School of Computer Science (ENSI-Tunis). Currently, she is an Assistant Professor at the College of Computer Science and Engineering, Computer Science and Artificial Intelligence Department, University of Jeddah, Saudi Arabia. Her research interests involve constrained problems, multi-agent systems, meta-heuristics, machine learning, renewable energy and web composition.

We live in an era where everything is connected and where everything is evolving very quickly thanks to very advanced developments in both, computing in general and new technologies in particular. Artificial intelligence, the internet of things, cognitive computing, virtualisation, cloud computing, edge computing, big data, high performance computing, have invaded the world of Computing. These new technologies streamline the development of several applications to ease human tasks and mainly cope with real world activities that, at a time, were difficult to accomplish as health, social cyber security, education, environment, etc. All research papers published in this special issue are focused on this large domain. Therefore, this special issue entitled *Recent Advancements in Intelligent Systems* is

reserved for intelligent applications whose main objective is to enrich the state of the art and to propose new approaches and innovative techniques to deal with various problems in the society.

The IJHPSA special issue includes several topics in intelligent systems varying from problem modelling and formalisation to deep learning and big data approaches improving thus certain concepts and architectures in the framework of high performance computing. The included papers are selected from the *International Conference on Modern Intelligent Systems Concepts* that was held in Morocco in December 2018 (MISC'2018). We have explored some important branches of the field of AI, which deal with high performance computing particularly its

applications and extensions in solving important real-life problems, for known and unknown environments.

In this special issue, six papers are presented. In the first one, Retal and Idrissi propose a virtual network functions placement in 5G architecture based on multi agent approach. 5G architecture is a new framework that uses existing technologies to meet the requirements of numerous applications that increase data traffic daily. The authors proposed a multi-agent system that appears to be a very useful tool for the operation and the control of VNFs placement in 5G architecture. It brings a real-time solution to the problem of VNFs placement. This proposal enhances the existing autonomous and adaptable solutions and is considered as a new approach for this problem. In this paper, the authors focused their research on the use of an intelligent agent to manage QoE, routing, mobility and resources allocation.

In the second paper, Trichni et al. deal with an intelligent strategy for encryption decisional support system. They proposed a new security strategy based on artificial intelligence tools to make this goal adjustable change and adaptable from one platform to another by ensuring the highest possible level of confidentiality. Their goal is to particularly perform the two protocols called encryption and decryption in the most effective manner, taking into account the constraints of the environments and data sources. To do so, they used the Skyline algorithm namely block nested loop (BNL), as it is one of the best-known methods in the field of artificial intelligence, easily adaptable, to identify the most effective solutions.

As for the third paper, Zarnoufi et al. tackle the problem of cyber-violence. Cyber-violence can be considered as a behaviour that takes place online using internet technologies. It includes multiple forms of aggression. Victims of cyber-violence may develop variant psychological and physical distress. To remedy to this phenomenon, several studies have been conducted to detect the cyber-violence circle. The authors, in this paper, analyse the users' generated texts based on social media (SM) in order to reveal the behavioural characteristics of a cyber perpetrator. They focused on the detection of the harmful behaviour of SM users starting from their emotions. Their approach is based on emotions that can be expressed in any type of violence. They extract the features related to emotional states based on semantic similarity by exploiting word embedding technique. Then they use Ensemble Machine Learning Algorithm to predict the presence or not of harmful behaviour of a user from the posted text in SM, as well as handling the problem of imbalanced data distribution. They concluded through obtained results that artificial intelligence could play a major role in improving the individual's mental health and human well-being in general.

El Kassiri and Belouadha, in the fourth paper entitled semantic approach using unified and summarised ontologies for analysing data from social media, deal with the hard problem of aggregating and analysing data from online social networks (OSN). In fact, aggregating multiple users'

data from multiple media requires a unified representation model. The authors interested by ensuring the interoperability of different OSN in terms of data and ensuring a better generic analysis responding to a multitude of requirements. They proposed an approach that allows an aggregated description of social Web content from a multitude of OSN and then favours the realisation of a better multi-aspects analysis. Their approach allows to aggregate data from a multitude of OSN among the most popular from them, and is dedicated to a multi-aspect analysis of the social web.

In the fifth paper, Marwan et al. used cloud computing for e-health implementation. Cloud facilitates interoperability among different healthcare organisations and accelerates the deployment of EMR systems. The authors propose a security approach based on segmentation and digital signatures. Their proposal aims to offer adequate protection mechanisms to guarantee confidentiality and privacy of medical information when using online services. They suggest to use K-means algorithm to segment the secret image into small portions according to pixels' colour. Subsequently, each portion will be normally processed in a distinct server of a multi-cloud environment. They proposed also a hybrid technique that relies on trust model and existing frameworks. They concludes that this two-level architecture is a very simple way to dramatically reduce security risks and increase cloud services assurance.

The last and not the least effort, given by Abatal et al. deals with enhancing the processing of the exponential growth of data. Their objective remain focused on processing data in the Web based on semantics' aspect. They stated that a critical requirement for the evolution of the current Web of documents into a web of data is the inclusion of the vast quantities of data stored in relational databases (RDB). The authors propose to improve the functioning of RETRO framework, by proposing algorithms for the extension of RETRO to deal with the conversion of SQL queries like INSERT, UPDATE and DELETE to equivalent SPARQL queries taken into account the RDB schema upon which RETRO is based.

All these efforts are performed in order to show the importance of improving algorithms in different areas of life. All the experimental results and interpretations are given in details and explained in the end of each paper.

We consider that this special session presents some real and recent advancements in Intelligent Systems coupled with High Performance Computing. It contributes to their emergence, their evolution, and particularly their orientation in the service of the humanity.

We would like to thank all the authors for their interactions and interesting contributions.

In addition, we will not close this issue without warmly acknowledging the great efforts of the Editors, especially Professor Nadia Nedjah, Liz Harris, Darren Simpson, Joane Esmejarda, Albert Ang and all the Staff of the IJHPSA Journal for their great help and support and to any person whom contribute to promote the IJHPSA Journal.

Thank you