
Editorial

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Biographical notes: Lorna Uden is Professor Emeritus of IT Systems in the Faculty of Computing, Engineering and Technology at Staffordshire University. Her research interests include technology learning, HCI, mobile learning, activity theory, knowledge management, web engineering, multimedia, e-business, service science and innovation, semantic web, software as a service (SaaS) and problem-based learning.

Welcome to the V8N2 issue of *IJWET*. I would like to express my sincere thanks to Maria Moreno, Javier Bajo and Juan M. Corchado for their contributions to this issue. They have selected papers from the 9th International Conference on Practical Applications of Agents and Multi-Agent Systems and helped to edit this issue. Many thanks to the authors who have revised and extended their papers to make this issue possible. There are five papers in this issue.

The first paper is titled 'Lightweight tourism recommendation', by Nuno Luz, Ricardo Anacleto, Constantino Martins, Ana Almeida and Joel Pinho Lucas. According to these authors, semi automated advising and planning systems in tourism systems rely on complex decision support techniques.

The heterogeneity of places, their specificities, and the endless amount of variables involved in travelling adds a considerable amount of complexity to the problem, thus making it difficult to solve without assistance. User interests and preferences also affect the decision process, and how to efficiently model, retrieve and evolve the system beliefs about the user is a complex problem. These authors argued that despite recent evolutions in user modelling (UM) and recommendation systems (RSs), it is difficult create a well balanced user model regarding complexity and performance. To overcome this, they have developed the tours planning system entitled TOURSPLAN, with a new lightweight UM process to work as a tourism RS in a commercial environment. The new process tackles issues like cold start, grey sheep and over specialisation through a rich user model and the application of a gradual forgetting function to the collected user action history. Further work is needed for the analysis of collaborative filtering methods that exploit clustering and classification techniques.

The second paper is by Didier Schwab, Jérôme Goulian and Andon Tchechmedjiev. In their paper, 'Worst-case complexity and empirical evaluation of artificial intelligence methods for unsupervised word sense disambiguation', they talk about word sense disambiguation (WSD) for natural language processing (NLP). WSD is a core task in NLP. It has the potential to improve many of its applications: multilingual information retrieval, automatic summarisation or machine translation. The aim of WSD is to assign

for each word of a text the appropriate sense(s) in context from a pre-defined sense inventory. Schwab, Goulian, and Tchechmedjiev argue that WSD is a difficult problem for NLP. Algorithms that aim to solve the problem focus on the quality of the disambiguation alone and require considerable computational time. In this paper, these authors have focused on the study of three unsupervised stochastic algorithms for WSD: a genetic algorithm (GA) and a simulated annealing (SA) algorithm from the state of the art and their own ant colony algorithm (ACA). Comparison was made both in terms of the worst case computational complexity and of the empirical performance of the algorithms in terms of scores, execution time and evaluation of the semantic relatedness measure. They claim that the worst-case complexity of GA is a factor of 100 higher than SA. However, it is difficult to make any comparison to ACA. They estimated the best parameters manually for SA and GA, but automatically for ACA (made possible by its short execution time). These authors found that ACA leads to a shorter execution time (factor of 10 and 100, respectively) as well as better results. Using different voting strategies, they found a small increase in the scores of SA and GA and significant improvements in the results of the ACA. However, there are still issues that need to be addressed. One of these is that the degree of supervision remains far below supervised approaches that use training corpora approximately 1,000 times larger. Further work in this is required.

The third paper is, 'Towards user-authored agent dialogues for assessment in personalised ambient assisted living' by Helena Lindgren and Ingeborg Nilsson. According to these authors, existing approaches to ambient assisted living (AAL) often fail to consider a human agent's needs from a holistic perspective. In particular, the regular assessment of their changing abilities, skills and limitations are often treated as a separate matter in healthcare, thereby affecting the possibilities to provide support tailored to their current condition. To overcome this, these authors have integrated assessment done by the healthcare professional into the framework of AAL. They used a case scenario as the base for domain experts in their development of the interaction between software agents and with the older adult-in-assessment and adaptation for supporting him/her in a home environment. The potentials in allowing professionals to author and design the dialogue systems as part of a meta-design process is evaluated and discussed. Further research is needed to verify the claims.

The fourth paper is, 'A self-healing distributed pervasive health system' by Stefano Bromuri, Michael I. Schumacher and Kostas Stathis. Pervasive healthcare brings healthcare everywhere, breaking the boundaries of hospital healthcare. A personal health system (PHS) is a complex system where multiple components interact to allow large scale monitoring of physiological data of heterogeneous patients. According to these authors, two main limitations affecting existing PHSs are:

- a failures of the distributed system are never taken into consideration
- b the system topology is statically defined.

Consequently, PHSs need fault tolerance mechanisms as system downtimes may be dangerous for patients relying on them. These authors argue that, in a pervasive healthcare system, there is a growing need of services that are constantly available to the patients accessing them.

To address this issue, they present a distributed pervasive infrastructure that is capable of self-healing one or more of its parts when an external event causes a

disruption of the service in the areas covered by the pervasive system. They utilised approaches from multi-agent systems (MASs) such as communication, coordination, planning and agent environments to create a distributed system whose emergent behaviour shows the capability to heal itself even if 50% of the system is not functioning due to external causes. Work is required in future to deal with patients roaming in a distributed network that is self-healing from a disruption.

The last paper is, 'Learning object retrieval in heterogeneous environments' by Ana B. Gil, Sara Rodríguez, Fernando De la Prieta and Juan Manuel Corchado. These authors argue that there is a large volume of educational content on the web, which is not directly accessible through conventional search engines. This information is said to belong to the so-called hidden, deep, or invisible web, as opposed to the contents of the website which are referred to as visible. A new approach for intelligent search of educational content was introduced by these authors on the application of virtual organisations of MASs. This paper presents a solution to the problem of the search and retrieval digital tagged content in heterogeneous learning object repositories through architecture for intelligent retrieval of educational content in heterogeneous environments (AIREH) framework. This architecture unifies the search and retrieval of objects, thus facilitating the personalised learning search process by filtering and properly classifying learning objects retrieved for an approach for semantic-aware learning content retrieval based on abstraction layers between the repositories and the search clients. The use of federated databases techniques by using an organisation of agents allows those agents to work in a coordinated manner to solve a common problem, allowing the agents to adapt to the constantly changing environment (users, content repositories, etc.). Combining a complete agent-based architecture that implements the concept of federated search along with IR technologies may help organising and sorting search results in a meaningful way for educational content. However, further research is still need for research towards enhanced content based retrieval systems.