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New Trends in Semantic Web-Based Applications

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The Semantic Web brings a new way of representing information, thereby making it more understandable for computers. Ontologies are the building blocks of the semantic web framework and have thus become its cornerstone, as they allow sharing and reusing – in a standardized way – heterogeneous data between applications of different nature. In this sense, ontology capabilities have paved the way for new, innovative trends in web-based applications across multiple domains, including medicine, e-learning, and ontology and software engineering.

This Special Issue explores how semantic web application trends are being developed as of the popularity of semantic web technologies. To prepare this compilation of works, the editors promoted an open call for papers through multiple international email lists and received a vast number of prospects. Then, every paper was thoroughly peer-reviewed by subject matter experts. The peer-review process resulted in the selection of eight high-quality manuscripts compiled and published in this Special Issue.

In the first paper, titled *Astmapp: A Platform for Asthma Self-Management*, authors Harry Luna-Aveiga, José Medina-Moreira, Oscar Apolinario-Arzube, Mario Andrés Paredes-Valverde, Katty Lagos-Ortiz and Rafael Valencia-García introduce Astmapp, a platform for supporting the asthma self-management process. The platform relies on semantic technologies to define an ontology that models asthma symptoms, patient behaviour and mood, asthma triggers, and concepts. Similarly, mobile technologies are employed to record patient activity, whereas recommender systems provide patients with a direct access line to an asthma-related knowledge repository.

In the second manuscript, named *EduRP: An Educational Resources Platform based on Opinion Mining and Semantic Web*, Maritza Bustos López, Giner Alor-Hernández, José Luis Sánchez-Cervantes, María del Pilar Salas-Zárate, and Mario Andrés Paredes-Valverde propose an e-learning platform that is primarily based on

semantic profiling and sentiment analysis. Specifically, semantic profiling is used to build semantic user profiles, whereas sentiment analysis helps assess the quality of every educational resource. To validate the platform's performance, the authors conducted experiments by using a labelled corpus of educational resources. The harvested results confirmed the platform's high accuracy when detecting the polarity of Spanish educational resource reviews.

In the third work, *Enabling System Artefact Exchange and Selection through a Linked Data Layer*, researchers Jose María Alvarez-Rodríguez, Roy Mendieta, Jose Luis de la Vara, Anabel Fraga, and Juan Llorens tackle the problem of artefact reusability across the system development lifecycle stages. Generally, these artefacts are created along the process in a private way and in a different format. Therefore, the authors propose a real multi-format system based on Open Services for Lifecycle Collaboration (OSLC), which enables developers to share and exchange any artefact defined under the Linked Data initiative. The proposed solution is validated against other platforms, and the authors obtain significant improvements.

In the fourth manuscript, named *Enhancing Spatial Keyword Preference Query with Linked Open Data*, João Paulo Dias de Almeida, Frederico Aráujo Durão, and Arthur Fortes da Costa present an algorithm that increases the accuracy of spatial keyword preference querying. The algorithm utilizes Linked Open Data to represent the keywords and features used to describe objects located in the repository. Then, given a set of keywords, the authors use SPARQL to explore their neighbourhood and extract more details, which are used to enrich the search. To assess the algorithm, the authors conduct two different experiments, thus comparing the algorithm's accuracy against that of the traditional spatial keyword preference query.

In the fifth paper, Shadi Abudalfa and Moataz Ahmed discuss their work: *Open Domain Targeted Sentiment Classification Using Semi-Supervised Dynamic Generation of Feature Attributes*. Namely, the researchers propose a new semi-supervised learning technique for opinion mining that requires small amounts of labelled data. The method utilizes hidden Markov Support Vector Machine (HM-SVM) to improve the accuracy of the sentiment classification. Finally, to assess the novel technique, Shadi and Moataz conducted multiple experiments to compare the efficiency of their technique with that of previous related works.

In the sixth contribution, titled *Mining of Educational Opinions with Deep Learning*, researchers Raúl Oramas Bustillos, Ramón Zatarain Cabada, and María Lucía Barrón Estrada describe an opinion mining module that relies on deep learning techniques to accomplish sentiment analysis on student opinions about exercises in Java. As a part of their conclusions, the authors conduct multiple experiments to assess the effectiveness of the deep learning module.

In the seventh paper, Laura Po and Davide Malvezzi introduce their work: *Community Detection Applied on* Big *Linked Data*. Namely, the authors describe high-level visualizations on Big Open Linked Data (known as H-BOLD), a new tool that enables users to explore Big Linked Data. As its main characteristic, H-BOLD utilises schema summary and community detection techniques to represent and visualize RDF datasets. Similarly, the authors assess H-BOLD's performance by comparing four different community detection algorithms aimed at finding potentially collapsible nodes, taking into account the density of their connections.

Finally, in *Human Language Technologies*: *Key Issues* for *Representing Knowledge* from *Textual Information*, Yoan Gutiérrez, Elena Lloret, and José M. Gómez describe an ontology schema that has been defined to semantically express text content. Furthermore, the authors define the algorithm called Semantic Package population to populate the pre-defined ontology schema. To conclude the work, the researchers evaluate the ontology schema by conducting several tests that analyse concrete features about its structure and organization.

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