FEATURE SECTION EDITORIAL

Semantic and conceptual issues in geographic information systems

Recent advances in information technology have changed the way geographical data were originally produced and made available. Nowadays, geographic information systems (GIS) are emerging as a common information infrastructure, which penetrates into more and more aspects of our society. The technological drift implies a profound change in mentality, with a deep impact on the way geographical data needs to be conceptualized. New methodological and data engineering challenges must be confronted by GIS researchers in the near future in order to accommodate new users' requirements for new applications.

This Special Feature derives from the 6th edition of the International Workshop on Semantic and Conceptual Issues in Geographic Information Systems (SeCoGIS), which took place in Florence, Italy, in October 2012. The series of SeCoGIS workshops intend to bring together researchers, developers, users, and practitioners with an interest in all semantic and conceptual issues in GISs. The aim is to stimulate discussions on the integration of conceptual modeling and semantics into various web applications dealing with spatiotemporally referenced data and how this benefits end-users. The workshops provide a forum for original research contributions and practical experiences of conceptual modeling and semantic web technologies for GIS, fostering interdisciplinary discussions in all aspects of these two fields and highlighting future trends in this area. The workshops are organized in a way to stimulate interaction amongst the participants.

The 6th edition of the SeCoGIS workshop in 2012 received many more submissions than previous editions—25 submissions—from which the Program Committee selected 10 high-quality papers, corresponding to an acceptance rate of 40%. The authors of the accepted papers are distributed worldwide, making SeCoGIS a truly international workshop. The accepted papers were organized in four sessions. The first one contained a keynote speaker and one accepted paper. The following sessions contained three papers each. The second session was about semantic issues of geographic data modeling. The third session was about conceptual modeling of geographic applications. The fourth was about technical aspects of spatiotemporal data modeling. These papers have been published in a volume of LNCS [1].

Among the workshop papers, 5 had the best evaluation from the Program Committee members and their authors were invited to prepare an extended version to be submitted to the Journal of Spatial Information Science. The three papers that are part of this Special Feature are those that succeeded in the reviewing process of the journal.

The first paper is "The semantic similarity ensemble," by Andrea Ballatore, Michela Bertolotto, and David C. Wilson. The similarity ensemble is a combination of WordNet-based lexical and semantic similarity measures. This concept has important applications in

geographic information retrieval, natural language processing, data mining, and artificial intelligence. The authors have conducted detailed experiments to compare the cognitive plausibility of the combined measure with individual measures on OpenStreetMap terms.

The second paper, entitled "Multi-scale window specification over streaming trajectories," by Kostas Patroumpas, proposes a method to summarize trajectories at a variety of temporal scales, such that rapid querying across vast datasets may be optimized. The increasing number of devices which can stream spatiotemporal location data gives rise to a demand for new methods able to handle the growing data volume. Preference for higher resolution is given to more current events, while historical events are reported at coarser levels.

The third and last paper is "Formalizing spatiotemporal knowledge in remote sensing applications to improve image interpretation," by Christelle Pierkot, Samuel Andrés, Jean François Faure, and Frédérique Seyler. The authors propose a method to classify remote sensing images using an ontology that captures the expert knowledge and an automated reasoner. They propose a two-level ontology with a first level (knowledge level) that describes general concepts related to remote sensing images and a second level (ground level) that describes concepts related to the particular use case. Then, the authors use an automated reasoner to classify remote sensing images that were previously segmented.

We hope you will enjoy reading these three papers and find them relevant and useful for your work, bringing at the same time your attention to the SeCoGIS series of events. We take the opportunity here to thank all the people who made possible this special feature. In particular, many thanks to the Program Committee members of the SeCoGIS workshop, whose devoted work evaluating all the submitted papers made possible a successful workshop. Finally, our special thanks go to Matt Duckham, Editor-in-Chief of the Journal of Spatial Information Science, for the enthusiasm with which he welcomed our proposal for this Special Feature, and all the invaluable work he did for making it a reality.

References

[1] CASTANO, S., VASSILIADIS, P., LAKSHMANAN, L. V., AND LEE, M. L., Eds. *Advances in Conceptual Modeling, Proceedings of the ER 2012 Workshops* (2012), vol. 7518 of *Lecture Notes in Computer Science Volume*.

Eliseo Clementini
University of LAquila

Esteban Zimanyi
Université Libre de Bruxelles