EDITORIAL

Bridging space, time, and semantics in GIScience

The increased availability of geographic data (often in massive volumes) together with the advances in spatiotemporal data management, integration, analysis, and visualization present an emerging need and opportunity: how to transform these massive volumes of geographic data into meaningful information about places, events, activities, and interrelations. The integration of space, time, and semantics provides the basis to infuse data with meaning and deepen our knowledge of complex natural and social systems and intricate interactions in space and time. This key research issue is also relevant to other cutting edge research themes such as volunteered geographic information, geospatial semantic web, semantic sensor networks, big data, linked data, etc. Context and granularity (spatial, temporal, and semantic) constitute additional dimensions of geographic data that are not fully explored and may provide valuable insights into this issue.

The AGILE 2017 Pre-Conference Workshop "Bridging space, time, and semantics in GIScience," organized by ISPRS Working Groups IV/1 Multi-dimensional modelling and IV/2: Ontologies, Semantics, and Knowledge Representation for Geospatial Information, provided an excellent forum to discuss a range of topics on semantics, ontologies, and knowledge-based modelling and to identify future research challenges. Presented papers were focused on the extraction, analysis, and formalization of knowledge of spatial entities, their semantic properties and relations, qualitative locations, as well as movements in space and time from diverse sources such as crowdsourced data, standards, LIDAR point clouds, trajectory data, and maps. These diverse sources of geographic information have a strong convergence point: they all contain a wealth of information about space and time that could be enriched with semantics in order to enhance spatial knowledge representation, analysis, and search.

The Call for Papers for this special feature was issued in August 2017 with a due date in early February 2018. Several papers were submitted that went through the same peer review process as regular JOSIS submissions. The paper accepted develops an ontology-based framework and approach for the harmonization of international property measurement standards and the analysis of semantic relations between them in order to identify commonalities and heterogeneities in the formalization of concepts relating to area and volume types of land, buildings, and building parts.

We hope that aspects relevant to the integration of spatial, temporal, and semantic information will continue to be explored in the future in order to advance our understanding and knowledge of how to support richer representations of complex spaces and dynamic phenomena, unveil implicit interactions in space and time, and analyze the spatial and semantic evolution of entities along time.

To conclude, we would like to thank the authors for submitting manuscripts for this special feature, the reviewers for providing valuable feedback on the manuscripts, and the Editors in Chiefs Matt Duckham, Ross Purves, and Benjamin Adams for their cooperation and support.

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