A special issue on **Semantic Interoperability in GIScience** with *Transactions of GIS*.

Semantic interoperability for geospatial information has been acknowledged as a fundamental research topic in the GIScience community for the following reasons: (1) GI systems rely on explicitly defined semantics to describe feature classes, attributes, and the usage of GIS operations; (2) geospatial information retrieval and search process requires machine intelligence for semantic disambiguation of human needs described in natural language; and (3) semantic and ontology modeling become essential ways to formalize the representation of the body of knowledge in GIScience.

As we are entering the era of Big (Geo) Data, massive volumes of geospatial data are being produced at a rapid velocity and disseminated by different stakeholders. The volume and diversity of data make it a huge challenge to retrieve, analyze, integrate and utilize this information. Semantic interoperability, in turn, plays a key role in improving understanding of these geographically distributed, heterogeneous resources. For instance, in order for disparate data resources to be integratable, there must exist a commonly agreed protocol to convert data from one syntax to another, or map multiple data syntaxes to a common one. This falls within the scope of semantically enabled data interoperability. Indeed, interoperability is also a ubiquitous goal across computing environments and computing domains, as the computational elements (compute nodes and architectures) tend to be highly heterogeneous as well.

Enabled by the global cyberinfrastructure, traditional single-desktop based spatial analysis is transforming into a web-based, or service-oriented/cloud computing paradigm. Complex geospatial problems can be tackled by chaining ad-hoc service components from distributed web environments. Careful definition and new methods to interpret service semantics is the key to ensure the success composition and interoperation of reusable spatial analysis models.

This special issue of the *Transactions in GIS* seeks original unpublished papers that describe the advancements in semantic interoperability research for GIScience. Suggested topics include (but are not limited to):
- Big Data semantics
- Geospatial semantic search
- Ontological and uncertainty issues in geospatial data
- Provenance and metadata for spatial analytical methods
- New methods, new technique, and new models to address interoperability issues among heterogeneous GIS data, methods and systems
- Semantic modeling, categorization and analysis of geographical phenomena
- Intelligent retrieval, integration, and processing of distributed computing resources
- Semantic interoperability in physical, environmental and social applications

Important dates:

• January 1, 2015, full paper due, manuscript submitted through http://mc.manuscriptcentral.com/tgis
• March 15, 2015, end of first review cycle
• Novemeber 1, 2015, end of second review cycle
• February 1, 2016, paper in final form
• special issue published (estimated in 2016)

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