Editorial

GIScience Research at the Twenty-ninth Annual ESRI International User Conference

The nine articles included in this special issue of *Transactions in GIS* were gathered from a special call for abstracts and will be presented in research sessions scheduled on the second day of the Twenty-ninth Annual ESRI International User Conference. A total of 39 abstracts were submitted and nine were selected by the journal editors for the preparation of full journal articles. Each of the manuscripts has been through the usual journal peer review process and the final versions included in this issue have been revised in light of both the reviewer's and editor's suggestions. They cover a wide range of topics and address some of the key concepts and applications of geographic information science from a variety of perspectives. Some address data capture and representation issues, others describe specific software components and tools, and still others discuss collaborative decision-making, geo-design and visualization challenges.

The first article by Paul A. Zandbergen presents an evaluation of the accuracy of locations obtained using the Assisted GPS (A-GPS), WiFi and cellular network positioning modes on the 3G iPhone. The strengths and weaknesses of these three positioning technologies are presented in terms of coverage, accuracy and reliability, and the implications of the results for Location Based Services (LBS) that rely on the 3G iPhone and similar mobile devices are discussed.

The second article by Kathleen Stewart Hornsby and Naicong Li shows how text documents that contain movement verbs can be analyzed for deriving representations of movement or dynamic paths. The authors show how movement descriptions in text can be mapped to a set of elemental components including source, destination, route, direction, distance, start time, end time and duration which, in turn, capture the spatiotemporal characteristics of the path of a moving object as described using natural language.

The third article by Alain Tamayo, Joaquín Huerta, Carlos Granell, Laura Díaz and Ricardo Quirós presents the software engineering development process followed to build the gvSOS client module that allows gvSIG users to interact with Sensor Observation Services (SOS) servers, displaying the information gathered by sensors as a layer composed by features. The authors discuss the main obstacles – the restrictions of the gvSIG architecture, inaccuracies in the OGC specifications, and a set of common problems found in current SOS server implementations available on the Internet – and potential solutions during each step in the development process.

The fourth article by Brett K. Lord-Castillo, Dawn J. Wright, Bruce R. Mate, and Tomas Follett customizes the generic Arc Marine data model to support the use of satellite telemetry for mapping the distribution and movement of endangered marine mammal species. Three new groups of object classes are proposed, a comprehensive framework for animal tracking with Argos satellite telemetry data is developed, and a new multidimensional data cube model was also devised to show how this extension of Arc Marine serves as an appropriate target schema for the application of on-line analytical processing (OLAP) tools and spatial data mining of satellite telemetry tracking datasets.

The fifth article by Edward Pultar, Martin Raubal, Thomas J. Cova, and Michael F. Goodchild describes the "Extended Dynamic GIS" or EDGIS system which provides a platform for spatiotemporal data representation, storage, and query in order to address the need for a dynamic GIS to manage complex geographic data types. The dynamic GIS analysis techniques facilitated with this approach are further improved and enhanced through applications to wildfire evacuation modeling and travel scenarios of urban environments with individuals providing volunteered geographic information in this particular article.

The sixth article by Danny Vandenbroucke, Joep Crompvoets, Glen Vancauwenberghe, Ezra Dessers, and Jos Van Orshoven combines the productional and the geographic information process perspectives into a network perspective on Spatial Data Infrastructures (SDA), and utilizes Social Network Analysis to show how this network perspective can be used to characterize the Flemish SDI, to describe the data flows between stakeholders and to analyze the behavior of the different (types) of stakeholders within the network.

The seventh article by Guoray Cai and Bo Yu proposes the GeoDeliberative Annotation Technology (GeoDAT) as a framework for addressing the challenges of facilitating effective deliberation processes and to highlight the progress needed to support spatially-enabled public deliberation technologies. The GeoDeliberator software, based on this GeoDAT framework, is used to demonstrate the utility of this framework through a simulated scenario where a community in a university campus deliberates on the alternative courses of actions available for building a smoke-free campus.

The eighth article by Constance C. Bodurow, Calvin Creech, Alan Hoback, and Jordan Martin explores how aspects of the post-industrial city can be understood, communicated and leveraged in service of equity and sustainability and how technology can be used to reveal data about the city in order to convince community, political and economic leadership to embrace a broader interpretation of value. The Value Densification Community Mapping Project (VDCmp) digital interface described in this article models "social exchanges" in three dimensions and allows the user to overlay social and infrastructure layers with physical density to support community design and development policy decisions.

The ninth and final article by Sven Fuhrmann, Oleg Komogortsev, and Dan Tamir investigates whether three-dimensional spatial mappings (holograms) provide better support for route planning than traditional two-dimensional representations. The eye-movements of the participants were recorded in a series of experiments and showed that three-dimensional holographic maps enable more efficient route planning. A new algorithm to analyze the differences between participant-selected routes and a set of "good routes" is currently being developed as part of their overall goal of creating a theoretical framework for investigating and quantifying route planning effectiveness.

These nine articles, taken as a group, illustrate the breadth and depth of geographic information science scholarship across a variety of disciplines and application domains.

Special thanks are owed to the authors and especially those who provided the peer reviews for helping to move these articles from concept to reality in just a few short months. I trust that you will see how your contributions bore fruit when you read the final versions of these articles in this second special issue organized around a series of research sessions that is hosted by ESRI and given a prominent place in its International User Conference program.

John P. Wilson
Editor