Spatial and spatio-temporal databases provide backbone support for a set of widely used applications including geographic information systems, location-based services, moving objects databases, transportation, and emergency services. This special issue includes ten articles geared towards new frontiers of spatial and spatio-temporal databases.

The first article by Sankaranarayanan and Samet presents a paradigm shift in querying road networks where they strongly advocate for storing road networks in relational databases, as opposed to the widely used graph data structure. The article introduces a new data structure, called road network oracle, that resides in a database and enables the processing of many operations on road networks with just the aid of relational operators. Doing so also takes advantage of the power of SQL queries along with the database query optimizers. The second article by Jensen *et al.* presents one of the first attempts to efficiently track moving objects in indoor environments. In contrast to the commonly used outdoor environments, indoor environments suffer from inaccurate positioning and complex topologies.

The third article by Wolfson and Xu describes very interesting applications, research issues, and approaches related to applying spatio-temporal databases in urban transportation, from trip planning and navigation, to abstraction of concepts from spatio-temporal sensor data, mobile peer-to-peer environments, and social networks. The fourth article by Zhou *et al.* presents the application of spatio-temporal databases in emergency situations. More specifically, the article presents an efficient approach for evacuation planning in case of natural disasters or terrorist attacks. Getting a lot of media attention (e.g., Fox TV News), this article presents one of the very unique applications of spatio-temporal databases.

The following two articles address the use of spatio-temporal data in social networks. Banaei-Kashani *et al.* present GeoSIM (Geospatial Social Image Mapping), a system that enables a group of users with camera-equipped mobile phones to participate in a collaborative collection of urban texture information. GeoSIM has the ability to enable inexpensive, scalable, and high resolution data collection of urban texture mapping. Zheng *et al.* introduce GeoLife, a social networking service which aims to understand and mine trajectories, locations, and users. GeoLife also aims to share life experience among its users based on their GPS trajectories and provide personalized friend, travel, and location recommendations to its users.

The seventh article by Nguyen-Dinh *et al.* gives a very thorough survey of a large number of spatio-temporal access methods, widely used to support the various spatio-temporal applications discussed in this issue. This survey focuses on access methods developed since 2003, where an earlier version of the survey covering access methods up to 2003 was published in this bulletin on June 2003. The eighth article by Güting *et al.* presents the SECONDO extensible database system into which a lot of moving object technology has been built already. SECONDO is one of the unique open-source systems built in academia that allows researchers to implement their new techniques in moving object databases within a system context and to make them available for practical use by other researchers. SECONDO has the ability to transform research in spatio-temporal databases into a new frontier where system-oriented research can take place, which would have significant impact on industry.

The issue is then concluded by two industrial articles from IBM and Microsoft that discuss supporting spatio-temporal data streams using IBM System S and Microsoft StreamInsight, respectively. Both articles present the first *industrial* attempts to support spatio-temporal data streams. Biem *et al.* utilize IBM System S to support real-time traffic information management in the city of Stockholm where large volumes of GPS data are collected and processed online. Ali *et al.* discusse the native support of spatio-temporal streams in Microsoft StreamInsight along with the ongoing effort at Microsoft SQL Server to bring together the temporal aspect of StreamInsight and the spatial support of the SQL Server Spatial library.