

An Introduction to the First International Symposium on Spatiotemporal Computing

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Climate change, natural disaster, and infectious disease are examples of global challenges to contemporary society. These processes are inherently spatial, yet they unfold both in space and time. A good understanding of the spatiotemporal characteristics of their occurrences is critical to strategies for mitigation, adaptation, and sustainable communities. Observing the phenomena at only one single location or with static time-slice cannot provide the scientific basis to explore the dynamics of these phenomena. Exploiting and using spatiotemporal principles that underlying these and other phenomena would enable the development of novel methodologies, tools and software to enable new solutions for these challenges. Spatiotemporal computing, the computing paradigm that utilizes spatiotemporal principles to devise cutting-edge computing technologies and solutions, sets a foundation for the future generation of cyberinfrastructure that is vital to overcome the obstacles to meet these global challenges.

1. GOALS AND OBJECTIVES

The International Symposium on Spatiotemporal Computing (ISSC) is a collaboration between ISPRS (the International Society of Photogrammetry and Remote Sensing), UCGIS (University Consortium of Geographic Information Science), CPGIS (the international association of Chinese Professionals in Geographic Information Sciences), and the AAG (American Association of Geographers). ISSC aims to explore the potential of spatiotemporal computing to address our societal challenges from global to local by bringing together people with different backgrounds and expertise. Another objective is to capture and share the latest advances in spatiotemporal computing and related topics. Through a series of presentations, panel discussions and research papers, ISSC strives to:

- explore spatiotemporal principles and develop novel representations of space-time processes from current research, such as in the computing, geospatial, and social sciences.
- combine understanding about spatiotemporal patterns and next-generation computational technologies to foster future computing infrastructure to accelerate big data discovery, access, and processing.
- develop new spatiotemporal computing tools and software to improve our capability of responding to urgent events today.

This bi-annual event invites the leading scholars and professionals in the geospatial, spatiotemporal, computing, geographic information science, and geography fields to define and evolve a potential roadmap for this critical domain in the next 10-15 years. ISSC will also contribute high quality papers and provide an international forum for discussions of leading research and technological developments as well as applications in the field.

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2. CONFERENCE TOPICS

The topics in this ISPRS Archives include:

- Spatiotemporal Computing. 11 papers discuss advanced cyberinfrastructure and cutting-edging computational technologies, such as GPU, MapReduce, HPC, and cloud computing. By using these technologies, they addressed critical problems including remote sensing image retrieval, DEM partitioning, disaster response, route planning, and video surveillance analysis.
- Spatiotemporal Methodologies. 11 papers discuss spatiotemporal principles, spatiotemporal data mining, big data processing, geovisualization and spatiotemporal patterns. The research varies from sensor data outlier detection, police patrol route analysis, RS image pattern mining, and tide data visualization to web GIS spatial temporal patterns analysis.
- Spatiotemporal Applications. 11 papers discuss social media, Earth systems, public health, land use/cover, environment and other applications of spatiotemporal computing. From these applications, scientific workflows and solutions for different domains are built based on spatiotemporal computing platforms and methodologies.

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4. PAPER SELECTION PROCESS

We received 80 submission representing 11 countries and over 250 authors. The papers were reviewed by at least three members of the program committee. Based on the reviews, 33 papers were accepted for publication in the “The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences”.

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