

ISPRS Book Series

in Photogrammetry, Remote Sensing and Spatial Information Sciences

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Volume 9

Advances in Web-based GIS, Mapping Services and Applications

Advances in Web-based GIS, Mapping Services and Applications is published as part of ISPRS WG IV/5 effort, and aims at presenting: (1) Recent technological advancements, e.g., new developments under Web 2.0, map mashups, neogeography and the like; (2) Balanced theoretical discussions and technical implementations; (3) Commentary on the current stages of development; and (4) Prediction of developments over the next decade. Containing 21 contributions from 60 researchers active within ISPRS communities, most of them from academia and some from governments, the book covers a wide range of topics related to the state-of-the-art in web mapping/GIS and geographic information services.

The volume is organized in five sections:

1. Analytical and Geospatial Services;
2. Performance;
3. Augmentation and LBS;
4. Collaboration and Decision Making; and
5. Open Standards for Geospatial Services.

Supported by a considerable number of examples and reasonable level of details, an overall view of the current achievements and progress made in the field of web-based GIS and mapping services is given. The papers reflect timely and future developments addressing: constant updating of related web and geospatial technologies as well as the revolution of web mapping caused by mainstream IT vendors such as Google, Yahoo and Microsoft; increased interest from industry on geo-spatial information technologies; and increasing demand from the general public for prompting effective spatial information services. **Advances in Web-based GIS, Mapping Services and Applications** is of much interest to academia and researchers, application specialists and developers, practitioners, and undergraduate and graduate students.

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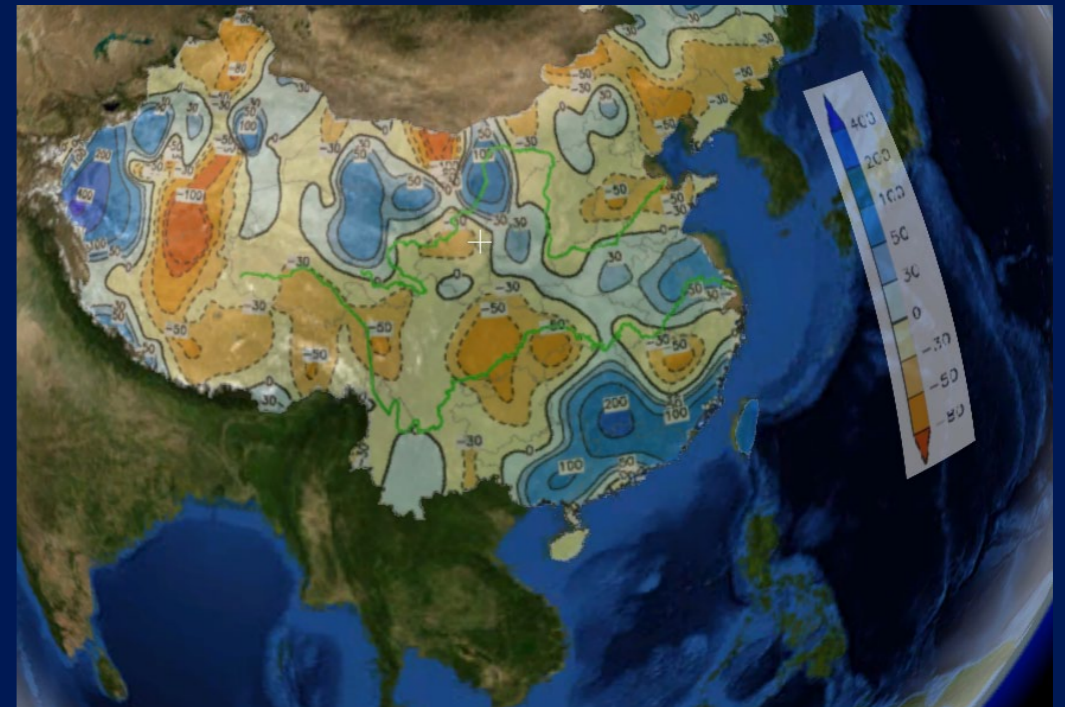
Li, Dragičević
& Veenendaal

Advances in Web-based GIS, Mapping Services
and Applications

9



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Advances in Web-based GIS, Mapping Services and Applications

Edited by Songnian Li, Suzana Dragičević & Bert Veenendaal

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information from imagery

Advances in Web-based GIS, Mapping Services and Applications

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Preface

Web mapping/GIS is the process of designing, implementing, generating and delivering maps, geospatial data and Geographic Information Systems (GIS) functionality or services on the Web. Primarily focusing on technological issues, this field increasingly includes theoretic aspects such as cartographic design, theory and principles, social and organizational issues and applications. Given the recent advances led by mainstream Information Technology (IT) developers, the need to examine these issues becomes increasingly critical.

This book volume, *Advances in Web-based GIS, Mapping Services and Applications*, aims at examining both theoretical/technological advancements and social/organizational issues in the field of web-based GIS and mapping services and applications. It presents an overall view of current progress and achievements with considerable technical details and examples. The contents address: 1) constant updating of related web and geospatial technologies as well as the revolution of web mapping caused by mainstream IT vendors such as Google, Yahoo and Microsoft; 2) increased interest in geospatial information technologies from the industry; and 3) increasing demand from the general public for prompt and effective online access to geospatial information. All contributing chapters were advised to consider: 1) inclusion of recent technological advancements, especially new developments under Web 2.0, map mashups, neogeography, and the like; 2) balanced theoretical discussions and technical implementations; 3) commentary on the current stages of development; and 4) prediction of future developments over the next decade.

The original recommended topics and themes, as listed in the call for chapter proposals, include:

- Web 2.0, neogeography, and map mashups
- Technologies providing new service-oriented, distributed architectures, e.g., web services, SOA, P2P, grid computing, etc.
- Technologies enhancing web interaction with maps and spatial representations, e.g., Ajax, SVG, GeoRSS, etc.
- Advances in virtual earth technologies
- Open source and open standards as related to web GIS/mapping
- Web-based spatial decision support
- Applications in public participation
- Geospatially-enabled workflow processes for automating web-based geospatial services
- Content and knowledge mapping
- Social mapping and networking
- New service and application models such as SaaS
- Data quality and integration, data policies, privacy and ownership
- Quality of web-based geospatial services and processes
- Impact of Web 2.0 on enterprise-wide web GIS/mapping and location services

While many of these topics have been addressed in this book volume, we feel that what needs to be further studied is related to social and organizational issues in the field of web-based GIS and mapping services and applications, as well as an assessment of the impact of Web 2.0 and more recently emerged web 3.0 on enterprise-wide web GIS/mapping and location services. We would like to see more research into, for example, data policies, privacy and ownership, quality assurance and acceptable use policies, especially for crowd-sourcing and community-generated geographic content technologies and applications.

In addition to the introductory chapter, the book includes 20 accepted chapters after double-blind peer review processes, which are organized into the following six sections:

SECTION 1: INTRODUCTION

An introductory chapter is included to present an overview of recent advances in web-based GIS, mapping services and applications, and identified some of issues and challenges faced by researchers and professionals in the field.

SECTION 2: ANALYTICAL AND GEOSPATIAL WEB SERVICES

This section includes six chapters focusing on various state-of-the-art geographic information web and processing services, ranging from analytical, simulation and virtual visualization uses to building web services and mashups.

SECTION 3: PERFORMANCE

Three chapters included in this section present some recent studies on techniques and solutions to enhance the performance of web mapping and services.

SECTION 4: AUGMENTATION AND MOBILE MAPPING

Mobile applications are increasingly using better positioning techniques and augmented reality. The three chapters in this section describe recent developments and advances in geolocating using a range of positioning systems, and augmented systems and environments for use in mobile mapping.

SECTION 5: COLLABORATION AND DECISION MAKING

This section covers the developments in both traditional application areas such as decision support and public participation, and new emerging areas such as social mapping and collaboration. Application cases exemplify the developments in some emerging areas. Five chapters are included in this section.

SECTION 6: OPEN STANDARDS FOR GEOSPATIAL SERVICES

The three chapters in this section retrieve some aspects of open standards and their use in developing web-based geospatial services.

The volume is aimed at researchers, application specialists and developers, practitioners and students who work or have an interest in the area of web GIS/mapping and its application for business, government services, communities, enterprise computing and social networking.

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The editors of this ISPRS book volume would like to acknowledge many colleagues who have contributed to the publication of the book in preparing, authoring and reviewing chapters as well as providing administrative assistance in the final compilation. Without their invaluable help and support, the book would not have been published.

All chapters included in the book have gone through a rigorous double-blind peer review process. We are grateful to all the reviewers including chapter authors and many external researchers in the field who kindly agreed to review the chapters. Our special thanks go to the following reviewers who are not a chapter author: Shivanand Balram, Mustafa Berber, Soheil Borousshaki, Guoray Cai, Rosaline Canessa, Rob Corner, Matt Duckham, Mark Gahegan, Nick Hedley, Shunfu Hu, Bin Jiang, Anthony Jjumba, Ari Jolma, Carsten Kessler, Menno-Jan Kraak, Jane Law, Lingkui Meng, Martin Meyers, Ahmed Mohamed, Mir Abolfazl Mostafavi, Zigiang Ou, Theresa Rhyne, Xianfeng Song, Tele Tan, Jianguo Wang, Geoff West, Stephan Winter, and Paul Zandbergen.

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