

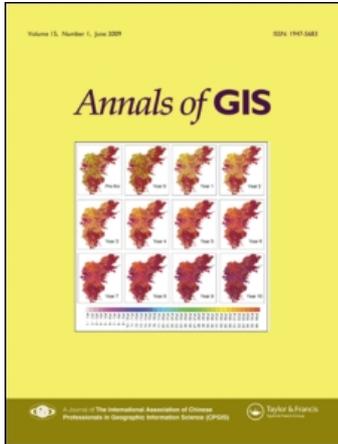
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Book Review

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BOOK REVIEW

Virtual geographic environments, edited by Hui Lin and Michael Batty, Beijing, China, Science Press, 2009, 350 pp., hardcover, ISBN: 978-7-03-023467-4

Because of the recent technological advances and the Internet, geography and geographic information have become mainstream – an integral part of people’s daily lives. GIS technologies are nowadays being utilized by both experts and nonexperts to help them in their spatio-temporal decision-making in highly dynamic environments. Much of this is due to the availability and sophistication of Virtual Geographic Environments (VGEs) – explicitly geographic environments, which make it possible for the user to become more-or-less immersed in a realistic representation of the world. This book does an excellent job in covering the broad area of topics that are important for designing and implementing VGEs within Web 2.0, that is, the necessary technologies, user interface and visualization issues, mobile environments, and many of the diverse application fields. This makes the book appealing for a broad audience, ranging from graduate students in GIScience to researchers, and geospatial business people.

The book sets off with some thoughts on the future of GIS and the Web by Jack Dangermond, President of ESRI, the world leader in GIS software. The editors then set the context by highlighting some of the key issues related to VGEs, such as GIS and GIScience, user interaction, virtual worlds, and neogeography. The book is then structured into five parts, covering virtual environments and Web 2.0 technologies; virtual cities and landscapes; user interfaces, public participation, and geovisualization; constructing mobile and networked VGEs; and mobility and dynamics in visualization.

Part 1 focuses on what we may call the *geographic revolution*: the GIS world has changed because of the widespread use of tools like Google Earth and as a result the public can nowadays create their own maps and perform their own spatial analyses. To do so, we need data, and much of the gigantic data volume that is available comes from the users in the form of Volunteered Geographic Information. The point is made that geographic realism is a major driving force for the utilization of VGEs and such realism leads to exciting new possibilities for space–time analyses that are currently missing in the ‘old’ GIS world. Location matters and it becomes clear that it will matter even more so in all of

the upcoming Web x.0s. As stated nicely by Tao, ‘To the geospatial community, there is a fundamental conceptual change in the notion that we are moving from organizing spatial information to organizing information spatially’ (p. 63).

In the second part, several interesting and important applications of VGEs are shown, including Virtual Kyoto, an online GIS time machine that lets a user investigate the past, present, and future of this historical city. A 3D model of Phoenix serves as an example for an urban simulation model to measure the impact of planning decisions on future urban environments. An evaluation of different systems for the landscape visualization offers useful advice for the practitioner, and so does the explication of a system that automatically generates 3D building models.

Part 3 focuses on user interfaces as a (or possibly *the*) key component of VGEs, both for experts and for nonexperts. It is important to know how people interact with such systems, so that future VGEs can seamlessly extend their users’ ability to interact with geographic data. It is suggested that an affordance-driven approach to geovisualization can help. VGEs should also recognize and adapt to context changes, this is especially important when facing the challenges of viewing 3D virtual urban environments on small mobile devices. Nonphotorealistic visualizations are advocated as a possible solution. This part of the book also highlights the potential power of VGEs for public participation, whether the goal is to reach consensus on design guidelines for a townscape or the highly sensitive and political issue of evaluating a barrier between Israel and the ‘West Bank.’

Part 4 deals with questions that arise during the construction of mobile and networked VGEs. A novel application shows the reader the use of virtual reality to simulate GPS satellite geometry and to explore spatial uncertainty. Such tools can be efficiently used in higher education to provide students with better learning experiences. Another application utilizes VGEs as a tool for collaborative decision-making. Two of the more technical chapters deal with the problem of quantifying information displayed on mobile phone screens and argue that digital measurable images provide all of the essential functions of a digital Earth environment, which is being searchable, visible, measurable, and minable.

The final part focuses on our mobile lives and dynamics in visualization. When using VGEs for spatiotemporal analysis, one of the essential questions is ‘how do people move?’ A multiagent simulation of crowds at outdoor events demonstrates the importance of such tools for emergency scenarios and public safety. Another application uses 3D visualization to investigate children’s walking to evaluate the relationship between urban form and physical activity of children. This part of the book also includes a presentation of advanced geocoding methods for route and scene descriptions in natural language to derive higher dimensional spatial objects. Finally, the reader is made aware of the connection between virtual games and GIS. What can GIS learn from videogames? Do games even provide a new paradigm for GIS? It seems that dynamic process modeling, user interface design, and

multisensory representations are indeed areas where GIS can learn a lot from the gaming industry.

Overall, this book provides a good mix between theory and applications. It further points to important future research issues with regard to VGEs, such as user interfaces, motion, dynamics, and temporality and scale. Adding to these the technical issues including but not limited to rendering, speed, and storage, one can see that we will not be running out of master and PhD thesis topics in the area of VGEs. Both editors and authors have done a great job in outlining the current state and potential future of VGEs so let’s get to work!

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