

GIS, Remote Sensing and Human Geography: Concepts, Data Analysis and Applications

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There is a wide agreement among researchers and professionals that the use of geographic information systems and remote sensing methodologies can contribute significantly to a better understanding of human interactions in space and the environment and to a well-suited planning. Two related reasons can make the use of geographic information methods attractive in human geography: (i) the ability to compile multi-layer data and conduct quantitative analysis with rich data sets of built environments that are dynamic by nature; and (ii) the cost-effective manner that these methods bring to planning processes. This special issue of *Geography Research Forum* includes innovative papers by contributors from around the globe which cover both the conceptual and applied aspects of the use of GIS and remote sensing in human geography.

The issue of using remote sensing and GIS in human geography covers a wide range of topics. The papers here focus primarily on concepts, data analysis and applications. Apart from these topics, this volume includes a review paper by Tal Svoray on the current use of GI approaches in human geography research. The paper provides evidence to the relative lack of GI-related papers in nineteen of the mainstream human geography journals compared to journals in physical geography, hydrology and ecology. Nonetheless, a temporal analysis reveals a slight but consistent increase in GI-related publications in the surveyed human geography journals.

Two papers provide concepts of modeling the urban environment. The paper by Fulong Wu addresses several important issues in the new generation of urban simulation dynamic models (i.e., cellular automata, microsimulation and multi-agent simulation). It proposes to use simulation as a computational laboratory to study complex processes within the urban environment. The author asserts that the recognition of complexity has proven the urgent need to use simulation as a computation laboratory in which the major future obstacle would not be a matter of technology

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but rather a matter of a better understanding of the real world complexity. Yizhak Omer and Yizhak Benenson provide a fine-scale analysis of an individual-based data structure of residential segregation. Their approach is based on a geo-referenced fusion of census data, questionnaire data and infrastructure maps. This proposed concept combines both objective and subjective spatial data, and in so doing it includes in the analysis both the neutral conditions of the infrastructure and desires and preferences of the population.

Referring to data analysis, the paper by Mike Poulsen sheds new light on the misuse of large databases that result from the multitude of possible geographic objects to be established from the same census data. This problem is further enhanced given the growing need for data mining from census sources in the modern age. Poulsen suggests the adoption of a standard procedure, that of fragmentation and objectification analysis, which he successfully applies to a race/ethnicity dataset of Los Angeles. The paper by Dan Blumberg provides a survey of the available digital data that could become data load to geographical information systems. Data collection for GISs progressed immensely in recent years, and the study by Blumberg discusses particularly the use of GPS data, integration of remote sensing data in GIS, and cadastre mapping. The case study provided by Blumberg is from Israel, however, it may reflect the situation in many other countries around the western world.

The last two papers present applications of GIS and remote sensing methodologies in human geography and are strongly related to planning processes. The study by Cynthia Croissant and Darla Munroe uses remotely sensed classified images and the GIS Patch Analyst module as a tool for testing the effectiveness of zoning-related policy on fragmentation of forest and agricultural land use/land covers on primarily residential parcels. This is a classic example of an applied use of advanced geocomputation methods to improve a planning process for the benefit of the community and the environment. The paper by Yafit Cohen integrates the use of least-cost path functions for the delineation of least environmentally disturbed corridors in densely inhabited areas, with a case study from central Israel. The analysis is based on data gathered from the national GIS of Israel, fieldwork and satellite imagery. This work has considerably facilitated the transformation of theoretical land use planning concepts into practical planning language.

We believe this special issue of *Geography Research Forum* will serve researchers, students and professionals who are interested in both fields of human geography and information technologies. We believe further that the issues raised here are in the forefront of the field, and that their innovative messages may enrich the knowledge of readers seeking better understanding of human behavior in space and the environment.

The papers in this special issue all demonstrate the utility of GIS and remote sensing in the research and environmental and spatial planning. However, the introduction of these methodologies into the user side rather than to GI professionals has been rather slow. Leaders of the GIS industry have been trying to encourage potential users to intensify their utilization of Geographic Information, but much still remains

to be done. It is quite clear that many aspects of our life can benefit from the use of GIS and remote sensing. Yet, much thought needs to be given to the mechanisms of making these technologies much more user friendly.

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