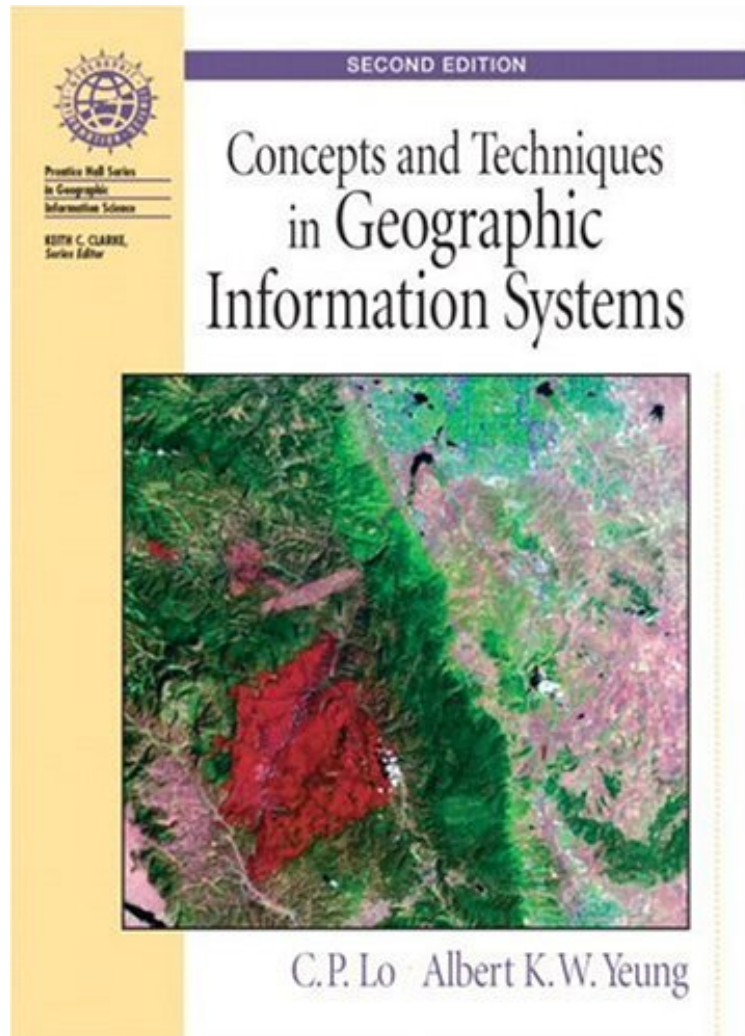


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## Concepts and Techniques of Geographic Information Systems (2nd Edition)

*Chor Pang Lo, Albert K.W. Yeung*

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**Chor Pang Lo, Albert K.W. Yeung : Concepts and Techniques of Geographic Information Systems (2nd Edition)** before purchasing it in order to gage whether or not it would be worth my time, and all praised Concepts and Techniques of Geographic Information Systems (2nd Edition):

0 of 0 people found the following review helpful. Five StarsBy Bette LamoreEverything I expected.1 of 1 people found the following review helpful. Excellent and thoroughBy Sean P. TwomeyI purchased this book for a Fundamentals of GIS course I am taking online, it is very thorough. I can't imagine what a better book would look like. This one has it all. Lots of detail, highly recommended.24 of 24 people found the following review helpful. Broad yet

thorough treatment of GIS techniques and issues. The focus of this book is on the concepts and techniques needed by GIS professionals. Thus, this book stands out for its intentional focus on professional education. The reader should be proficient in geometry, algebra and trigonometry and also have some background in computer science and geography. While this book deals with the range of topics normally included in introductory GIS courses, coverage of many subjects is deep enough for the advanced reader. The authors definitely had a problem trying to place the many interconnected topics of GIS into a linear sequence of chapters. Thus, there are many times where a topic is briefly introduced in one chapter only to have it reappear in greater depth in some subsequent chapter. Sometimes, the connection between the original introduction and the later details is not clear. For example, in Chapter 2, surveying gets a much more thorough treatment than photogrammetry. However, in chapter 8, six chapters later, photogrammetry reappears as a topic and is covered in tremendous detail. The references at the end of each chapter are very good and are usually in sources that should be accessible to most readers. Once past the simple scale and map theme topics, students face their first mathematical challenge in meaty sections on planar coordinate transformations, projections, geodetic datums, UTM, state plane systems and even a brief introduction to land surveying and GPS. This demonstrates that the authors decided not to shy away from the difficult details of GIS. This would make a good textbook in an upper undergraduate class as well as a good professional reference. Since the table of contents is not shown, I do that next:

1. INTRODUCTION - This chapter explains the context for studying GIS in both the academic and professional settings.
2. MAPS AND GEOSPATIAL DATA - This chapter explains the relationship between maps and GIS.
3. DIGITAL REPRESENTATION AND ORGANIZATION OF GEOSPATIAL DATA - Explains the concepts and techniques of representing geographic data in digital form using different data models. Includes a quick reference to important geographical foundations such as Berry's geographic matrix, then introduces the concepts of objects and fields and rasters and vectors. This chapter also includes a useful section on representing temporal relationships and a good level of detail on object-oriented data models and database systems.
4. GEOSPATIAL DATA QUALITY AND STANDARDS - Defines the basic concepts and terminology commonly used for the description and evaluation of data quality with special reference to GIS. Includes an introduction to spatial autocorrelation and error propagation covered in much greater detail later in the book. Interoperability and OGC get one page here and one more page later in Chapter 12. Finally the chapter includes an extensive section on data standards both in the US and elsewhere.
5. RASTER GEOPROCESSING - Includes rasterfile formats and various topics related to acquiring raster data such as rectification, registration and mosaicing. Brief reference is made to various ways in which raster operations might be categorized. Then the local, neighborhood, extended neighborhood and regional classification system is used to explore the range of operations. Logical overlay operations are thoroughly covered. The determination of slope is also covered here under extended neighborhood operations. Map algebra and cartographic modeling are discussed later in the chapter along with some worked examples.
6. VECTOR GEOPROCESSING - Covers a variety of vector topics including digitizing, scanning, editing, topology building, attribute data conversion, address geocoding, a selection of basic vector operations such as buffering and topological overlay, and a good introduction to network analysis, picked up in much greater detail in Chapter 10.
7. GEOVISUALIZATION AND GEOSPATIAL INFORMATION PRODUCTS - An eclectic mix that covers GIS as information communication channel, human-computer interaction and user interfaces, scientific visualization, 3D, animation, web cams, hypermaps, digital spatial libraries, and how CRTs work.
8. REMOTE SENSING AND GIS INTEGRATION - Deep coverage on such topics as orthophotography production, thermal infrared energy equations, radar imaging theory, photogrammetric considerations of satellite imaging systems, and image classifiers.
9. DIGITAL TERRAIN MODELING - Deep coverage of a range of topics including sampling terrain data, geometric characteristics of DEMs, construction of TINs (including their topological datastructure), more on GPS, stereoplotters, sources and quality of existing DEM data, extraction of topographic features, watershed analysis, terrain visualization (including tables summarizing various software packages for terrain modeling). It also includes brief coverage of interpolation, surface fitting and trend surface analysis.
10. SPATIAL ANALYSIS, MODELING, AND MINING - Examines spatial analysis at a higher level than the simple map data manipulation of chapters 5 and 6. Good coverage of advanced topics include spatial autocorrelation indices, quadrat counts, nearest-neighbor analysis, gravity models and network analysis. A few detailed examples of integrating GIS with mathematical models concludes the chapter.
11. GIS IMPLEMENTATION AND PROJECT MANAGEMENT - Thorough coverage of important topics such as the value of a software engineering approach, stages of GIS project planning, system analysis, database design methodology (including several pages on E-R modeling, logical schema and normalization), application software design, system implementation and maintenance.
12. GIS ISSUES AND PROSPECTS - Overview of the key issues facing GIS users today. It also examines the emerging concepts and techniques that are rapidly changing the nature of using geographic information.

Fully updated to reflect advances in GIS concepts and techniques, this guide approaches the subject from the broader context of information technology. Gives complete, up-to-date coverage to the concepts and techniques pertaining to every stage of the systems development life cycle of GIS, as well as its applications to various areas of spatial problem

solving and decision making. For GIS specialists, GIS technologists, GIS sales directors, urban planners, natural resource managers, land surveyors, geomatics engineers, and foresters who want a complete understanding of GIS and how GIS applies to their fields of interest.