like this redundancy, but the repetition should help with the retention and reinforcement of key points. Finally, the book contains a useful glossary and an extensive list of references. Overall, the book covers the subject of data warehousing thoroughly.

—*David G. Hill*, Westwood, MA

GENERAL TERMS: DESIGN, MANAGEMENT

Logging and Recovery
See: 0705-0438 [H.2.7—*Data Warehouse and Repository*]

H.2.8 Database Applications
See: 0705-0438 [H.2.7—*Data Warehouse and Repository*]

Data Mining
See: 0705-0438 [H.2.7—*Data Warehouse and Repository*]

Image Databases

CHEN, YIXIN; LI, JIA; AND WANG, JAMES Z.   0705-0439
Machine learning and statistical modeling approaches to image retrieval (Kluwer International Series on Information Retrieval).
Kluwer Academic Publishers, Norwell, MA, 2004, 182 pp., ISBN 1402080344.

The authors of this book consider the domain of Web searching and Internet browsing to be the typical arena for researchers in their field. They are interested in a broad range of applications, including biomedical imaging, digital libraries, and forensic sciences, spanning the financial, educational, and military fields. The research literature is full of methods for image indexing and retrieval. Few of those approaches, however, have been able to bridge the "semantic gap" between the data and the real world. Because of this, the authors concentrate on machine learning and statistically based techniques, which have demonstrated impressive successes in discerning between small sets of objects.

The authors list a number of important contributions that their work makes to the research literature, and to the advancement of the field. A major concern of any image indexing system is a robust similarity measure that properly collects and catalogs different images for later retrieval. Earlier attempts concentrated on global features such as histograms, textures, and layouts. Those computations are sensitive to variations, however, and to any distortions or noise. The authors propose a fuzzy logic approach to handle those situations. Fuzzy reasoning supports the description of gradual changes between neighboring areas of interest where significant features are found. This approach also handles uncertainties during image retrieval.

Another important issue in indexing a collection of image files is properly clustering groups of images a priori. This would expedite subsequent query and retrieval processes. The authors introduce a new retrieval scheme that uses clustering techniques that are based on the mutual distance (similarity) between images in the search space of the query. The clusters are generated by a graph-cut algorithm. This has the advantage of enabling relevant user feedback methods. The authors feel that this technology

is robust enough to be incorporated into Google's image search engine, via appropriate application programming interfaces.

After grouping similar images into categories as a supervised learning problem, an even harder task is associating a query image with one of the observed categories as an unsupervised learning problem. Very often, the likelihood that an image belongs to one category rather than another is determined by a fitness function measuring the relative positions of similar regions from different images with the same properties. Following the success of these tasks, the authors experiment with an inverse problem: given a set of similar images belonging to the same category, construct a dictionary of statistical models (attribute rules) that can predict features found in the images. They employ a two-dimensional multiresolution hidden Markov model; experiments yield encouraging results.

This text makes a particular contribution to a unique application: modeling ancient paintings. There has been growing interest in viewing art online in digitized form. To facilitate the study of art, it would be ideal if the computer system holding the collection could compare similar works from the same artist, and extrapolate features and styles of the paintings. The system developed by the authors would be perfect for studying art, because, in addition to querying images for retrieval purposes, their system constructs statistical models of the features found in an image for comparative analysis. This text makes an important contribution to the image analysis literature because of its total dedication to a comprehensive single system that has been tested successfully in the field.

—*Minette Carl*, Flushing, NY
—*R. Goldberg*, Flushing, NY

GENERAL TERMS: ALGORITHMS, PERFORMANCE

H.3   INFORMATION STORAGE AND RETRIEVAL
H.3.3   Information Search and Retrieval
See: 0705-0439 [H.2.8—*Image Databases*]

Retrieval Models
See: 0705-0439 [H.2.8—*Image Databases*]

H.3.4   Systems and Software
See: 0705-0428 [D.2.6]; 0705-0452 [I.7.2—*Scripting Languages*]

World Wide Web (WWW)
See: 0705-0428 [D.2.6]; 0705-0442 [H.5.3—*Microsoft .NET*]; 0705-0452 [I.7.2—*Scripting Languages*]

H.3.5   Online Information Services
See: 0705-0434 [D.3.2—*Java*]

Web-Based Services
See also: 0705-0434 [D.3.2—*Java*]See also: 0705-0442 [H.5.3—*Microsoft .NET*]

MOORE, RYAN   0705-0440
Foundation ASP.NET 2.0 for Flash.
Friends of ED, Berkeley, CA, 2005, 424 pp., ISBN 1590595173.

This book is about the application of ASP.NET for Flash. It is meant for users of Flash who want to develop productive