

# Exploratory Image Databases: Content-Based Retrieval (Communications, Networking and Multimedia)

By Simone Santini



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The explosion of computer use and internet communication has placed new emphasis on the ability to store, retrieve and search for all types of images, both still photo and video images. The success and the future of visual information retrieval depends on the cutting edge research and applications explored in this book. It combines the expertise from both computer vision and database research.

Unlike text retrieval and text/numeric databases the challenges of image databases are enormous. How do you use "data mining" to search for an image if you do not have "key words" to search? **Exploratory Image Databases** introduces the idea that it is possible to solve this problem by merging database systems into a single search and browse activity called "exploration."

**Exploratory Image Databases** is one of the first single-author books that unifies the critical emerging topic of image databases. A new approach to image databases, the work is divided into four central parts: introduction to the problems that image database research must solve; computer vision and information retrieval techniques; image database issues; and interface and engines for visual searches.

Example: Imagine the difficulty of building and using a database for "face recognition," where an image of a face is used. In order to effectively use the image a huge number of characteristics would need to be entered in the database. The goal of future image databases is to use hardware and software to recognize and categorize images without typing in characteristics.

- \* Comprehensive coverage of the image analysis as well as the database/theoretical aspects of image databases.
- \* Extensive coverage of interfaces and interaction models, with a theoretical framework for the development of new interaction schemes.
- \* Identifies three interaction models between users and image databases, two of which have no counterpart in traditional databases.
- \* Coverage of the relation between image and text, including mixed search

models and the automatic determination of the relation between images and text on large corpuses like the web.

\* Analysis of the process of signification in images and its influence on the interaction models and technological problems of image databases.

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#### **Editorial Review**

From the Back Cover

Exploratory Image Databases gives a comprehensive look at the developing field of image databases. It attempts to delineate the boundaries of the field and to determine the common features and key differences between multimedia databases and the neighboring areas of databases, image analysis, and information retrieval.

The two key concepts that frame image databases are the process of signification in images, and the structural properties of image features as data types. The author presents that signification in images is a different process than in language, and it can be divided into three different modalities. Each one of these modalities gives rise to a different query paradigm and, therefore, to different models of databases. For two of these three modalities exploration (defined as a mix of navigation and query), rather than simple querying, is the correct interaction model between the user and the database.

Image features are data types endowed with rather complex structure. The study of the syntactic structure of features is essential in order to incorporate them into an established database model, and to bridge the gap between the heterogeneous interface and interaction models necessary for images on one side, and the technical requirements of fast and robust access on the other.

#### Features:

- \* Comprehensive coverage of the image analysis as well as the database/theoretical aspects of image databases.
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- \* Analysis of the process of signification in images and its influence on the interaction models and technological problems of image databases.

#### About the Author

Simone Santini, Ph.D. is affiliated with the Visual Computing Laboratory at the University of California, San Diego He is gaining widespread recognition for his research and publications in the rapidly emerging field of image databases and visual information retrieval.

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