INDEXING MULTIMEDIA DATABASES

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Tutorial Description

The tutorial surveys state-of-the-art methods for storing and retrieving multimedia data from large databases. Records (= documents) may consist of formatted fields, text, images, voice, animation etc. A sample query that we would like to support is *'in a collection of 2-d color images, find images that are similar to a sunset photograph'*. Indexing for images and other media is a new, active area of research; the tutorial will present recent approaches and prototype systems, for 2-d and 3-d medical image databases, 2-d color image databases, and 1-d time series databases.

Outline

- Definition of the problem - applications

- Access methods for multi-dimensional points ('secondary key' or 'spatial access methods', or SAMs): R-trees, quadtrees, gridfiles.

- Indexing methods for images, time series and signals, in general.

  - Main idea: use feature extraction functions, to map an image into a point in feature space, so that we can use SAMs to accelerate the search.

  - Properties of good feature extraction functions, subtle problems (eg., the 'dimensionality curse'), solutions, and

  - discussion of existing prototype systems: 1-d time sequences, 2-d color images, 3-d medical brain scans.

Target audience:

Researchers and developers of multimedia database systems.

Prerequisites:

Familiarity with basic file structures (B-trees and hashing).

Instructor

Christos Faloutsos (Ph.D. from University of Toronto, Canada) is an associate professor in the department of Computer Science at University of Maryland, College Park. He is currently on a leave, at AT&T Bell Laboratories. His research interests include physical data base design, searching methods for text, geographic information systems and indexing methods for medical and multimedia databases.