

# INDEXING MULTIMEDIA DATABASES

*Christos Faloutsos*  
AT&T Bell Laboratories and  
Univ. of Maryland at College Park

## 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.

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SIGMOD '95, San Jose, CA USA  
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