

Multimedia Database

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Introduction

What is Multimedia Data ?

- Text, Images, Audio, Video, Graphical Objects (like CAD, CAM objects).

How is Multimedia Data different ?

- Size
- Capture Methods
- Time Constraint like streaming
- Querying

Basic Approach of data retrieval

- Conventional Database System
- Information Retrieval System
- Content Based Retrieval System
- Graph or Tree Pattern Matching

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Advance Data Structure

Why are these important ?

- Spatial Indexing
- Clustering Technique

Different Data Structures:

- k-d trees
- Quadtree
- R-tree

K-d Tree

K-d trees has properties like:

- Each node represents a rectilinear region
- Each node associated with an axis
- Direction of cutting plane alternate with depth

Node Structure of K-d Tree

- Child pointers
- Extent of the cell
- Parent pointer
- pointers to content of the cell

K-d Tree Example

Division of points by k-d tree

Building K-d Tree

QuadTrees

Representing Image through quad-tree

Quadtree

R-trees

R-trees

R-trees

Types of Queries

- Whole Match Queries
- Sub-pattern Match Queries
- K-nearest Neighbour Queries
- All Pair Queries or Spatial joins

Comparison of Data Structures

- K-d tree is easy to implement
- Tree height of K-d tree is greater
- For R-tree: large no of rectangles in one node(lower disk space)
- In R-trees overlapping of nodes allowed
 - So while searching, go down multiple paths
- In Quadtree: searching and deletion more difficult

Metadata

Need of Metadata

- Inadequate processing techniques:
- Different Query Paradigm
- Lacking Efficiency
- Semantics of Multimedia Data

Metadata Classification

Based on dependence on content
Hierarchical Classificaton

Source and Generation

Source of Metadata
Generation of Metadata

Metadata Standards

What does it Mean ??

- Development of metadata taxonomy
- Development of ontologies related to metadata attributes, description, and domain
- Development of metamodel registry structure (interoperabilty)
- Definition of functionalyu of tools for development and operation of metadata base.

Organization providing metadata standards

- Dublin Core metadata element set
- ISO 11179 standards
- Metadata Content Format(MCF)

Things to remember

Multimedia support for Database: SQL/MM

Requirement for new data types ??

Oracle and SQL/3 supports:

Supported Operations:

SQL/MM & Oracles Intermedia

Thanks !!