

Visual Information Systems

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Objectives

- Give the fundamentals to understand and design information systems based on images (vector or raster), and visual symbols, i.e.
 - in terms of contents
 - in terms of modeling
 - in terms of access and querying

Systems of Visual Information

Visual Systems of Information

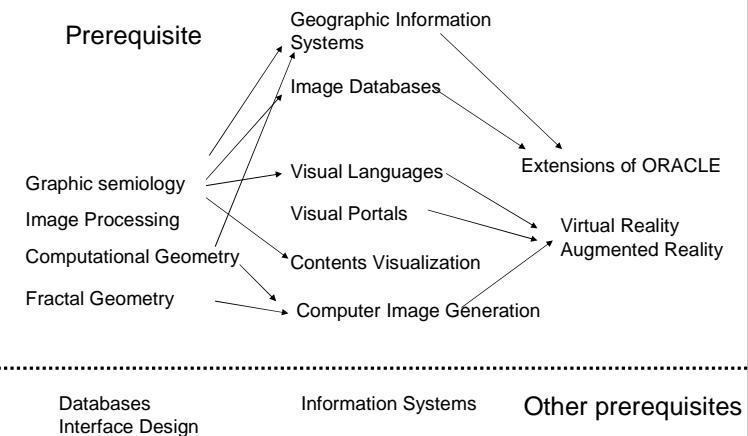
Basic Definitions (1/2)

- Computer Graphics
- Imagery
- Human Vision
- Color Systems
- Graphic Semiology
- 2D and 3D Modeling
- Visualization of MM data and documents

Basic Definitions (2/2)

- Computer Image Generation
- Virtual Reality
- Augmented Reality
- Immersion
- Image Database
- Visual Languages
- Visual access to DB
- Metaphors

Visual Information Systems



Cours 3IF (2008-09)

- 1 – Visions de l'espace
- 2 – Introduction à la géométrie algorithmique euclidienne
- 3 – Introduction au traitement d'images
- 4 – Introduction à la géométrie fractale
- 5 – Introduction à la synthèse d'images
- 6 – Introduction aux systèmes d'information géographiques

Course 4IF (2009-10)

- 1 – Introduction to Graphic Semiology
- 2 – GIS: Data Modeling
- 3 – GIS: Data Processing
- 4 – Introduction to Geo Web
- 5 – Virtual 3D Cities
- 6 – Introduction to Image Databases
- 7 – Visual Access to Multimedia Databases
- 8 – Visual Portals to Multimedia Information

Rapid Bibliography

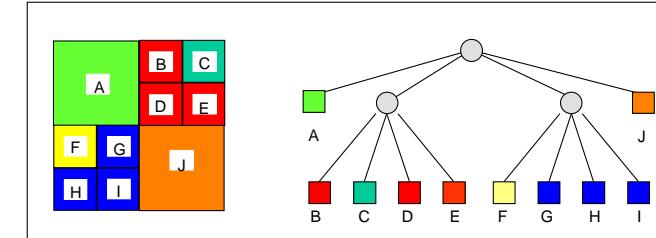
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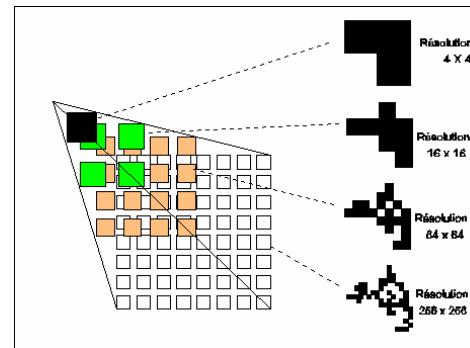
Reminder

- Computer Graphics
- Imagery (Image Processing)

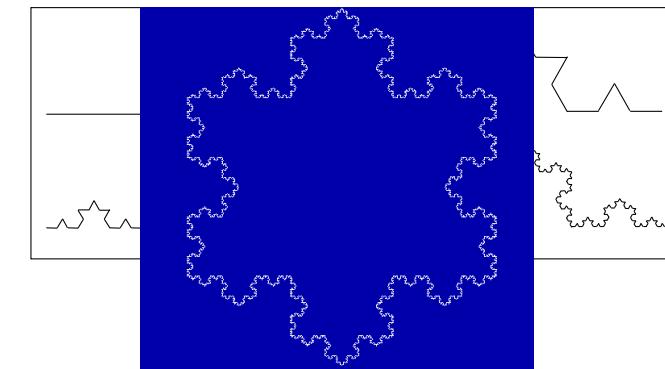
Quadtree



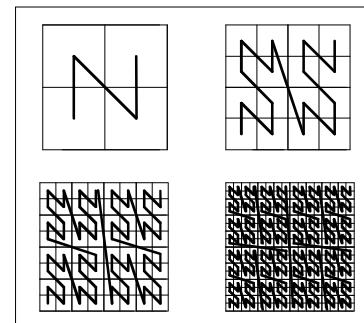
Pyramid



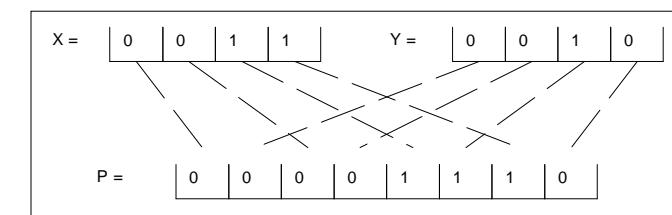
Koch curve: initial steps



First steps of the N-Peano curve

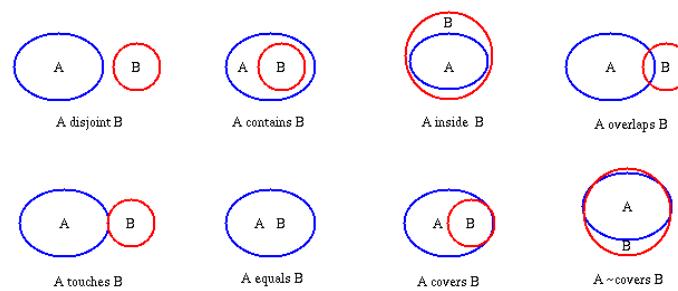


Obtaining Peano keys by bit interleaving



$$(x = 3) \text{ and } (y = 2) \Rightarrow p = 14$$

Egenhofer Relations



9-intersection Egenhofer model

Object A:

- Inside: A°
- Outside: $\neg A$
- Boundary: δA

Object B:

- Inside: B°
- Outside: $\neg B$
- Boundary: δB

	B°	∂B	$\neg B$
A°	$A^\circ \cap B^\circ$	$A^\circ \cap \partial B$	$A^\circ \cap \neg B$
∂A	$\partial A \cap B^\circ$	$\partial A \cap \partial B$	$\partial A \cap \neg B$
$\neg A$	$\neg A \cap B^\circ$	$\neg A \cap \partial B$	$\neg A \cap \neg B$

$R(A,B) =$

$$R(A,B) = \begin{pmatrix} A^\circ \cap B^\circ & A^\circ \cap \partial B & A^\circ \cap \neg B \\ \partial A \cap B^\circ & \partial A \cap \partial B & \partial A \cap \neg B \\ \neg A \cap B^\circ & \neg A \cap \partial B & \neg A \cap \neg B \end{pmatrix}$$

disjoint	meet	overlap	contains
$\begin{pmatrix} \emptyset & \emptyset & \neg\emptyset \\ \emptyset & \emptyset & \neg\emptyset \\ \neg\emptyset & \neg\emptyset & \neg\emptyset \end{pmatrix}$	$\begin{pmatrix} \emptyset & \emptyset & \neg\emptyset \\ \emptyset & \neg\emptyset & \neg\emptyset \\ \neg\emptyset & \neg\emptyset & \neg\emptyset \end{pmatrix}$	$\begin{pmatrix} \neg\emptyset & \neg\emptyset & \neg\emptyset \\ \neg\emptyset & \neg\emptyset & \neg\emptyset \\ \neg\emptyset & \neg\emptyset & \neg\emptyset \end{pmatrix}$	$\begin{pmatrix} \neg\emptyset & \neg\emptyset & \neg\emptyset \\ \emptyset & \emptyset & \neg\emptyset \\ \emptyset & \emptyset & \neg\emptyset \end{pmatrix}$
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