

IMA5001	Multimedia indexing
Period: S9 / P1	ECTS: 4
Language: English	

Organization:

- Teaching Load / Total Load: 45/90
- Lectures/Exercices/Labs/Final Exam 1: 36/0/9/0

Assessment:

Continuous evaluation based on lab assignments (BE) and personal supervised project (P) linked to real industrial applications or to national/European research projects.

Final grade = Average (BE, P)

Objectives:

- To be able to exploit the content-based representations and access paradigms for approaching indexing, searching and enriching heterogeneous content problems in a unitary way.
- To know how to take advantage of relevance feedback and user profiling in order to design customized and interactive services.
- To master data mining key techniques for implementing real-time searching engines in huge databases (Internet).
- To be able to deploy interoperable indexing tools based on multimedia standards and description languages (MPEG-7, XML...).

Reference to CDIO Syllabus:

- 1.1.1 Mathematics (including statistics)
- 1.2 Core engineering fundamental knowledge and other disciplines
- 1.3 Advanced engineering fundamental knowledge, methods and tools
- 2.1.4 Analysis with Uncertainty
- 2.1.5 Solution and Recommendation

Keywords:

Multimedia indexation, visual descriptors, shape, color, motion, texture, description scheme, description languages, MPEG-7 standard.

Prerequisites:

None

Course outline:

- 2D/3D shape extraction
- Color segmentation
- Extraction of texture primitives
- Motion analysis

- Scene 3D structure estimation
- Audio segmentation
- The metadata era: a new multimedia consumption
- Low-level descriptors for content indexing and content-based access : audio descriptors, (2D, 3D and 2D/3D) shape descriptors, motion descriptors, texture descriptors
- Query by example and similarity metrics
- Towards high-level descriptions: description schemes, hierarchical and multigranular representations
- Structural and semantic descriptions of multimedia documents
- Training, profiles and relevance feedback
- Search engines and data mining
- Description languages: XML, XML-schema, RDF, MPEG-7
- Applications (video archiving, sign language, face recognition)

Learning materials and literature:

Learning materials: Documentation provided by lecturers.

Literature:

- A.K. Jain, *Fundamentals of Digital Image Processing*, Prentice Hall, 1989.
- B.S. Manjunath, P. Salembier, T. Sikora, *Introduction to MPEG-7*, Wiley, 2002.
- A. Mostefaoui, F. Prêteux, V. Lecuire, J.-M. Moureaux (Ed.), *Gestion des données multimédias*, Traité IC2 - Série Informatique et Systèmes d'Information, Hermès-Lavoisier, Paris, France, Mars 2004.

Person in charge:

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Lecturers:

Guest lecturer:

- Dr. Samuel CRUZ-LARA (INRIA/LORIA laboratory)