IMAGINE Team
Feature Extraction and Identification

LIRIS   **CNRS**

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Members

- 5 Professors (incl. 3 half-time members)
- 13 Associate Professors (incl. 1 half-time member)
- 17 PhD students

Keywords

- Image, video, feature extraction, content-based indexation, document analysis

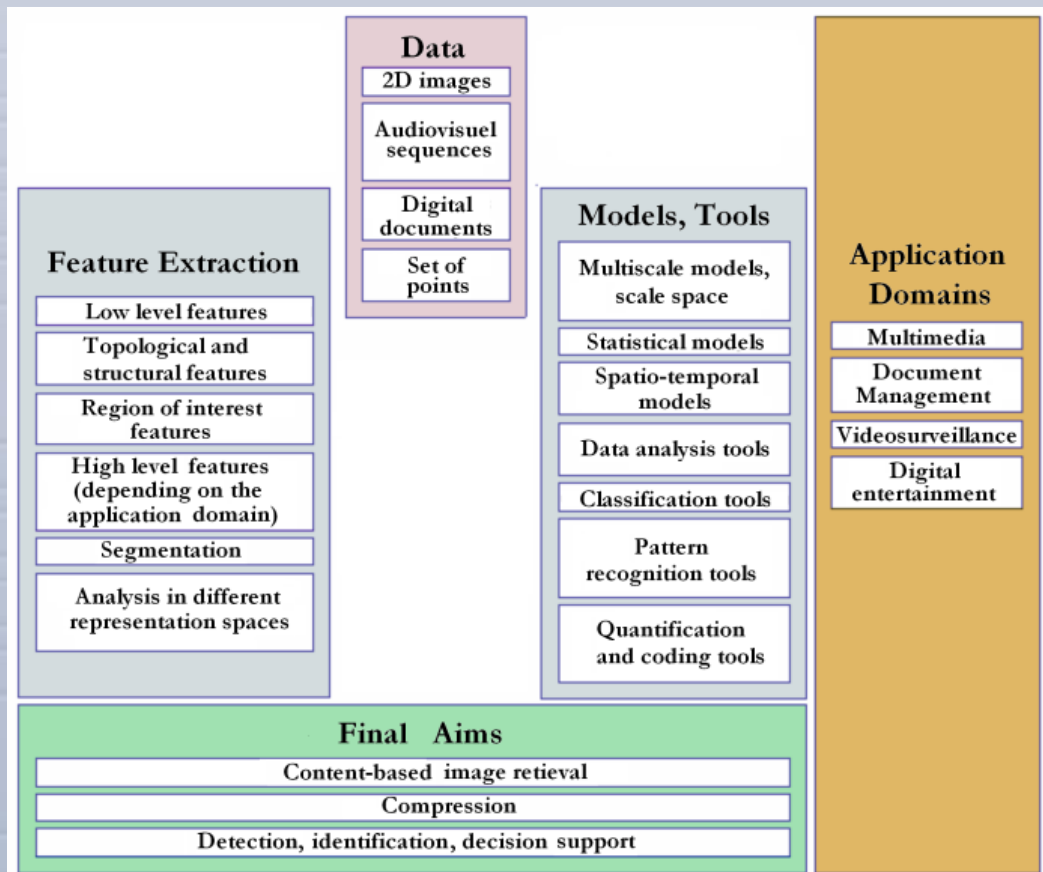## Defended PhD Thesis

- 6 or 7 each year

Publications

- In average, each year : 3 or 4 international journals, 2 national journals, 17 international conferences and 2 national conferences

The research activities of the Imagine team are focused on the analysis and treatment of visual media (including images, video, 3D objects and images of documents) to:
- segment them in regions of interest;
- extract characteristics through compact descriptors;
- adapt and enrich this description using:
  - a priori information on the content and on the context, the parameters of acquisition;
  - models of high-level knowledge

The main objectives of the team are:
- a better understanding and interpretation of the content and identifying objects of interest;
- an intelligent indexing, which would facilitate access to huge databases;
- compression, transmission and storage taking into account the means of transmission and capacity of terminals "end-user"

Data
- 2D images
- Audiovisuel sequences
- Digital documents
- Set of points

Feature Extraction
- Low level features
- Topological and structural features
- Region of interest features
- High level features (depending on the application domain)
- Segmentation
- Analysis in different representation spaces

Models, Tools
- Multiscale models, scale space
- Statistical models
- Spatio-temporal models
- Data analysis tools
- Classification tools
- Pattern recognition tools
- Quantification and coding tools

Application Domains
- Multimedia
- Document Management
- Videosurveillance
- Digital entertainment

Final Aims
- Content-based image retieval
- Compression
- Detection, identification, decision support

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Applications
- Analysis and indexation of images et videos
- Treatment and analysis of contemporary and inheritage written documents
- Video surveillance

Achievements, outstanding facts
- Technological transfer and incubation of three Startups within the team:
  - FoxStream, which specializes in video surveillance
  - Ghanni Music, for classification and advice for music data
  - CoReNum, for digitization services of written documents and their treatment
- Digitization platform of very high quality for books and paper documents retroconversion

Neutral   Zigomatic Major   Matched surfaces
Min = 0.085   Max = 6.1866   Mean = 1.6432   Std = 0.9619

Colormap of deviation measurement

Positioning
- **International context**
  - Project Apollo PRA, PCRD IST Digital Olympics PHENIX SSA, MoSAIC
  - Member of international journal editorial boards : IEEE-PAMI, IJDAR, PR, PRL, CVIU, PAA, ELCVIA, JASP, EURASIP, TSI
  - Participation to international competitions : TREC-VID, Image EVAL
- **National context**
  - GdR CNRS ISIS (Information, Signal, Images and ViSion)
  - Projects ANR : OMNIA, GRAPHEM, FAR3D
  - Project ACI : MADONNE, MD MusicDiscover
  - DGA Contract (Direction Générale pour l'Armement)
- **Regional context**
  - Cluster 2 (ISLE : (Informatique, Signal, Logiciel Embarqué) : LIMA (Loisirs et Images) Project
  - Cluster 13 (Culture Patrimoine Création) Project 4-5: Corpus Numérique ; Project 6 : Numérisation et reconnaissance de documents

Industrial partnerships
- France Télécom R&D, IFP (Institut Français du Pétrole), Xerox, CESA, EverTeam, FoxStream, NemOptic, PINKA, Telem Sécurité Electronique, Spigraph

International relationships
- Belarussia, China, Japan, Morocco, Poland, Taiwan, Tunisia, Vietnam