



ALMA MATER STUDIORUM - UNIVERSITÀ DI BOLOGNA

# Modeling and Processing of Multimedia Data

International Second cycle degree programme (LM) in  
Digital Humanities and Digital Knowledge (DHDK)  
University of Bologna

## Free Exercise on Multimedia DBs

Home page: <http://www-db.disi.unibo.it/courses/DMMMDB/>

Electronic version: 0.04.FreeExercise-MMDBs.pdf

Electronic version: 0.04.FreeExercise-MMDBs-2p.pdf

# Exercise 1.A

- Make a note of all the different media and combinations of media you are exposed to in a single day
- Figurate some concrete examples of MM applications (like the ones just illustrated) by separately describing, in **natural language**, relevant **structured**, **semi-structured**, and **unstructured data**

## Archivio Storico Fiat



- Trimotore Fiat G212
- Data: 1947
- Collezione: Tema di cultura industriale
- Tipologia: Immagine
- Aereo, Motore, Ali

what else? ...

## Exercise 1.B

- Starting from **descriptions in natural language** of relevant **structured, semi-structured, and unstructured data** selected for your examples of Exercise 1.A, **model the data** according to:
  - **relational model** (for **structured data**), and
  - **XML model** (for **semi-structured data**)
- Provide a **definition accurate as much as possible of the low-level features** you chose for describing the “content” of involved MM data (**unstructured data**)

# Exercises 1.A/1.B: students to do list

- Prepare an electronic version of your proposals
  - .ppt filesimilarly, to the examples proposed during lectures
- Upload it into the **OneDrive folder “DMMMDBs”**, using the link provided by the teacher, and following the instruction:
  - File name: **“Secondname.Firstname.ESE1.AB.ppt”**

## Archivio Storico Fiat

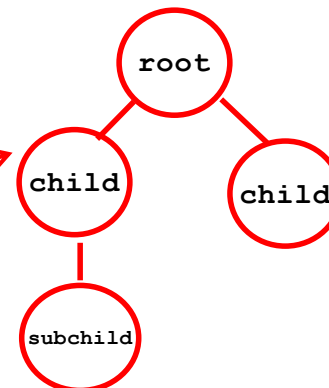


- Trimotore Fiat G212
- Data: 1947
- Collezione: Tema di cultura industriale
- Tipologia: Immagine
- **Aereo, Motore, Ali**



## Descrizione low-level features per dati unstructured

- Distribuzione colore dell'immagine
- Forma degli oggetti nell'immagine
- ...



## Exercise 1.C

- Starting from Examples proposed in Exercises 1.A/1.B, and by focusing on the **textual documents** only
- Draw
  - the **term-document matrix** and
  - the **inverted index**representations for Boolean and VS retrieval models
- Identify some relevant **queries**
- Plot the two separate graphs of
  - **Average Precision vs. Nret documents** and
  - **Average Recall vs. Nret documents**

## Exercise 1.C: students to do list

- Starting from the solution you proposed in Exercises 1.A/1.B (i.e., the file “**Secondname.Firstname.ESE1.AB.ppt**”), enrich the description of your MM Applications by adding
  - **visual examples** (i.e., **images**) of involved **relevant textual information**
  - provide a sketch of the **VS model-based inverted index** you built for solving your IR queries
- Upload it into the **OneDrive folder “DMMMDBs”** the updated electronic version of your work following the instruction:
  - **File name: “Secondname.Firstname.ESE1.C.ppt”**

## Exercise 1.D

- Let's complete our Exercise 1, in its last part “D”...
- Starting from the **definitions of the low-level features** you selected for describing the “**content**” of **unstructured data** involved in your MM applications, provide a **concrete representation/comparison modality** of them with visual examples
- Among features possibilities:
  - global features vs. local features (region-based approach) and/or
  - local salient points

E.g., “*global color distribution for an image*” (definition) vs. “*color histograms*” by using the “*weighted Euclidean distance*” as similarity measure (representation/comparison modality)

## Exercise 1.D: students to do list

- Starting from the solution you proposed in Exercise 1.C (i.e., the file “**Secondname.Firstname.ESE1.C.ppt**”), enrich the description of your MM Applications by adding
  - **concrete representation/comparison modality** of involved **low-level features** with **visual examples**
- Upload it into the **OneDrive folder “DMMMDBs”** the updated electronic version of your work following the instruction:
  - **File name: “Secondname.Firstname.ESE1.D.ppt”**
- **In doing the exercise, let’s keep in mind the final goal: retrieve relevant MM content! 😊**

N.B. You may work alone or in team (max. 4 students); in the latter case, the reference name for the ppt file is the one of the team “leader”. In both cases, before starting working, please, fill the file “StudentsFreeExercise.doc” (OneDrive folder “DMMMDBs”), providing requested information