

# Shallow representation - From Shallow to Deep representation for multimedia data

Johnny Nguyen<sup>1</sup>

**Abstract**—This electronic document permits me to synthesis the first course of analysis and indexation.

## I. INTRODUCTION

Use a picture to know where you are. How can we manipulate a content of an image.

## II. INFORMATION RETRIEVAL

IR (workflow) [figure workflow]

- 1) Feature extraction -> transforming,
- 2) Indexing -> metadata,
- 3) Search engine -> similarity,
- 4) Interfaces -> query.

### A. Motivations

- Digitalize communication phone -> digitalize image,
- Big Data: Youtube has 100h per second are uploaded,
- Need for data representation.

### B. Content-base image retrieval

- Keyword based to associate an image with a text,
- Be careful with high dimension to update the information,
- Google don't use image to add a keyword on an image,
- Even tinyed can be tricked.

### C. Architecture of content-based information retrieval

[figure architecture]

## III. 2 STANDART CONTEXT

### A. Target search

First paradigm : cut a part of an image to find the object  
Second paradigm : find the category like an emotion or romantic. (open question in machine learning). Find a new category using old category.

### B. Visual content indexing

Dense image primitive (sparsing into a grid) If the image is shifted, we can't retrieve it.

### C. Sparse image primitive

Flat, edge and corner. [Figure] Edge : variation into intensity curve (dark to bright, bright to dark) We can use convolution [Figure] [Formule]

[Brain figure]

Octopuss see only the edge of an image. (human) Octopuss see multiple image with edge to get the norm and the correct of an image (cat). We need to smooth the signal before derivate it. Or directly derivate it while deep learning it.

<sup>1</sup>This work was not supported by any organization

### D. Image descriptors

We can use different descriptors :

- Color descriptor : histogram of color (bag of word),
- Texture descriptor : use different filter,
- Shape descriptor : count the number of contour point.

## ACKNOWLEDGMENT

Thanks to Frederic Precioso for his work.

## REFERENCES

- [1] <https://moodle.polytech.unice.fr/course/view.php?id=31>