

# Analyse d'images Christophe RIGAUD, Nhu Van NGUYEN, Jean-Christophe BURIE

GdR ISIS : traitement du signal et des images pour l'art et le patrimoine

# Le projet e-BDthèque Dataset (<http://ebdtheque.univ-lr.fr/>)

## ➤ Objectifs

- > Valorisation du patrimoine culturel
- > Recherche d'image par le contenu

## Annotations bibliographiques



**PAGE**  
**Collection:** Chilling Tales  
**Album:** 17 Geo  
**Editor:** Youthful Magazines  
**Drawer:** Matt Fox  
**Writer:** Matt Fox  
**Language:** English  
**Page number:** 16  
**Release date:** 1953

## ➤ Jeu de données

- > 100 pages de 20 albums
- > Franco-Belge, comics Américain et manga

## Annotations visuelles et sémantiques



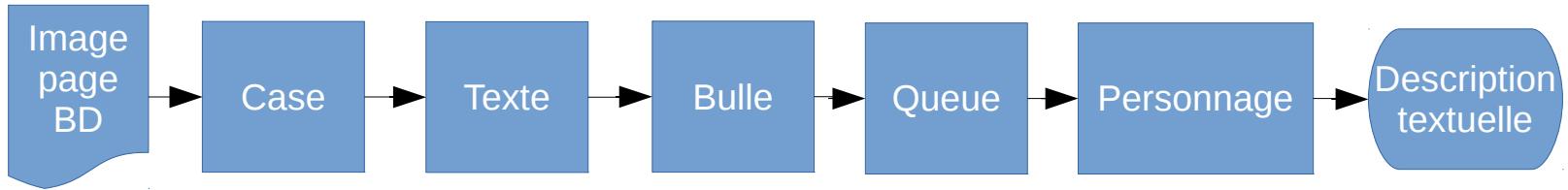
**PANEL**  
**Rank:** 1

**BALLOON**  
**Rank:** 2  
**Shape:** Oval  
**Tail direction:** South-West

**TEXT LINE**  
**Text:** « STARK RAVING »

**CHARACTER**  
**LinkedToBalloon:** 2

# Approche par le contenu **Case & texte**



# Approche par le contenu Case & texte

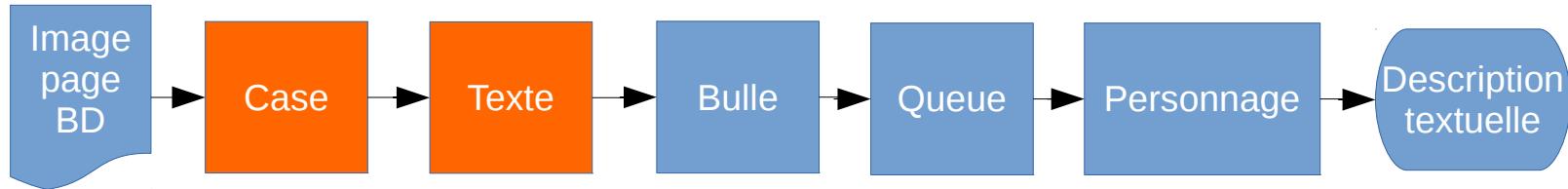


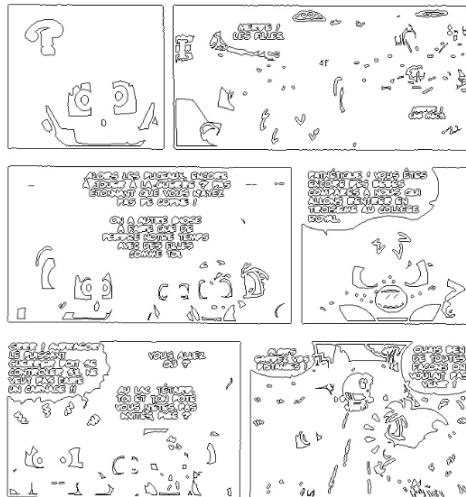
Image	OCR output	Lex.
LES JAPONAIS,	Les mmmsc,	67%
UN TRUC COINCÉ	UN TRUC COINCÉ	91%
best people eat dessert	best" people eat dessert	95%
REASON WHY WE	REASON WHY WE	100%



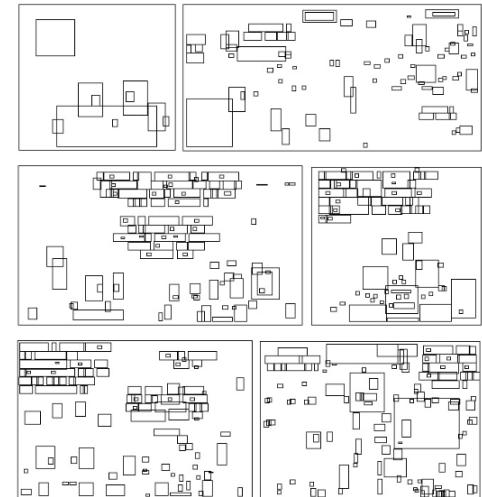
# Approche par le contenu Case & texte



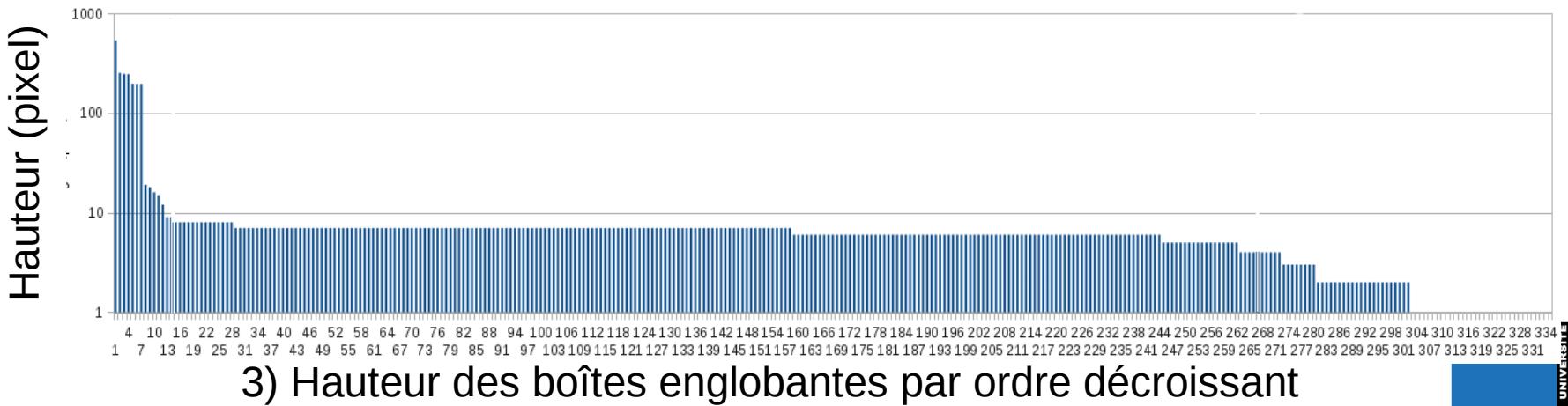
1) Composantes connexes (CC)



2) CC noires



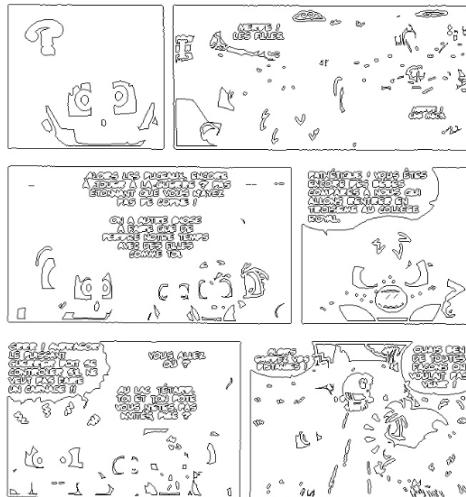
3) Boîtes englobantes



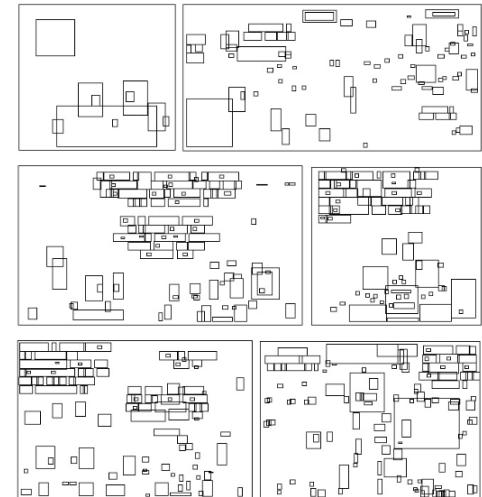
# Approche par le contenu Case & texte



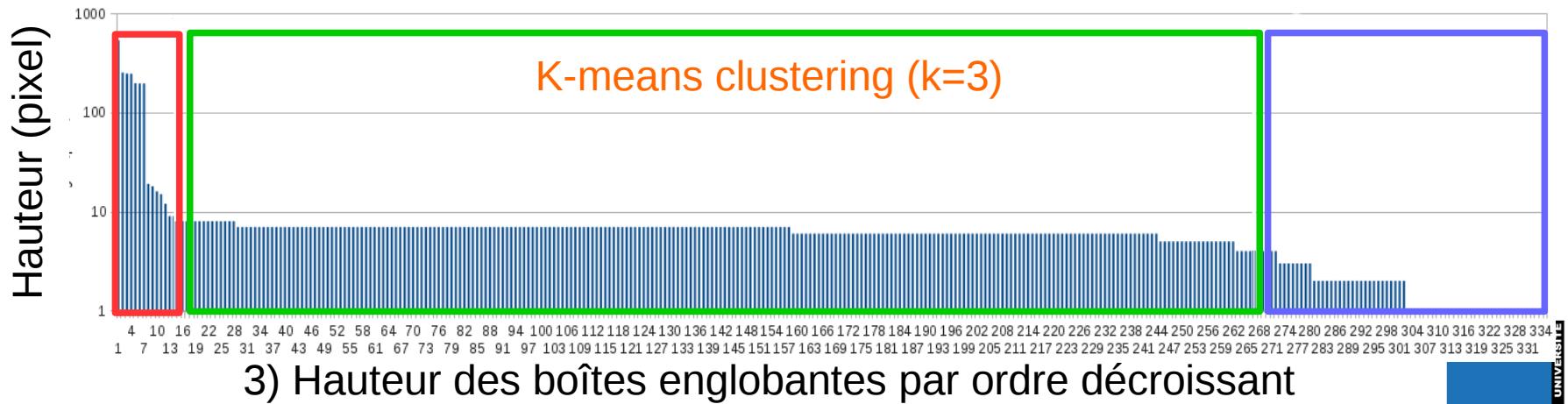
1) Composantes connexes (CC)

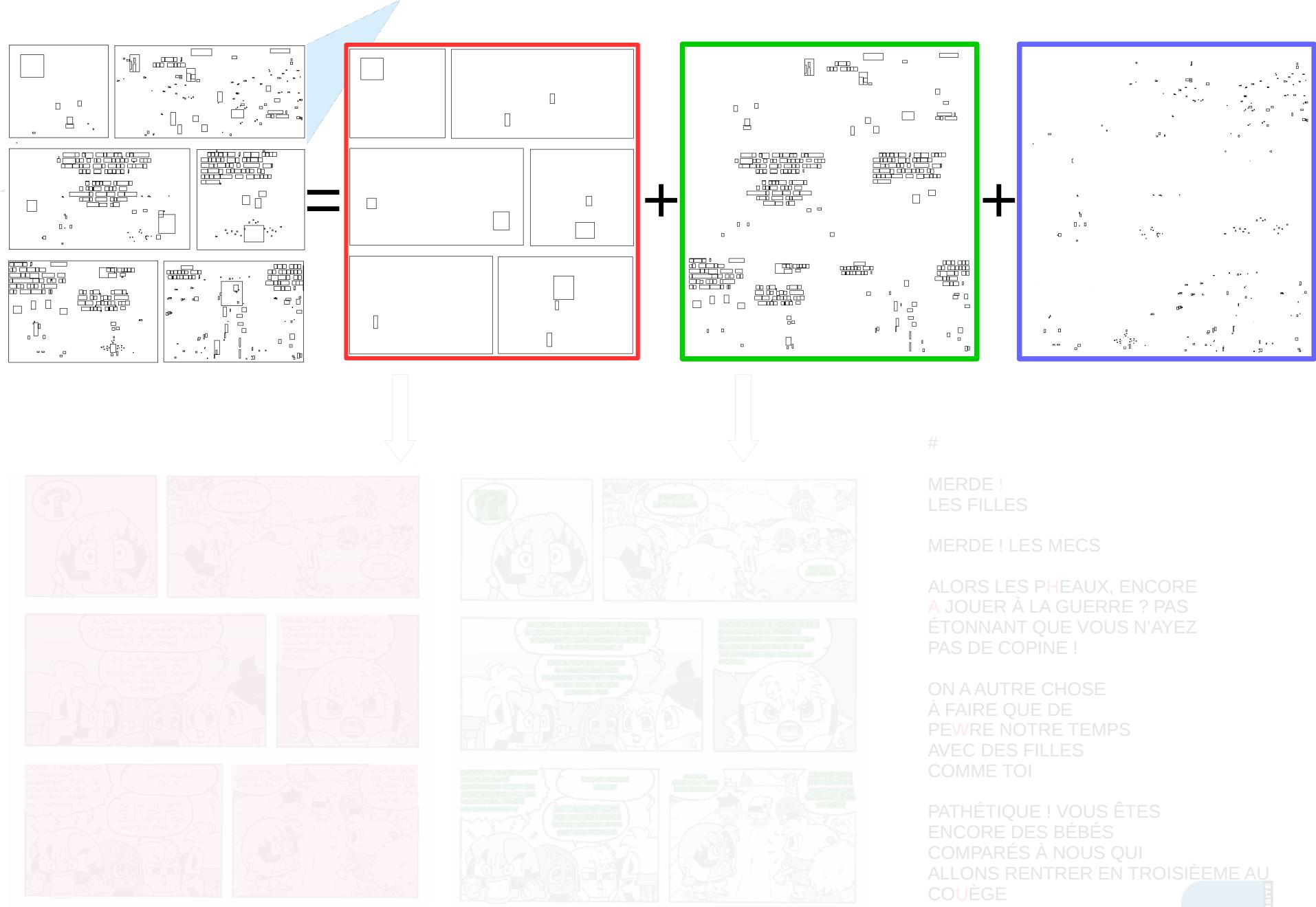


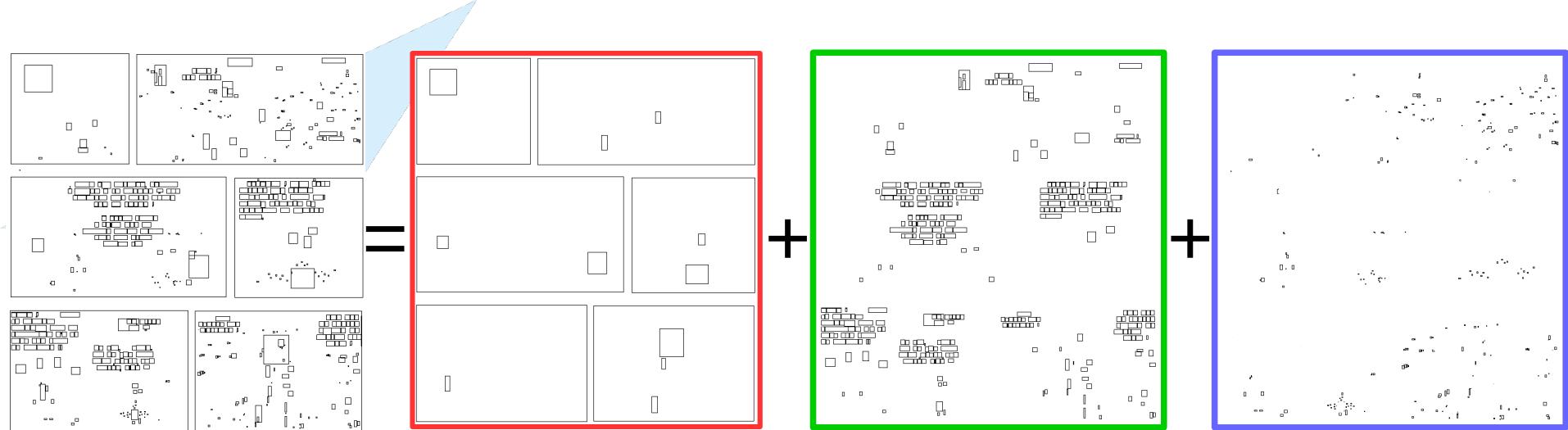
2) CC noires



3) Boîtes englobantes







#

MERDE !  
LES FILLES

MERDE ! LES MECS

ALORS LES PHEAUX, ENCORE  
A JOUER À LA GUERRE ? PAS  
ÉTONNANT QUE VOUS N'AYEZ  
PAS DE COPINE !

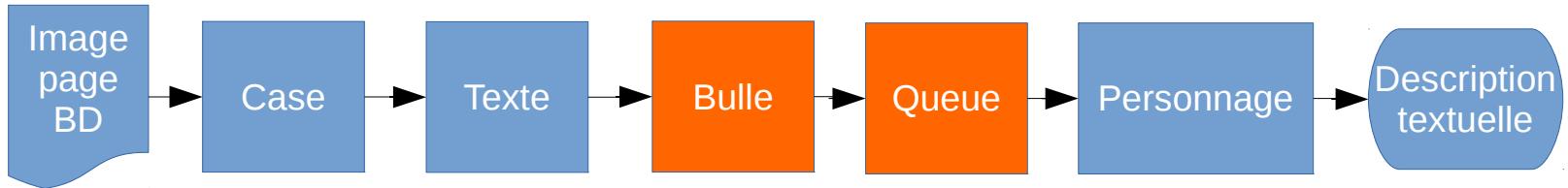
ON A AUTRE CHOSE  
À FAIRE QUE DE  
PEWRE NOTRE TEMPS  
AVEC DES FILLES  
COMME TOI

PATHÉTIQUE ! VOUS ÊTES  
ENCORE DES BÉBÉS  
COMPARÉS À NOUS QUI  
ALLONS RENTRER EN  
COUÈGE  
ROYAL

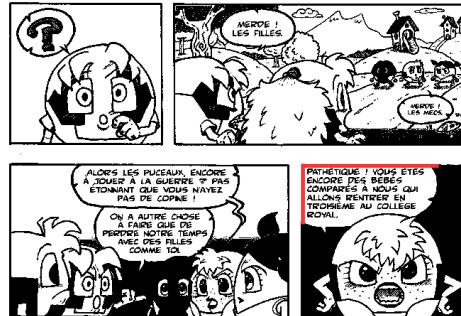
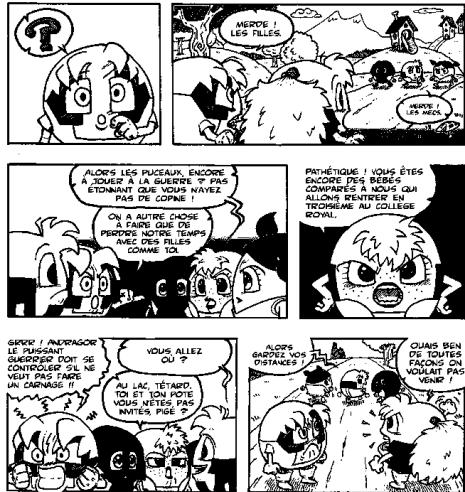
...



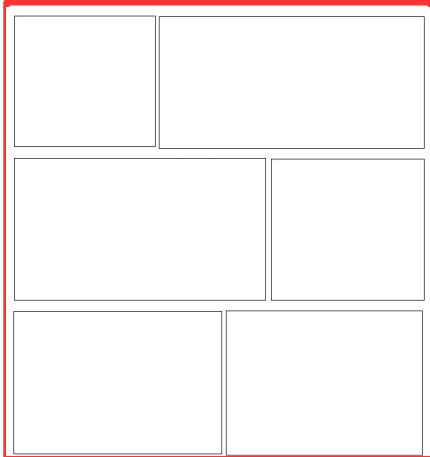
# Approche par le contenu **Bulle & queue**



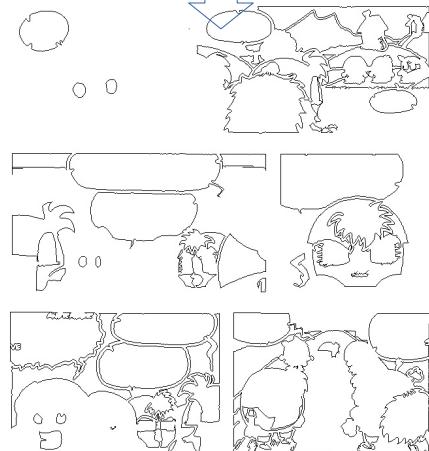
# Approche par le contenu Extraction des bulles



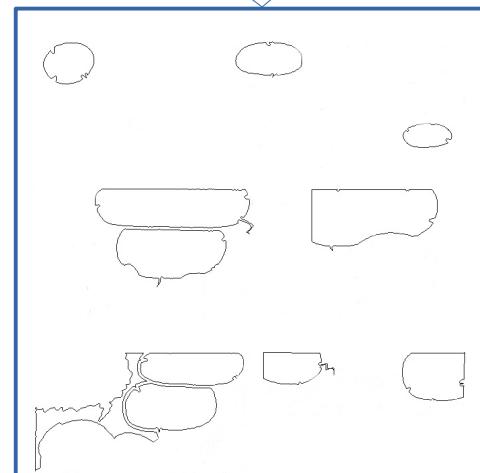
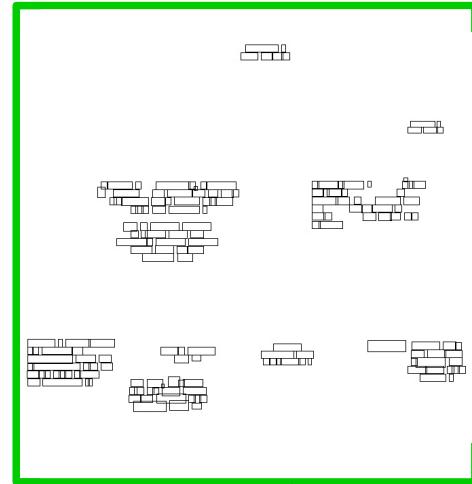
1) Composantes connexes (CC)



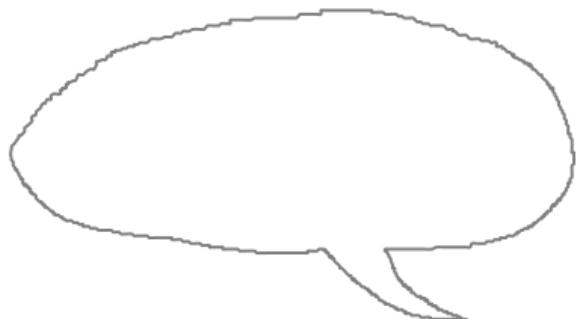
2) Fermeture des cases ouvertes



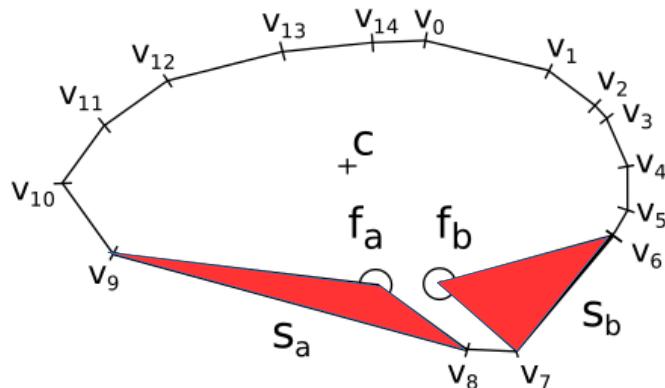
3) CC blanches



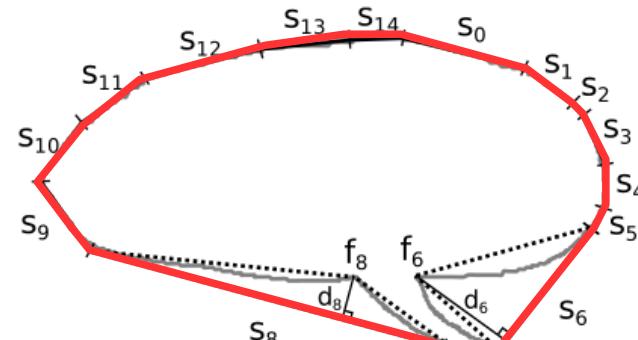
# Approche par le contenu Détection de la queue



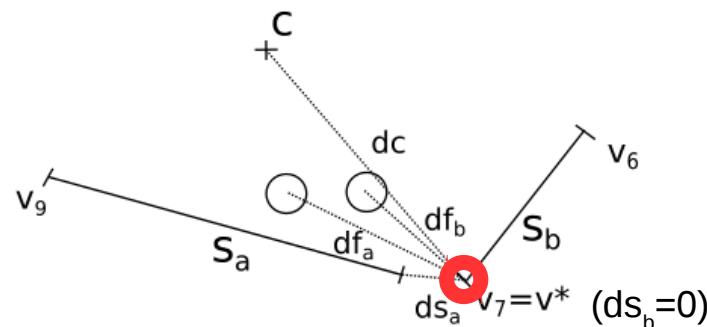
1) Contour de bulle



3) Défauts de convexité



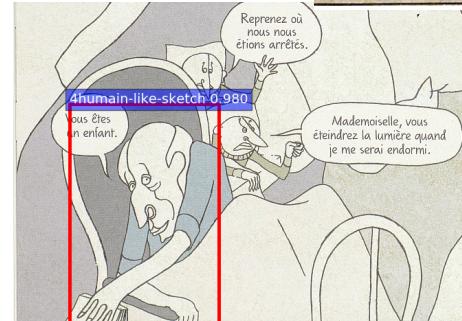
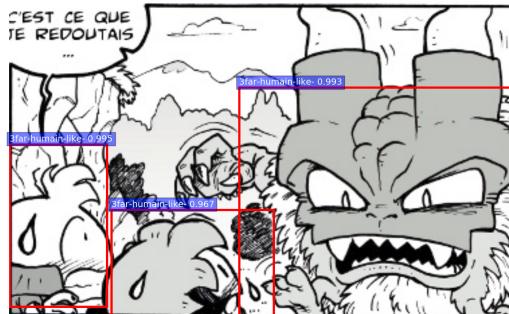
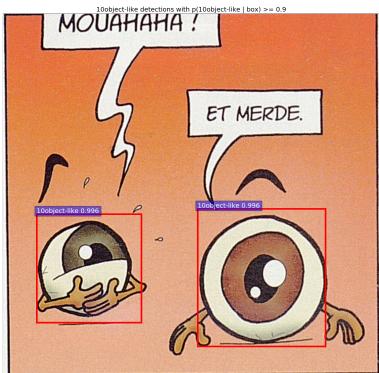
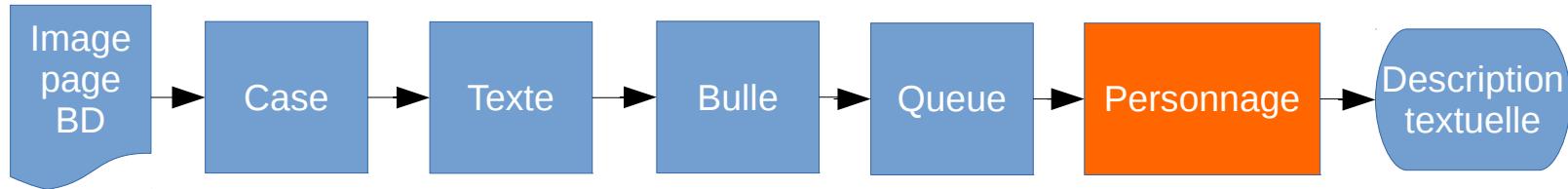
2) Enveloppe convexe



4) Position de la queue

Sélection du sommet optimal :  
 $v^* = \operatorname{argmax}(\max(dc + df_a + df_b) + \min(ds_a + ds_b))$

# Approche par le contenu Détection des personnages



# Approche par le contenu **Apprentissage profond**

## ➤ Algorithmes de détection d'objets

- > YOLO (You Only Look Once)
- > Faster-RCNN (Recurrent Convolutional Neural Network)

## ➤ Données d'entraînement

- > 612 images aléatoires issues de 140,000 images => 2319 cases
- > 772 images de 27 comics Américains de l'âge d'or => 4339 cases
- > 100 images de eBDthèque => 537 cases
- > 4 albums privés (4AS, Yoko, Asterix, Midam) => 426 cases
- > 4 catégories/classes: visage, humain, animal, objet

# À suivre...

## Collaborations en cours

- Base de données MEDIABD
- Librairie en ligne **Sequency** × E.Leclerc
- Bremen Institute for Transmedial Textuality Research (**BITT**)

## Colloques spécialisés

- International Workshop on coMics ANalysis, Processing and Understanding (MANPU, Kyoto 2017)
- The Empirical Study of Comics (Bremen 2017)
- Workshop on Comics Annotation: Designing Common Frameworks for Empirical Research (Potsdam 2018)
- International Conference on Document Analysis and Recognition (ICDAR , Kyoto 2017)

## Articles de journaux

- Christophe Rigaud, Clément Guérin, Dimosthenis Karatzas, Jean-Christophe Burie and Jean-Marc Ogier. Knowledge-driven understanding of images in comic books. International Journal on Document Analysis and Recognition (IJDAR), Volume 18, 2015, Pages 199-221 ([link](#))
- Clément Guérin, Christophe Rigaud, Karelle Bertet, Arnaud Revel, An ontology-based framework for the automated analysis and interpretation of comic books' images, Information Sciences, Volume 378, 1 February 2017, Pages 109-130 ([link](#))

Crédit images : <http://ebdtheque.univ-lr.fr/database/>

Présentation : <https://github.com/crigaud/> > publication > 2018 > TALK > GdR\_ISIS