Université Paris Cité

image analysis: projet

Extraction and text recognition present on a board

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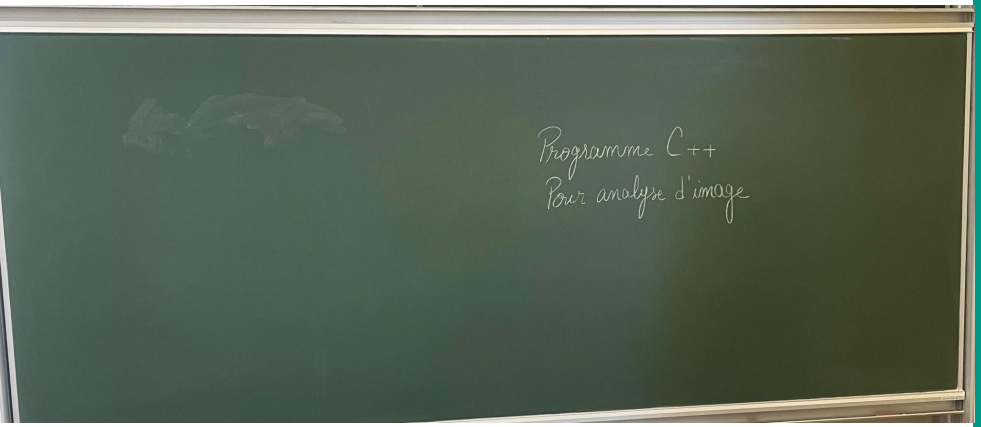
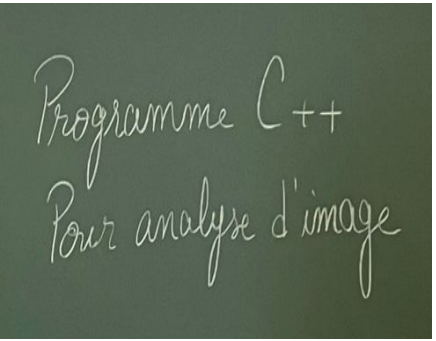


Goal of the project

Extract text from a board and recognize it



Programme C++
Pour analyse d’image

MAJOR STEPS

- Board detection
- region/paragraphe segmentation
- Lines detection / word estimation
- Word detection
- Character segmentation
- Predicting the character using a trained model
- Reconstruct the paragraph/line text
- Correcting the phrases using NLP

Board detection

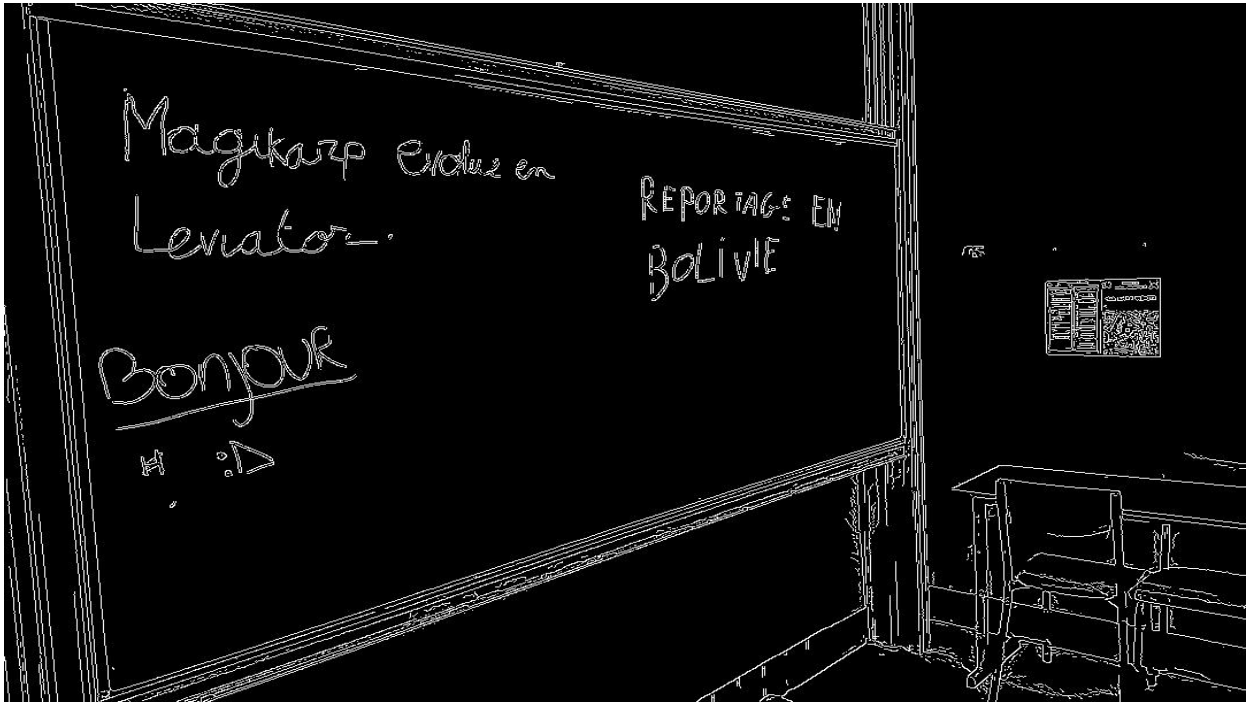
- Pre-process the image: Original image

Board detection

- Pre-process the image: BiLateral Filter

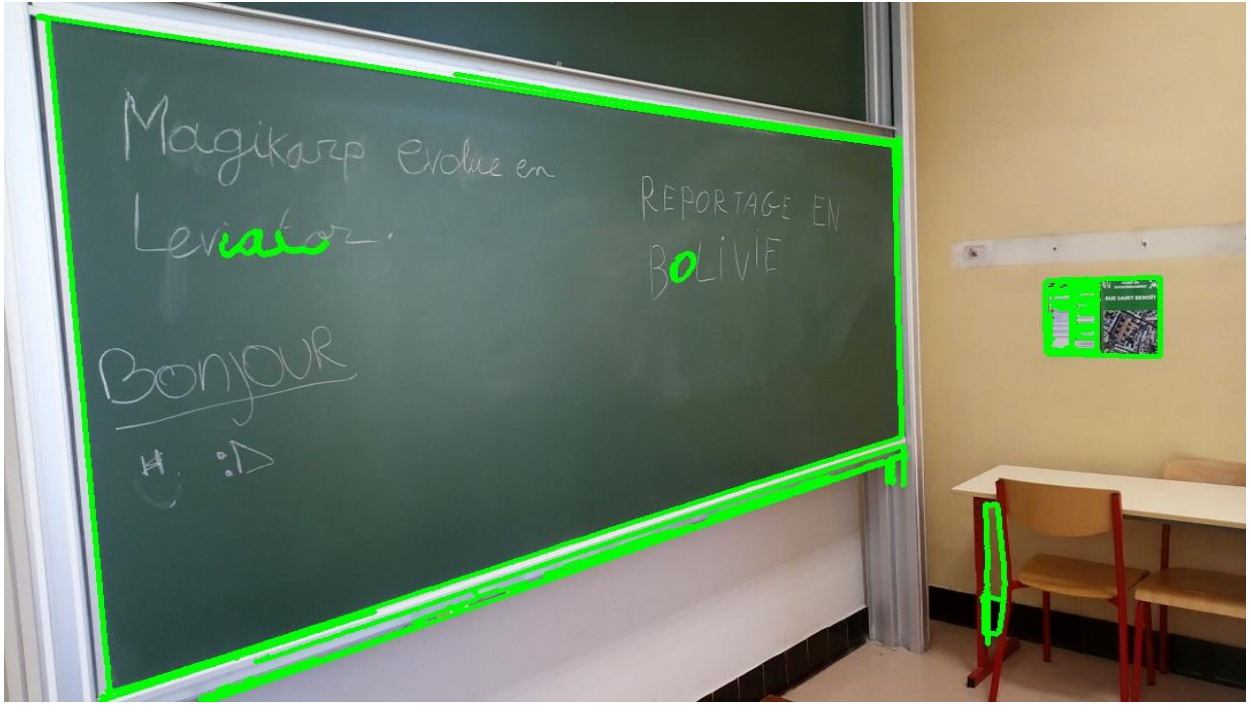
Board detection

- Pre-process the image: Canny’s contour detection after gauss and weights



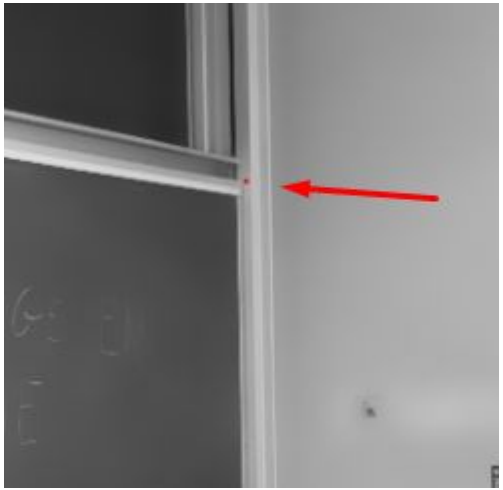
Board detection

- Pre-process the image: Display the 10th biggest closed contours only (clear)



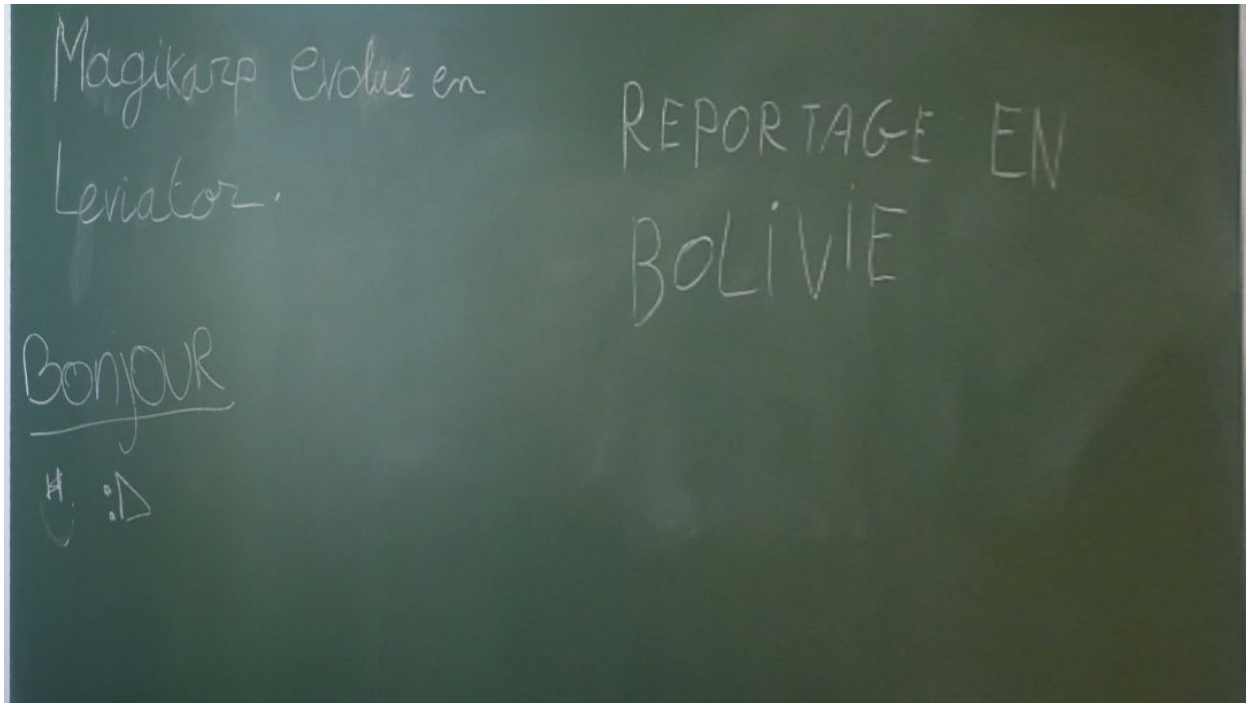
Board detection

- Pre-process the image: Biggest + rectangle



Board detection

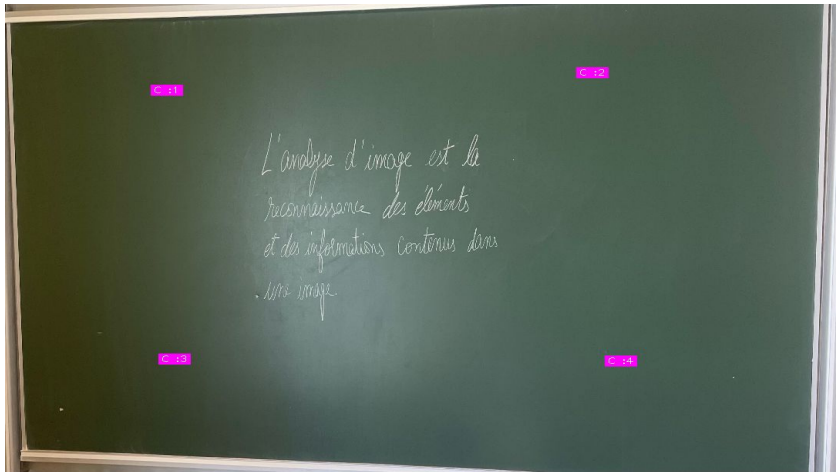
- Pre-process the image: Warped image



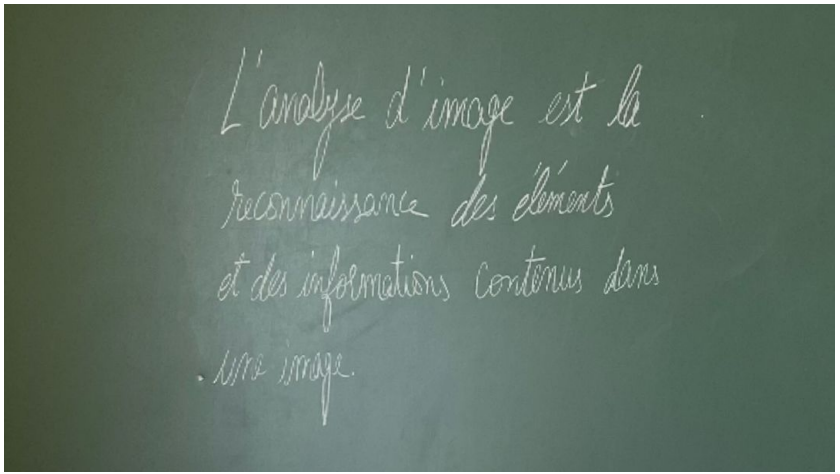
No board detected ? no problem.

- A manual warping will be triggered, selecting all corners will give the new warped image

Corner selection



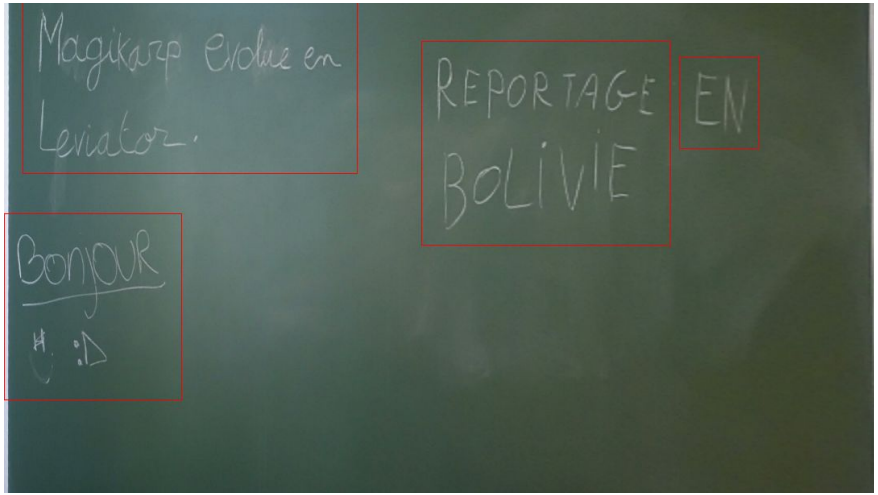
Manual warp



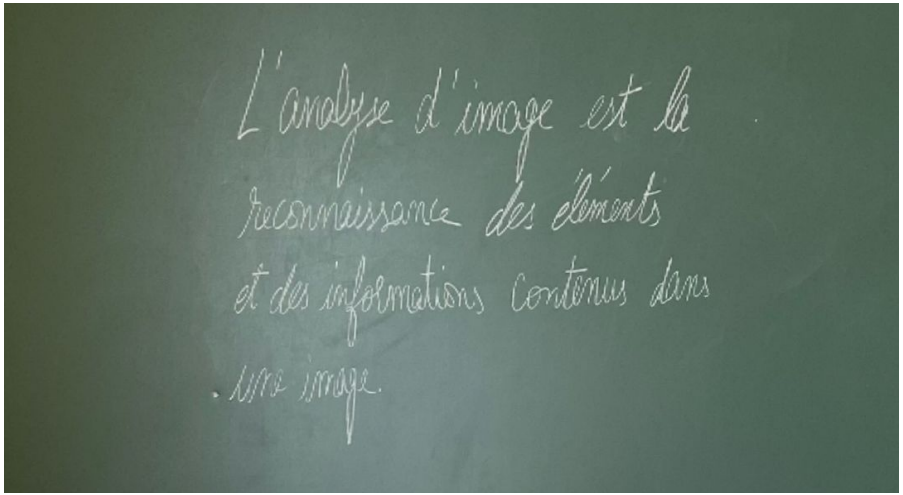
Region / Paragraph segmentation

- Process the image (if chosen to paragraph segment it): Dilatation + contours

Paragraph segmentation = True

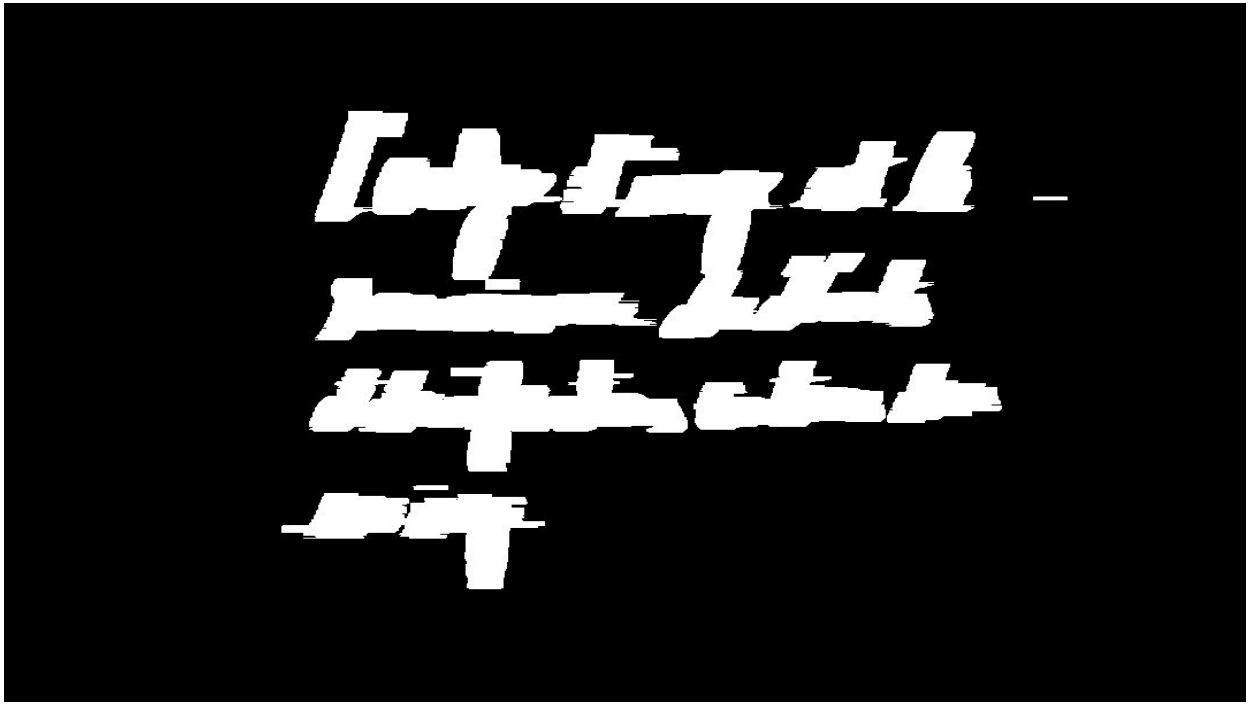


Paragraph segmentation = False



Line / Word estimation

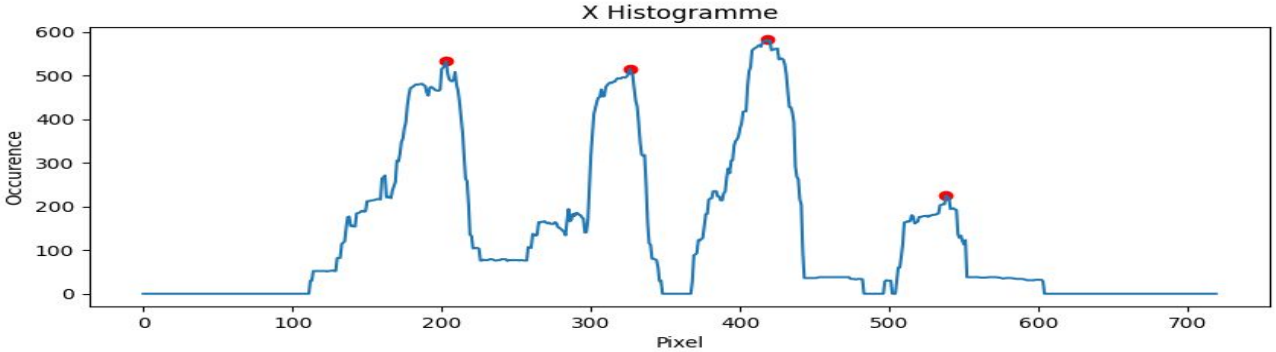
- Process the image : Gaussian + mask weights + canny + dilatation

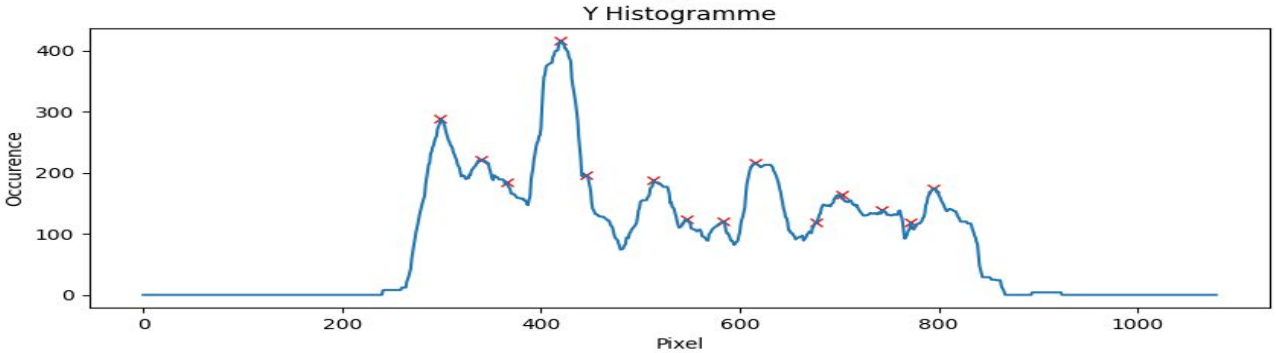


Line / Word estimation

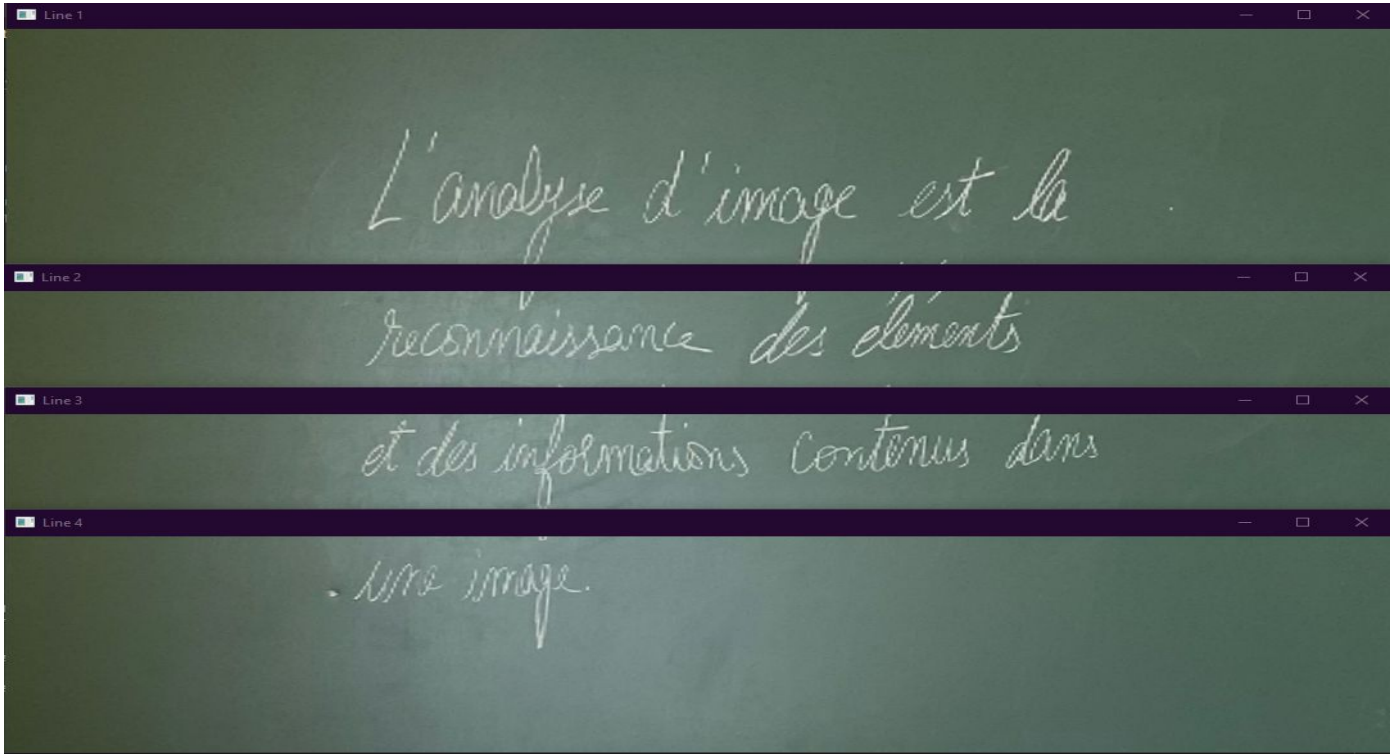
- Process the image : Dilatation

```
Estimated lignes on the image is : 4
Those lines are around these pixels : [203 326 418 538]
Estimated words on the image is : 14
```



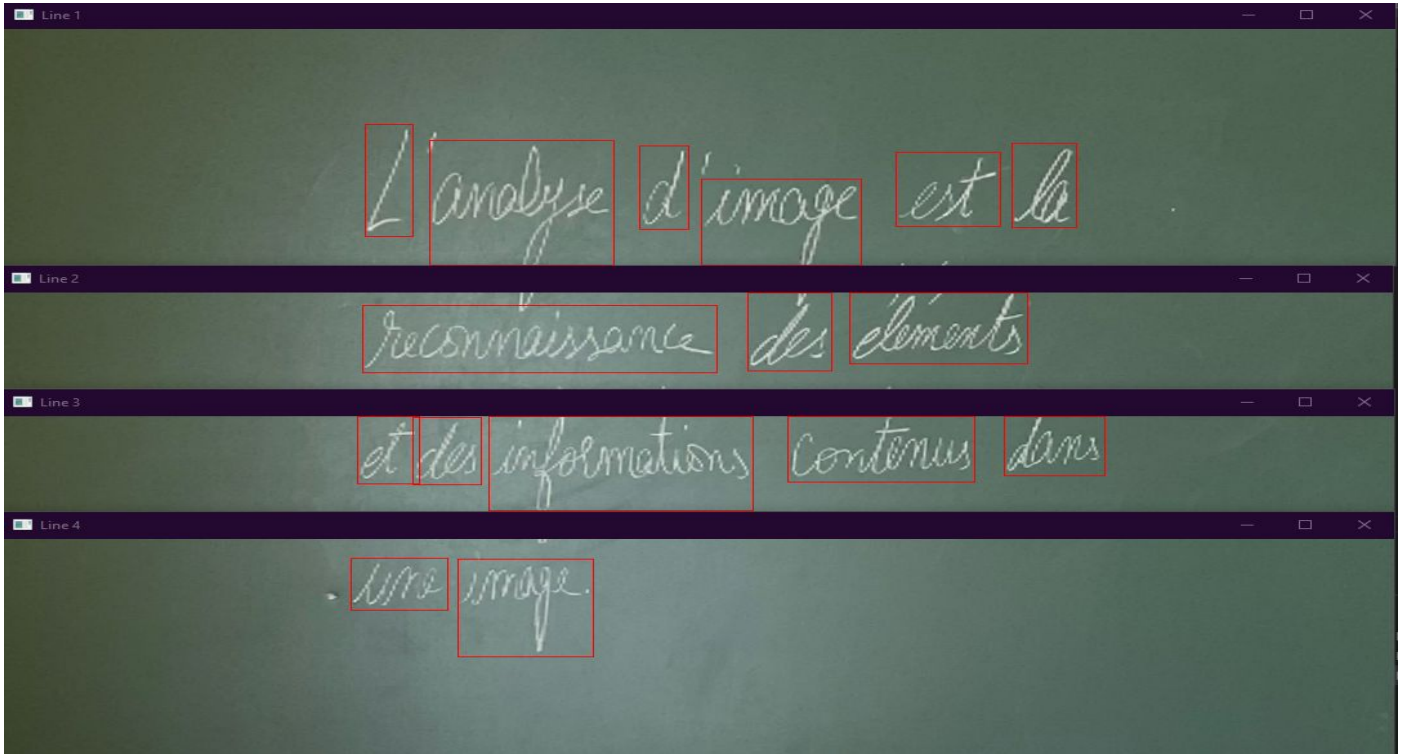


Line / Word estimation



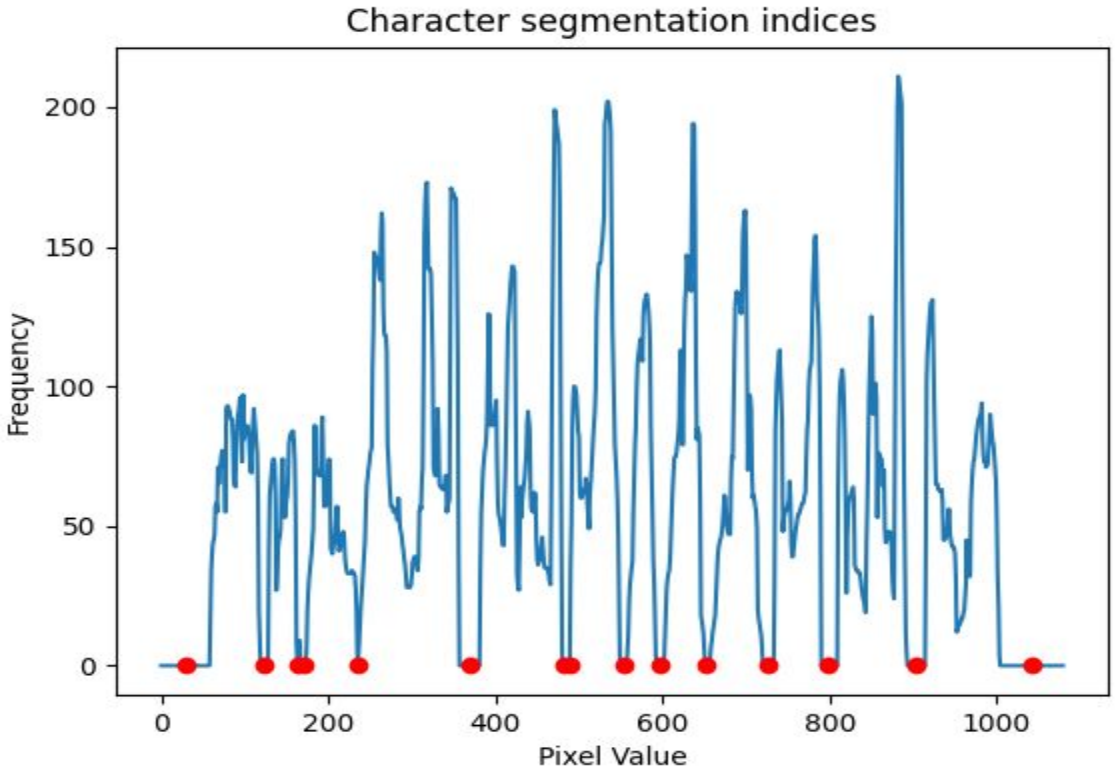
Line / Word detection

- Process the image : Contours

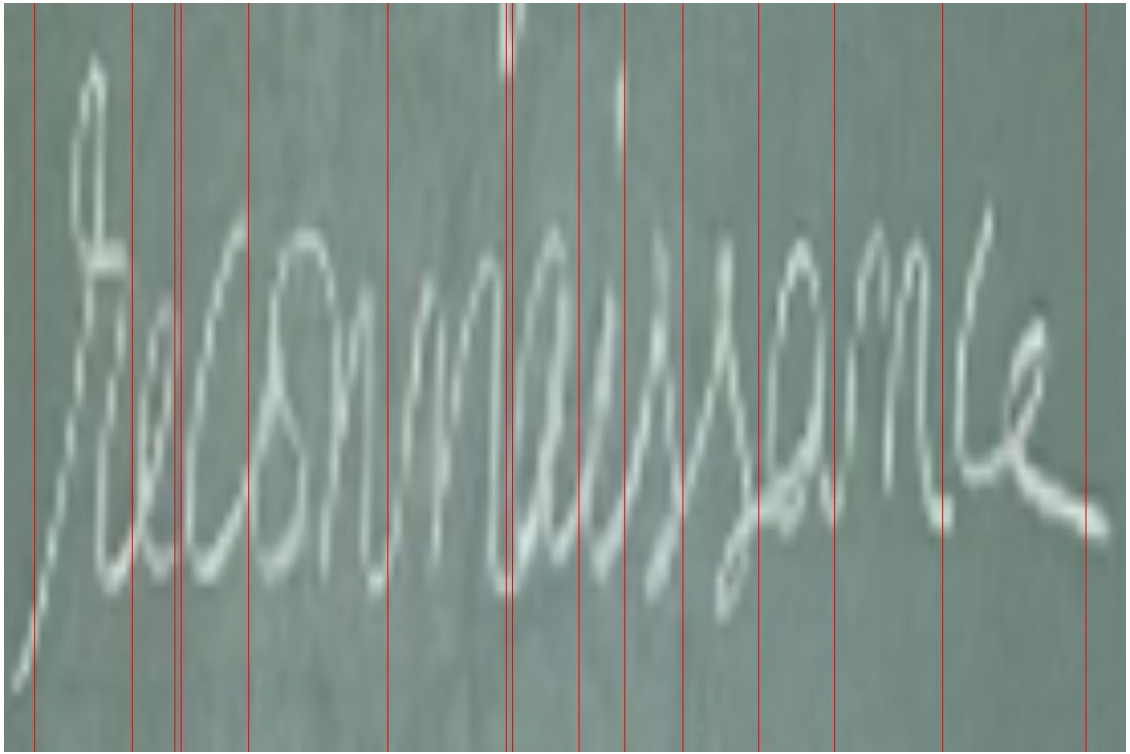


Character segmentation

Character segmentation

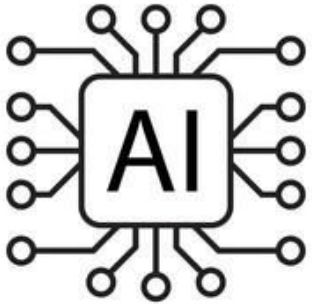


Character segmentation



Character recognition

```
1/1 [==============================] - 0s 200ms/step
Z
```

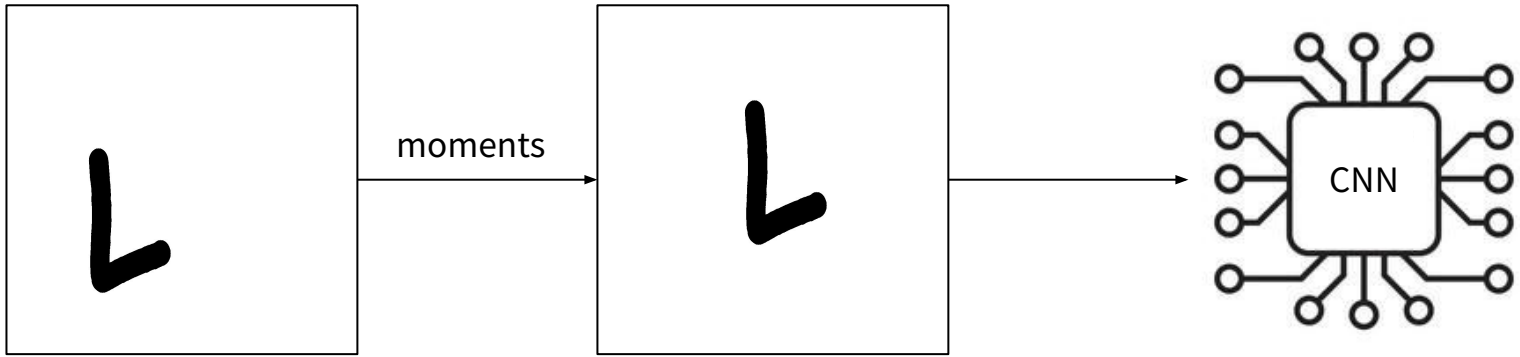


23% acc

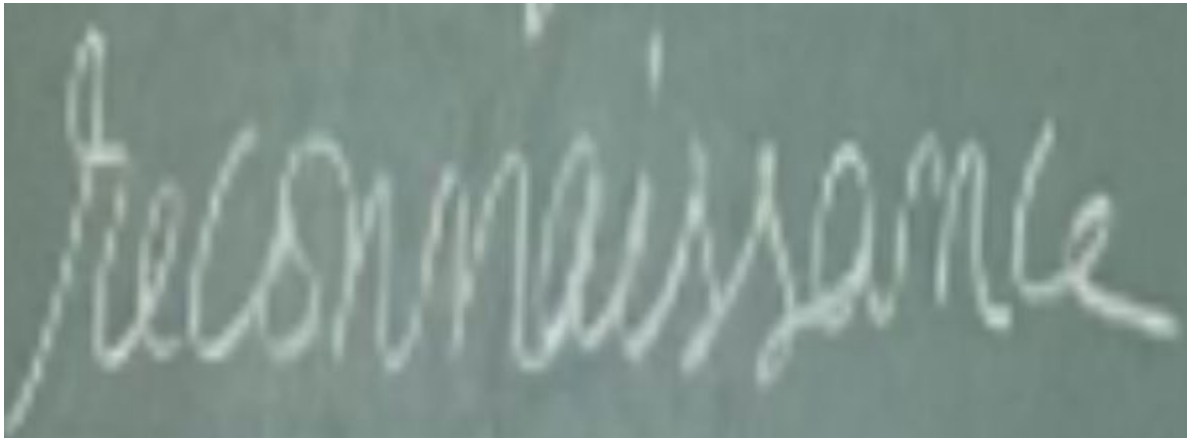
“Z”

Dataset sample

- Data set contains 62 classes, each class has 55 images



Text reconstruction



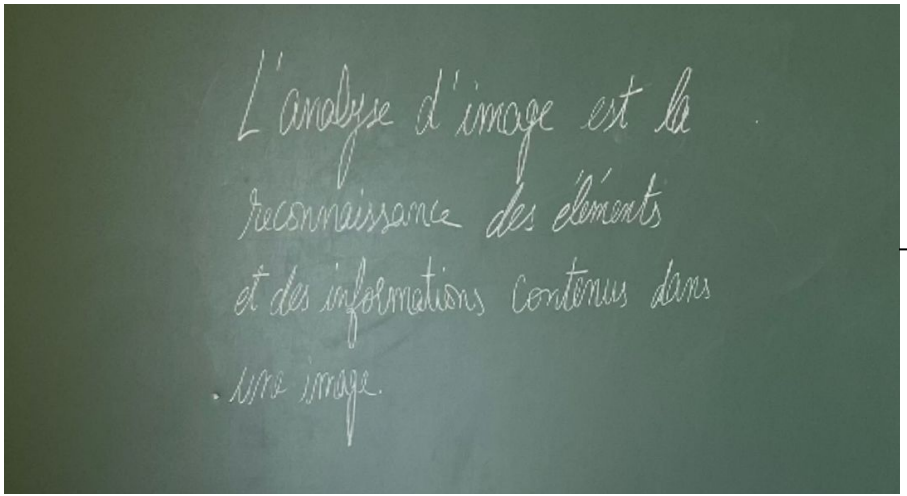
“Zecainaissonv”

NLP

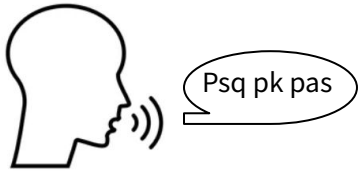
“zecainaissonv”

“Reconnaissance”

Text recognition



L'analyse d'image est la reconnaissance des éléments et des informations contenus dans une image



Evaluation

- Global evaluation on all the 25 given images

25 Images	Board segment	Parag segment	Line segment	Word segment	Char segment	prediction
Manual param	100%	100%	100%	100%	100%	30%
Auto param	100%	70%	50%	40%	20%	12%

Conclusion / perspectives

Overall, the project aimed to develop an efficient and accurate system capable of automatically segmenting and recognizing text from images

Persps:

- Generalizing parameters for an adequate segmentation
- Improving the character recognition models
- Improving the way of NLP text corrector

THANKS