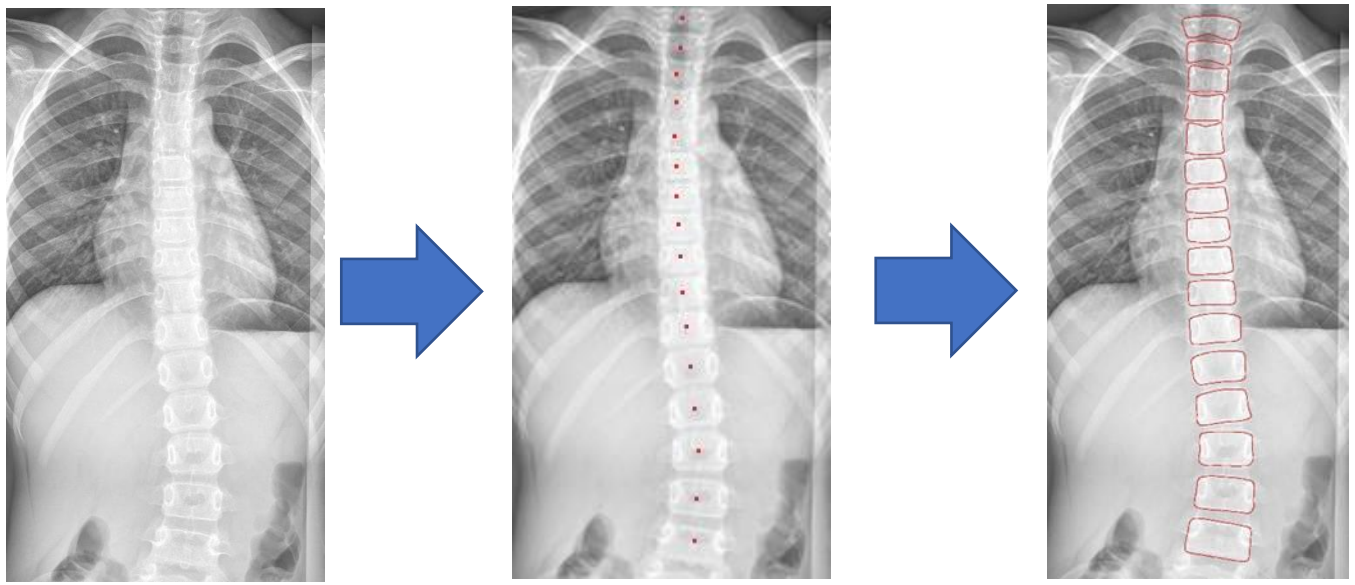
Objective

Cobb angle can be measured from spinal X-ray images.

An accurate localization and segmentation of vertebra is very important.

Target :
Automatic locate and segment the vertebra from an anterior-posterior (AP) view spinal X-ray images (grey level).

Flowchart



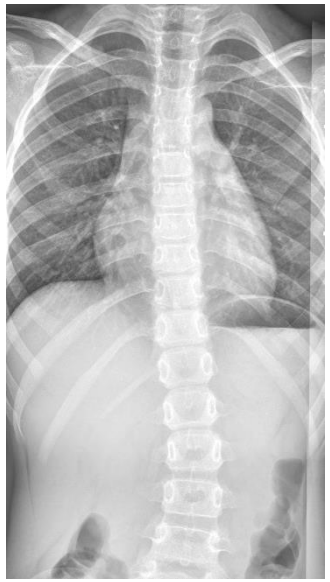
Input

Vertebrate localization

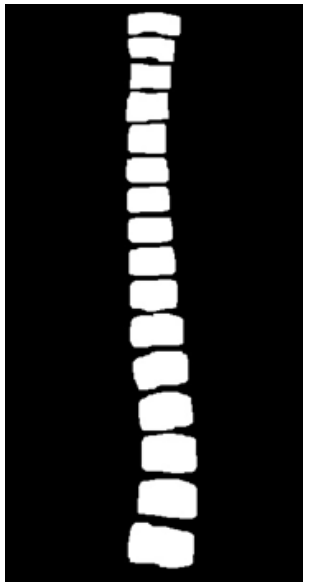
Vertebrate segmentation

Data

- 60 grey level X-ray vertebral digital images with ground truth.
- Size : 500x1200 pixels.
- The ground truths are drawn by an expert.



Source image



Ground truth image

Evaluation

- Use the Dice Coefficient(DC) to evaluate your segmentation result with the ground truth

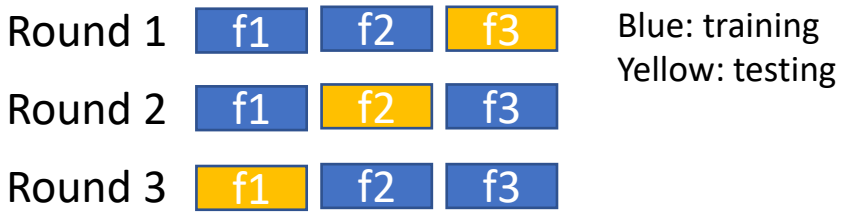
$$DC = \frac{2(A \cap B)}{(A+B)}$$

Where A is the ground truth region, B is the segmentation result,
$A \cap B$ is the intersect region, A+B is the sum of the regions;

Evaluation

- You should clearly show the number of training, validation and testing images of your evaluation.

- If you are using training base methods, **3 fold cross-validation is required**.

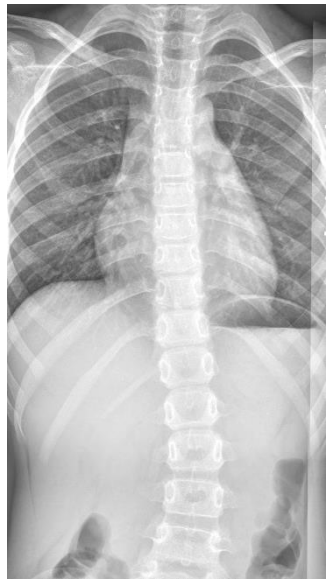


- You should evaluation the segmentation result of each vertebra individually of a vertebral column and show the average of them.

Requirement

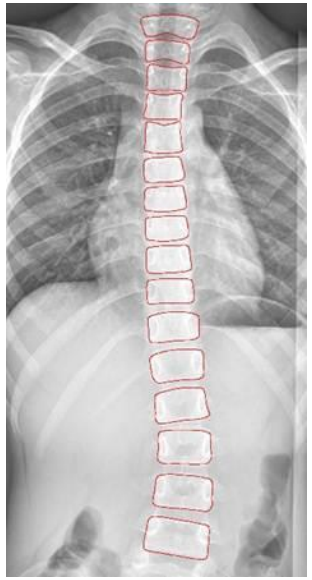
- 1) Read an input image and its ground truth from your program interface.
- 2) Run your program,
  - show the input image and ground truth in the program interface
  - **locate each vertebrate** and display it on the program interface
  - **show the overlapping of segmentation result(red) on the original input image** in the program interface.
- 3) Show numbers of vertebrae of GT and detected by your system.
- 4) Show the evaluation results of each vertebrae and the average by DC.

Program Interface



Input

Location



Segmentation

Number of vertebra:
GT : 16
Detected :16

DC :
V0 : 0.85
V1 : 0.87
V2 : 0.83
…
V15 : 0.83
Average : 0.84

References

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