Digital Image Processing

Feature Extraction

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Distance/online Course: Session 05 Episode 02

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Aim and Goal

- Representation and Description
  - Alternate Presentation of Objects
  - Computer-Friendly Presentation (numerical feature vector)
- Final Results:

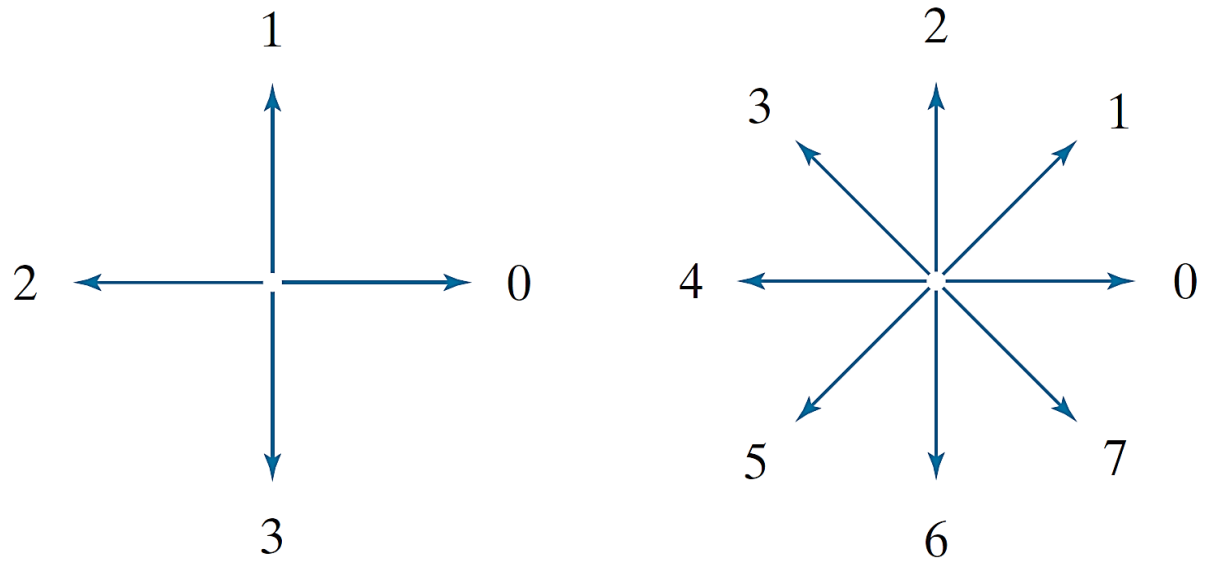
Image → k-elements vector of features

Chain Code

- Chain codes are used to represent a boundary by a connected sequence of straight-line segments of specified length and direction.

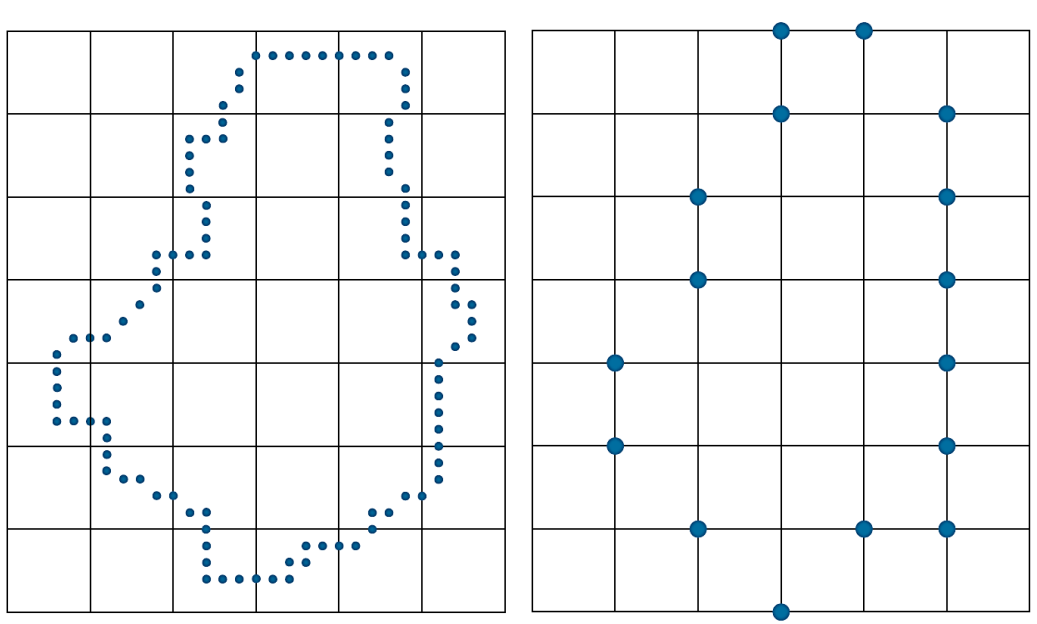
Freeman Chain Code

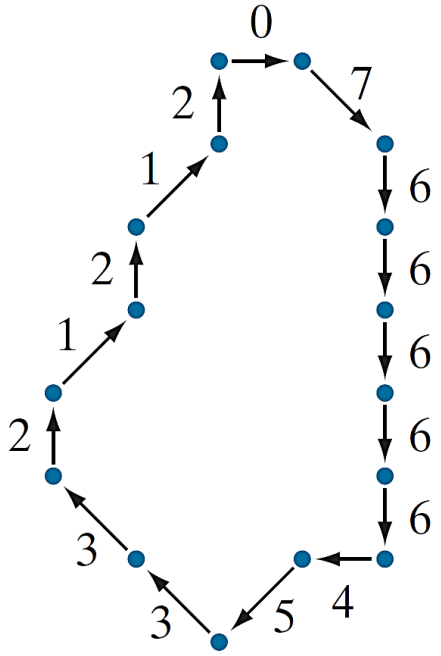
- The direction of each segment is coded by using a numbering scheme (angel quantization):
- (4/8) directional freeman chain code:



Example

› Resampling and Tracing:



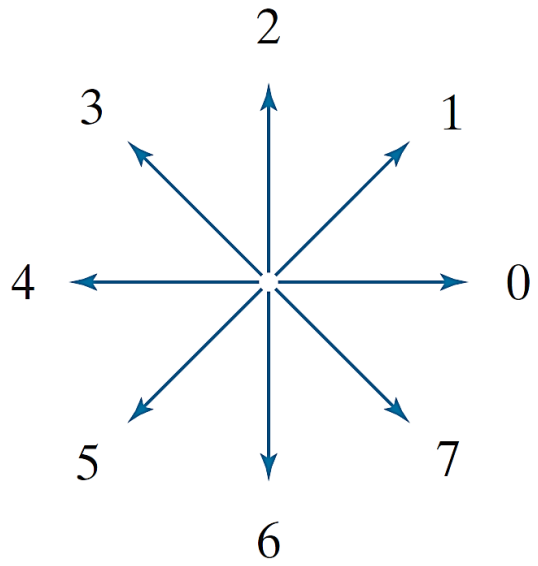


› Chain Code: [0766666453321212]

› How to solve starting point problem: Minimum integer code!

First Difference Chain Code

- Code the transition between two successive direction:
- 1→3: 2
- 0→3: 3
- 1→0: 7
- 3→0: 5
- 4→4: 0

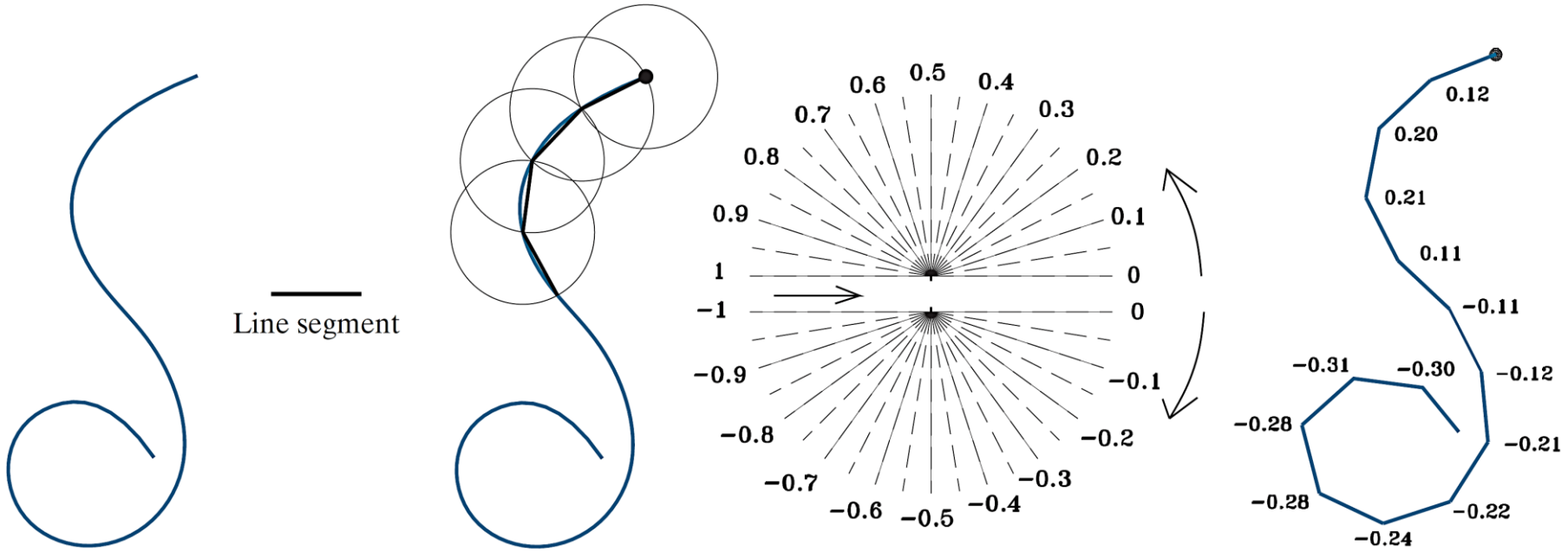


- Minimum integer Code: 000060666666664444424222220220 2
- First Difference Code: 00626000000060000062600006206 26

Slope Chain Code

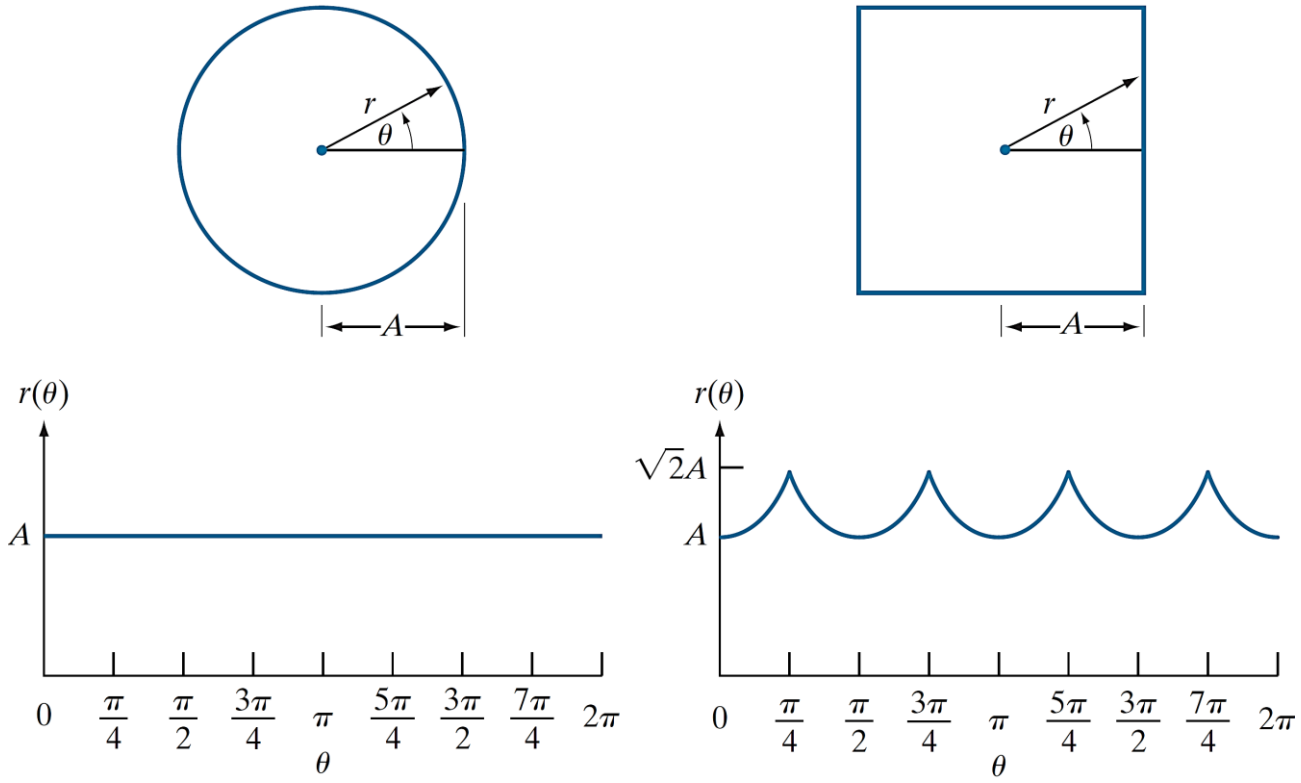
› An alternative for open curves:

› Slope range: [-1 1]:



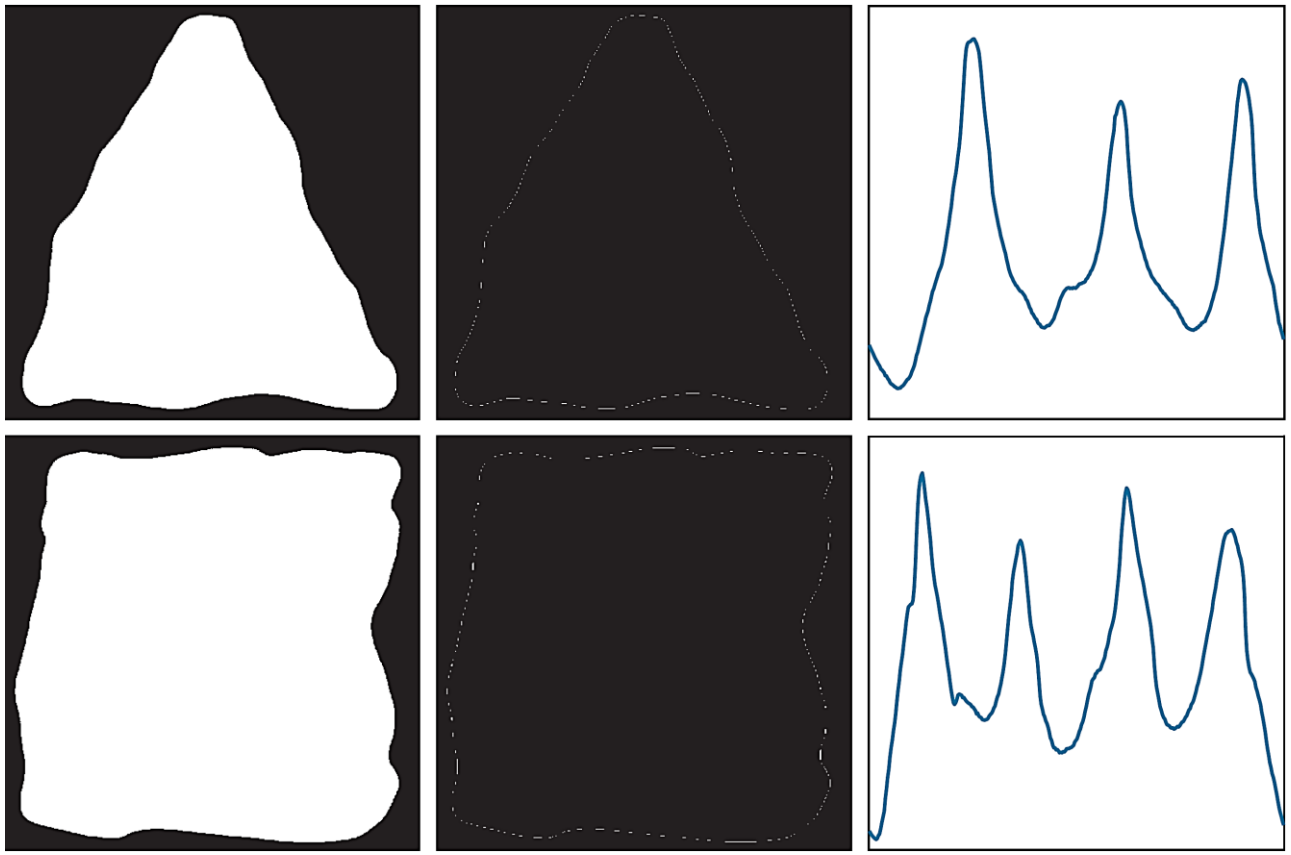
Signature

› Convert a closed contour to function using parametric curve representation:



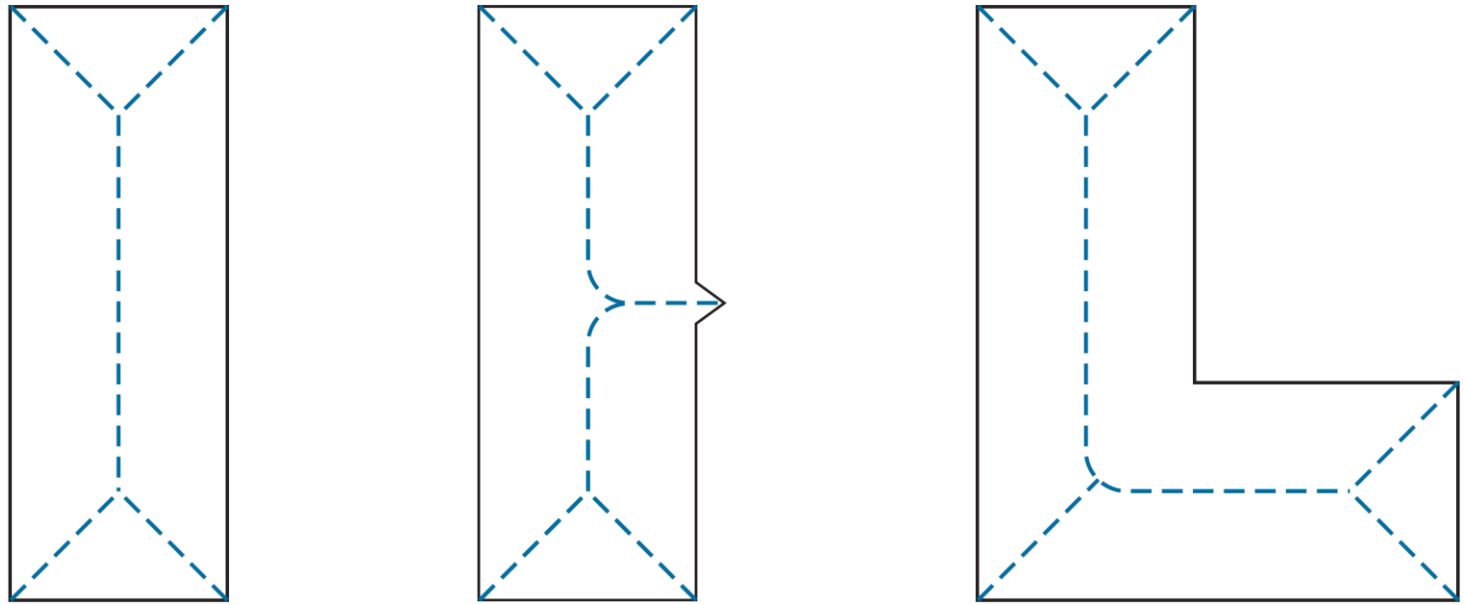
Signature - Example

› Example:



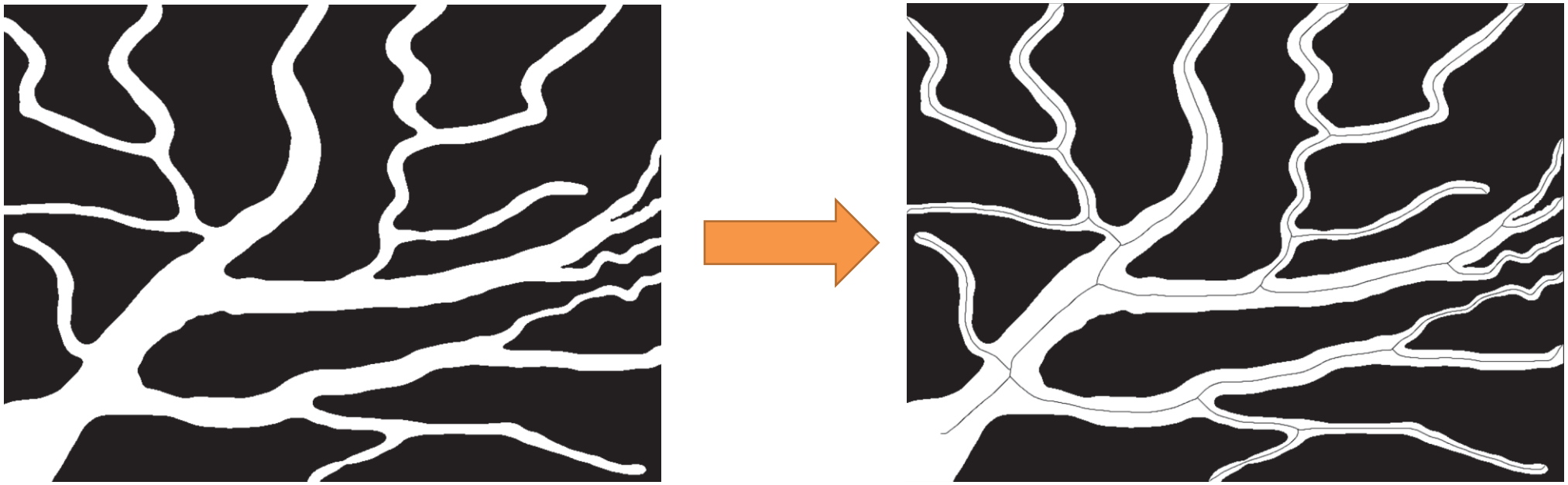
Skeleton - Medial Axis

› Definition by example:



Skeleton - Medial Axis

› Example:



The End

› AnY QuEsTiOn?