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FACULTY OF EGINEERING

Digital Image Processing
LECTURE-26

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OUTLINE

- Opening And Closing
- Opening
- Closing
- Use of opening and closing for morphological filtering
- MCQ
- References

Opening And Closing

- Opening – smoothes contours , eliminates protrusions
- Closing – smoothes sections of contours, fuses narrow breaks and long thin gulfs, eliminates small holes and fills gaps in contours
- These operations are dual to each other
- These operations are can be applied few times, but has effect only once

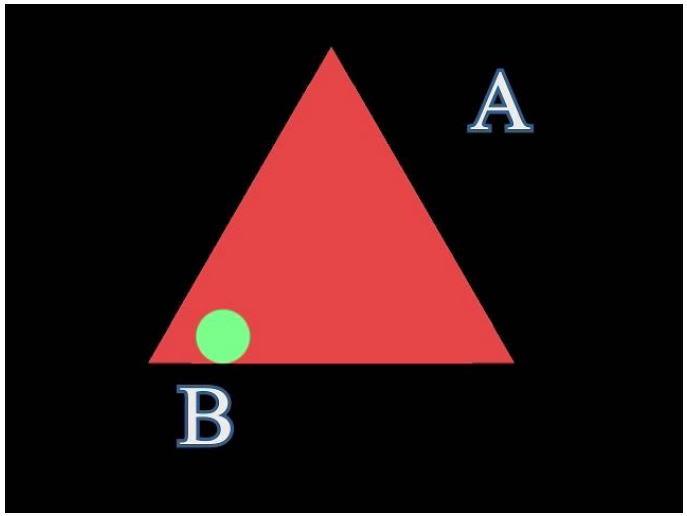
Opening

Opening –

•First – erode A by B, and then dilate the result by B

•In other words, opening is the unification of all B objects Entirely

Contained in A



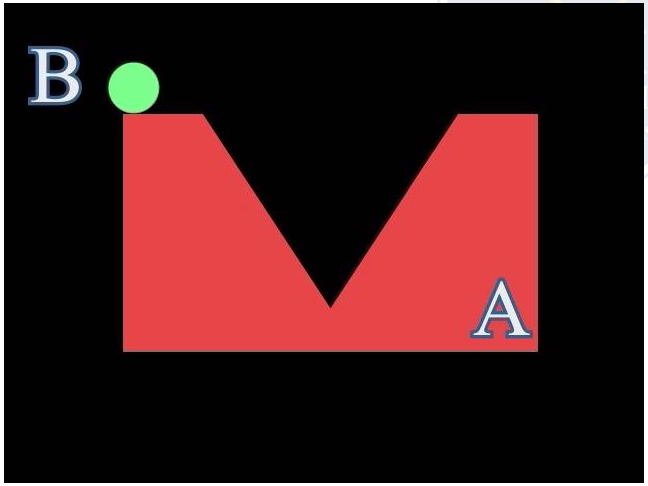
Closing

Closing –

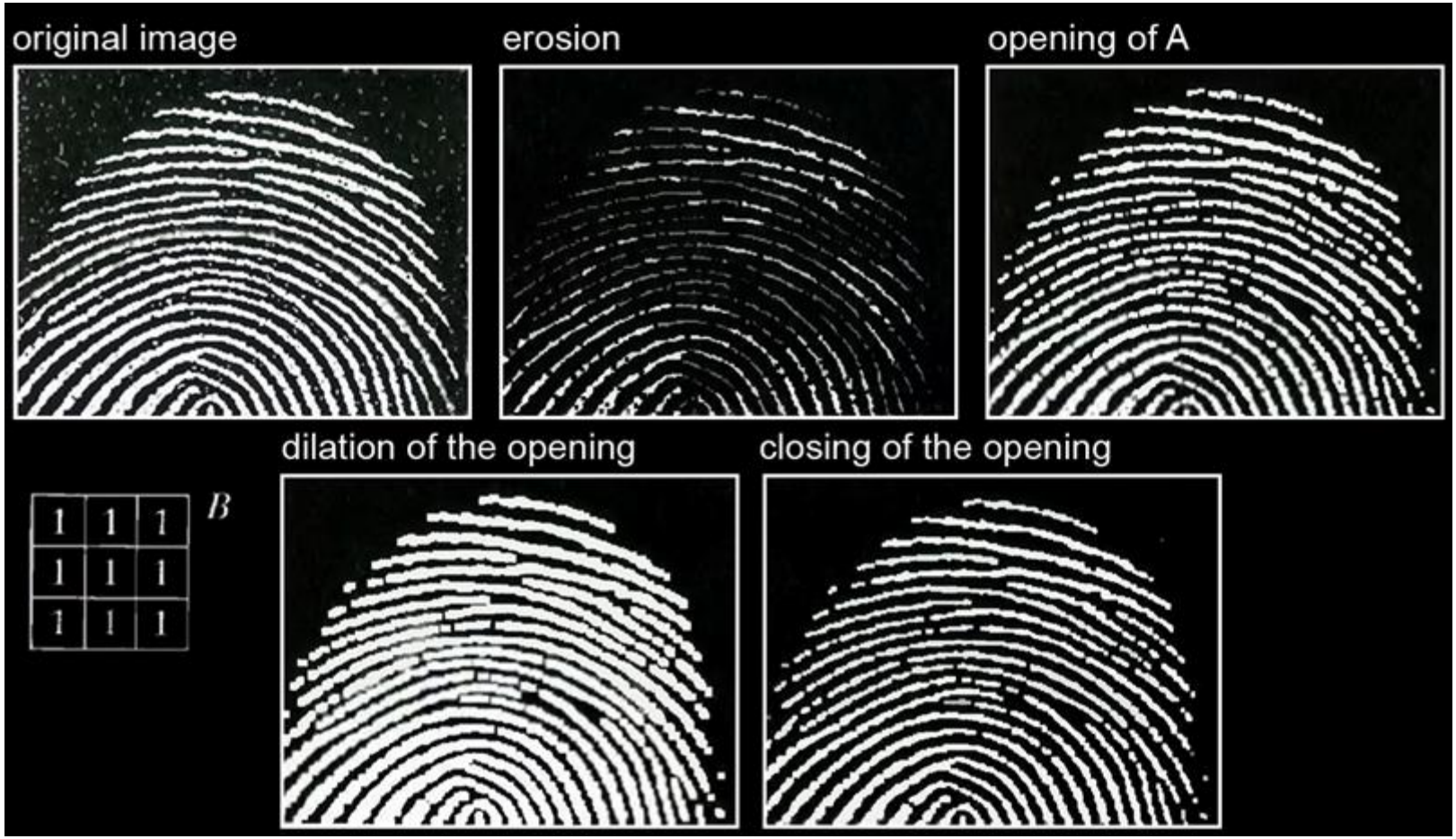
First – dilate A by B, and then erode the result by B

In other words, closing is the group of points, which the

intersection of object B around them with object A – is not empty



Use of opening and closing for morphological filtering



MCQ

1. Which of the facts(s) is/are true for the second order derivative of a digital function?

   a) Must be zero in the flat areas

   b) Must be nonzero at the onset and end of a gray-level step or ramp discontinuities

   c) Must be zero along the ramps of constant slope

   d) All of the mentioned

2. The derivative of digital function is defined in terms of difference. Then, which of the following defines the first order derivative $\partial f/\partial x$= _____ of a one-dimensional function f(x)?

   a) f(x+1)-f(x)

   b) f(x+1)+ f(x-1)-2f(x)

   c) All of the mentioned depending upon the time when partial derivative will be dealt along two spatial axes

   d) None of the mentioned

3. The derivative of digital function is defined in terms of difference. Then, which of the following defines the second order derivative $\partial 2\ f/\partial x2$ = _____ of a one-dimensional function f(x)?

   a) f(x+1)-f(x)

   b) f(x+1)+ f(x-1)-2f(x)

   c) All of the mentioned depending upon the time when partial derivative will be dealt along two spatial axes

   d) None of the mentioned

MCQ

4. What kind of relation can be obtained between first order derivative and second order derivative of an image having a on the basis of edge productions that shows a transition like a ramp of constant slope?

a) First order derivative produces thick edge while second order produces a very fine edge

b) Second order derivative produces thick edge while first order produces a very fine edge

c) Both first and second order produces thick edge

d) Both first and second order produces a very fine edge

5. What kind of relation can be obtained between first order derivative and second order derivative of an image on the response obtained by encountering an isolated noise point in the image?

a) First order derivative has a stronger response than a second order

b) Second order derivative has a stronger response than a first order

c) Both enhances the same and so the response is same for both first and second order derivative

d) None of the mentioned

References

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