Morphological Profile Examples

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Morphological profiles

- Opening by reconstruction isolates structures that are brighter than their surroundings.
- Closing by reconstruction isolates structures that are darker than their surroundings.
- These operations are applied using increasing structuring element (SE) sizes to generate morphological profiles.

- Structuring element: disk
- Variables:
  - Number of openings/closings
  - Radius increment (step size)
Morphological profiles

(a) Grayscale image
(b) SE

(c) 3D representation
(d) Opening by rec.
(e) Closing by rec.

Figure 1: Opening and closing by reconstruction example.
Morphological profiles

(a) Grayscale  
(b) SE  
(c) Opening MP  
(d) Derivative MP  

Figure 2: Example morphological profile (MP) and its derivative (DMP).
Morphological profiles

(a) Opening DMP

(b) Thresholding at DMP > 0

Figure 3: Example connected components with DMP > 0.
Morphological profiles

(a) False color image  (b) A connected component for SE size 3

(c) A connected component for SE size 5  (d) A connected component for SE size 6

Figure 4: Example connected components for a building structure.
Morphological profiles

Figure 5: Example connected components for SE sizes 2 to 10.