

Morphological Profile Examples

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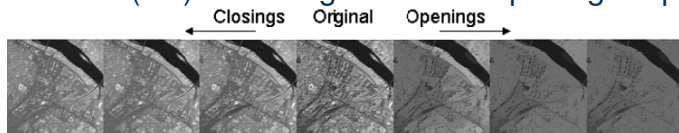
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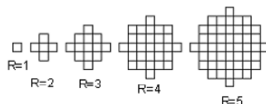


Morphological profiles

- ▶ 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)



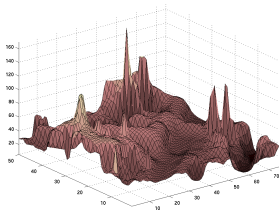
Morphological profiles



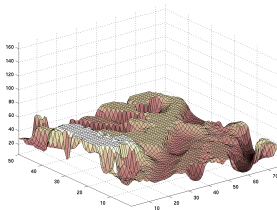
(a) Grayscale image



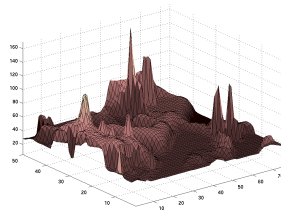
(b) SE



(c) 3D representation



(d) Opening by rec.

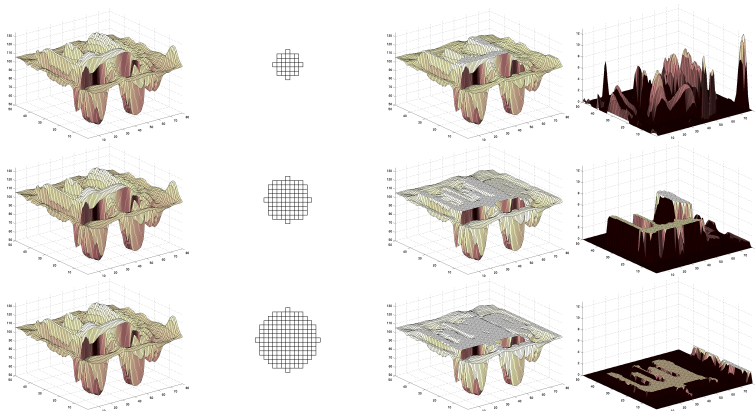


(e) Closing by rec.

Figure 1: Opening and closing by reconstruction example.



Morphological profiles



(a) Grayscale

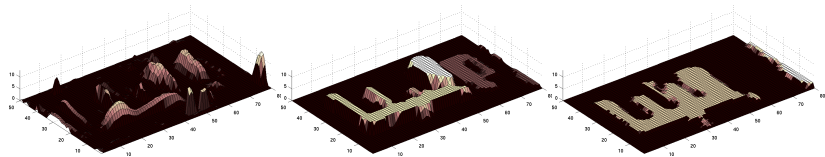
(b) SE

(c) Opening MP

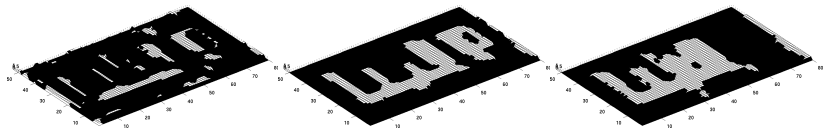
(d) Derivative MP

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

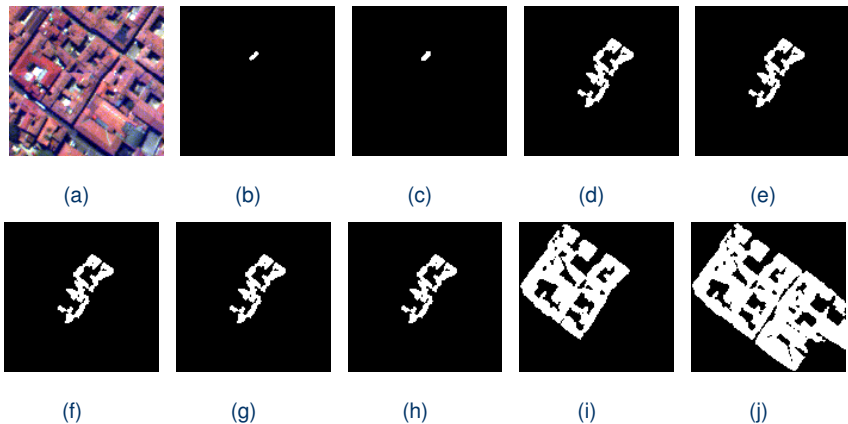


Figure 5: Example connected components for SE sizes 2 to 10.