



Pattern Recognition For Binary Images

The tool box for pattern recognition for binary images

1. Size
2. Moments
- \bar{x}
- \bar{y}
- x^k
- \bar{y}^k etc.
3. Perimeter
4. Orientation
5. Compositions of the above
Perimeter and moments: vector
6. Invariant operators
 - size invariant
 - orientation invariant
 - illumination invariant

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Biologically inspired techniques

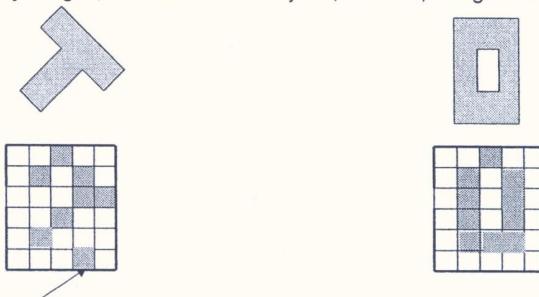
- Rule 1. Proximity
- Rule 2. Similarity
- Rule 3. Closure
- Rule 4. Good continuation
- Rule 5. Symmetry
- Rule 6. Simplicity

Note: 'Proximity' usage for clean up binary image and remove noise, as well as growing boundary points per 'good continuation' rule to form a better edge map.

Note: Similarity defines a interesting question, how to describe one object is similar, or somewhat similar to others, neural network and fuzzy logic may help.

Example On Simple Pattern Recognition

Given two binary images, derived from two objects, T and O, design a technique to identify them

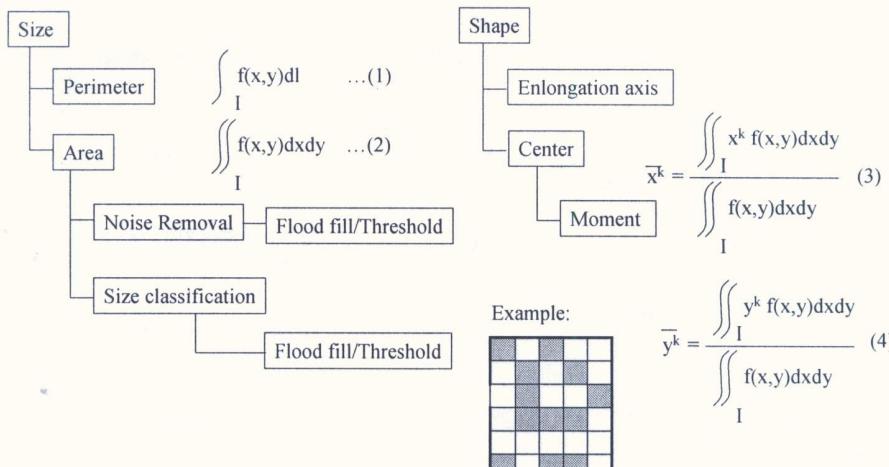


Good continuation or noise? What to do with this noise?

	Size	X-bar	Y-bar	Orientation	Perimeter
T	x	x	x	x	x
L	x	x	x	x	x

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Binary Image Processing

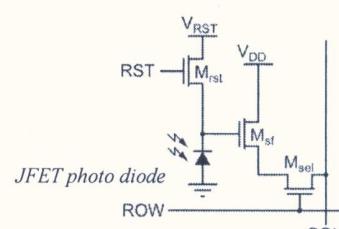
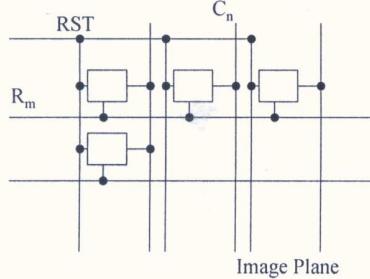


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CMOS Active Pixel Sensor (APS)

CCD (charge-coupled device) and CMOS (complimentary metal-oxide semiconductor) image sensors

CMOS devices utilizes several transistors at each pixel to amplify and move the charge by traditional wires. More flexible, each pixel can be read individually.



Three Transistor Pixel Sensor

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