Arithmetic & Morphology - IP notes

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1 Pre-lecture

Preparation: Sections 4.4.2 + 4.5 + 4.6 + chapters 13 and 6 in introduction to video and image processing.

- **Morphology**
- **Computing with images**

2 Lecture

2.1 Computing with images

- If image are different sizes, resize them to fit.
- Overflow/underflow, use intermediate image(x bits higher(32 eg)) then rescale back to 255
- Feature scaling
  $X' = a + \frac{(X - X_{min})(b-a)}{X_{max} - X_{min}}$

2.2 Arithmetic Ops

in video:
Subtacting we can remove noise(one image from the next in a sequence)
Input then mean then subtract then edge detection

2.3 Logic Ops

Restricted to binary

2.4 Morphological Ops

- Remove noise
  Remove small objets, x pixel wide objects(noise)(opening)
  Fill holes(Closing)

- Isolate objects
  Remove specific shapes

(Structuring element) SE refers to kernel in compound operations.

2.5 Opening

Erosion + Dilation = Opening:
9x3 and 3x9 SE will keep the horizontal and vertal lines in an image respectively.
The bigger the SE the bigger effect on the image

Dilation + Erosion = Closing
Fill holes but keep original size

3 Knowledge

4 Important notes

4.1 MiniProject