

T-61.5070 COMPUTER VISION, Exercise 4/08

Motivation

The purpose of this exercise is to brush up the most central edge detection and image enhancement methods.

1. Test the following edge detection algorithms for the given image:

- (a) Roberts operator
- (b) Sobel operator
- (c) Frein and Chen gradient masks

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1 2 1 0 1 0 2
0 8 9 6 7 0 3
2 5 6 9 8 8 3
4 6 7 9 9 4 3
2 8 8 2 2 3 0
1 6 3 7 2 2 1
3 6 0 1 8 0 2
2 2 0 3 1 2 1
```

2. Show that median filtering based on an unsymmetrical neighbourhood may move the location of an edge.
3. Suggest an edge detection algorithm that can be used for volume images (3D) and for multispectral satellite images.
4. Assume a non-zero intensity distribution $f(x)$, $\{x \in [a, b]\}$, in an image. Define a transform $y = g(x)$ so that the distribution of y will be even in the range $[0, c]$. Derive an algorithm for histogram equalization based on that transform.