Practice Time!

IF5153 – Pemrosesan dan Pengelolaan Data Multimedia
Genap 2018/2019

Basic Skills

- ✓ Read images
- ✓ Show images
- ✓ Write images
- ✓ Convert images into grayscale, binary, color space
- ✓ Find and Plot Histogram
- ✓ Use Histogram Equalization

Smoothing

Smoothing

- Our Images contain some noise
  - Random variation of color or brightness
- Idea : using low-pass filter kernel to smoothen images
  - Remove high frequency content, such as edges and noises
- Method
  - Averaging
  - Gaussian
  - Median filtering
  - Bilateral filtering

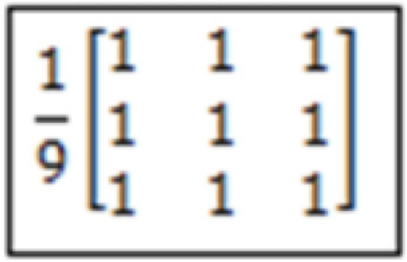
Methods

- Averaging
- Gaussian
- Median Filtering
- Bilateral Filtering

- Links : https://docs.opencv.org/4.0.1/d4/d13/tutorial_py_filtering.html

Averaging

- Using 2D kernel convolution to filter images



- Needs image border

Gaussian

- Same idea with averaging

- Using Gaussian function
  - SigmaX: standard deviation on x axis
  - SigmaY: standard deviation on y axis

Median Filtering

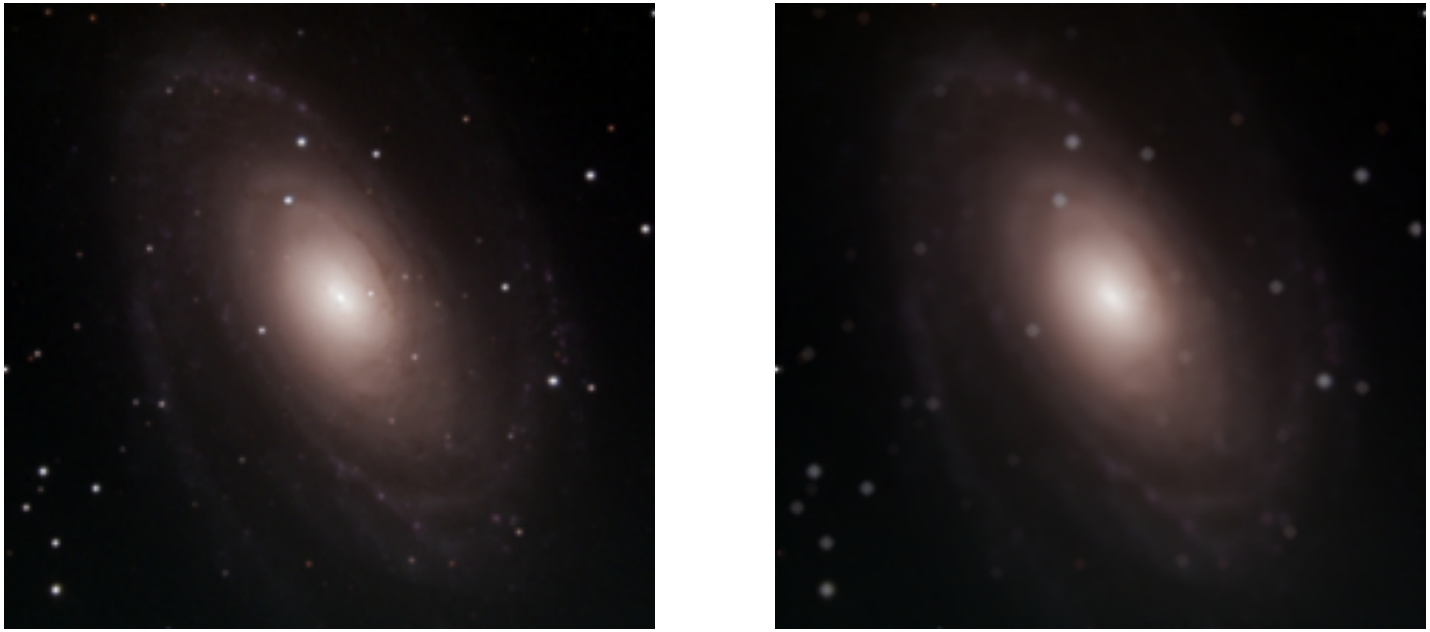
- Select median pixel instead of mean pixel

Bilateral Filtering

- Other techniques before tend to smoothen noise and edges
- Bilateral filtering preserves them

Example

Before and After



Before and After Low-Pass Filter

Quest

By doing this quest you'll able to

- ✓ Smoothing images using various techniques

Smoothing

- Using lena_noise.png (uploaded in google drive), perform smoothing using this techniques :
  - Averaging
  - Gaussian
  - Median
  - Bilateral
- Using several kernel size
  - 3
  - 5
  - 7

Deliverables

- Photo results, include it on document
- Answer these on IF5153-Tugas3-NIM-Nama.docx
  - What is kernel?
  - Which smoothing technique produce the best result? Why?
  - What is correlation between kernel and smoothing result?

Submission

- Send to fitra@informatika.org, subject [IF5153]Tugas3-Nim-Nama
- Deadline February 2nd, 2019 19.20

- Get this slide on http://bit.ly/ppdm2019