

COMP4421 (Fall 2018)

Assignment #1

Name: Chan Chui Hang

Student ID: 20423753

E-mail: chchancl@connect.ust.hk

I. EXERCISES

1) Solutions:

- a) It is because Fig.(c) was padded with zeros, so the borders of the image are not discontinuous. Therefore, the horizontal and vertical edges become stronger as the image ends suddenly and continues with a value. The strength of the spectrum along the horizontal and vertical axes therefore affected by the sharp transitions.
- b) As zeros are padded around the image in Fig(c), the zeros are considered to be low frequency so the signal strength in the low frequency region of Fig(d) significantly increased compared to Fig(b).

II. PROGRAMMING TASKS

1) Task 1: Spatial Linear Filtering

- a) Result image



- b) Result image



c) Result image



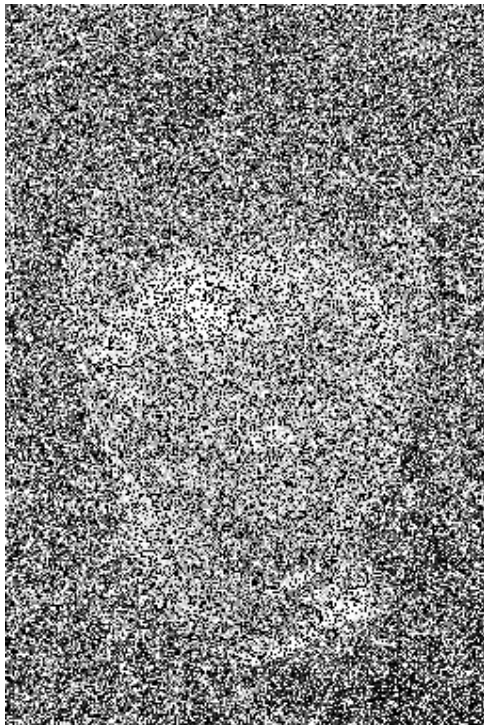
2) Task 2: Spatial Non-linear Filtering

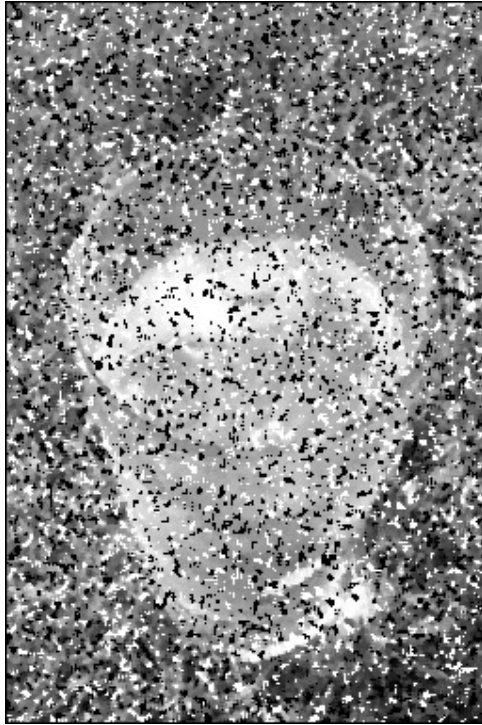
a) Result image





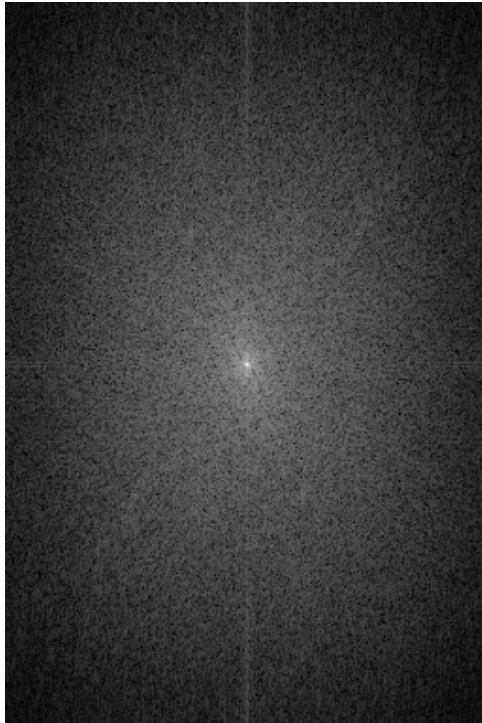
b) Result image





3) Task 3: Discrete Fourier Transform

a) Result image



b) Result image



4) Task 4: Filtering in the Frequency Domain

a) Result image



b) Result image



5) Task 5: High Frequency Emphasis

a) Result image



b) Result image

