

BMED318 Hands-on: Filtered-backprojection

1. Make Filtered-backprojection codes under the described rules below.

- Main program: FBP_students_name.m

input parameters: input_filename, output_filename, filter_option(hamming or ramp)

This program should follow the logic flow below.

1. Read input sinogram
2. Apply 1D filter in frequency domain
3. Back-project filtered sinogram
4. Display the output

- Program should include three functions below.

backprojection(2D_sinogram)

Make it as a single function if possible. you have to deal with # of angle bins automatically by your program.

frequency_filter(2D_sinogram, filter_option, cutoff):

This function should use 1D frequency filter, and include ramp and hamming filter. Also, the hamming filter should be able to change cutoff (0.0 1.0]

display_output()

This function should display input image, output image, and frequency response of the filter used in one figure.

2. Apply ramp filter to 'sinogram_lownoise.png' and save the image as 'FBP_001.png'.
3. Apply hamming filter to 'sinogram_lownoise.png' and save the image as 'FBP_002.png'.
Cutoff of the filter should be 0.3.
4. Compare 2 & 3, which is better?
5. Apply ramp filter to 'sinogram_highnoise.png' and save the image as 'FBP_003.png'.
6. Apply hamming filter to 'sinogram_highnoise.png' and save the image as 'FBP_004.png'.
Cutoff of the filter should be 0.3.
7. Apply hamming filter to 'sinogram_highnoise.png' and save the image as 'FBP_005.png'.
Cutoff of the filter should be 0.1.
8. Compare 5~7. Discuss about difference of images.- Submission: You should submit submit all files for your project as an archive file. archive file should be named 'FBP_students_name.zip'.

- Caution: You can't use MATLAB built-in function for image processing. (ex. radon()) Also, the program should be on your own. Don't copy the codes from the internet.

- Deadline: 2018. 11. 21(Wed) 11:59 PM Delayed Assignments will never be taken.