Implementation Presentation

FBP CT Image Reconstruction

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Overview

1. Recap

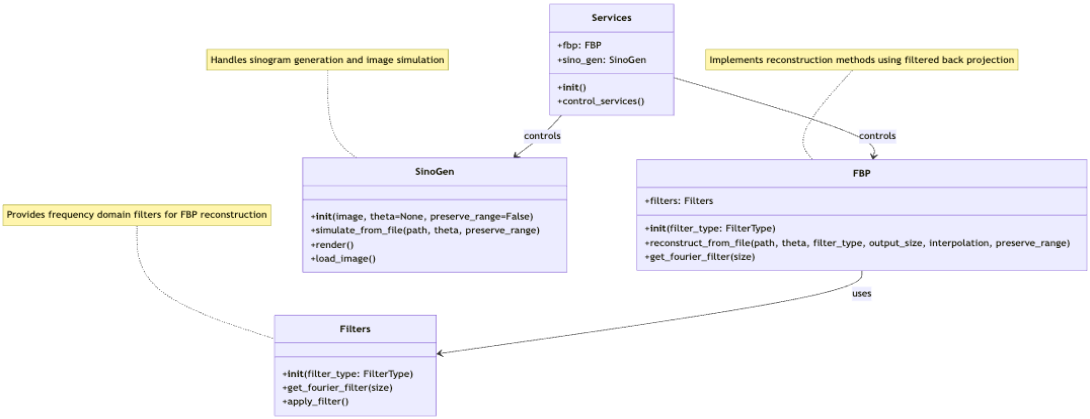
2. Implementation Details

3. Others: UI, Tests, Coverage, CI/CD

Functional requirements

- The system can provide a CT detector simulation to simulate sinogram given an image.
- The system must perform the back-projection over all projection angles to reconstruct image given its sinogram.
- The system can allow users to select a filtering method.

Class Diagram



Key Ideas

fbp reconstruction

It applies the Fourier slice theorem(Fast Fourier Transform) to reconstruct an image by multiplying the frequency domain.

sinogram simulation

It aims to simulate the detector and produce sinogram.
Unlike the detector rotate the object, it rotate the given imgae around its center to collect projections from each angle using rotation matrix R where:

$$R(\theta) = \begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$$

UI, Tests, Coverage, CI/CD

Will be presented...

The End