Math 6397 – Spring 2015 Name:

TEST #2

The goal of this test is to write a Matlab code implementing the filtered back-projection reconstruction algorithm for data acquired in the parallel beam setting. You are supposed to develop this code on your own based on the material presented in class.

I am providing a code for the computation of projections on a Shepp-Logan phantom. In fact, you will find 2 versions of such code, one based on the Matlab function `radon`; the other code is written from scratch.

As part of this assignment, you need to prepare a brief written report that (i) demonstrates your reconstruction code on projections from a Shepp-Logan phantom of size 128×128 and 256×256; (ii) analyzes the reconstruction error in the ℓ^2 norm; (iii) discusses the features and limitations of your code from the analysis of its performance (e.g., visual artifacts; you can also examine the performance with different choice of filters).

In addition to your report, you should send me your Matlab file(s) including a Matlab demo that is ready to run. NOTE: Your code should be readable and commented.