Subject: Re: Code for Helical CT
From: Jordan Kisner <kisner@ecn.purdue.edu>
Date: 12/16/15 1:43 PM
To: Thilo Balke <tbalke@purdue.edu>
BCC: kisner@ecn.purdue.edu

Thilo,

Sorry this has taken so long. I had some problems with it and I actually had to trace down a bug in the code.

Here's a series of steps for generating a set of simulated data and running the reconstruction:

1. Go into the matlab folder and run one of the phantom generating scripts

```
create_twoballs('phantom.vjk',256);
```

This is an 3d image file that you can view with the 'disp_img.m' function. The format "vjk" is my own hybrid which has 3 lines of ascii describing the dimensions, then the remaining pixel values stored as 2-byte unsigned shorts. For CT, it's assumed to be in Hounsfield units.

2. Copy the 'phantom.vjk' file to the 'recon' folder.

3. Compile the source code in the 'src' folder by running 'make'. Copy 'fpro' and 'ct' into the 'recon' folder.

4. Run the 'Run_proj.sh' shell script. This will generate a synthetic sinogram file 'phantom.sino' from the phantom image using the cone projector (same one used in the reconstruction).

5. Run the 'Run_recon.sh' script to reconstruct a volume from that sinogram file. It will output a file after each iteration. The 3d reconstruction generally takes a while to run--maybe .5 to 1 hour per iteration, depending on the image size.

All the reconstruction parameters are contained in the 'params' subfolder of 'recon'. You can look at the shell scripts for the command line syntax. There's a file that mainly specifies the system geometry parameters, one that specifies the image size, dimensions and position, and a third specifying the prior paramenters.

There's a document src/docs/geometry.pdf that describes the assumed geometry and forward model. It has a couple minor typos but I don't have the source to edit it.

One more thing.. At the bottom of the 'data.h' file is a parameter that defines the number of cores to use in a parallelized reconstruction. It's currently set to 4, and you can change that and recompile depending on your system.

Again, sorry for the long delay. Please let me know if you have any problems or questions.

Jordan

Attachments:

3DconeBeam.tar.gz 100 KB