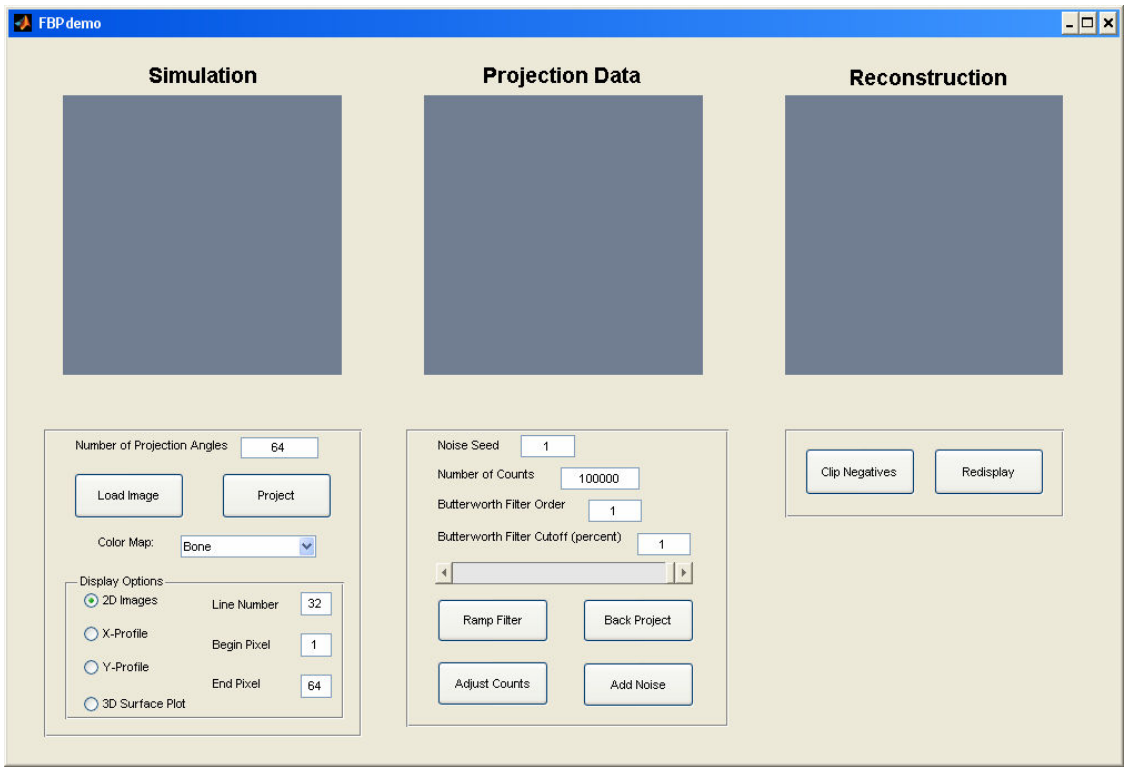
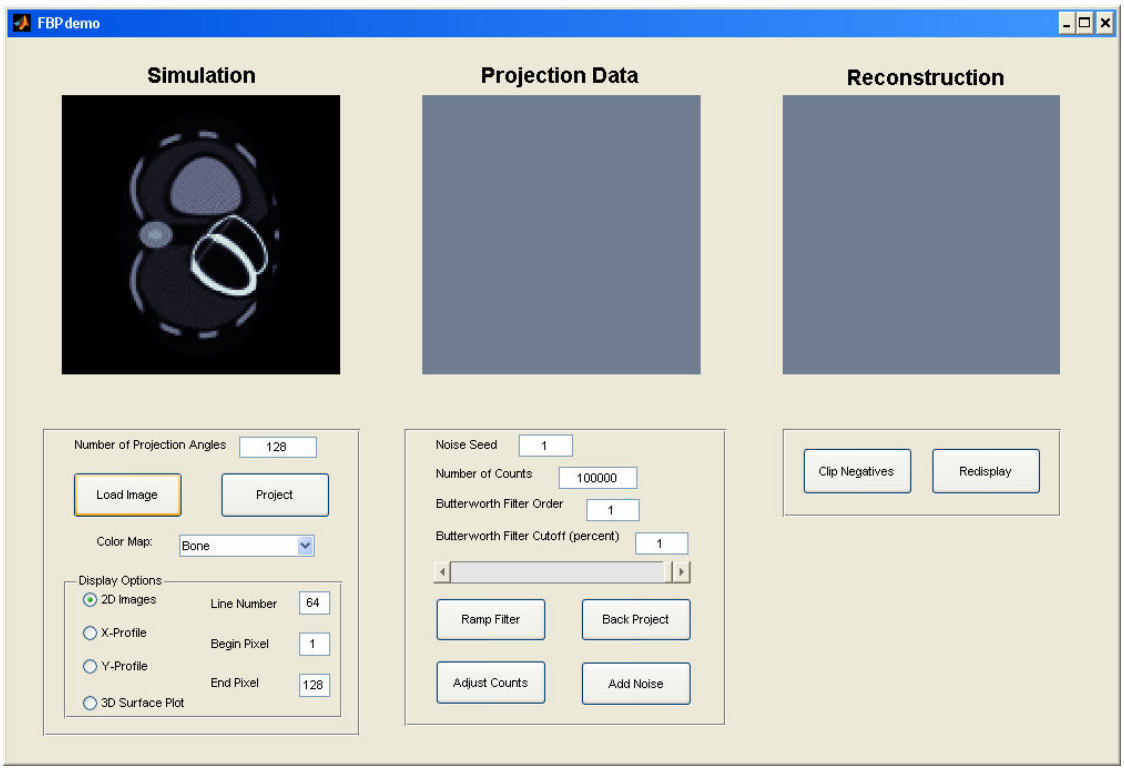
FBP Demo - Readme

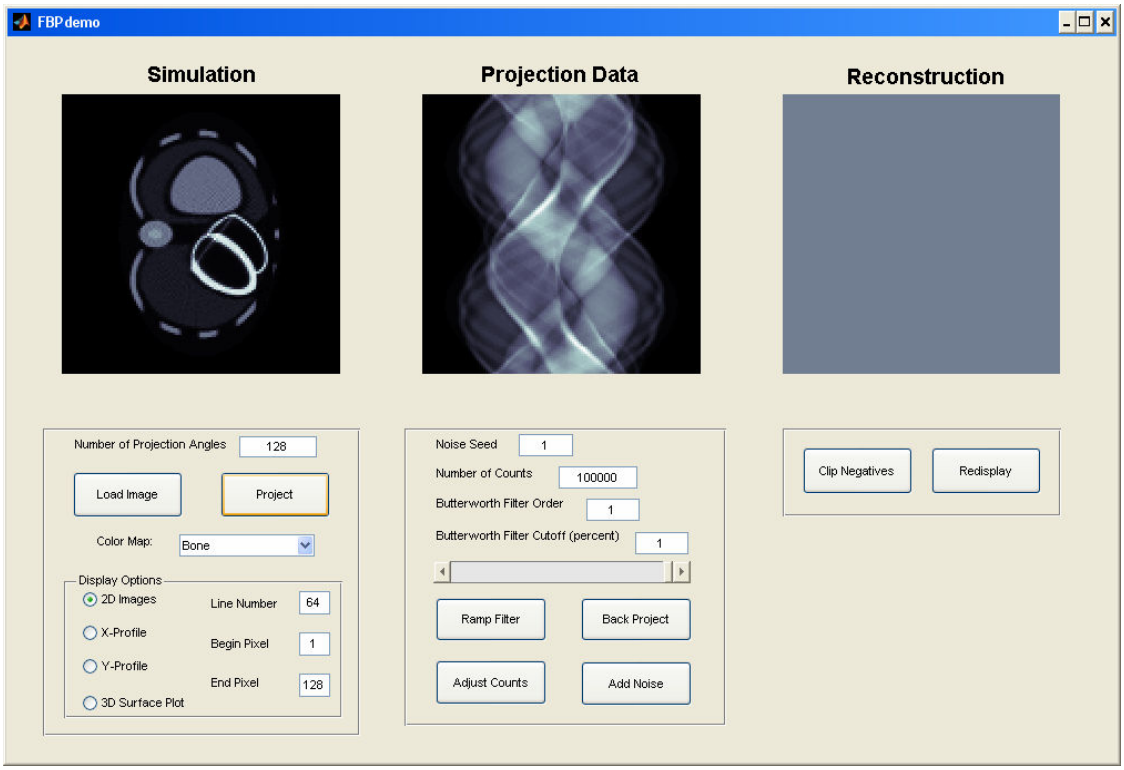
Begin by running the demo. Follow the procedure outlined on the Download page. A command window pops up, followed by the demo GUI.



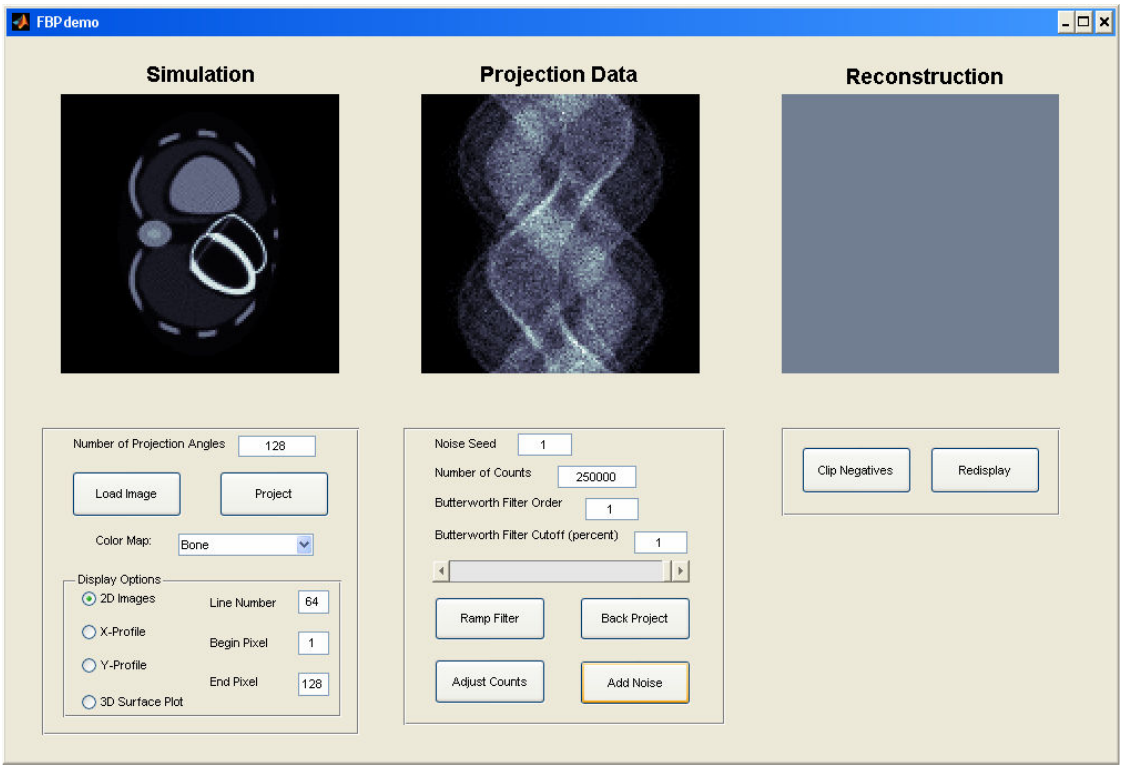
Next, in the Simulation pane, click on **Load Image** and choose one of the .mat files listed: a 64 x 64 disk, choice of two 64 x 64 Gaussians, and a 128 x 128 cardiac simulation (which is seen below).



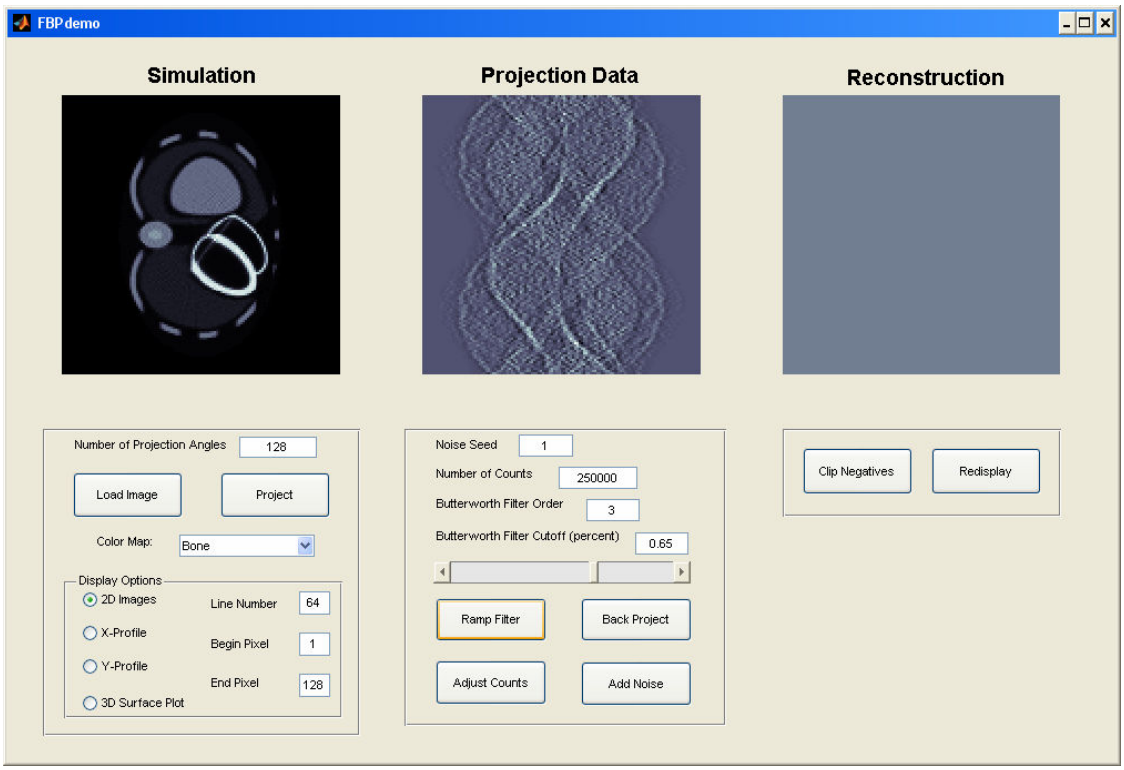
Keep projection angles at 128 and click on **Project** to generate data.



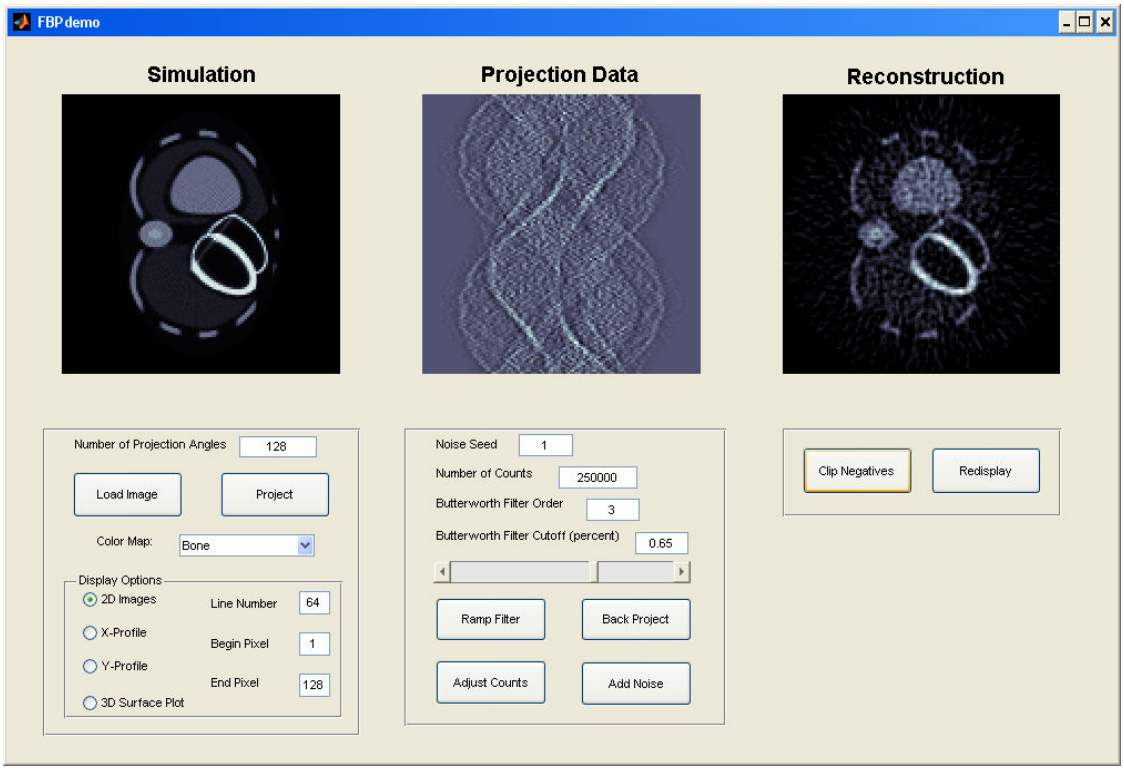
In the Projection Data pane, set the **Number of Counts** to whatever you want it to be (pos. integer), click on **Adjust Counts**, then click on **Add Noise**. The higher the count level, the less relative noise (250000 selected).



Choose a Butterworth Filter Order (pos. integer) and slide the Butterworth Filter Cutoff bar to the desired cutoff (.5 means 50%). Then click on **Ramp Filter**. The higher the order, the faster the transition of the filter at the cutoff frequency. The higher the cutoff, the more high frequency terms are kept. Since image details and noise reside in the high frequency range, the cutoff trades off noise for resolution. A lower cutoff diminishes noise and image detail (order = 3. cutoff = .65).



Now click on **Backproject** to obtain the reconstruction. After being displayed, you may toggle between **Clip Negatives** and **Redisplay** to see the reconstruction w/ negative values being set to zero.



At this point, you know how to run the demo. You can visualize the effect of different parameters on the quality of the reconstruction. Vary one quantity and keep all others fixed.

Exercises:

1. Vary the number of projection angles. The more angles, the fewer streak artifacts in the reconstruction.
2. Vary the number of counts. If you vary the number of counts but DON'T add noise, the reconstruction looks the same visually. But when adding noise, the effect of the noise is diminished with increasing count level.
3. Vary the Butterworth filter order and cutoff. The higher the cutoff, the more noise and fine detail are retained in the reconstruction.

When you are done, simply kill the application.