Description for MATLAB example code

The scripts and data provide example code for the method described in:

Polak et al. 2021, "Scout Accelerated Motion Estimation and Correction (SAMER)"

To start run *samer_main_script.m* in MATLAB.

This example was most recently tested using MATLAB 2020a, and uses that version's syntax for optimization settings. etc.

Key scripts

samer_main_script.m - This script performs the SAMER motion estimation and correction for various sampling schemes and low-resolution scout scans. In addition, the use of coil compression and the effect of noisy k-space data is demonstrated.

The following outputs will be generated:

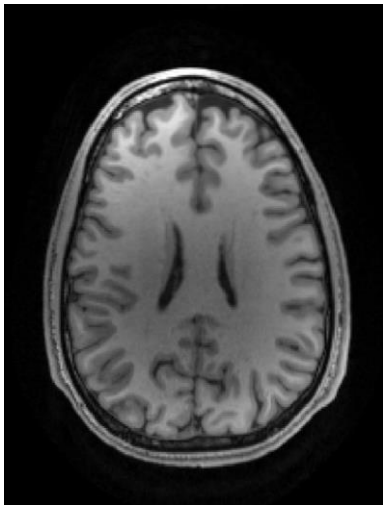

Figure 1: Ground truth reference image used for motion simulations

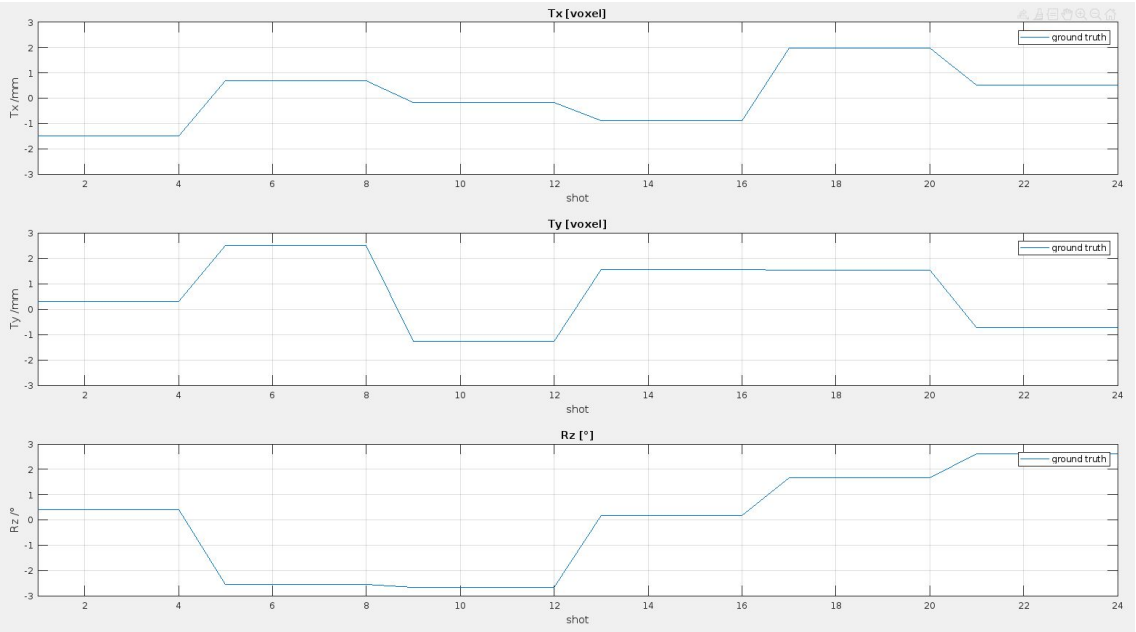

Figure 2: Ground truth motion parameters used for motion simulations

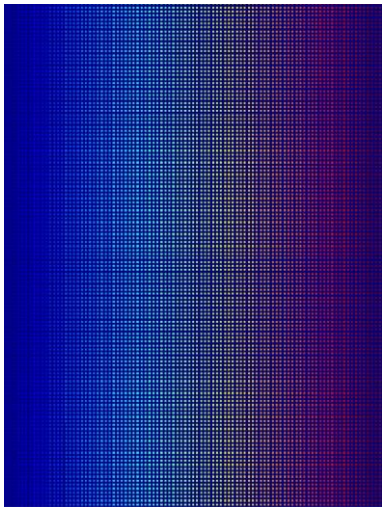

Figure 3: Shot mask for linear reordering at R=2x2 (color = shot number)

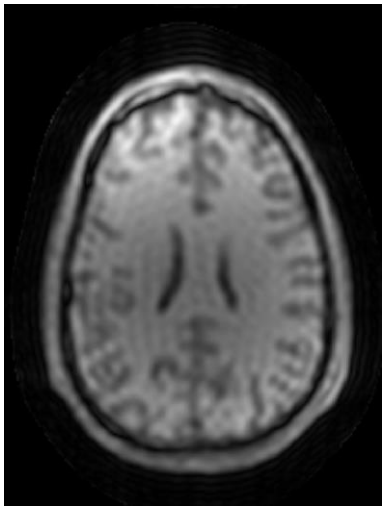

Figure 4: Low resolution scout scan (1x4x4 mm³, R=4)

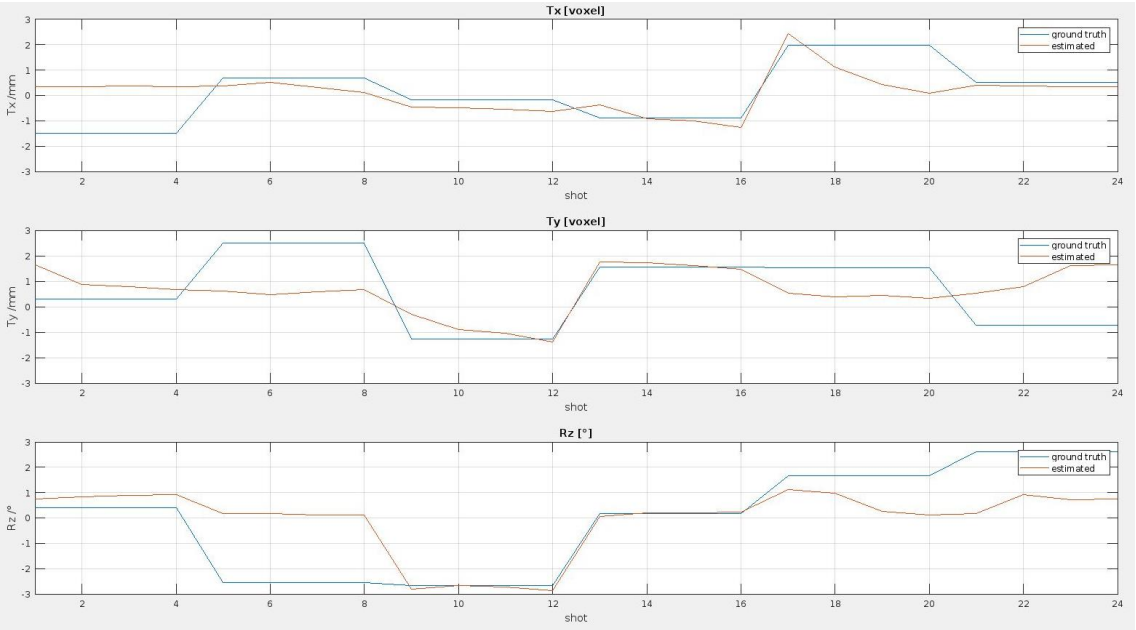

Figure 5: Estimated motion using linear reordering and R=4 accelerated low-resolution scout scan

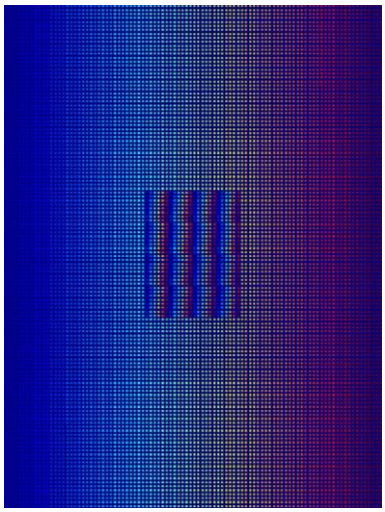

Figure 6: Shot mask for linear + checkered reordering (R=4)

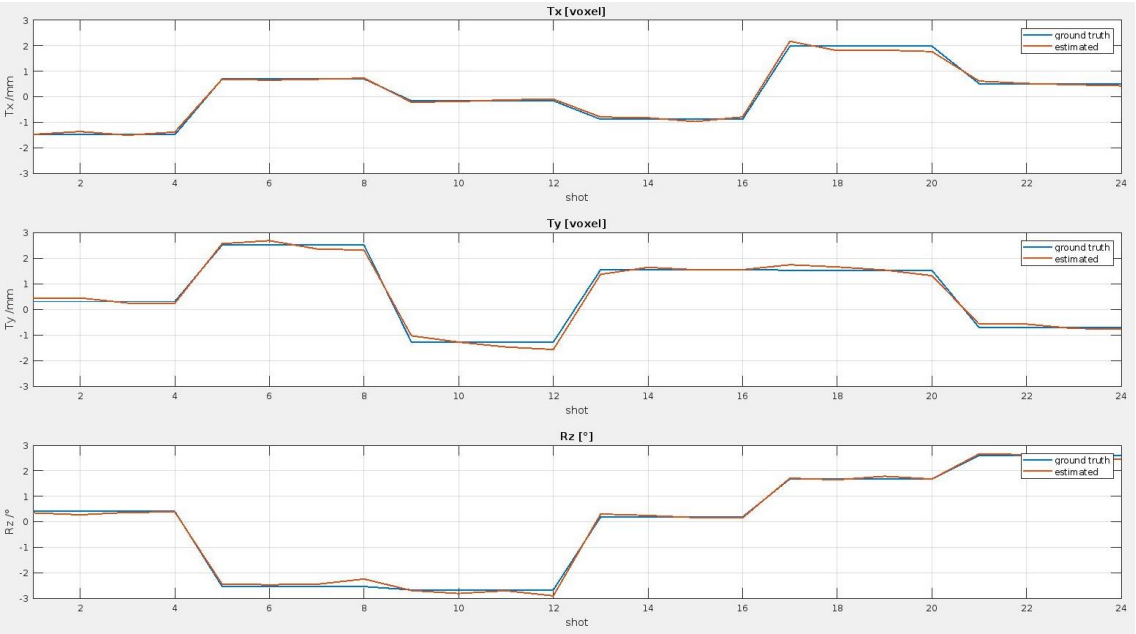

Figure 7: Estimated motion using linear + checkered reordering and R=4 low-resolution scout scan

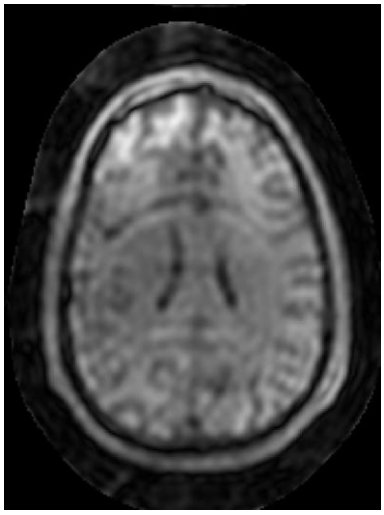

Figure 8: R=12 accelerated low-resolution scout scan (1x4x4 mm³)

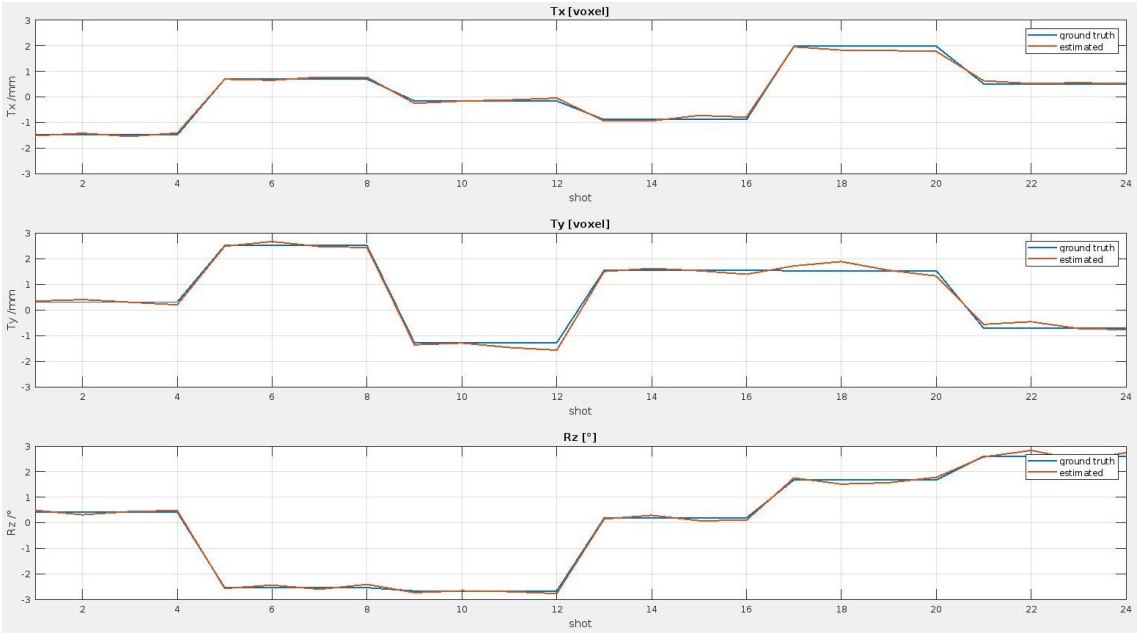

Figure 9: Estimated motion using linear + checkered reordering and R=12 low-resolution scout scan

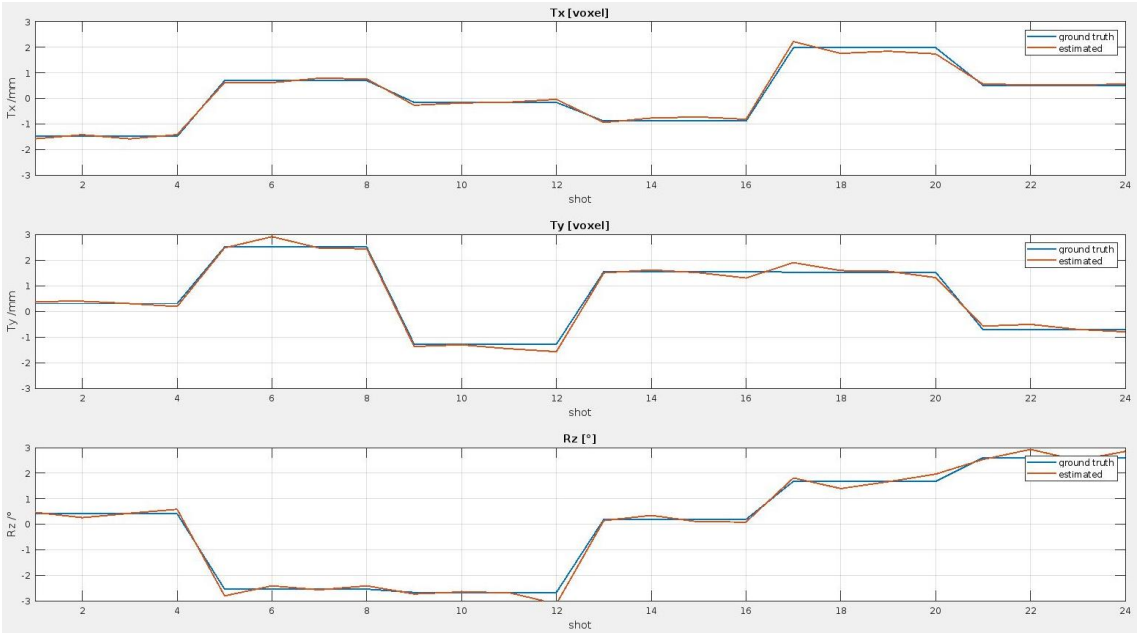

Figure 10: Estimated motion using linear + checkered reordering, N_{ch}=4 coil compression and R=12 low-resolution scout scan

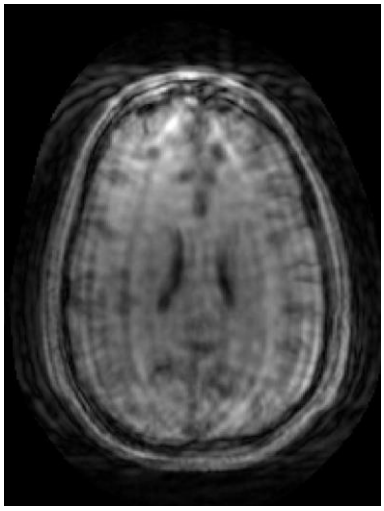

Figure 11: SENSE image reconstruction (no motion correction)

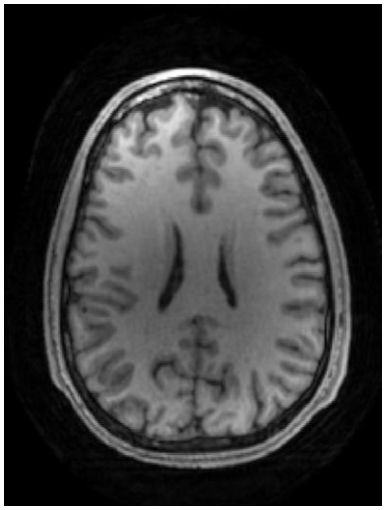

Figure 12: SAMER image reconstruction using estimated motion parameters

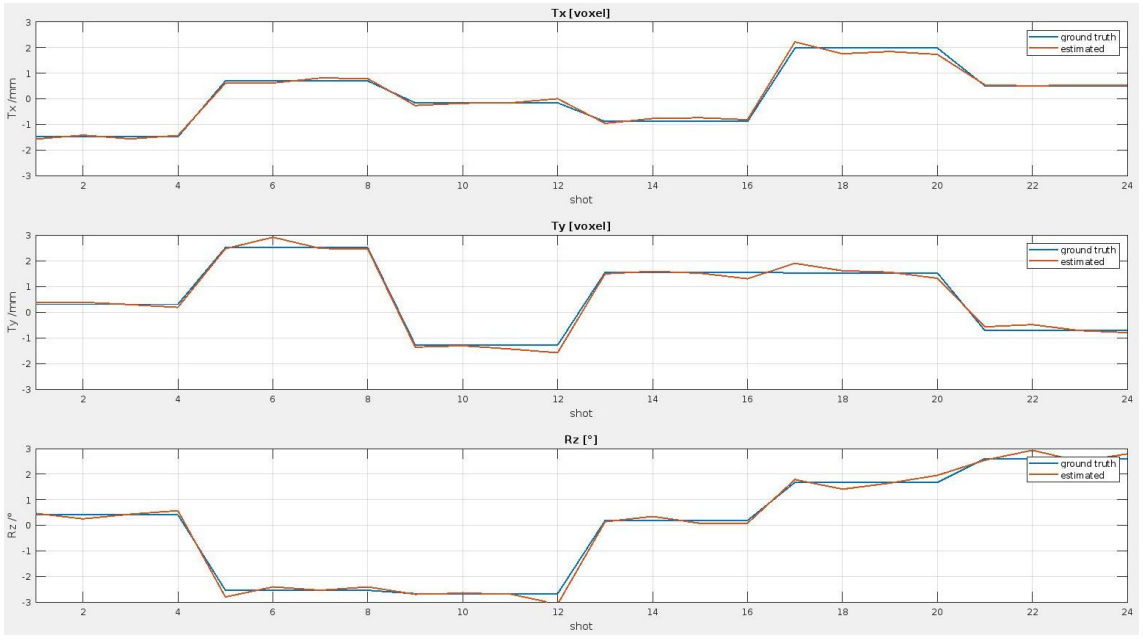

Figure 13: Estimated motion on noisy k-space data using linear + checkered reordering, N_{ch}=4 coil compression and R=12 low-resolution scout scan

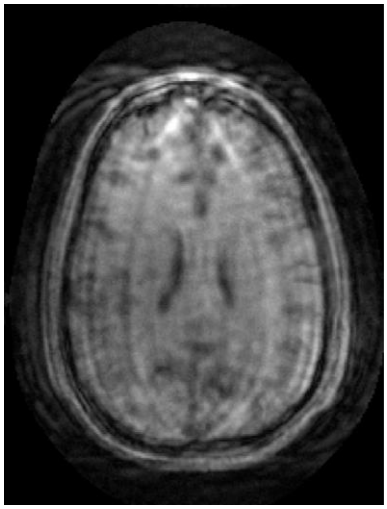

Figure 14: SENSE image reconstruction on noisy k-space data (no motion correction)

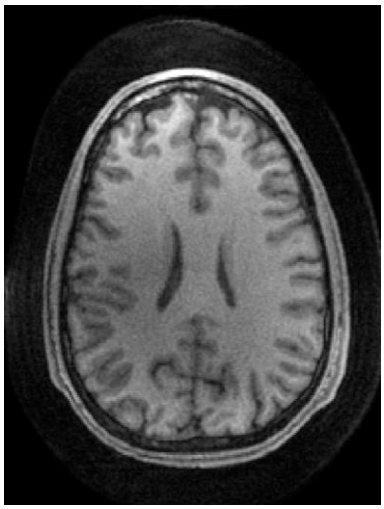

Figure 15: SAMER image reconstruction on noisy k-space data using estimated motion parameters