

Localization of Spherical Fiducials in CBCT using Projections

The files contained in this directory are the matlab source code for localizing a spherical fiducial imaged with a cone-beam CT. If you use the code in your research please cite it as:

"Evaluation of Spherical Fiducial Localization in C-arm Cone-Beam CT using Patient Data", Z. Yaniv, *Med. Phys.*, vol. 37(10), pp. 5298-5305, 2010.

or

"Localizing spherical fiducials in C-arm based cone-beam CT", Z. Yaniv, *Med. Phys.*, vol. 36(11), pp. 4957-4966, 2009.

Algorithmically interesting functions:

- `ransacSphereConstrainedRadius.m`
- `ransacRayIntersections.m`
- `fiducialLocalization.m` - `localizeFiducialMenuItem.Callback`

Data files:

- `projectionMatrices.txt` - Sample ASCII file containing C-arm's calibration matrices.
- cine loops and reconstructions - available upon request (these are large data sets).

To run the program type `fiducialLocalization`.

For a description of available functionality use the program's help menu or read the `help.txt` file.

For questions and/or bug reports contact Ziv Yaniv, zivy@isis.georgetown.edu

Distribution manifest:

1. README.pdf
2. createBackprojectedRaySet.m
3. crossMatrix.m
4. drawCircle.m
5. epipolarGeometry.m
6. fiducialLocalization.fig
7. fiducialLocalization.m
8. getEdges2DInWindowUsingEpipolarConstraint.m
9. help.txt
10. license.txt
11. loadProjectionMatrices.m
12. localize2DFiducialsUsingRansac.m
13. projective2DPointLineDistances.m
14. ransac.m
15. ransacRayIntersections.m
16. ransacSphereConstrainedRadius.m
17. readFrame.m
18. readFrameDicomTransferred.m
19. readFramePadded.m
20. sampleProjectionMatrices.txt
21. saveFigure.m
22. savePlot.m