Bruker2nifti: Magnetic Resonance Images converter from Bruker ParaVision to Nifti format

Sebastiano Ferraris[1], Dzhoshkun Ismail Shakir[1], Johannes Van Der Merwe[2], Willy Gsell[3], Jan Deprest[1,2,4], and Tom Vercauteren[1,2,4]

[1]Translational Imaging Group, Centre for Medical Image Computing (CMIC), Department of Medical Physics and Bioengineering, University College London, Malet Place Engineering Building, London, WC1E 6BT, UK
[2]Department of Development and Regeneration, Organ System Cluster, Group Biomedical Sciences, KU Leuven, Belgium.
[3]Biomedical MRI, Department of Imaging and Pathology, KU Leuven, Belgium.
[4]Wellcome/EPSRC Centre for Interventional and Surgical Sciences, University College London, UK.

28 July 2017

Motivations and Summary

In clinical and pre-clinical research involving medical images, the first step following a Magnetic Resonance Imaging dataset acquisition, usually entails the conversion of image data from the native scanner format to a format suitable for the intended analysis. The proprietary Bruker ParaVision software currently does not provide the tools for conversion of the data to suitable and open formats for research, such as nifti (Cox, Robert W and Ashburner, John and Breman, Hester and Fissell, Kate and Haselgrove, Christian and Holmes, Colin J and Lancaster, Jack L and Rex, David E and Smith, Stephen M and Woodward, Jeffrey B and others 2004), for which most of the available tools for medical image analysis are implemented.

For this purpose we have designed and developed bruker2nifti, a pip-installable Python tool provided with a Graphical User Interface to convert from the native MRI Bruker format to the nifti format, without any intermediate step through the DICOM standard formats (Mildenberger, Eichelberg, and Martin 2002).

Bruker2nifti is intended to be a tool to access the data structure and to parse all parameter files of the Bruker ParaVision format into python dictionaries, to select the relevant information to fill the Nifti header and data volume. Lastly it is meant to be a starting point where to integrate possible future variations in Bruker hardware and ParaVision software future releases.

Acknowledgements

References

Cox, Robert W and Ashburner, John and Breman, Hester and Fissell, Kate and Haselgrove, Christian and Holmes, Colin J and Lancaster, Jack L and Rex, David E and Smith, Stephen M and Woodward, Jeffrey B and others. 2004. "A (Sort of) New Image Data Format Standard: Nifti-1." *Neuroimage* 22: e1440.

Mildenberger, Peter, Marco Eichelberg, and Eric Martin. 2002. "Introduction to the Dicom Standard." *European Radiology* 12 (4): 920–27. doi:10.1007/s003300101100.