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# Open-source tools for within-exam automatic brain segmentation for accurate and reproducible geometry planning

Delphin Aurélien<sup>1</sup>, Pietras Johan<sup>1</sup>, Gourieux Emmanuelle<sup>1,2,3,4</sup>, Miquel Lucie<sup>1</sup>, Chéchin David<sup>5</sup>, Lamalle Laurent<sup>1</sup>

<sup>1</sup> Univ. Grenoble Alpes, Inserm, US17, CNRS, UAR 3552, CHU Grenoble Alpes, IRMaGe, 38000 Grenoble, France  
<sup>2</sup> Univ. Grenoble Alpes, Inserm, U1216, Grenoble Institut Neurosciences, GIN, 38000 Grenoble, France  
<sup>3</sup> Univ. Grenoble Alpes, CNRS LPNC UMR 5105, 38000 Grenoble, France

<sup>4</sup> Univ. Grenoble Alpes, UAR GRICAD, 38000 Grenoble, France  
<sup>5</sup> Philips France Commercial, Suresnes, France

## Motivation

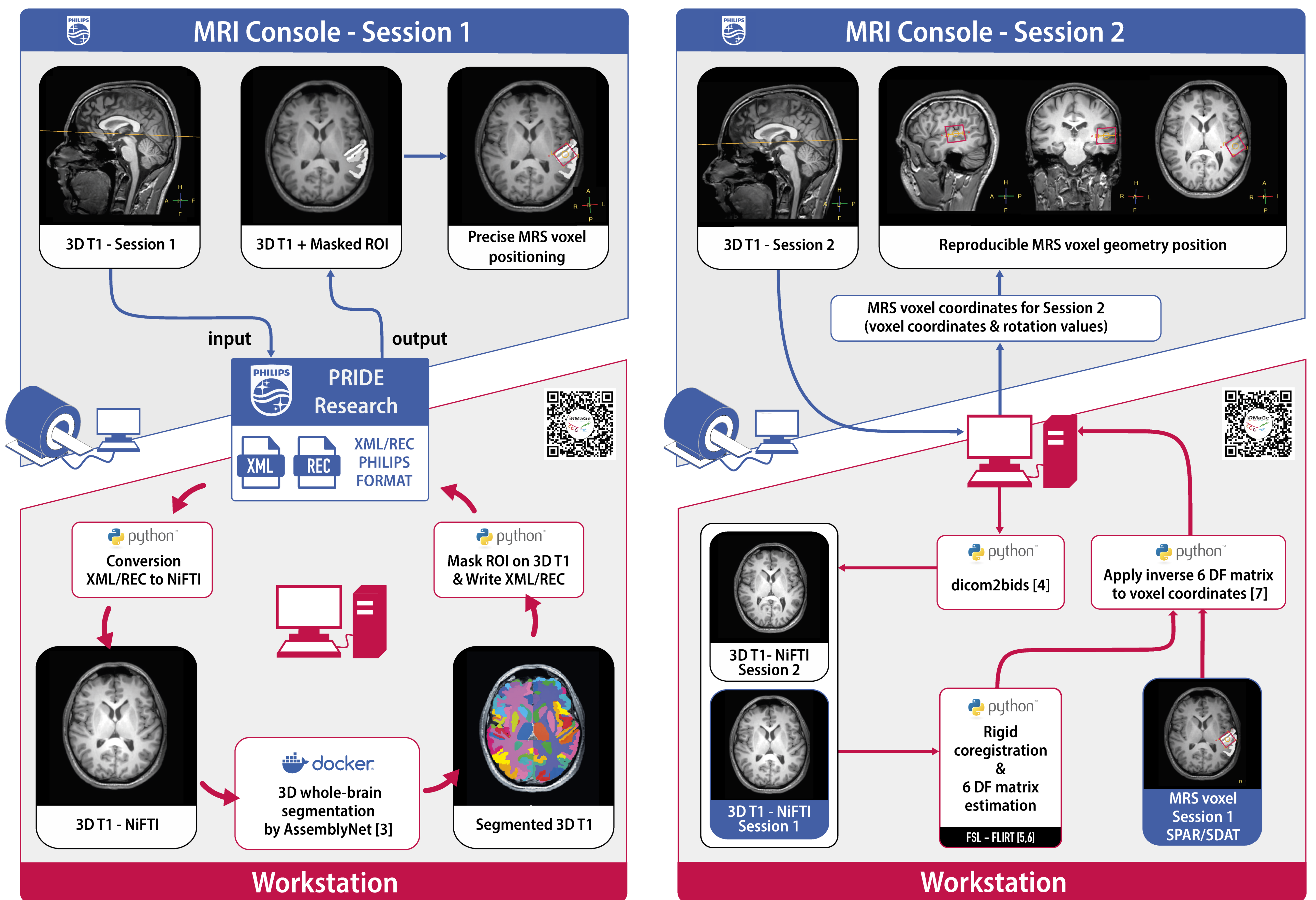
Precise and reproducible imaging volume positioning is a must-have, but is often hindered by several difficulties:

- MRI scan planning sometimes targets very specific anatomic regions
- Limited automatic scan geometry planning on the MRI console
- Impossibility to use state-of-the-art open-source tools or canonical atlases [1, 2] at scan time on the MRI console

→ The Philips PRIDE Research tool allows to externally process data and reuse it in the console during an exam.

→ We illustrate the benefits of external data processing with two open-source tools to help with MRS voxel positioning.

## Proposed workflow



## Discussion

- The tool for Session 1 runs in around 15' and that for Session 2 runs in 2', which is reasonable research sessions with several scans to acquire during processing time. Note that for several sessions per patient, the segmentation is only needed once.
- The two proposed tools are available on GitHub, are low-dependency and have a user-friendly graphical interface.
- It should be straightforward to use a different segmentation algorithm to reduce the processing time or to obtain finer segmentations.
- We believe these tools can be precious to help the precision and reproducibility of imaging volume positioning, especially for users which are not expert in brain anatomy.

**Bibliography :** [1] Fonov *et al.*, NeuroImage 2011 - [2] Fonov *et al.*, NeuroImage 2009 - [3] Coupé *et al.*, NeuroImage 2020 - [4] Boré *et al.*, "dcm2bids" 2023 - [5] Jenkinson *et al.*, NeuroImage 2002  
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