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

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## Motivation

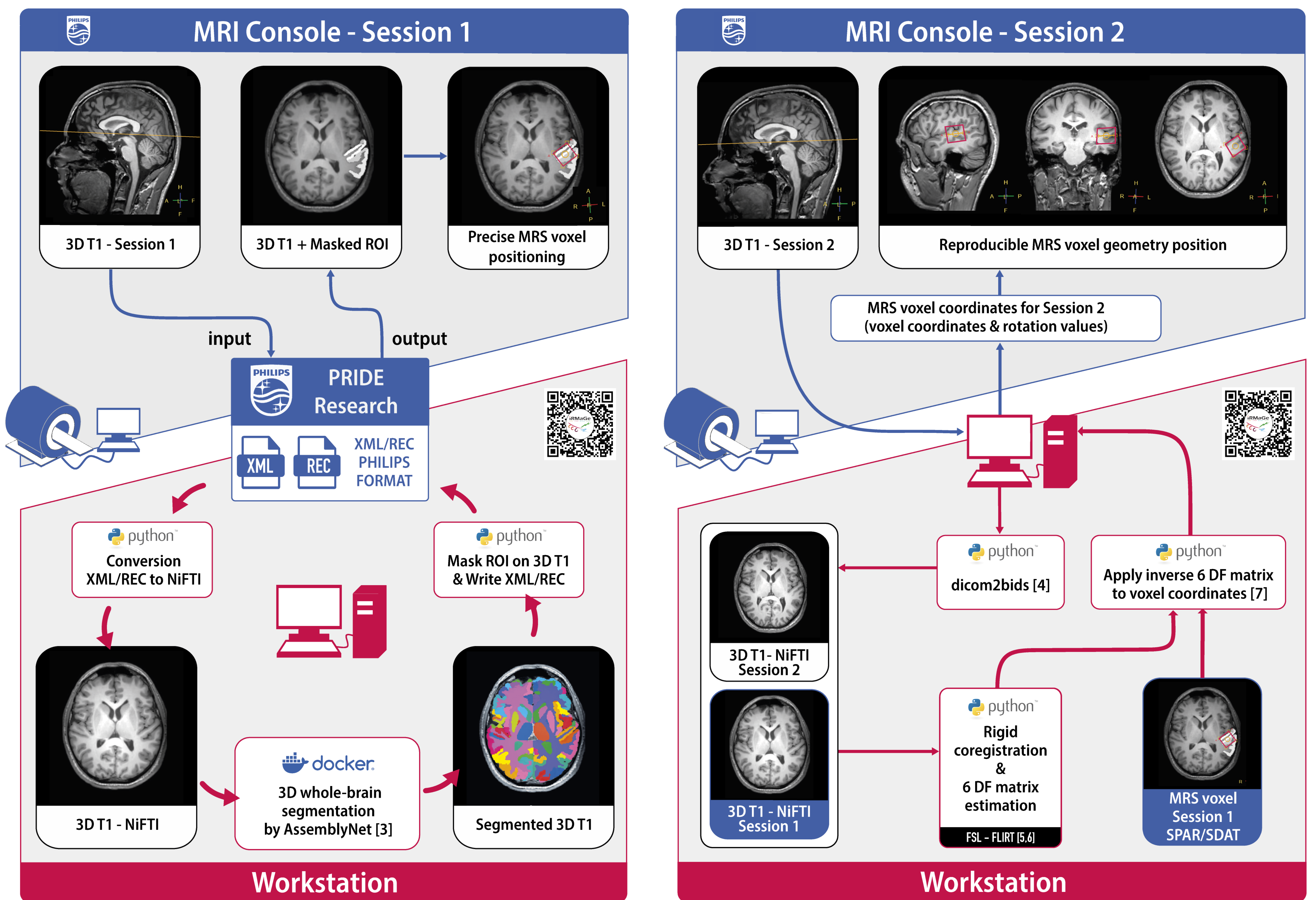
Precise and reproducible imaging volume positioning is a must-have, but is often hindered by several difficulties:

- 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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