Student project about time-encoded arterial spin labelling

To students that are looking for a research project.

Arterial spin labelling (ASL) is a noninvasive MRI technique to measure cerebral blood flow (CBF). After magnetically labelling the blood in the neck, the blood flows to the brain during the post-labelling delay (PLD) and an image is acquired. One of the main challenges of ASL is choosing the correct PLD. When the PLD is too short, the labeled blood will still be in the macrovasculature but longer PLDs will suffer from more signal decay. With the introduction of time-encoded ASL (teASL), multi-PLD images are acquired in a single time efficient acquisition. This solves the problem of choosing the correct PLD and allows for simultaneous estimation of arterial transit time (ATT) and (CBF).

In the Amsterdam UMC (location AMC), teASL is currently used in a large study to investigate the impaired hemodynamics in patients with sickle cell disease. One of the outcome parameters is the cerebrovascular reactivity (CVR). CVR is typically defined as the capacity of the blood vessels to dilate in response to a challenge such as breath-holding, CO_2 inhalation or administration of acetazolamide. To compare our results from the teASL acquisition with previous studies, a thorough comparison of both techniques has to be performed. Therefore, we aim to compare single-PLD ASL with teASL for estimating CVR.

We are looking for a bachelor or master's student who wants to do their research project with us. You are highly motivated, your interests lie with image analysis and MR physics. You have a background in biomedical sciences or biomedical engineering and physics (or similar). This project will take three months but can be expanded to six months if desired. As this project will require a lot of programming in matlab, at least minimal experience with matlab is required (more experience is preferred). A lot of data is already available but you will be involved in data acquisition and participant recruitment as well.

If you are interested in doing this project, please send your motivation and resume to:
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