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Schedule design for parameter quantification in the transient state using Bayesian optimization

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Magnetic resonance fingerprinting (MRF) is a new quanti- tative imaging paradigm, which simultaneously acquires multiple tissue parameters in an efficient experiment. MRF can map several parameters simultaneously including T1, T2, and spin density. However, it is important to underline that specific sequences may be better suited for certain parameter ranges or sampling patterns. This work aims to introduce a framework for pulse sequence optimization, individually optimizing for T1 or T2 relaxation times. We demonstrate a new method, including undersampled acquisitions, by simulating the MRI signal encoding, gridding, and pattern recognition directly in the optimization. The design framework could obtain efficient schedules for T1 and T2 acquisition.

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