



Magnetic Resonance Dynamic Imaging Sequence for Accelerated Pseudo-Random Data Magnetic Resonance Imaging

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a system and a method for accelerated pseudo-random data magnetic resonance imaging.

Overview

Current MRI techniques to obtain images of rapidly changing anatomies such as the beating heart or to monitor the flow of fluids such as contrast agents through organs and peripheral vasculature acquire less information than normally is utilized for image reconstruction. As a result, the absent data must be estimated in some way for high-quality image reconstruction. It is difficult to obtain temporal and spatial resolution that is sufficient for diagnosis using accelerated imaging techniques. A need exists for improved methods of data acquisition, estimation and reconstruction in time-resolved MRI.

The Invention

UW-Madison researchers have developed a system and method for improving image data acquisition and processing for time-resolved MRI. The method includes an acquisition sequence configured to acquire an undersampled set of magnetic resonance data. The undersampled data set has a pseudo-random sampling pattern within a data space, which is influenced by other pseudo-random sampling patterns within the data space arising from the acquisition of additional undersampled sets of magnetic resonance data over time.

In some embodiments of the proposed method, the pseudo-random sampling patterns of the data sets interleave to yield a desired sampling pattern. Each sampling location of the desired sampling pattern is sampled at least once, and the sampling locations towards the center of the data space are sampled with greater frequency than those further from the center of the data space. The data are combined with parallel image reconstruction and/or a Fourier transform, resulting in a high-quality image with improved temporal and spatial resolution.

Applications

- Accelerated magnetic resonance data collection and image reconstruction

Key Benefits

- Improves temporal and spatial resolution, resulting in high-quality images more suited to diagnosis
- Provides improvement to existing imaging processes by integrating algorithms into MRI software without requiring additional hardware

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Tech Fields

- [Medical Imaging : MRI](#)

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