

Reducing motion-related artifacts in magnetic resonance imaging

Value Proposition

Magnetic resonance imaging (MRI) is useful in diagnosing a wide variety of diseases and conditions. However, the procedure is highly susceptible to motion-induced artifacts. Existing magnetic resonance imaging protocols largely rely on either breath holding or respiratory gating. However, the gating does not completely eliminate motion-related artifacts, while the breath-holding can be difficult for pediatric patients and some adult patients. Since existing motion artifact reduction methods cannot always completely eliminate motion-related artifacts, a significant subset of patients need to be sedated to complete MRI procedure. The invention enables high-quality body MRI for patients without requiring sedation.

Technology

Researchers at Duke have developed a method of minimizing motion-related artifacts in MRI imaging. The technique can effectively suppress artifacts in data obtained with different accelerated magnetic resonance pulse sequences, k-space trajectories and contrasts. It can be applied to address in-plane motion artifacts in 2D MRI. It can be directly extended to eliminate artifacts induced by both in-plane and through-plane motion in 3D imaging. The procedure has been validated in participants with incessant head tremors.

Advantages

- Compatible with echo-planar imaging, fast spin-echo imaging, and gradient-echo and spin-echo imaging
- Can be applied to address motion-related artifacts in 2D and 3D MRI data
- Effectively suppress motion-related artifacts even for highly challenging cases, such as continual head tremor
- Eliminates the need for sedation

Publications

- [POCS-based reconstruction of multiplexed sensitivity encoded MRI \(POCSMUSE\): a general algorithm for reducing motion-related artifacts \(Magnetic Resonance in Medicine, 2014\)](#)

Duke File (IDF)

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Links

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Patents

Patent Number: 10,317,499

Title: MRI WITH REPEATED K-T -SUB-SAMPLING AND
ARTIFACT MINIMIZATION ALLOWING FOR FREE
BREATHING ABDOMINAL MRI

Country: United States of America