



Image Reconstruction Method for Motion Encoded Magnetic Resonance Images

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WARF: P06241US

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a new method for reconstructing motion encoded magnetic resonance (MR) images from undersampled data using a highly constrained backprojection method.

Overview

Magnetic resonance imaging (MRI) is a medical imaging technique that takes measurements, or “views,” of a subject’s nuclear magnetic resonance (NMR) to form images of internal structures. The phase contrast (PC) MRI technique can image and provide quantitative measurements of blood flow by encoding motion into the phase of the acquired MR signal. This technique can be an extremely lengthy process because four to six fully sampled images are required.

MR data is sampled with a series of interleaved projection views that increase scan time. This data then is used to reconstruct an image of the subject using a 2D or 3D Fourier transform and a technique known as backprojection. If insufficient views are acquired, the reconstructed images may contain unwanted streaks, or “artifacts,” that distort the image.

The Invention

UW-Madison researchers have developed a new method for reconstructing motion encoded magnetic resonance (MR) images from undersampled data. A highly constrained backprojection method is used to reconstruct MR images using a composite image made up of interleaved projection views.

The composite image allows the method to produce good quality images with far less data, reducing scan time for PC applications. The highly constrained backprojection reconstruction method weights image pixels to increase the image quality at areas in which the composite image pixels intersect structures in the subject, instead of simply assuming the pixels should be weighted evenly. Increasing the quality of this composite image, by taking a series of undersampled images and interleaving them, directly increases the reconstructed image quality and also maintains the ability to quantitatively measure blood flow.

Applications

- Highly constrained image reconstruction for phase contrast MR

Key Benefits

- Increases image resolution
- Decreases scan time
- Increases signal to noise ratio
- Decreases the appearance of image artifacts

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Additional Information

For More Information About the Inventors

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Related Technologies

- [For information about contrast enhanced magnetic resonance angiography \(CEMRA\), see WARF reference number P06132US.](#)

Tech Fields

- [Medical Imaging : MRI](#)

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846

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