Real-Time Progressive Medical Image Reconstruction Method for Time-Resolved Data

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method for medical image reconstruction that delivers quality images from time-resolved image data in real time.

OVERVIEW

Computed tomography (CT) systems are used for medical imaging and produce images by measuring the loss in an X-ray beam's strength. These measurements are used to reconstruct an image in 2-D or 3-D, based on the data collection technique. Image-guided radiation therapy (IGRT) is a technique that employs CT imaging systems simultaneously with the radiation therapy to improve radiation accuracy and reduce the dose delivered to surrounding healthy tissue.

The inventors previously developed an image reconstruction method that used a "prior image," an image directly reconstructed from acquired data, and an estimated image to create a "sparsified" image that undergoes a transformation into the final image. This technique is more accurate and delivers less radiation to the patient than other techniques, but it is not able to provide accurate image data in real time.

THE INVENTION

UW–Madison researchers have developed a method for medical image reconstruction that delivers quality images from time-resolved image data in real time. The method provides accurate images with increased signal-to-noise ratio and temporal resolution while minimizing a patient's exposure to X-ray radiation.

The method starts with two related images that can be neighboring images from a time series image set or images from the same phase point during repeated motion, such as breathing or the beating of the heart. The images are subtracted to get an image of the difference between the two, which undergoes a sparsifying transformation to reconstruct the final image of interest. All of this is done in real time to achieve more dynamic medical imaging, such as image guided interventional procedures.

THE WARF ADVANTAGE

Since its founding in 1925 as the patenting and licensing organization for the University of Wisconsin-Madison, WARF has been working with business and industry to transform university research into products that benefit society. WARF intellectual property managers and licensing staff members are leaders in the field of university-based technology transfer. They are familiar with the intricacies of patenting, have worked with researchers in relevant disciplines, understand industries and markets, and have negotiated innovative licensing strategies to meet the individual needs of business clients.

APPLICATIONS

- Dynamic imaging for CT and magnetic resonance imaging (MRI) systems
- Image guided interventional procedures

KEY BENEFITS

- Decreases radiation dose to patient
- Accurately reconstructs the image
- Less projection data needed for imaging
- Increases signal-to-noise ratios
- Increases temporal resolution while using time-resolved image data

ADDITIONAL INFORMATION

Tech Fields
Medical Imaging - MRI
Medical Imaging - CT
Medical Imaging - Other diagnostic imaging

CONTACT INFORMATION

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