



Cardiac Image Reconstruction with Improved Temporal Resolution

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WARF: P09268US

Inventors: Guang-Hong Chen, Jie Tang

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing methods for imaging a dynamic subject, such as a beating heart, more accurately and with fewer artifacts using a reconstructed prior image from acquired data from the same subject.

Overview

Visualizing a patient's heart by non-invasive cardiovascular imaging is a powerful tool for diagnosis and therapy. Yet the heart's movement and small branching arteries make quality cardiac imaging a challenge. Radiation exposure during nuclear myocardial perfusion imaging (MPI) and X-ray computed tomography (CT) is concerning. Moreover, even cutting-edge imaging systems like multidetector CT (MDCT) can't achieve the mechanical speeds needed to assess valve and wall motion abnormalities. Heartbeat-slowing beta blockers often must be given to patients to make up for these limitations in temporal resolution.

UW-Madison researchers previously developed an image reconstruction method that uses an image acquired in a prior time frame, an image directly reconstructed from acquired data and an estimated image to create a 'sparsified' image that undergoes a transformation into the final product. This technique is more accurate and delivers less radiation to the patient than other techniques. Using this strategy, heart care could be dramatically enhanced by clearer, faster imaging.

The Invention

UW-Madison researchers now have developed a 'prior image' method for reconstructing dynamic and undersampled data. The method is applicable to a number of different modalities including CT, X-ray C-arm imaging, MDCT, magnetic resonance imaging (MRI), positron emission tomography (PET) and single photon emission CT (SPECT).

Specified for each system, in general the method combines image data from current and prior time frames, like heartbeat phases. A limited amount of additional image data is incorporated into the consistency condition imposed during prior-image constrained-image reconstruction.

Applications

- Cardiovascular imaging
- Software for CT, MRI, PET, SPECT and other imaging modalities

Key Benefits

- Significantly improves diagnostic accuracy and measurements of cardiac function

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- No need to use beta blockers or heart rate constraints
- Increased temporal resolution
- Reduced image artifacts

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| info@warf.org | 608.960.9850

- Increased signal-to-noise ratio
- Quality reconstructions where other methods fail

Additional Information

For More Information About the Inventors

- [Guang-Hong Chen](#)

Related Technologies

- [WARF reference number P08250US describes a medical image reconstruction method for time-resolved data.](#)

Tech Fields

- [Medical Imaging : CT](#)
- [Medical Imaging : MRI](#)

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

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