عنوان مقاله:

A Four-Dimensional MRI reconstruction approach by Compressive Sensing

محل انتشار:

پنجمین کنفرانس ملی تکنولوژی در مهندسی برق و کامپیوتر (سال: 1399)

تعداد صفحات اصل مقاله: 5

نویسندگان:

Mitra Tavakkoli - *Electrical and Computer Engineering Babol Noshirvani University of Technology Babol, Iran*

Atta Ebrahimzadeh - *Electrical and Computer Engineering Babol Noshirvani University of Technology Babol, Iran*

Seyed Javad Kazemitabar - *Electrical and Computer Engineering Babol Noshirvani University of Technology Babol, Iran*

خلاصه مقاله:

non-Cartesian acquisition, like radial sampling, is widely used in fast Magnetic Resonance Imaging (MRI). This method has several advantages compared to Cartesian samplings, like low sensitivity to motion artifacts, which is important for dynamic imaging. Compressive Sensing (CS) is another approach that has recently been introduced to accelerate MR imaging. The incoherent artifact is one of the three basic CS requirements, which can be achieved through irregular sampling in the Cartesian acquisition. However, under-sampling in the radial acquisition would generate noise-like artifacts with higher incoherency than Cartesian sampling with an irregular pattern. This characteristic of radial sampling makes it an inherent fir by CS. This study reconstructed four-dimensional cardiac imaging data by combining a penalty function for each pixel of the image (Total-Variation) in the GRASP acquisition and reconstruction method. Comparing output images with both the GRASP algorithm and Non-Uniform Fast Fourier Transform (NUFFT) showed that the images' similarity increased by ۰.۳۹ compared to the non-uniform Fourier transform. The dramatic reduction in line artifacts in all three modes is also visually evident. According to this paper's findings, the proposed method can be used to increase the speed of dynamic magnetic resonance imaging to produce high-quality images under the Nyquist sampling rate.

کلمات کلیدی:

Cardiac MRI, Compressive Sensing, parellel Imaging, Radial Golden Acquisition