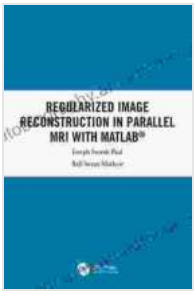
Regularized Image Reconstruction in Parallel MRI with MATLAB

Magnetic resonance imaging (MRI) is a powerful medical imaging technique that provides detailed anatomical and functional information about the human body. However, conventional MRI scans can be time-consuming, which can limit their clinical utility. Parallel MRI is a technique that can accelerate MRI scans by using multiple receiver coils to acquire data simultaneously. However, parallel MRI can also lead to image artifacts due to the undersampling of the data.



Regularized Image Reconstruction in Parallel MRI with MATLAB

★★★★★ 5 out of 5

Language : English
File size : 27842 KB
Print length : 322 pages

Regularized image reconstruction is a technique that can be used to reduce artifacts in parallel MRI images. Regularization involves adding prior knowledge about the image to the reconstruction process. This prior knowledge can help to stabilize the reconstruction and reduce noise. In this book, we will explore a variety of regularized image reconstruction techniques for parallel MRI. We will also provide MATLAB code for implementing these techniques.

Regularization Methods

There are a variety of different regularization methods that can be used for parallel MRI image reconstruction. Some of the most common methods include:

- Tikhonov regularization
- Total variation regularization
- Wavelet regularization
- L1 regularization

Each of these methods has its own advantages and disadvantages. The choice of regularization method will depend on the specific application.

MATLAB Implementation

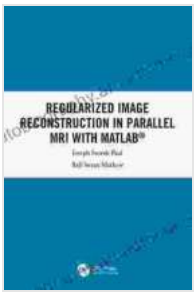
The MATLAB code for implementing the regularization methods described in this book is available online. The code is well-documented and easy to use. It can be used to reconstruct images from parallel MRI data and to evaluate the quality of the reconstructed images.

Applications

Regularized image reconstruction has a wide range of applications in parallel MRI. Some of the most common applications include:

- Accelerated MRI scans
- Reduced artifacts in MRI images
- Improved image quality in MRI images

Regularized image reconstruction is a powerful tool that can be used to improve the quality and speed of MRI scans. This book provides a comprehensive overview of the theory and practice of regularized image reconstruction for parallel MRI. The MATLAB code provided with the book makes it easy to implement these techniques and to evaluate their performance.



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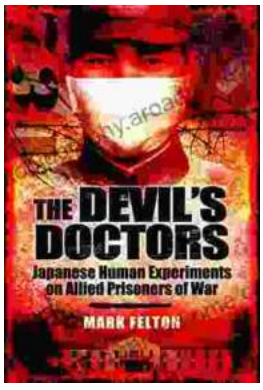

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