Hindawi Publishing Corporation

Go

Advanced Search

Home Books Journals About Us

About this Journal Submit a Manuscript Table of Contents

Journal Menu

- Abstracting and Indexing
- Aims and Scope
- Article Processing Charges
- Articles in Press
- Author Guidelines
- Bibliographic Information
- Contact Information
- Editorial Board
- Editorial Workflow
- Reviewers Acknowledgment
- Subscription Information

- Open Special Issues
- Published Special Issues
- Special Issue Guidelines

Call for Proposals for Special Issues

International Journal of Biomedical Imaging
Volume 2007 (2007), Article ID 63634, 8 pages
doi:10.1155/2007/63634

Abstract
Full-Text PDF
Linked References
How to Cite this Article

Research Article

A General Local Reconstruction Approach Based on a Truncated Hilbert Transform

Yangbo Ye,[1] Hengyong Yu,[2] Yuchuan Wei,[3] and Ge Wang[2,3]

[1]Department of Mathematics, University of Iowa, Iowa City 52242, IA, USA
[2]CT Laboratory, Biomedical Imaging Division, VT-WFU School of Biomedical Engineering, Virginia Tech, Blacksburg 24061, VA, USA
[3]CT Laboratory, Biomedical Imaging Division, VT-WFU School of Biomedical Engineering, Wake Forest University, Winston-Salem 27157, NC, USA

Received 15 May 2007; Accepted 22 May 2007

Academic Editor: Lizhi Sun

Abstract

Exact image reconstruction from limited projection data has been a central topic in the computed tomography (CT) field. In this paper, we present a general region-of-interest/volume-of-interest (ROI/VOI) reconstruction approach using a truly truncated Hilbert transform on a line-segment inside a compactly supported object aided by partial knowledge on one or both neighboring intervals of that segment. Our approach and associated new data sufficient condition allows the most flexible ROI/VOI image reconstruction from the minimum account of data in both the fan-beam and cone-beam geometry. We also report primary numerical simulation results to demonstrate the correctness and merits of our finding. Our work has major theoretical potentials and innovative practical applications.

Copyright © 2009 Hindawi Publishing Corporation. All rights reserved.