

Gpu Based Iterative Cone Beam Ct Reconstruction Using

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Gpu Based Iterative Cone Beam

Iterative reconstruction of high-resolution cone-beam CT data is still a difficult task due to the demand for vast amounts of computer cycles and associated memory. In order to improve the performance of iterative algorithms for cone-beam CT reconstruction, an acceleration approach integrating GPU acceleration, empty space skipping and multi-resolution technique is proposed.

GPU based iterative cone-beam CT reconstruction using ...

X-ray imaging dose from serial cone-beam CT (CBCT) scans raises a clinical concern in most image guided radiation therapy procedures. It is the goal of this paper to develop a fast GPU-based...

GPU-based Iterative Cone Beam CT Reconstruction Using ...

GPU-based iterative cone-beam CT reconstruction using tight frame regularization. Jia X(1), Dong B, Lou Y, Jiang SB. Author information: (1)Center for Advanced Radiotherapy Technologies, University of California, San Diego, La Jolla, CA 92037-0843, USA.

GPU-based iterative cone-beam CT reconstruction using ...

Matenine, D., Goussard, Y. & Després, P. Gpu-accelerated regularized iterative reconstruction for few-view cone beam ct. Medical physics 42, 1505-1517 (2015).

GPU acceleration of a model-based iterative method for ...

GPU-based iterative cone-beam CT reconstruction using tight frame regularization Xun Jia1,2, Bin Dong3, Yifei Lou4 and Steve B Jiang1,2 1 Center for Advanced Radiotherapy Technologies, University of California, San Diego, La Jolla, CA 92037-0843, USA 2 Department of Radiation Oncology, University of California, San Diego, La Jolla, CA 92037-0843, USA

GPU-based iterative CBCT reconstruction using tight frame ...

It sets and advises on standards for the practice, education and training of scientists and engineers working in healthcare to secure an effective and appropriate workforce. GPU-based iterative cone-beam CT reconstruction using tight frame regularization. Xun Jia1,2, Bin Dong3, Yifei Lou4 and Steve B Jiang1,2.

GPU-based iterative cone-beam CT reconstruction using ...

In summary, we propose a GPU acceleration method of calculating voxel-driven forward projection for cone-beam CT. The method is composed of three key steps and is easy to implement. The experimental results demonstrate its effectiveness and efficiency in handling the inter-thread interference problem, and a surprising acceleration ratio, as high as 105, has been achieved.

GPU accelerated voxel-driven forward projection for ...

TIGRE: Tomographic Iterative GPU-based Reconstruction Toolbox TIGRE is an open-source toolbox for fast and accurate 3D tomographic reconstruction for any geometry. Its focus is on iterative algorithms for improved image quality that have all been optimized to run on GPUs (including multi-GPUs) 1 for improved speed.

TIGRE: Tomographic Iterative GPU-based ... - GitHub

Jia X. et al. , " GPU-based iterative cone beam CT reconstruction using tight frame regularization," Phys. Med. Biol. 56, 3787 (2011).10.1088/0031-9155/56/13/004 Gu X. J. et al. , " A GPU-based finite-size pencil beam algorithm with 3D-density correction for radiotherapy dose calculation ," Phys. Med. Biol. 56 , 3337-3350 (2011).10.1088/0031-9155/56/11/010 [PMC free article] [PubMed] [Cross Ref]

A GPU tool for efficient, accurate, and realistic ...

A FAST GPU-BASED APPROACH TO BRANCHLESS DISTANCE-DRIVEN PROJECTION AND BACK-PROJECTION IN CONE BEAM CT DANIEL SCHLIFSKE, B.S. MARQUETTE UNIVERSITY, 2015 Modern CT image reconstruction algorithms rely on projection and back-projection operations to refine an image estimate in iterative image reconstruction. A

Fast GPU-Based Approach to Branchless Distance-Driven ...

This iterative cone-beam computed tomography reconstruction pipeline uses a finite element solver (AcurosCTS)-based scatter correction and a statistical (iterative) reconstruction in addition to a standard kernel-based correction followed by filtered back-projection-based Feldkamp-Davis-Kress cone-beam computed tomography reconstruction.

Evaluation and Clinical Application of a Commercially ...

In order to improve the performance of the iterative algorithms for high-resolution cone-beam DSCT reconstruction, a graphics processing unit (GPU)-based multi-resolution approach is proposed.

A GPU-based multi-resolution approach to iterative ...

In GPU-based iterative cone-beam DSCT reconstruction, the basis material images of the entire 3D region need to be reconstructed simultaneously, which requires the whole volumes of the two basis material images to be resident in GPU memory to avoid expensive data transfers between GPU memory and system memory and obtain an acceptable reconstruction speed,.

A GPU-based multi-resolution approach to iterative ...

Cone-beam x-ray micro computed tomography (CT) is a high resolution three- ... which are based on the iterative solution of the system of linear equations generated from discretising the x-ray projection process. ...

GPU Based Structure Exploiting Algorithm Performance Comparisons and Results

GPU Accelerated Algebraic Iterative Reconstruction for ...

Sharp G, Kandasamy N, Singh H, Folkert M. GPU-based streaming architectures for fast cone-beam CT image reconstruction and demons deformable registration. Phys Med Biol. 2007;52(19):5771-83. CrossRef Google Scholar

GPU based parallel acceleration for fast C-arm cone-beam ...

Accelerated iterative image reconstruction for cone-beam computed tomography through Big Data frameworks. ... we show that we can obtain results up to 10 × faster for projection and 21 × faster for backprojection when using a GPU-based cluster compared to a traditional multi-core version. Although a linear speed up was not reached, the ...

Accelerated iterative image reconstruction for cone-beam ...

Utilizing GPU to speed up the computationally intensive tasks in CBCT reconstruction problems has drawn a lot of attention recently. In this talk, GPU-based CBCT reconstruction algorithms will be reviewed, with an emphasis on an iterative CBCT reconstruction algorithm via TV regularization.

GPU-based Cone Beam CT Reconstruction on Vimeo

Purpose: Scatter artifacts severely degrade image quality of cone-beam CT (CBCT). We present an ultrafast scatter correction framework by using GPU-based Monte Carlo (MC) simulation and prior patient CT image, aiming at automatically finish the whole process including both scatter correction and reconstructions within 30 seconds.

WE-G-18A-03: Cone Artifacts Correction in Iterative Cone ...

@article{osti_22624399, title = {SU-D-206-01: Employing a Novel Consensus Optimization Strategy to Achieve Iterative Cone Beam CT Reconstruction On a Multi-GPU Platform}, author = {Li, B and Southern Medical University, Guangzhou, Guangdong and Tian, Z and Jiang, S and Jia, X and Zhou, L}, abstractNote = {Purpose: While compressed sensing-based cone-beam CT (CBCT) iterative reconstruction ...

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