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Katservich Algorithm Based on Spherical Detector for Cone-Beam CT and the Implementation on GPU

Yan Zhang, Qian Li

Harbin Institute of Technology Shenzhen Graduate School,
Shenzhen, Guangdong, China, 518055
ianzh@foxmail.com, lqiankm@foxmail.com

Abstract

Katsevich algorithm is an exact cone-beam reconstruction algorithm of filtered backprojection (FBP) type. In this paper, an implementation for a spherical detector is proposed. It reduces the error generated by geometric shapes such as curved or plan detector. CT image reconstruction using spherical detector makes the speed of reconstruction faster and the quality of image better. Since CT image reconstruction has a huge amount of computation, it is difficult to meet the requirements of both fast and accurate reconstruction using CPU. This paper takes the advantages of GPU which is programmable and parallelizable to accelerate the image reconstruction.

Key words: cone-beam CT, Katservich algorithm, spherical detector, GPU, acceleration