International Journal of Biomedical Imaging
Volume 2007 (2007), Article ID 86741, 4 pages
doi:10.1155/2007/86741

Research Article

Experimental Study on Bioluminescence Tomography with Multimodality Fusion

Yujie Lv,[1] Jie Tian,[1,2] Wenxiang Cong,[3] and Ge Wang[3]

[1]Medical Image Processing Group, Institute of Automation, Chinese Academy of Sciences, P.O. Box 2728, Beijing 100080, China

[2]Life Science Center, Xidian University, Xian, Shaanxi 710071, China

[3]Division of Biomedical Imaging, VT-WFU School of Biomedical Engineering and Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061, USA

Received 12 March 2007; Accepted 1 August 2007

Academic Editor: Ming Jiang

Abstract

To verify the influence of a priori information on the nonuniqueness problem of bioluminescence tomography (BLT), the multimodality imaging fusion based BLT experiment is performed by multiview noncontact detection mode, which incorporates the anatomical information obtained by the microCT scanner and the background optical properties based on diffuse reflectance measurements. In the reconstruction procedure, the utilization of adaptive finite element methods (FEMs) and a priori permissible source region refines the reconstructed results and improves numerical robustness and efficiency. The comparison between the absence and employment of a priori information shows that multimodality imaging fusion is essential to quantitative BLT reconstruction.