Digital-based detection system for optical tomography

Technology #2361

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Limitations of Analog-Based Optical Tomography

Optical tomography is a promising, non-invasive in-vivo diagnostic imaging procedure that generates 3-dimensional images revealing a tissue’s structure, optical properties and physiological processes. The imaging modality is often performed by detecting transmitted and back-reflected intensities of near-infrared light directed at multiple positions on the surface of interest. Because most current optical tomography systems execute imaging signal operation in the analog domain, they suffer from a number of deficiencies, including elevated noise floor, diminished dynamic range, and slower data acquisition.

Digital-Based Optical Tomography System

This technology consists of methods and systems for a digital signal processor based detection system for optical tomography. Besides eliminating shortcomings characteristic in analog-based detection schemes, the new design offers great reduction in settling time of electronics, facilitates study of functional imaging and real-time imaging, and offers easy expandability. The authors have achieved significantly better signal-to-noise ratios and can acquire data at higher speeds and precision than comparable analog-electronics-based systems.

Applications: • Detection and monitoring of joint diseases • Imaging of limbs for diagnostics and monitoring of diabetic patients • Monitoring of tissue oxygenation • Small animal imaging

Advantages: • Better image quality (greater dynamic range, less noise) • Faster data acquisition which facilitates study of functional and real-time imaging • Easy expandability


Licensing Status: Available for Licensing and Sponsored Research Support

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