

Review Article A Review of Optical Ultrasound Imaging Modalities for Intravascular Imaging

Abstract

Recent advances in medical imaging include integrating photoacoustic and optoacoustic techniques with conventional imaging modalities. The developments in the latter have led to the use of optics combined with the conventional ultrasound technique for imaging intravascular tissues and applied to different areas of the human body. Conventional ultrasound is a skin contact-based method used for imaging. It does not expose patients to harmful radiation compared to other techniques such as Computerised Tomography (CT) and Magnetic Resonance Imaging (MRI) scans. On the other hand, optical Ultrasound (OpUS) provides a new way of viewing internal organs of the human body by using skin and an eye-safe laser range. OpUS is mostly used for binary measurements since they do not require to be resolved at a much higher resolution but can be used to check for intravascular imaging. Various signal processing techniques and reconstruction methodologies exist for Photo-Acoustic Imaging, and their applicability in bioimaging is explored in this paper.

Keywords

Imaging; Intravascular; Optoacoustic; Photoacoustic; Reconstruction; Ultrasound