

Fiber Optic Sensing Ultrasonic Imaging System



Overview

A miniaturized ultrasound sensor based on optical fiber is designed and realized for multichannel parallel ultrasound detection and photoacoustic imaging. The fiber optic sensor is composed of a polymer coating, a reflective mirror and a single-mode optical fiber, with only 125 μm in diameter. By. Ultrasound (US) imaging is widely used for guiding percutaneous needle interventions, but the 2D nature of most clinical US probes limits accurate 3D localization, particularly of the needle tip. In this work, we introduce a novel system that combines both volumetric US imaging and 3D needle. The small size, high sensitivity, and immunity to electromagnetic interference of fibre-optic ultrasound sensors make them highly attractive for applications in biomedical imaging and metrology.



Article Content

Jul 23, 2026

Volumetric ultrasound imaging with a sparse matrix array and

To the best of our knowledge, this work presents the first integrated system capable of real-time volumetric imaging and 3D needle

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All fiber sensor array for ultrasound sensing

The field of Optical Fiber Sensors (OFS) is gaining tremendous popularity in recent years. OFS natural immunity to

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Acoustic sensing in the ultrasound range is important for a variety of underwater applications, such as sonar, navigation,

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Fiber-optic ultrasonic sensors and applications

Several fiber-optic ultrasonic sensors with smart packaging are proposed and also used for the scanning imaging of two physical

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Optical ultrasound sensing for biomedical imaging

In this review, we provide a summary of recent technical advances in optical ultrasound sensing for biomedical

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In this review, we focus on recent advances in ultrasound sensing applications using three types of optical

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(PDF) All-optical fiber ultrasound imaging system based on the ...

This paper presents the design, fabrication, and characterization of a novel fiber optic ultrasonic sensing system

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://khanimamboguesthouse.co.za>

Email: sales@khanimamboguesthouse.co.za

Phone: +27 64 852 1973

Address: Unit 7, Greenway Business Park, 8 Innovation Drive, Centurion, 0157, South Africa

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