

Fiber Optic Shape Sensing Based on OFDR



Overview

We present a twist compensated, high accuracy and dynamic fiber optic shape sensing based on phase demodulation in Optical Frequency Domain Reflectometry (OFDR) by using multiple single core fiber based sensor (MFS). A WFBG array consisting of 60 identical WFBGs was successfully inscribed in each core along a 2 and 8 mm. Mobina Tavangarifard Wendy Rodriguez Ovalle and Farshid Alambeigi This work is supported by the National Institute Of Biomedical Imaging and Bioengineering of the National Institutes of Health under Award Number R21EB030796. Alambeigi are with the Walker. Fiber Bragg Grating (FBG) sensors inscribed in multi-core optical fibers have been democratized over the years and nowadays offer a compact and robust platform for shape reconstruction. In this work, we propose a novel, computationally efficient method for determining the 3D tip position of a bent.

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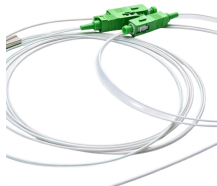
Optical Frequency Domain Reflectometry (OFDR) is the basis of an emerging high-definition distributed fiber optic sensing (HD-FOS) technique that provides an unprecedented ...



In this work, we propose a novel, computationally efficient method for determining the 3D tip position of a bent multi-core FBG-based optical fiber using a second-order polynomial ...



To address the challenges associated with shape sensing of continuum manipulators (CMs) using Fiber Bragg Grating (FBG) optical fibers, we feature a unique shape sensing assembly ...



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This study demonstrates a frequency-spatial division multiplexed optical frequency domain reflectometry (FSDM-OFDR) system that allows for parallel interrogation of simultaneous ...



In optical fiber shape sensing technology, enhancing sensing accuracy while simultaneously achieving real-time shape reconstruction presents ...



A highly accurate 3D shape sensing scheme based on special fiber OFDR is proposed and demonstrated. Combining with ICP algorithm, the maximum reconstruction error is effectively ...



This paper introduces a novel shape-sensing approach for Concentric Tube Steerable Drilling Robots (CT-SDRs) based on Optical Frequency Domain Reflectometry (OFDR).



An optical frequency domain reflectometry (OFDR) shape sensor was demonstrated based on a femtosecond-laser-inscribed weak fiber Bragg grating (WFBG) array in a multicore fiber (MCF).

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