

Measurement of radial force using fiber optic gratings



Overview

Here, a new conceptual design for a force and temperature sensor system is developed using fiber-optic Bragg grating sensors embedded within composite materials, and a mathematical model is proposed that allows one to estimate strain and temperature based on signals obtained. Here, a new conceptual design for a force and temperature sensor system is developed using fiber-optic Bragg grating sensors embedded within composite materials, and a mathematical model is proposed that allows one to estimate strain and temperature based on signals obtained. Here, a new conceptual design for a force and temperature sensor system is developed using fiber-optic Bragg grating sensors embedded within composite materials, and a mathematical model is proposed that allows one to estimate strain and temperature based on signals obtained from the optical Bragg. This manuscript introduces the theory of gratings, investigates the material properties of different brackets, and performs strain and temperature experiments. However, I am not clear with the novelty and impact of this work. Overall, the quality of this manuscript is poor and I would not recommend. To solve the limitation of deficient multi-dimensional force feedback in MIS, we present a series of Fiber Bragg Grating (FBG)-based force sensors, which can detect the surgical device-tissue interaction forces during surgery precisely. © 2022 The Author (s) View More.



Article Content

Sensor Systems for Measuring Force and Temperature with Fiber

Here, a new conceptual design for a force and temperature sensor system is developed using fiber-optic Bragg grating sensors embedded within composite materials, and a mathematical

Sensor Systems for Measuring Force and Temperature with Fiber

The authors propose and demonstrate a sensor system for measuring force and temperature with FBG embedded in composite materials. Their results show a linear response of FBG wavelength variation

Design and Characterization of a Fiber Bragg Grating-Based Force

This study presents the design, optimization, and experimental validation of a compact fiber Bragg grating (FBG)-based force sensor specifically developed for soft tissue palpation in MIS

Design of a Modular 3-D Force Sensor With Fiber Bragg Gratings for ...

Based on this application background, a novel fiber Bragg grating (FBG)-based 3-D force sensor is proposed. This sensor consists of an axial force perceptive zone and a radial force perceptive zone.

Strain transfer mechanism and axial/radial force sensing ...

Through finite element simulations, the strain values of the bonding and fiber layers were analyzed and compared with the theoretical values to determine the influence of the bonding layer

Applications of fibre Bragg grating sensors for monitoring geotechnical ...

This paper presented a critical review of different types of optical fibre-based sensors with a special focus on the calibration methodology of Fibre Bragg Grating (FBG) sensors.

Fiber Bragg grating (FBG)-based sensors: a review of technology and ...

This review paper aims to give a general understanding of the basic principles of FBG sensors, advances in sensing and data processing techniques, developments of novel optical fiber

Optomechanical sensor network with fiber Bragg gratings

The authors demonstrated a kilometer-scale optomechanical sensor network by integrating multiple fiber-optic optomechanical sensors into a standard single-mode fiber, enabling

Fiber Bragg grating-based force sensor for the surgical device

To solve the limitation of deficient multi-dimensional force feedback in MIS, we present a series of Fiber Bragg Grating (FBG)-based force sensors, which can detect the surgical device-tissue interaction

An FBG-based optical pressure sensor for the measurement of radial ...

The design and experimental testing of an optical sensor based on Fiber Bragg Gratings (FBG) is presented in this paper. An FBG is used to measure the radial artery pulses using a 3D

Long period fiber grating-based biosensing: Recent trends and future ...

Abstract Decades have passed since the first demonstration of a long-period fiber grating (LPFG) and its practical application for sensors, and, in this period, manufacturing techniques,

Fiber Bragg Grating-Based Force-Torque Sensor with Six Degrees of

They also proposed the use of fiber Bragg gratings (FBGs) as strain sensors applied to the six beams of the transducer structure instead of conventional strain gauges. Puangmali et al. give an overview of

A Fiber Bragg Grating Sensor for Radial Artery Pulse Waveform Measurement

The design and experimental validation of a novel optical sensor for radial artery pulse measurement based on fiber Bragg grating (FBG) and lever amplification mechanism is reported,

Fiber Bragg Grating Sensors: Principles and Applications

Fiber Bragg grating (FBG) optical sensors have emerged as a leading technology for distributed strain and temperature measurement. Their unique attributes—compactness, immunity to electromagnetic

Development of a Hybrid Force-Displacement Sensor Based on Fiber

This paper proposes a novel Fiber Bragg Grating (FBG)-based hybrid force and displacement sensor with a high sensitivity to achieve accurate measurement of radial artery pulse waveforms. The

Design of optical fiber Bragg grating-based sensors for flow ...

Abstract In this work, optical Fiber Bragg grating (FBG) sensors were used to measure water flow in pipes. Several types of coatings were incorporated into the design of the sensors to

Three-Dimensional Force Sensor Based on Fiber Bragg Grating for

Moreover, the force transfer to the base introduces various disturbing forces and the measurement accuracy is low. To reduce the risk of soft tissue being damaged and to enhance the

Recent Advances in Fiber Bragg Grating Sensing

In the vast realm of optical fiber sensing, where precision and innovation converge, Fiber Bragg Gratings (FBGs) stand as luminaries, casting their influence across myriad applications .

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