

Principle of Fiber Optic Torque Sensor



Overview

The Principle of Measurement The measurement system employs four-quadrant photoelectric sensors to convert torque-induced deformations into voltage signals, requiring sensor modules characterized by high sensitivity and precision. Subsequently, the system employs the radial basis function neural network optimized by simulated annealing combined with particle swarm. The highest sensitivity of the sensor tested in our experiments is 1,687 Hz/degree, and the corresponding resolution of torsion angle is up to 0. The proposed sensor is a promising candidate for the. In this paper, we propose and demonstrate experimentally an optomechanical torsion sensor using a microfiber mechanical resonator. The torsion angle could be obtained by monitoring the resonant frequency shifts of the micro fiber resonator. Theoretical and experimental results show that the shift of. To overcome these issues, we have proposed various compliant fiber-optic based force and torque sensors that have proved their capabilities to accurately measure force and torque in three and six directions.



Article Content

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Fiber-optic sensor

A fiber-optic sensor is a sensor that uses optical fiber either as the sensing element ("intrinsic sensors"), or as a means of relaying

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Fiber-optic sensors based on Bragg gratings, long-period gratings, interferometry, surface plasmon resonance (SPR),

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Accurate and efficient monitoring of electrical machine (EM) operating parameters, including temperature, mechanical

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Operating Principle Optical fibers are also attractive for applications in sensing, control and instrumentation. In these areas, optical

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This sensor comprises a torque-sensitive bending structure and two diagonally arranged optical fibers, incorporating

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A direct implication of these constantly growing developments is the recent development of various torque sensors,

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Therefore, the integration of optical fiber sensors in WSNs introduces benefits and new capabilities for the design of advanced hybrid

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45]. Therefore, it is significant to extend optomechanical ultrasensitive sensing mechanisms to fiber-optic sensing

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This work proposes a miniature and high-sensitivity torque sensor that mainly consists of a torque-sensitive flexure

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Currently, torque sensors are classified into 12 types based on different physical principles. These include resistive

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It provides an overview of MRI-compatible fiber optic force sensors based on different sensing principles, including

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