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## Challenges in the Development of Optical Fiber Sensors

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### Message from the Guest Editor

Optical fiber is characterized as being lightweight, flexible, lightning resistant, long-lasting, and explosion proof. It is mainly used for optical communications; however, when used as a sensor, the distribution of temperature, strain, and vibration can be measured over the entire length of a long optical fiber. The general principle of such devices is that light from a laser or a superluminescent source is sent through an optical fiber, experiences subtle changes to its parameters either in the fiber or in one or several fiber Bragg gratings, and then reaches a detector arrangement that measures these changes. For some application areas, optical fiber sensors are increasingly recognized as a technology with very interesting capabilities. This is particularly true for harsh environments, such as sensing in high-voltage and high-power machinery or in microwave ovens. Bragg grating sensors can also be used to monitor conditions, e.g., within the wings of airplanes, in wind turbines, bridges, large dams, oil wells, and pipelines. Placing optical fiber sensors inside the human body can also help researchers and physicians to understand and treat a variety of medical conditions.



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