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Alex A. Kazemi
Christopher S. Baldwin
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Introduction

The field of fiber optic sensors has undergone a remarkable change over the past two decades. Today, a great proportion of the world's communications are carried by fiber optic cables. The fiber optics technology has revolutionized the telecommunications market and is rapidly becoming a major player in such areas as telephone, cable TV, and local-area network (LAN). It has spread into every situation in which information is being transmitted.

More information, intelligence, and data are transferred from one point to another, more quickly and precisely than ever thought possible, thanks to the miracle of optical fibers. As their algorithms and equations are developed and proved, fiber optics shall become as common as wire, easy to construct to precise tolerances, accurate and indefatigable in operation, and a type of circuit which enhances our lives and ways of living.

At the same time fiber optic sensor technology has developed in parallel with fiber optic and other optoelectronics industries such as lasers, which dominate the compact disk, DVD, laser printers, and scanner industries with the most promising uses for lasers and communications over fiber optic cable. In recent years, the fiber optic sensor greatly benefited from the low-cost telecommunications industries. Due to this synergy, an enormous amount of new technologies have been introduced in the form of smart sensors, biomedical sensors, microsensors, pressure, temperature, and liquid level, to name a few.

This book contains a series of papers which contains state-of-the-art fiber optic sensor technologies for photonics in transportation industries such as microsensors for cryogenic hydrogen and oxygen leak detection for space applications, to a new generation of fiber optic sensor using holography for detection of motion and vibration in automobile bumper shock, and finally a 360-degree vision system for transportation.

Alex A. Kazemi

*Dedicated to my wife **MARY** & late father **KAMAL** for their support throughout my life.*

