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# *Photonics in the Transportation Industry: Auto to Aerospace III*

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*Editors*

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# Introduction

Today, a great proportion of the world's communications is carried by fiber optic cables. Over the past three decades, the field of fiber optic sensors has undergone a remarkable change. The fiber optic 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.

I have been greatly impressed over the years by the tremendous progress in photonics in the transportation industry. The technology has gone through a quantum leap. 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. Fiber optics shall become as common as wire, easy to construct to precise tolerances and accurate and perfect in operation.

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 has been introduced in the form of smart sensor, biomedical sensors, pressure, temperature and liquid level, to name a few. At the same time, fiber optic sensor technology and photonics in the transportation industry have developed in parallel with fiber optic and other optoelectronics industries such as lasers, which dominate the compact disk, DVD, laser printer, and scanner industry with the most promising users for lasers and communications over fiber optic cables.

I find myself among pioneers and the thrill of technical achievement can be just as tangible to those of us involved with engineering, technology, and science as the thrill of lifetime accomplishment. This book contains a series of papers that contain state-of-the-art fiber optic sensor technologies for photonics in transportation industries, such as advanced technologies for cryogenic leak detection systems for space applications, a new generation of fiber optic sensor using holography for detection of motion and vibration in automobile bumper shock, and novel optical tags based on planar digital micro-optics that is used for anticounterfeiting.

On behalf of SPIE and myself, I would like to thank the individual authors for their valuable contributions, particularly professor Patrick Meyrueis of the Université de Strasbourg, professor Nabeel Riza of CREOL, the University of Central Florida, Dr. Bernard Kress of USI Photonics Inc., Dr. Allen Panahi of Accro USA LLC, and Dr. Eric Chan of the Boeing Co. for the outstanding papers they presented in this book.

**Alex A. Kazemi**