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Integrated Optics, Microstructures, and Sensors

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Kenichi Iga, Yasuo Kokubun



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Chemical Sensors 246 8 4 3 Extrinsic Chemical Sensors 250 8 4 4 Polymer Waveguide Chemical Sensors 251 8 4 5 Surface Plasmon Chemical Sensors 252 8 4 6 Indicator Mediated Extrinsic Sensing 253 8 4 7 Optical Biosensors 256 8 4 8 Ultrasonic Gas and Chemical Sensors 257 8 4 9 Intelligent Sensors 258 8 5 Connections Links and Wiring 258 8 5 1 Optical Links 260 8 5 2 Requirement on the Processing Unit Intelligence 262 8 6 Actuators 263 8 7 Signal Processing Computing 264 8 7 1 Implicit Computation 266 8 7 2 Explicit Computation 267 8 8 References 274 Subject Index 279 Micro Actuators Electrical Magnetic Thermal Optical Mechanical and Chemical It has become quite apparent that sensors and actuators are the main bottleneck of the modern information processing and control systems Microprocessors and computers used to be the main limiting element in most information processing systems But thanks to the enormous progress in the microelectronics industry most information analysis tasks can be processed in real time The data has to be acquired by the processor in some form and processed and used to produce some useful function in the real world Encyclopedic Handbook of Integrated Optics Kenichi Iga,Yasuo Kokubun,2018-10-03 As optical technologies move closer to the core of modern computer architecture there arise many challenges in building optical capabilities from the network to the motherboard Rapid advances in integrated optics technologies are making this a reality However no comprehensive up to date reference is available to the technologies and principles underlying the field The Encyclopedic Handbook of Integrated Optics fills this void collecting the work of 53 leading experts into a compilation of the most important concepts phenomena technologies and terms covering all related fields This unique book consists of two types of entries the first is a detailed full length description the other a concise overview of the topic Additionally the coverage can be divided into four broad areas A survey of the basics of integrated optics exploring theory practical concerns and the fundamentals behind optical devices Focused discussion on devices and components such as arrayed waveguide grating various types of lasers optical amplifiers and optoelectronic devices In depth examination of subsystems including MEMS optical pickup and planar lightwave circuits Finally systems considerations such as multiplexing demultiplexing 3R circuits transmission and reception Offering a broad and complete treatment of the field the Encyclopedic Handbook of Integrated Optics is the complete guide to the fundamentals principles and applications of integrated optics technology **Fundamental Concepts of Integrated and Fiber Optic Sensors** ,1995 *Fiber-Optic Fabry-Perot Sensors* Yun-Jiang Rao,Zeng-Ling Ran,Yuan Gong,2017-04-27 The authors deliver a complete overview of fiber optic Fabry Perot FFP sensing technology integrating the knowledge and tools of multiple fields including optics sensing micromachining instrumentation physics and materials science The main chapters discuss operating principles microstructures fabrication methods signal demodulation and instrumentation This treatment spans the full range of structures intrinsic extrinsic multimode fiber vs single mode fibers as well as advanced micromachining technologies and major interrogating and multiplexing methods for the formation of multi point quasi distributed sensing networks Readers will also gain a summary of state of the art applications in oil gas and electricity

industries aerospace technology and biomedicine Yun Jiang Rao is Dean of the School of Communication Information Engineering and Director of the Key Lab of Optical Fiber Sensing Communications at the University of Electronic Science and Technology of China Zeng Ling Ran and Yuan Gong are both associate professors at the Optical Fiber Technology Research Laboratory of the University of Electronic Science and Technology of China

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Handbook of Microlithography, Micromachining, and Microfabrication: Micromachining and microfabrication P. Rai-Choudhury, 1997 Focusing on the use of microlithography techniques in microelectronics manufacturing this volume is one of a series addressing a rapidly growing field affecting the integrated circuit industry New applications in such areas as sensors actuators and biomedical devices are described

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Advances in Integrated Optics M. Bertolotti, Arthur N. Chester, S. Martellucci, 2012-12-06 This volwne contains the Proceedings of a two week summer conference titled Advances in Integrated Optics held June 1 9 1993 in Erice Sicily This was the 18th annual course organized by the International School of Quantum Electronics under the auspices of the Ettore Majorana Centre for

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