DESCRIPTION

This book explores the state-of-the art in computational modelling techniques for photonic devices

In this book, the author provides a comprehensive coverage of modern numerical modelling techniques for designing photonic devices for use in modern optical telecommunications systems. In addition the book presents the state-of-the-art in computational photonics techniques, covering methods such as full-vectorial finite-element beam propagation, bidirectional beam propagation, complex-envelope alternative direction implicit finite difference time domain, multiresolution time domain, and finite volume time domain. The book guides the reader through the concepts of modelling, analysing, designing and optimising the performance of a wide range of photonic devices by building their own numerical code using these methods.

Key Features:

• Provides a thorough presentation of the state-of-the art in computational modelling techniques for photonics

• Contains broad coverage of both frequency- and time-domain techniques to suit a wide range of photonic devices

• Reviews existing commercial software packages for photonics

• Presents the advantages and disadvantages of the different modelling techniques as well as their suitability for various photonic devices

• Shows the reader how to model, analyse, design and optimise the performance of a wide range of photonic devices by building their own numerical code using these methods
Accompanying website contains the numerical examples representing the numerical techniques in this book, as well as several design examples (http://www.wiley.com/go/obayya_computational)

This book will serve as an invaluable reference for researchers, optical telecommunications engineers, engineers in the photonics industry. PhD and MSc students undertaking courses in the areas of photonics and optical telecommunications will also find this book of interest.

ABOUT THE AUTHOR

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Salah Obayya received a BSc in Electronics and Communications Engineering from Mansoura University, Egypt in 1991. Between Oct 1991 and Sept 1996 he worked as an Engineer with the Telecommunications Authority, Egypt. In September 1996, Obayya joined the Department of Electrical, Electronic and Information Engineering, City University London to study for his PhD, in which he developed a novel finite element based full vectorial beam propagation algorithm for the analysis of various photonic devices. Following his PhD, and from Jan 2000 to June 2003, Obayya worked as a Senior Research Fellow at the School of Engineering, City University London. In June 2003, he joined the School of Engineering and Design, Brunel University, UK as a Lecturer, and subsequently became a Senior Lecturer in Oct. 2005. In Sept. 2006 Obayya joined Swansea University as a Reader and moved on to the University of Leeds in July 2007. Obayya is currently Full Professor and Chair in Photonics at the University of Glamorgan where he leads the "Photonics Research Group".

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