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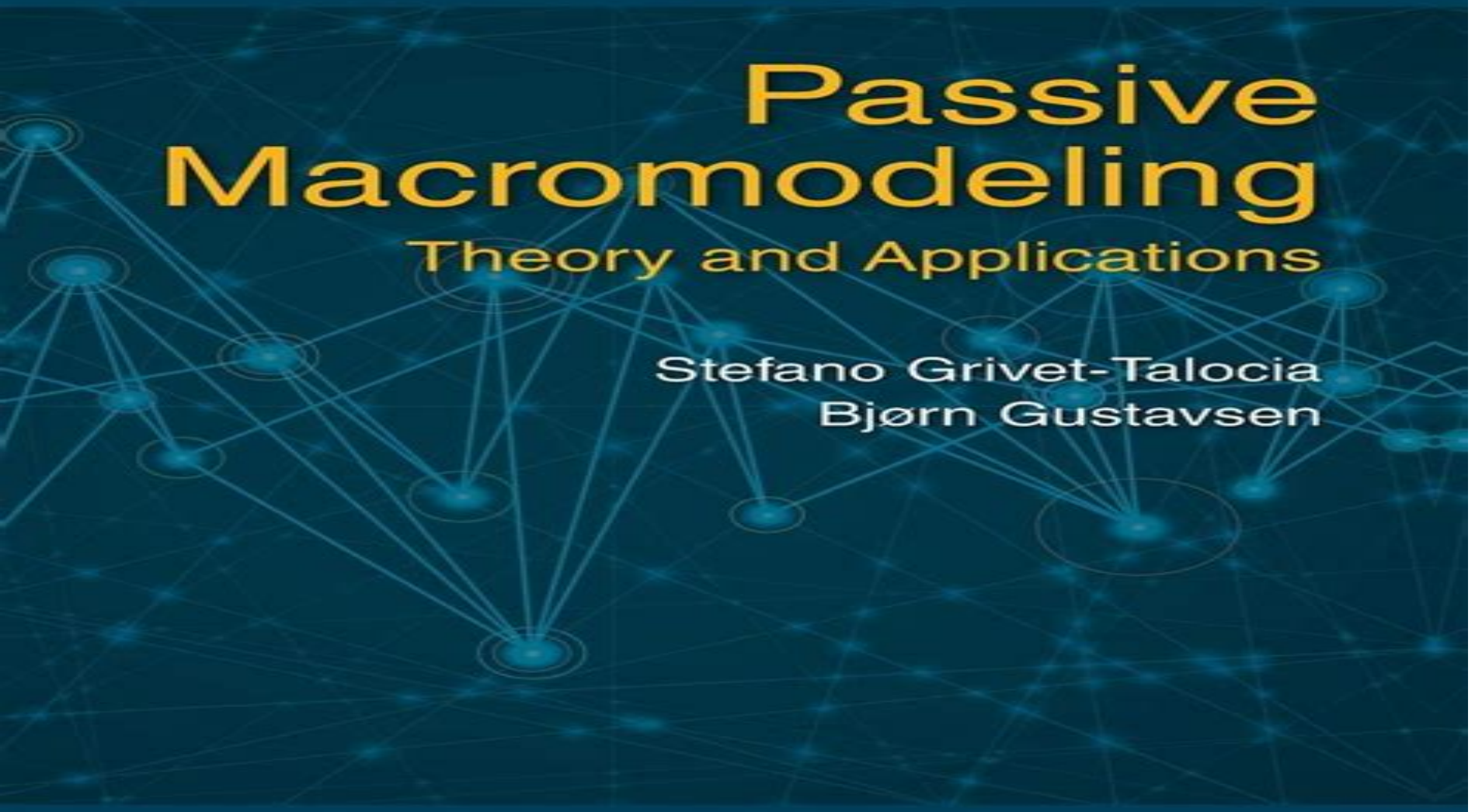

Passive Macromodeling

Theory and Applications

Stefano Grivet-Talocia
Bjørn Gustavsen

WILEY

Passive Macromodeling Theory And Applications Wiley Series In Microwave And Optical Engineering

Ferran Martín,Lei Zhu,Jiasheng Hong,Francisco Medina

Passive Macromodeling Theory And Applications Wiley Series In Microwave And Optical Engineering:

Passive Macromodeling Stefano Grivet-Talocia,Bjorn Gustavsen,2015-10-19 Offers an overview of state of the art passive macromodeling techniques with an emphasis on black box approaches This book offers coverage of developments in linear macromodeling with a focus on effective proven methods After starting with a definition of the fundamental properties that must characterize models of physical systems the authors discuss several prominent passive macromodeling algorithms for lumped and distributed systems and compare them under accuracy efficiency and robustness standpoints The book includes chapters with standard background material such as linear time invariant circuits and systems basic discretization of field equations state space systems as well as appendices collecting basic facts from linear algebra optimization templates and signals and transforms The text also covers more technical and advanced topics intended for the specialist which may be skipped at first reading Provides coverage of black box passive macromodeling an approach developed by the authors Elaborates on main concepts and results in a mathematically precise way using easy to understand language Illustrates macromodeling concepts through dedicated examples Includes a comprehensive set of end of chapter problems and exercises Passive Macromodeling Theory and Applications serves as a reference for senior or graduate level courses in electrical engineering programs and to engineers in the fields of numerical modeling simulation design and optimization of electrical electronic systems Stefano Grivet Talocia PhD is an Associate Professor of Circuit Theory at the Politecnico di Torino in Turin Italy and President of IdemWorks Dr Grivet Talocia is author of over 150 technical papers published in international journals and conference proceedings He invented several algorithms in the area of passive macromodeling making them available through IdemWorks Bj rn Gustavsen PhD is a Chief Research Scientist in Energy Systems at SINTEF Energy Research in Trondheim Norway More than ten years ago Dr Gustavsen developed the original version of the vector fitting method with Prof Semlyen at the University of Toronto The vector fitting method is one of the most widespread approaches for model extraction Dr Gustavsen is also an IEEE fellow *Passive Macromodeling* Stefano Grivet-Talocia,Bjørn Gustavsen,2016 In the first comprehensive treatment of passive macromodeling on the market macromodeling experts Stefano Grivet Talocia and Bjorn Gustavsen address the complex subject with examples of effective proven methods Finally students and researchers may turn to a text that tends to the theoretical background essential to comprehending the algorithms advantages and disadvantages With the latest information on black box passive macromodeling and software implementation this book is a foolproof guide to both the basics and complexities of passive macromodeling R sum de l diteur

Mathematical Optimization for Machine Learning Konstantin Fackeldey,Aswin Kannan,Sebastian Pokutta,Kartikey Sharma,Daniel Walter,Andrea Walther,Martin Weiser,2025-05-06 Mathematical optimization and machine learning are closely related This proceedings volume of the Thematic Einstein Semester 2023 of the Berlin Mathematics Research Center MATH collects recent progress on their interplay in topics such as discrete optimization nonlinear programming optimal

control first order methods multilevel optimization machine learning in optimization physics informed learning and fairness in machine learning Enabling Technologies for High Spectral-efficiency Coherent Optical Communication Networks Xiang Zhou,Chongjin Xie,2016-04-29 Enabling Technologies for High Spectral efficiency Coherent Optical Communication Networks Presents the technological advancements that enable high spectral efficiency and high capacity fiber optic communication systems and networks This book examines key technology advances in high spectral efficiency fiber optic communication systems and networks enabled by the use of coherent detection and digital signal processing DSP The first of this book s 16 chapters is a detailed introduction Chapter 2 reviews the modulation formats while Chapter 3 focuses on detection and error correction technologies for coherent optical communication systems Chapters 4 and 5 are devoted to Nyquist WDM and orthogonal frequency division multiplexing OFDM In chapter 6 polarization and nonlinear impairments in coherent optical communication systems are discussed The fiber nonlinear effects in a non dispersion managed system are covered in chapter 7 Chapter 8 describes linear impairment equalization and Chapter 9 discusses various nonlinear mitigation techniques Signal synchronization is covered in Chapters 10 and 11 Chapter 12 describes the main constraints put on the DSP algorithms by the hardware structure Chapter 13 addresses the fundamental concepts and recent progress of photonic integration Optical performance monitoring and elastic optical network technology are the subjects of Chapters 14 and 15 Finally Chapter 16 discusses spatial division multiplexing and MIMO processing technology a potential solution to solve the capacity limit of single mode fibers Contains basic theories and up to date technology advancements in each chapter Describes how capacity approaching coding schemes based on low density parity check LDPC and spatially coupled LDPC codes can be constructed by combining iterative demodulation and decoding Demonstrates that fiber nonlinearities can be accurately described by some analytical models such as GN EGN model Presents impairment equalization and mitigation techniques Enabling Technologies for High Spectral efficiency Coherent Optical Communication Networks is a reference for researchers engineers and graduate students **Inverse Synthetic Aperture Radar Imaging With MATLAB Algorithms** Caner Ozdemir,2021-03-24 Build your knowledge of SAR ISAR imaging with this comprehensive and insightful resource The newly revised Second Edition of Inverse Synthetic Aperture Radar Imaging with MATLAB Algorithms covers in greater detail the fundamental and advanced topics necessary for a complete understanding of inverse synthetic aperture radar ISAR imaging and its concepts Distinguished author and academician Caner zdemir describes the practical aspects of ISAR imaging and presents illustrative examples of the radar signal processing algorithms used for ISAR imaging The topics in each chapter are supplemented with MATLAB codes to assist readers in better understanding each of the principles discussed within the book This new edition incudes discussions of the most up to date topics to arise in the field of ISAR imaging and ISAR hardware design The book provides a comprehensive analysis of advanced techniques like Fourier based radar imaging algorithms and motion compensation techniques along with radar fundamentals for readers new to the

subject The author covers a wide variety of topics including Radar fundamentals including concepts like radar cross section maximum detectable range frequency modulated continuous wave and doppler frequency and pulsed radar The theoretical and practical aspects of signal processing algorithms used in ISAR imaging The numeric implementation of all necessary algorithms in MATLAB ISAR hardware emerging topics on SAR ISAR focusing algorithms such as bistatic ISAR imaging polarimetric ISAR imaging and near field ISAR imaging Applications of SAR ISAR imaging techniques to other radar imaging problems such as thru the wall radar imaging and ground penetrating radar imaging Perfect for graduate students in the fields of electrical and electronics engineering electromagnetism imaging radar and physics Inverse Synthetic Aperture Radar Imaging With MATLAB Algorithms also belongs on the bookshelves of practicing researchers in the related areas looking for a useful resource to assist them in their day to day professional work *Balanced Microwave Filters* Ferran Martín,Lei Zhu,Jiasheng Hong,Francisco Medina,2018-02-26 This book presents and discusses strategies for the design and implementation of common mode suppressed balanced microwave filters including narrowband wideband and ultra wideband filters This book examines differential mode or balanced microwave filters by discussing several implementations of practical realizations of these passive components Topics covered include selective mode suppression designs based on distributed and semi lumped approaches multilayer technologies defect ground structures coupled resonators metamaterials interference techniques and substrate integrated waveguides among others Divided into five parts Balanced Microwave Filters begins with an introduction that presents the fundamentals of balanced lines circuits and networks Part 2 covers balanced transmission lines with common mode noise suppression including several types of common mode filters and the application of such filters to enhance common mode suppression in balanced bandpass filters Next Part 3 examines wideband and ultra wideband UWB balanced bandpass filters with intrinsic common mode suppression Narrowband and dual band balanced bandpass filters with intrinsic common mode suppression are discussed in Part 4 Finally Part 5 covers other balanced circuits such as balanced power dividers and combiners and differential mode equalizers with common mode filtering In addition the book Explores a research topic of increasing interest due to the growing demand of balanced transmission lines and circuits in modern communication systems Includes contributions from prominent worldwide experts in the field Provides readers with the necessary knowledge to analyze and synthesize balanced filters and circuits Balanced Microwave Filters is an important text for R D engineers professionals and specialists working on the topic of microwave filters Post graduate students and Masters students in the field of microwave engineering and wireless communications especially those involved in courses related to microwave filters and balanced filters and circuits will also find it to be a vital resource **Interpolatory Methods for Model Reduction** A. C. Antoulas,C. A. Beattie,S. Gü?ercin,2020-01-13 Dynamical systems are a principal tool in the modeling prediction and control of a wide range of complex phenomena As the need for improved accuracy leads to larger and more complex dynamical systems direct simulation often becomes the only available

strategy for accurate prediction or control inevitably creating a considerable burden on computational resources This is the main context where one considers model reduction seeking to replace large systems of coupled differential and algebraic equations that constitute high fidelity system models with substantially fewer equations that are crafted to control the loss of fidelity that order reduction may induce in the system response Interpolatory methods are among the most widely used model reduction techniques and Interpolatory Methods for Model Reduction is the first comprehensive analysis of this approach available in a single extensive resource It introduces state of the art methods reflecting significant developments over the past two decades covering both classical projection frameworks for model reduction and data driven nonintrusive frameworks This textbook is appropriate for a wide audience of engineers and other scientists working in the general areas of large scale dynamical systems and data driven modeling of dynamics **Coupled Multiscale Simulation and Optimization in Nanoelectronics** Michael Günther,2015-06-15 Designing complex integrated circuits relies heavily on mathematical methods and calls for suitable simulation and optimization tools The current design approach involves simulations and optimizations in different physical domains device circuit thermal electromagnetic and in a range of electrical engineering disciplines logic timing power crosstalk signal integrity system functionality COMSON was a Marie Curie Research Training Network created to meet these new scientific and training challenges by a developing new descriptive models that take these mutual dependencies into account b combining these models with existing circuit descriptions in new simulation strategies and c developing new optimization techniques that will accommodate new designs The book presents the main project results in the fields of PDAE modeling and simulation model order reduction techniques and optimization based on merging the know how of three major European semiconductor companies with the combined expertise of university groups specialized in developing suitable mathematical models numerical schemes and e learning facilities In addition a common Demonstrator Platform for testing mathematical methods and approaches was created to assess whether they are capable of addressing the industry s problems and to educate young researchers by providing hands on experience with state of the art problems *Multigrid Finite Element Methods for Electromagnetic Field Modeling* Yu Zhu,Andreas C. Cangellaris,2006-02-17 This is the first comprehensive monograph that features state of the art multigrid methods for enhancing the modeling versatility numerical robustness and computational efficiency of one of the most popular classes of numerical electromagnetic field modeling methods the method of finite elements The focus of the publication is the development of robust preconditioners for the iterative solution of electromagnetic field boundary value problems BVPs discretized by means of finite methods Specifically the authors set forth their own successful attempts to utilize concepts from multigrid and multilevel methods for the effective preconditioning of matrices resulting from the approximation of electromagnetic BVPs using finite methods Following the authors careful explanations and step by step instruction readers can duplicate the authors results and take advantage of today s state of the art multigrid multilevel preconditioners for finite

element based iterative electromagnetic field solvers Among the highlights of coverage are Application of multigrid multilevel and hybrid multigrid multilevel preconditioners to electromagnetic scattering and radiation problems Broadband robust numerical modeling of passive microwave components and circuits Robust finite element based modal analysis of electromagnetic waveguides and cavities Application of Krylov subspace based methodologies for reduced order macromodeling of electromagnetic devices and systems Finite element modeling of electromagnetic waves in periodic structures The authors provide more than thirty detailed algorithms alongside pseudo codes to assist readers with practical computer implementation In addition each chapter includes an applications section with helpful numerical examples that validate the authors methodologies and demonstrate their computational efficiency and robustness This groundbreaking book with its coverage of an exciting new enabling computer aided design technology is an essential reference for computer programmers designers and engineers as well as graduate students in engineering and applied physics **Asymmetric Passive Components in Microwave Integrated Circuits** Hee-Ran Ahn,2006-07-14 This book examines the new and important technology of asymmetric passive components for miniaturized microwave passive circuits The asymmetric design methods and ideas set forth by the author are groundbreaking and have not been treated in previous works Readers discover how these design methods reduce the circuit size of microwave integrated circuits and are also critical to reducing the cost of equipment such as cellular phones radars antennas automobiles and robots An introductory chapter on the history of asymmetric passive components which began with asymmetric ring hybrids first described by the author sets the background for the book It lays a solid foundation with a chapter examining microwave circuit parameters such as scattering ABCD impedance admittance and image A valuable feature of this chapter is a conversion table between the various circuit matrices characterizing two port networks terminated in arbitrary impedances The correct conversion has also never been treated in previous works Next the author sets forth a thorough treatment of asymmetric passive component design which covers the basic and indispensable elements for integration with other active or passive devices including Asymmetric ring hybrids Asymmetric branch line hybrids Asymmetric three port power dividers and N way power dividers Asymmetric ring hybrid phase shifters and attenuators Asymmetric ring filters and asymmetric impedance transformers With its focus on the principles of circuit element design this is a must have graduate level textbook for students in microwave engineering as well as a reference for design engineers who want to learn the new and powerful design method for asymmetric passive components *Balanced Microwave Filters* Ferran Martín,Lei Zhu,Jiasheng Hong,Francisco Medina,2018-02-26 This book presents and discusses strategies for the design and implementation of common mode suppressed balanced microwave filters including narrowband wideband and ultra wideband filters This book examines differential mode or balanced microwave filters by discussing several implementations of practical realizations of these passive components Topics covered include selective mode suppression designs based on distributed and semi lumped approaches multilayer technologies defect ground

structures coupled resonators metamaterials interference techniques and substrate integrated waveguides among others Divided into five parts Balanced Microwave Filters begins with an introduction that presents the fundamentals of balanced lines circuits and networks Part 2 covers balanced transmission lines with common mode noise suppression including several types of common mode filters and the application of such filters to enhance common mode suppression in balanced bandpass filters Next Part 3 examines wideband and ultra wideband UWB balanced bandpass filters with intrinsic common mode suppression Narrowband and dual band balanced bandpass filters with intrinsic common mode suppression are discussed in Part 4 Finally Part 5 covers other balanced circuits such as balanced power dividers and combiners and differential mode equalizers with common mode filtering In addition the book Explores a research topic of increasing interest due to the growing demand of balanced transmission lines and circuits in modern communication systems Includes contributions from prominent worldwide experts in the field Provides readers with the necessary knowledge to analyze and synthesize balanced filters and circuits Balanced Microwave Filters is an important text for R D engineers professionals and specialists working on the topic of microwave filters Post graduate students and Masters students in the field of microwave engineering and wireless communications especially those involved in courses related to microwave filters and balanced filters and circuits will also find it to be a vital resource

Reviewing **Passive Macromodeling Theory And Applications Wiley Series In Microwave And Optical Engineering**: Unlocking the Spellbinding Force of Linguistics

In a fast-paced world fueled by information and interconnectivity, the spellbinding force of linguistics has acquired newfound prominence. Its capacity to evoke emotions, stimulate contemplation, and stimulate metamorphosis is truly astonishing. Within the pages of "**Passive Macromodeling Theory And Applications Wiley Series In Microwave And Optical Engineering**," an enthralling opus penned by a highly acclaimed wordsmith, readers embark on an immersive expedition to unravel the intricate significance of language and its indelible imprint on our lives. Throughout this assessment, we shall delve into the book is central motifs, appraise its distinctive narrative style, and gauge its overarching influence on the minds of its readers.

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