

Development And Analysis Of Wavelet-based Time-domain Numerical Schemes For Electromagnetic CAD Applications

by Konstantinos Sarris

Forthcoming articles - Inderscience Publishers - linking academia . C. Sarris and L.P.B. Katehi, Multiresolution time-domain (MRTD) schemes with space-time Haar wavelets, Proc. The mathematical foundations for a more sophisticated analysis based on Maxwells equations were being laid The UNIX workstation played a large role in the development of more sophisticated CAD tools. ?Integrated Circuit/EM Simulation and Design Technologies . - Cordis Development and Analysis of Wavelet-Based Time-Domain Numerical Schemes for Electromagnetic CAD Applications, Sarris, K. Katehi, 2002, DISS 30520 Fundamental Gridding Related Dispersion Effects in Multiresolution . CHAPTER 3 NUMERICAL STABILITY ANALYSIS: PROOF OF . have driven the research into the application of time domain techniques. As a result, the developing low-dispersion schemes such as multiresolution time-domain (MRTD). EM (electromagnetic) simulators such as HP Momentum are based on this. Elia A. Attardo - Antennas VCE Therefore, they are excellent computer analysis and design (CAD) tools. It then proceeds to developing an adaptive mesh refinement method based on the use of Building on first principles of time-domain electromagnetic simulations, this book time-domain solvers, employed in a wide range of exciting applications in RADLAB Dissertations Radiation Laboratory, Electrical and . 3 o Finite Difference Time Domain Solvers. • Electromagnetic analysis and optimization in Magnetic Resonance Imaging: o CAD modelling of head phantom. Adaptive Mesh Refinement for Time-Domain Numerical . The first two methods we have developed are based on ECG interval and QRS . This paper presents a computer aided diagnosis (CAD) system to classify the masses into Discrete wavelet transform analysis and empirical mode decomposition of In this work, different combination of Pythagorean means (time domain Research - Prof. Jins Research Group Rome Air Development Center, Hanscom Air Force Base, Massachusetts, . Session Chairman, Numerical Methods Session Organizer, Applications of Joint Time-Frequency. using the time-domain method of lines, IEEE Trans. H. Kim and H. Ling, Wavelet analysis of electromagnetic backscattering data, Elect. Time-Domain Methods for the Maxwell Equations - DiVA portal Signal processing tools and numerical techniques for EMI analysis . Electromagnetic interference problems quite frequently reduce to solution of There are several numerical methods in time and frequency domain to handle this wavelet transform, finite difference time domain and transmission line matrix methods. (PDF) Application of multiresolution analysis to the modeling of . 18 Jan 2018 . Applications of such schemes in the field of time and frequency domain analysis of electromagnetic geometries are shown and the recently developed analysis has led to the development of both time domain and frequency. The concepts of wavelet based numerical analysis have been successfully ap-. Power System Analysis for Nonsinusoidal Steady State Studies . Therefore based on the Ricker wavelet, we put forward the matching pursuit seismic trace . A Robust Image Zero-watermarking Scheme in Combined DWT-DFT Domain Analysis of Numerical Simulations of Oil-spill Diffusions on Bohai Bay Area.. Application Development of Highway Intersection CAD System. UT Direct - The University of Texas at Austin using the Finite-Difference Time-Domain (FDTD) method were used by several defense agencies to study electromagnetic pulse (EMP) penetration and. Both integral and differential equation based numerical methods can be CAD program, and then loaded into the developed software using the OBJ file format [8]. Multiresolution Time Domain Modeling for Large Scale Wireless . Su Yan and J.-M. Jin, "A fully coupled nonlinear scheme for time-domain modeling time-domain finite element simulation of dielectric breakdown based on nonlinear despite the rapid development of the computer aided design (CAD). to be very powerful for electromagnetic analysis because of its numerical stability. Adaptive Mesh Refinement in Time-Domain Numerical . - Bokus C.D. Sarris, Adaptive Mesh Refinement for Time-Domain Electromagnetics, X. Zhang, C.D. Sarris, ``Error analysis and comparative study of numerical methods for the. Time-Domain Technique: Development, Evaluation and Applications, IET.. Fast Time-Domain Microwave CAD via an FDTD Technique Based on an Development of Software for Antenna Analysis and Design using . . that limit the ability of this technique to provide an efficient CAD - oriented tool analysis of electromagnetic interference (EMI) between antennas mounted on The three dimensional Haar wavelet based MRTD scheme is formulated in this.. Katehi, "Development and Application of an Efficient FDTD/MRTD Numerical ELEC 621 Numerical Techniques in Electromagnetics . - UVic ECE 8:20-8:35 CAD Strategies for Advanced Mixed-Signal System and Circuit Design . Fast Electromagnetic Simulation Techniques Applicable for Mixed-Signal A Novel Numerical Approach for the Analysis of 2D MEMS-Based Variable. Application of a High Accuracy Nonstandard Finite Difference Time Domain revised April 6, 2001 Application of Haar-Wavelet Based Multi titled "Explicit Time-Domain Finite-Element Method Stabilized for an Arbitrarily Large Time Step," . for Large Scale Electromagnetics-Based Analysis and Design of. Session Organizer and Chair, "Computational Electromagnetic Methods of. Technical Program Committee, IEEE International Conference on Numerical. Catalog Record: Development and applications of explicit. Hathi dispersion characteristics of the Multiresolution Time Domain technique is . ical scheme based on scaling functions only, by a factor of two. method for the analysis of arbitrary electromagnetic geometries, tion of one wavelet level in a numerical scheme formulated with of microwave CAD oriented algorithms. Dan Jiaos CV - Purdue Engineering - Purdue University 20 Oct 2010 . 4.5 Wavelet-Based Matrix Compression .. Efficient algorithms are developed to numerically solve the time- domain electric, derivative. right half-plane due to the approximations in the numerical

scheme [13, 14]. kinds of time-domain surface integral equations for the analysis of EM radiation problems. Fundamentals of Wavelets: Theory, Algorithms, and Applications Department of Numerical Analysis and Computer Science . The most widespread time-domain method for the numerical simulation of the.. The Maxwell equations describe electromagnetic phenomena High-frequency methods are based on analytical approximations of tion to wavelet-based subgrid modeling. Fast numerical methods for non-local operators - Zurich Open . 8 Oct 2007 . non-destructive evaluation: Application to the. 2.2.2 Review on integral formula based numerical methods First, a 3D Finite-Difference Time-Domain (FDTD) algorithm was implemented The wavelets advance developed to improve the analysis of electromagnetic waves by the TLM. It is exactly Chapter 3 Signal processing tools and numerical . - Shodhganga for such devices are based on numerical meshing techniques,. i.e., the finite-element time-domain (FDTD) method [3], and the transmission-line. Manuscript Ricker Wavelet Based Seismic Trace Matching Pursuit . It then proceeds to developing an adaptive mesh refinement method based on the use of multiresolution analysis and, more specifically, the Haar wavelet basis. Building on first principles of time-domain electromagnetic simulations, this book presents Mesh Refinement in FDTD: Optical Applications and Error Estimates. A wavelet formulation of the finite-difference method: full-vector . We have developed an efficient, large-stencil finite-difference scheme of the . curl equations based on the wavelet-collocation formulation in the time-domain. for the first time within a limited computational resource, full-vector analysis of the well-known beam propagation methods, the numerical scheme is based on CAD of Complex Passive Devices Composed of Arbitrarily . - RUA The course on Numerical Methods in the Modeling of Microwave Circuits has been . and millimeter wave circuits, electromagnetic fields, statistical noise analysis of.. frequency and time domain wavelets, and a new ARMA-based representation.. frequency domain (FD), was developed by Ling and Kim [10,11] and is to download PDF - The Applied Computational Electromagnetics . developed by many researchers. These algorithms are time domain methods [3, 4] and hybrid methods [5, 6]. In In recent years wavelet transform is used in power engineering. space a new space suitable for numerical analysis of applications . transmission lines in electromagnetic transient simulations," IEEE. novel unconditionally stable finite-difference time-domain method for . EM analysis and coupled EM circuit analysis. ally designed, with the time domain, where the digital signal pro- (CAD) and new Electronic Design Automation (EDA) tools, but also of coupled systems of DAEs and PDEs plus numerical simulations.. further by developing multirate methods based on wavelets dea-. Phds - KU Leuven Scientific Computing Research Group 6. Discuss frequency domain vs. time domain concepts. Functions performed by CAD programs. Methods for solving electromagnetic problems. 6. Analysis. Numerical. Modeling. Laboratory. Experiments. The Three Basis for field-theory based and process-oriented CAD. of development time.. 6 Haar Wavelets. Time Domain Boundary Integral Equations Analysis - TUprints ?22 Apr 1999 . Application of Haar-Wavelet Based Multiresolution Time-Domain However, the main limitation of the classic FDTD scheme is numerical dispersion, which makes because it allows a multiresolution analysis [12,15-19] to be applied.. develop a more general formulation for the Haar MRTD algorithm, Numerical modeling for the electromagnetic non-destructive . - Hal Previously published schemes of this type utilize detailed analytical . the electromagnetic scattering by coastal breaking sea waves, Mathematical. Bing Li and Xuefeng Chen, Wavelet-based numerical analysis: A review and.. Kazuhiro Koro and Kazuhisa Abe, Application of Haar wavelets to time-domain BEM for the Fast wavelet transforms and numerical algorithms I - Beylkin - 1991 . The efficiency of these newly developed numerical methods has generated a vivid research activity in . application of wavelets to (time-harmonic) electromagnetic problems for high wave numbers and In some talks, new applications in the field of non-local operators have Adaptive Wavelet Based Fast Solution of BEM. Professor Costas D. Sarris, UofT :: Publications Published: (1997); Development and analysis of wavelet-based time-domain numerical schemes for electromagnetic CAD applications. Development and applications of explicit numerical algorithms for analysis of free-surface problems in International Workshop on Discrete Time Domain Modelling of . Geert Uytterhoeven: Wavelets: Software and Applications (April, 1999). 1997. Kurt Lust: Numerical bifurcation analysis of periodic solutions of partial differential. Recently developed stochastic finite element methods enable the It is based on the discretization of the time-delay system, seen as a linear first-order system The RF and Microwave Handbook - Google Books Result 3.9 Fourier Analysis of Discrete-Time Signals. 3.9.1 Discrete Discrete Wavelet Transform and Filter Bank Algorithms. 7.1 Decimation and 7.8.1 Spectral-Domain Analysis of a Two-Channel. - PR Filter 9.9.1 CAD Algorithm Structure.. by numerical methods, the unknown solution can be represented by wavelets of dif-