Veröffentlichte Fachartikel

2009

Guttman Scaling in the FMEA of IT Security Objectives in Enterprises

European Safety and Reliability Conference (ESREL 09)
September 2009, Prag, Tschechien

Verfasser

R. Mock, E. Kollmann, C. Ballhaus, H. Straumann

Abstract

On the strength of experience with risk analysis methodology in IT-operating enterprises, an approach has to be able to deal with limited resources. This prompts an analyst to perform a heuristic and biased approach, which is typically a questionnaire structured by a IT security standard. The difficulty is to draw up a limited set of concise IT security related questions, which result in meaningful outcomes for IT risk analysis purposes. In the proposed approach, the Code of Practice ISO/IEC 27002 is used to structure the analysis and to restrict the number of questions. The Code's recommendations are rephrased and a Guttman scale is introduced for an IT security FMEA-like risk analysis approach. For frequency assessments it is assumed that an implemented high-level security measurement results in low frequencies of undesired events. The paper pictures the adapted IT-FMEA approach and presents the results of a feasibility study at Switzerland's leading telecom provider.

2008

Implementation of Risk and Reliability Analysis Techniques in ICT

European Safety and Reliability Conference (ESREL 08)
September 2008, Valencia, Spanien

Verfasser

R. Mock, E. Kollmann, & E.Bünzli

Abstract

Many industry sectors look back on a downright success story in development and implementing risk and reliability analysis methods. However the application of these methods seems to be questionable to enterprises in the area of information and communication technology (ICT) even though risk and reliability assessments are prominent on company and superordinate level. Major causes of reluctance are addressed in the paper:sophisticated analyses are not in line with the allocated resources. The acceptance of risk analysis methods in ICT strictly requires the inclusion of IT security issues and associated standards. The full performance of risk analysis to support the ranking of hazards or threats and prioritisation of measurements is often unknown to IT practitioners.The paper presents three projects accomplished at ICT operating enterprises in Switzerland in order to encircle the actual application of risk and reliability analyses in practice. Furthermore, it is outlined that national institutions as MELANI (Swiss Federal "Reporting and Analysis Centre for Information Assurance") support the risk analyses in enterprises. In order to communicate the full

performance of risk and reliability methodology to IT practitioners, an extended educational concept is briefly presented.(ESREL 08; Vol 4). Valencia: Taylor & Francis; p. 2641-1421

Web-splines for electromagnetic theory

IEEE European Electromagnetics (EUROEM'08)
July 2008, Lausanne, Switzerland

Verfasser

G. Apaydin, N. Ari

Abstract

The analyses presented in this study show the suitability of the proposed method to complex electromagnetic (EM) problems. The finite element method (FEM) which uses weighted extended basis-splines (web-splines) is applied to waveguides of arbitrary domain. The eigenvalue analysis is used to compare the proposed method with the standard FEM. Firstly; homogeneous essential boundary conditions can be modeled via weight function, which is zero on the boundary and positive in the domain. Secondly, a well conditioned basis can be obtained by extended b-splines. Combining these two ideas gives the definition of web-splines.

Download

Web-splines for electromagnetic theory	PDF		307 KB

Use of web-splines of arbitrary domain for waveguides

IEEE Mathematical Methods in Electromagnetic Theory (MMET'08)
June 2008, Odessa, Ukraine

Verfasser

G. Apaydin, N. Ari

Abstract

This paper illustrates the weighted extended b-splines as basis functions of finite element method of arbitrary domain for waveguides. This method does not need mesh generation for applications. The results are compared with the finite element method with triangulation method using Lagrange basis functions. This method can be used in more electromagnetic applications for future studies.

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Use of Web-splines of arbitrary domain for waveguides	PDF		405 KB

New physical discrete UHF multilayer propagation model for urban areas

Applied Computational Electromagnetics Society Journal, vol 23, no. 2
June 2008 (SCI)

Verfasser

S. Seker, G. Apaydin

Abstract

In this paper, a newly developed discrete multilayer propagation model using scattering theory is studied using rectangular lossy multilayer dielectric plates which model the walls, the streets, and avenues in urban areas. The model is presented to study radio wave propagation in street environments and to compare it with previous theoretical and experimental studies. Good agreements are found. Using the developed model, it is possible to calculate the contributions of direct and scattered wave separately. The simulations reveal that the developed model can be applicable for a broad band of frequencies. This model can be used effectively for prediction of loss characteristics in a situation when two antennas are located below the rooftops in conditions of direct visibility.

Keywords

Discrete model, path loss, urban areas, scattering, multilayer propagation model

Download

New physical discrete UHF multilayer propagation model for urban areas	PDF		268 KB

Application of web-spline method in electromagnetics

Int. Journal of electronics and Communicatins, vol. 62, no. 3, pp. 163-173,
Mar. 2008 (SCI)

Verfasser

G. Apaydin, S. Seker, N. Ari

Abstract

The finite element method, which uses weighted extended basis splines (web-splines) for solving two-dimensional electromagnetic wave equations, has been studied. The web-spline method, which does not need any mesh generation, is implemented easily. The web-spline method is more accurate numerical technique than the standard finite-element method. This new approach is applied to two-dimensional wave equations. The approximated solutions are compared with the literature. Using web-splines, more accurate results are obtained with fewer nodes.

Keywords

Electromagnetics; Finite element method; Wave equation; Waveguides; Web-splines

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Application of web-spline method in electromagnetics	PDF		636 KB

2007

Electromagnetic scattering properties of thin curved dielectric surface and cylinder

Asia pacific Microwave Conference (APMC'07), December 2007, Bangkok, Tailand

Verfasser

S. Seker, G. Apaydin,

Abstract

Electromagnetic (EM) scattering from curved surface and cylinder is important in the area of propagation and remote sensing in order to determine EM properties of scatterers. The radar cross sections (RCS) of a dielectric thin curved surface and cylinder are obtained by employing a quasi-static approximation. The results are complemented by numerical calculations and their validity is presented by comparison with available exact results in literature. Excellent agreement is found for horizontal and vertical polarization.

Keywords

dielectric surface; radar cross section; scattering

Download

Electromagnetic scattering properties of thin curved dielectric surface and cylinder	PDF		3.51 MB

Electronic information system for educational institutions

4th International on Electronics and Computer, October 2007, Bishkek, Kyrgyzstan

Verfasser

P. Schmid G. Apaydin

Abstract

Nothing is carved in stone, especially not the timetables at universities. But the students and the lecturers have to be informed about the daily changes. Computers are at reasonable prices and excellent free software is available. Why not build an electronic information system from scratch using these components?

Download

Electronic information system for educational institutions	PDF		423 KB

Weighted extended b-splines for one-dimensional electromagnetic problems

Applied Mathematics and Computation, vol. 190, no. 2, pp. 1125-1135,
July 2007 (SCI)

Verfasser

G. Apaydin, S. Seker, N. Ari

Abstract

This paper considers the weighted extended b-splines as basis function for finite element method in electromagnetics and compares with the standard finite element method applied to the two-point boundary value problems with different boundary conditions. This new approach, which provides more accurate results than standard finite element method, is presented to compare other numerical techniques and applied to one-dimensional electromagnetic problems. Computed results are compared with other numerical results in literature.

Keywords

b-Splines; Electromagnetics; Finite element method; Web-splines

Download

Weighted extended b-splines for one-dimensional electromagnetic problems PDF 461 KB

Application of web-spline for coaxial waveguides

International Review of Progress in Applied Computional Electromagnetics (ACES'07)
March 2007, Verona, Italy

Verfasser

G. Apaydin, S. Seker, N. Ari

Abstract

This paper illustrates the weighted extended b-splines as basis functions for finite element method in electromagnetics. This method does not need mesh generation, and is applied to coaxial waveguide applications. The results are compared with the exact solutions in literature. The maximum relative error is used for comparison. This method can be used in more electromagnetic applications for future studies.

Keywords

Finite Element Method, Waveguides, Web-splines

Download

Application of web-spline for coaxial waveguides PDF 511 KB

2006

Information Systems Risk Analysis by Agent-based Modelling of Business Processes

Proceedings of the European Safety and Reliability Conference 2006 (ESREL 2006)

September 2006, Estoril, Portugal

Verfasser

M. Kaegi, R. Mock, R. Ziegler & R. Nibali

Abstract

Today society highly relies on complex information and communication
technology (ICT). However, this technology is difficult to handle for established risk and reliability analysis modelling techniques (e.g.Markov chains) in practice. In this regard analysis techniques need sophisticated capabilities to represent complex systems as well as applicability in a business framework. High-level Petri nets and agent-based modelling (ABM) overcome a few methodological constraints in risk analysis. However, the former looks laborious in practice when trying to extract risk and reliability figures. Changing the view from ICT to conceptual information
systems simplifies their representation and opens managerial knowledge sources. In this paper, an ABM technique is used. The associated metamodel consists of business processes, modelled by event-driven process chains and simulated by the means of a discrete event ABM (including human interactions, hardware failures, etc.). The case study "Ticket Reseller" shows and discusses its feasibility.
London: Taylor & Francis; p. 2277 2284

Java-applet for wire interconnects as radiators

3rd International Conference on Electronics and Computer, April 2006, Bishkek Kyrgystzan

Verfasser

G. Apaydin, N. Ari

Abstract

This study illustrates b-splines as basis function for FEM in electromagnetics. The wave equation for one dimension has been compared with the exact results. Accurate and fast results are obtained while increasing order. This method can be used in electromagnetic applications in order to get better approximation in higher dimensions.

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Java-applet for wire interconnects as radiators	PDF		177 KB

2005

Risk Analysis of Information Systems by Event Process Chains

Int. Journal of Critical Infrastructures (Vol. 1, Nos. 2/3)

Verfassser

R. Mock, M. Corvo

Abstract

Information and Communication Technology (ICT) has an important impact on critical infrastructure operation. However, the current use of risk analysis techniques has reached its limits when analysing these systems at least in practical terms. The application of extended event process chains (EPC) bypasses some of the difficulties, as they model business processes within an information system instead of much more complex hardware architectures and software interactions. The methodology
described in this paper integrates ARIS (Architecture Integrated Information Systems) and FMEA (Failure Mode and Effects Analysis), i.e., a business modelling method based on EPCs and a risk assessment technique which are well established in their areas of application and branches of competence. A novel risk representation is discussed. The practicability of the methodology is demonstrated by a feasibility study.
Geneva: Inderscience Enterprises, 2005; p. 247 257

Symbolic Computation Techniques Using Maple

International Conference on Electronics and Computer
6. Mai 2005 Bishkek, Kyrgyzstan

Verfasser

Niyazi Ari, Jusupov Usonbek, Taalaibek Ashirov Bostonbekovic

Abstract

This paper deals with Maple as a symbolic computation techniques. After introduction some capabilities of Maple, somme examples have been discussed to illustrate the Maple. A teaching model at a University is given within the conclusions.

Keywords

symbolic computation techniques, Maple

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Symbolic Computation Techniques Using Maple	PDF		92 KB

DSP and microcrocontroller functions on one board using FPGA

International Conference on Electronics and Computer
6. Mai 2005 Bishkek, Kyrgyzstan

Verfasser

Prof. Georg Brügger, Taalaibek Ashirov Bostobekovic

Abstract

Understanding the fundamental structure of the universal Digital Signal Processor [DSP] Technology like as the mathematical and the different special commands written by the designated Assembler or High Level Language must be the first step in working with DSP. Learning the power of the different parallel mechanism given for the most DSP is one possibility to starting up with this powerful universal tool.

Keywords

Digital Signal Processor [DSP], Microcontroller

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DSP and microicrocontroller functions on one board using FPGA	PDF		66 KB

EMC-Education

International Conference on Electronics and Computer
6. Mai 2005 Bishkek, Kyrgyzstan

Verfasser

Prof. Dr. sc. techn. ETH Niyazi Ari, Baha Kanberoglu, Usonbek Jusupov

Abstract

The industry needs good EMC Engineers, not only for efficient solving the problems, but and for organising EMC management and EMC related products (and systems) development.
For the education of engineers in the EMC domain, we present the following possibilities: University activities, in-house courses for industry and co-ordination between University and Industry. This paper illustrates an education programm for engineers.
Main programm of the EMC-Education must include: Theory and numerical experiments; Experiments in EMC Labs and case studies.

Keywords

EMC

Download

EMC-Education	PDF		414 KB

RCS modelling and Simulation of curved arbitrary dielectric surfaces

LAPC/IEEE, April 2005, Loughborough, UK

Verfasser

S. Seker, G.Apaydin, R. Lang

Abstract

In this paper we have introduced new RCS model for the curved arbitrary dielectric surfaces, which can be thought as consisting of N rectangular lossy dielectric plates. Our simulations revealed that the developed model is applicable for a broad band of frequencies. This model can be used effectively for prediction of RCS in situation when dielectric surfaces are arbitrary and/or irregular shapes. If the shape of the object is entered to simulation program in great detail, the output can be very close to results, which are obtained by measurements.

Keywords

RCS, Modeling, Scattering, Curved Arbitrary Dielectric Surfaces

Download

RCS modelling and Simulation of curved arbitrary dielectric surfaces PDF 123 KB

2004

Human Reliability Analysis Related Issues in IT-System Operation: A Case Study

Proceedings of PSAM7/ESREL 2004, Juni 2004, Berlin

Verfasser

R. Mock, R. Scherrer

Abstract

The paper outlines the implementation of HRA in the framework of the IT-department of a major Swiss bank. The applicability of HRA techniques is shown by the case studies "Patch Management" and "Hardware Monitoring" which also include error probability assessments. Finally, a compilation of six case studies applying eight selected HRA techniques judges their practicability and usability. It is concluded that THERP and ASEP are the most appropriate techniques for analysing tasks in
system monitoring, testing, and operation.HRA techniques based upon PSF
are of limited practicability. Berlin, London, etc: Springer-Verlag,. 2004; p.650-655

Discrete propagation model for mobile communications in urban environment

IEEE Melecon 2004, May 2004, Dubrovnik, Croatia

Verfasser

S. Seker, C. Sezer, G.Apaydin

Abstract

The need for wireless communication data has increased considerably in past decades. In this paper we have introduced new propagation model for the streets and avenues in urban areas that can be thought as a wave-guide for EM-waves. Using our developed model it is possible to calculate the contributions of each direct and scattered wave separately. We don t assume the sidewalls as perfect conducting materials in our developed model unlike the previous studies. Our simulations revealed that developed model is applicable for broadband of frequencies. If the shape of the wave-guide is entered to simulation program in great detail, the output can be very close to results that are obtained by measurements. Even the shape is not entered very accurately; an approximate result can be obtained if the fast result is needed.

Download

Discrete propagation model for mobile communications in urban environment PDF 309 KB

Effects of electromagnetic fields on human beings and electronic devices

International Conference on Mathematical Methods in Electromagnetic Theory
April 2004, Bishkek, Kyrgyzstan

Verfasser

S. Seker, G.Apaydin

Abstract

It is important to be able to quantify both the absorption of electromagnetic (EM) energy in the human body and on electronic devices and the resulting effects. In this study, the electromagnetic radiation from electronic devices on the human and electronic devices was investigated. The human head model was simulated. The results were compared with the results of the studies in the literature, a good agreement was obtained.

Download

Effects of electromagnetic fields on human beings and electronic devices PDF 202 KB

Mesh Free Methods for Electromagnetics

International Conference on Mathematical Methods in Electromagnetic Theory
01.04.2004 03.04.2004, Bishkek, Kyrgyzstan
(C-2004-2)

Verfasser

Prof. Dr. sc. techn. ETH Niyazi Ari, Taalaibek Ashirov Bostonbekovic, Usonbek Jusupov

Keywords

Mesh free Method , Electromagnetics, PDE, FEM, mesh free method (MFM)

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Mesh Free Methods for Electromagnetics PDF 8 KB

Mesh Free Methods for Periodic Structurs

International Conference on Computional Electromagnetic and Applications ICCEA 2004
Beijing, China
1. November 2004 - 4. November 2004
(C-2004-4)

Verfasser

Prof. Dr. sc. techn. ETH Niyazi Ari, Taalaibek Ashirov Bostonbekovic, Usonbek Jusupov

Abstract

This paper illustrates the mesh free methods (MFM). Outgoing from introductory ideas for MFM, the basics of Fast Multipole Method FMM Tool explained. Some applications for the electromagnetnetic fields using different boundary conditions have been computed and discussed. As examples, a periodic structure has been studied under different boundary conditions and the solutions are given as contour plots.

Keywords

Mesh free Methods, Periodic Structurs, Fast Multipole Method

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Mesh Free Methods for Periodic Structurs	PDF		120KB

Fachartikel von von 1998 bis 2003

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