PENETRATION OF AN ELECTROMAGNETIC FIELD IN A LOSSY, INFINITE, CONDUCTING HALF-SPACE

BY

HUGO ROSMAN

Abstract. The expressions of the damping and phase coefficients, the phase speed, the wave length and of the complex vectors $\underline{\mathbf{E}}_l$, $\underline{\mathbf{H}}_l$, $\underline{\mathbf{J}}_l$, in the case of a harmonic electromagnetic field penetration in a lossy, conducting, infinite half-space are determined. In the studied case the complex Poynting vector, the active and reactive powers which penetrate through the unity area of a lossy, conducting, infinite half-space and the penetration depth are determined too.

Key Words: Lossy, Infinite, Conducting Half-Space; Penetration of an Electro-magnetic Field.

DETERMINATION OF THE TOTAL COMPLEX IMPEDANCE OF PLANE ELECTROMAGNETIC WAVES IMPINGING NORMALLY ON A LOSSY DIELECTRIC LAYER

BY

CAMELIA PETRESCU

Abstract. The analytical expressions for the total wave impedance are established in the case of a plane electromagnetic wave with normal incidence that passes through three successive media. The multiple reflections/refractions that occur due to the existence of two successive separating boundaries are taken into account. The expressions are valid for any materials, conductors or dielectrics, real or ideal.

Key Words: Plane Waves; Reflection and Refraction; Complex Impedance.

COMPARED ANALYSIS OF ENCODING TECHNIQUES USED IN SPACE TIME TRANSMISSIONS

BY

VALERIU MUNTENU and DANIELA TĂRNICERIU

Abstract. For the case in which the code alphabet consists of M letters, we perform a generalized Huffman encoding for a discrete, complete and memoryless source for which the probability of one message is equal to $1 - x$ and the other ones are of the form $k_i x$. For this case we derive the conditions for x and k_i which lead to an extended and to a compact coding graph, respectively. For each of these two cases the average codeword length is computed.

Key Words: Generalized Huffman Coding; Extended Graph; Compact Graph; Average Codeword Length.

OPTIMAL TECHNIQUES USED IN TURBO SPACE CODES

BY

DANIELA TĂRNICERIU and VALERIU MUNTENU

Abstract. In this paper we consider a discrete, complete and memoryless source for which, excepting one message, the other ones are equally likely. This source is encoded by means of a generalized Huffman code. For this special probability distribution we compute the maximum and the average code word length and determine the topology of the encoding graph. It is shown that, excepting one code word, the other ones are placed on the last two levels. The analysis is specialized for a case study, for which we perform a matrix characterization and derive the information quantities.

Key Words: Generalized Huffman Coding; Average Codeword Length; Entropies; Space-Time Codes.

ON LINEAR AND NON-AUTONOMOUS TWO-PORTS, SUPPLIED SIMULTANEOUSLY AT THEIR GATES WITH HARMONIC CURRENTS HAVING THE SAME FREQUENCY

BY

HUGO ROSMAN

Abstract. A new class of a linear and non-autonomous two-ports parameters is defined, based on the two-port's supplying with harmonic currents having the same frequency, equal amplitudes and equal or opposite initial phases. The defined parameters are dual to those introduced by C. Şora [1].

Key Words: Linear and Non-Autonomous Two-Ports; Simultaneous Supplying at the Two Gates with Harmonic Currents; New Class of Parameters.

DIGITAL SYSTEM FOR WAVE GENERATORS IMPLEMENTED IN COMPLEX PROGRAMMABLE LOGIC DEVICES

BY

NIRVANA POPESCU, D. POPESCU and C. POPESCU

Abstract. The paper presents a digital system designed for muscle stimulation with a specific electric stimulus. For this purpose, a Simulink model is proposed that realizes a certain waveform. The block diagram from Simulink is converted to hardware using the Verilog language. In this way, having a hardware description of the system, the implementation into a CPLD is easy to obtain.

Key Words: Waveform Generator; Simulink Model; Verilog Language; CPLD; FPGA.

AN OVERVIEW ON NEUROPROSTHESIS CONTROL AND TEST

BY

MARIAN POBORONIUC

Abstract. Functional electrical stimulation (FES) provides a means of producing controlled contractions in muscles that are paralysed due to a disease of the central nervous system. A so-called neuroprosthesis may be used to restore motor function at paraplegic patients on the basis of FES. The quality of paraplegic's lives can be improved by daily standing exercises. An overview on the methods to be implemented within a neoruprosthesis is presented, that aim to improve standing in paraplegia, along with some mechatronic devices designed to test a neuroprosthesis control *prior* to use it in clinical trials.

Key Words: Neuroprosthesis; Control Algorithm; Functional Electrical Stimula-tion (FES); Paraplegia; Rehabilitation; Control of Standing; Spinal Cord Injury.

FREQUENCY CONVERTER WITH RNSIC CONVERTER AND WITH PWM INVERTER FOR VECTORIAL SELF-CONTROL OF THE INDUCTION MACHINE

BY

ANATOLI PETRICHEI, DIMITRIE ALEXA, IRINEL-VALENTIN PLETEA, MARIANA PLETEA and ROXANA BUZATU

Abstract. The paper presents a method for the vectorial self-control of an induction motor fed by a PWM inverter with IGBT transistors. The vectorial self-control has the same object as the vectorial control but it is based on a certain transient state behaviour of the PWM inverter that feeds the induction machine, thus simplifying the hardware and software of the controller. Very good performances are obtained. To analyse the performances obtained with the proposed control technique, transient response simulation results are given, in comparison with the vectorial PWM control technique.

Key Words: Pulse with Modulation; Inverter; Induction Machine; Dynamic Performances.

COORDINATES DISPLAY DEVICE EQUIPPED WITH MICROCONTROLLER AT89S8253

BY

PETRUȚ DUMA and LUMINIȚA SCRIPCARIU

Abstract. The structure of a coordinates display device is described, which consists of an application system equipped with microcontroller AT89S8253 and two alphanumeric display circuits HDSP2112. This structure is used to display coordinates as a part of a system for assisting artillery firing of projectiles. The command messages received from the system by frames are analysed and interpreted through software in order to display coordinates, information or error messages as well as for testing and checking.

Key Words: Coordinates Display; Application System; Microcontroller; Alpha-numeric Display; Serial Asynchronous Message.

EXTENDED FUZZY LOGIC THEORY (TYPE-2 FUZZY SETS) IN AUTONOMOUS ROBOT NAVIGATION

BY

LAURENȚIU-FLORIN BUBUIANU

Abstract. A new fuzzy logic based control for mobile robot navigation is proposed, using the extended fuzzy theory (type-2 theory) for building intelligent systems.

In this work we are extend the use of fuzzy logic to systems with higher degree of uncertainty, so we can use the advantages of fuzzy logic in almost every real world applications.

Basically extended fuzzy logic set is a fuzzy logic set in which we have some uncertainty about membership function, so we can said that extended fuzzy logic is a generalization of conventional fuzzy logic, because uncertainty is present also in membership function, not only in linguistic variable definition. In this paper we also explain the basic concept of extended fuzzy reasoning in comparison to classic fuzzy systems. Combining extended fuzzy logic with other Soft Computing techniques (in our case feed-forward neural network) we can build powerfull systems that can use the advantages of both techniques.

Key Words: Fuzzy Logic; Type-2 Fuzzy Logic; Mobile Robot Navigation.

A PROBABILISTIC MODEL FOR CIRCUIT BREAKER ADEQUABILITY

BY

CIPRIAN NEMEŞ

Abstract. In electrical power systems, the communication equipments are very important, especially the circuit breakers which have the role to set up and to break the nominal power current of work and the short-circuit currents, deliberately and automatically, depending on the working conditions. In the present paper a method to determine the permitted average number of commutations between two revisions is proposed, based on the influence of the interrupted current value, on the used speed of the switcher, exactly on the diminution speed of the admitted number of communications.

Key Words: Short-Circuit Current; Admitted Number of Commutations; Switchers.