ABSTRACTS OF PAPERS IN ENGLISH

ANALYSIS OF A DISEASE TRANSMISSION MODEL IN AN OPEN ENVIRONMENT

M. Hesaraki
School of Mathematical Sciences
Sharif University of Technology
S.M. Moghadas
Dept. of Sciences
Khaje-Nassir-Toosi University of Technology

Abstract

In this papre, SIR, susceptible individuals, S, infective individuals, I, removed (or recovered) individuals, R, disease transmission model for an open environment are examined under the assumption that the size of population varies. The effect of the interacting between the host population and other infective population groups is shown. This paper also describes the concept of an open environment. The results presented show that, in general, the infected immigrants and passengers have an important role in the spread of disease in the general population. Furthermore some conditions are stated under which the spread of disease is controllable.

HYPERGONIOMETRIC FUNCTIONS AND THEIR APPLICATIONS

M. Bayat
H. Teimoori Faal
B. Mehri
Institute for Advanced Study in Basic Science, Zanjan gavenzang

Abstract

In this paper, a new kind of trignometric function is introduced, called hypergoniometric function. This function is the natural generalization of ordinary trigonometric and hyperbolic function. Then, their properties and connections with trigonometric and Jacobian elliptic functions are investigated. Finally, some application of these new functions are

presented for obtaining the closed form of some special integrals and solving the differential equation of simple harmonic pendulum.

COMBINING CONTEXT AND EMOTIONAL TEMPORAL DIFFERENCE LEARNING IN CONTROL ENGINEERING

J. Abdi
F. Rashidi
C. Lucas
Dept. of Electrical & Computer Engineering
University of Tehran
A. Khaki Sedigh
Dept. of Electrical and Computer Engineering
Khaje-Nasir-Toosi University of Technology

Abstract

One of the most important problems of delayed and nonlinear systems is to fulfill multiple goals simultaneously and in the best conditions. This paper present a method for controlling systems with multiple goals. The method is based on context and has a neuro-fuzzy structure with capability of temporal difference learning. The porposed method, regarding the current status, prior system conditions, and current control goals, would be capable of controlling the system in a way that these golas are achieved in the best way and the least time. In order to clarify the issue and prove the capabilities of the proposed method two well-known control problems, achieving the multiple goals of which, in the best way and the least time, would be very difficult through manipulating other control methods, would be faced using the proposed method.

DESIGN OF PREDICTIVE COMPENSATOR FOR SYSTEMS WITH INPUT CONSTRAINTS

M. Haeri
N. Aalam
Dept. of Electrical Engineering
Sharif University of Technology

Abstract

Existance of constraints on input signals is an important issue in the control of industrial systems. This problem has been studied from different point of views. Use of a compensator along with a controller has attracted much attention in recent years. In the present work, the concept of predictive control strategy is employed in the analysis and design of a new compensator. The performance of the proposed compensator is compared to that of the existing ones.

IMPROVING THE EFFICIENCY OF DATA TRANSMIT SYSTEM FOR LEO REMOTE SENSING SATELLITES BASED ON TRANSMISSION RATE AND POWER CONTROL

A. Payandeh
Dept. of Electrical Engineering
Khaje-Nasir-Toosi University of Technology
M.R. Aref
Dept. of Electrical Engineering
Sharif University of Technology

Abstract

In this paper, an adaptive rate and power control method for the efficient transmission of LEO remote sensing satellite images is presented, which is based on compensation change of distance between satellite and ground station. A model for the LEO satellite communications channel is proposed. In the proposed scheme, it is tried that bit error probability (or received SNR) does not vary in total communication seance between LEO satellite and ground station. Simulation results are presented showing that the proposed scheme attains good performance in comparison with traditional data transmition systems.

POWER / VOLTAGE STABILITY ANALYSIS OF SINGLE-INFEED HVDC SYSTEMS IN DIFFERENT CONTROL MODES

M.R. Mirsepassi
A. Shoulaie
Dept. of Electrical Engineering
Iran University of Science & Technology

Abstract

Voltage/Power stability of Single-Infeed HVDC Systems is elaborated in this paper . Analysis based on Quasi-Static Assumptions is performed with Sensitivity Analysis for best known control modes at Rectifier/Inverter side in SIF HVDC Systems.
component of variables is applied for analysis.

A simplified model based on fundamental component of variables is applied for analysis. With certain assumptions, Mismatch Power Flow Equations are developed and linearised around operating point and Jacobian Matrices are obtained due to stability computations. Two methods of analysis to cope with this task are presented before and motivated in this paper. Two criterion called "Voltage Stability Factor" and "Maximum Available Power" based on the mentioned methods are assessed and computed in different common control modes and results are compared. Also, Voltage/Power Stability Limits are developed based on system variables.

Dynamic Simulations in order to demonstrate computational, theoretical results are fulfilled and their results are shown. Simulations are performed for two systems with relatively weak and quite strong AC networks at inverter side of HVDC link. PSCAD-EMTDC Simulator is applied for simulations.

Furthermore, a simple dynamic analysis for Voltage/Power stability in power/extinction angle control mode is conducted and simulation results are shown. It is also demonstrated how an appropriate control of converters can be used to stabilize a voltage/power instability in weak systems.

SRM MODELLING: IMPROVMENT OF MILLER MODEL

M. Farshad
C. Lucas
Dept. of Electrical and Computer Engineering
Tehran University
H. Ghafoori-Fard
Dept. of Electrical and Computer Engineering
Amirkabir University

Abstract

Among the first presented models of switched reluctance motor (SRM) is the so designated Miller model, which has admissible ability in modeling / predicting the behavior of motor, despite relative structural simplicity, low-cost and simple implementation. For this reason and despite the introduction of the other models, the Miller model has been used in large scale, both in electromotor design phase and in controller design phase. However, among perfectly obvious weaknesses of the Miller model is non-satisfaction of the evident condition of "zero slope of flux characteristic in angular aligned / unaligned positions" which subsequently cause weak performance, of this model in aforementioned angular positions. In this paper, improvement of the Miller model abilities have been the focus of attention. By maintaining the total structure of model and carrying out necessary corrections, in addition to preserving the other advantages, the aforementioned evident condition has also been fulfilled. Flux information of the involved SRM 6/4 has been obtained from two dimensional finite element (FE) analysis. Simulation results show that improvement process of the Miller model is successful in modeling the various magnetic characteristics of SRM, specially in vicinity of angular aligned/unaligned positions.

A NEW APPROACH FOR CALCULATION OF PROJECTED RANGE DISTRIBUTIONS OF IMPLANTED IONS IN SEMICONDUCTORS

M. Moulavi Kakhaki
H. Salari
Dept. of Electerical Engineering
Ferdosi University of Mashhad

Abstract

Ion implantation plays an important role in fabrication of many types of semiconductor devices. Integrated circuits simulation of ion implantation and computation of projected range distribution is the corner stone in the design in VLIS. In this paper, a new physical model is presented for this purpose. This model is based on a transport equation technique similar to that employed by Furukawa and Ishiwara but with considering angular scattering of implanted ions. This model is capable of using all types of nuclear reaction crass sections. Comparison of results of this simulation with experimental results and other calculation proves the high accuracy of the presented physical model.