ABSTRACTS OF PAPERS IN ENGLISH

LIMIT CYCLES IN THE GAUSE PREDATOR-PREY SYSTEM WITH FUNCTIONAL RESPONSE

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Abstract

In this paper we have considered limit cycle problem in a Gause predator-prey system with a functional response. The functional response is assumed convex and increasing, also a unique root for the third derivative is assumed.

Under certain assumption we will admire necessary and sufficient condition for non-existence of limit cycle in the Gause system, this condition guarantee global stability of the positive equilibrium point in the x>0 and y>0 region.

DESIGN AND ANALYSIS OF NEW ALGORITHMS FOR SOLVING CERTAIN SYSTEMS AND LINEAR PROGRAMS OVER REAL AND INTEGER SPACES

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Abstract

First a new approach, based on ABS methods, is presented for computing the general solution of real linear inequality systems having full row rank, and then the results are used to solve linear programming problems with full row rank linear intequality constraints. The approach determines whether the problem is

unbounded or computes the general solution (if it exists). Then this approach is adapted to solve linear integer inequality systems. Using the results obtained, it is shown how to transform an integer linear programming problem with full row rank inequality constraints to a problem having finitely many integer solutions, and subsequently how to obtain one solution. Finally, a new class of algorithms ,based on the ABS methods, is presented for solving linear equations so that in every iteration two new equations are satisfied. Numerical results obtained from testing the implementation of certain special versions of the proposed algorithms indicate the efficiency of the new algorithms and the precision of the computed solutions.

SYNCHRONIZATION OF CHAOTIC SYSTEMS AND THE CONSTRUCTION METHODS

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Abstract

Chaotic systems are known as systems sensitive to the initial conditions. Recently Pecaro and Carroll have shown that two chaotic systems with some conditions can be synchronized. At first glance, synchronization of chaotic systems seems to be rather surprising because one may naively expect that the sensitive dependence on initial conditions would lead to an immediate breakdown of any synchronization of coupled chaotic systems. This, however, is not the case. In recent years, the synchronization of coupled chaotic systems has become an area of active research.

The main goal of this work is to review the recent ideas of synchronization theory. Particularly, the focus on identical synchronitation as well as general synchronization, using Pecaro and Carroll methods and active-passive decomposition method.

DESIGN AND IMPLEMENTATION OF

SharifSAN AND ITS FEATURES FOR PERFORMANCE EVALUATION OF COMPUTER SYSTEMS

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Abstract

Stochastic activity networks (SANs) are an extension of Petri nets (PNs). These models provide powerful and flexible capabilities for modeling and functional or operational analysis of concurrent and reactive systems. Several modeling tools based on the original definition of SAN models have been introduced. However, recently a new definition of SAN has been presented, which eliminates some problems of these models. Here a modeling tool called *SharifSAN* has been developed for this new deinition of SANs. This modeling tool provides an integrated environment for both verification and performance evaluation. Using this tool, SAN models can be constructed in a graphical user interface. Then, the verification of the functional properties is possible by model checking some user enetred temporal logic formulas or the evaluation of its operational measures by analytical solution or simulation techniques. In a previous paper, the features of *SharifSAN* for the verification purposes have been illustrated. In this paper, its features for performance evaluation and the specification, design, implementation and applications of this tool are introduced. By now, this tool has been employed in several research projects in the area of high - speed networks. These applications will also be described.

AN ENVIRONMENT FOR PROGRAM DEVELOPMENT FROM FORMAL SPECIFICATIONS

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Abstract

The use of traditional software development methods is

subject to problems such as lack of confidence in the correctness of the final product. The application of formal methods to the specification of software systems is expected to increase the level of this confidence. However, the gap between the two phases of program specification and program development causes this confidence in correctness to be degraded yet again during the transition from the specification to the actual program. A number of methods for developing programs from their formal specifications have been proposed, one of which is the method of deriving programs from the correctness proofs of formal specifications. In this paper, an environment for developing reliable programs from formal specifications is introduced. The formal specifications are written in a constructive version of the Z notation, called CZ. An automatic translation tool has been designed and implemented that can translate the correctness proofs of such a specfication into the corresponding proofs in Martin-Löf theory of types. Finally, the program is derived from the translated correctness proofs.

CELLULAR LEARNING AUTOMATA AND ITS APPLICATIONS

Abstract

In this paper, a new model called cellular learning automata (CLA) is introduced and its behavior is studied through simulation. In this model, a collection of learning automata is arranged in a grid similar to cellular automata that interact with each other. Each learning automaton in cellular learning automata, based on the actions chosen by its neighbors, tries to find its best action in order for the cellular learning automata to reach a particular goal. Cellular learning automata can be applied to solve numerous problems such as modeling social systems, modeling biological systems and image processing to mention a few. In this paper, application of cellular learning automata to rumor diffusion and image processing have been described.

A NEW SCHEME FOR SPACE VECTOR MODULATION FOR THREE PHASE HARMONIC GENERATORS

MULTIUSER DETECTION OF DS/CDMA SIGNALS IN MULTIPATH FADING CHANNELS

here takes the advantage of multipath diversity to improve the signal to noise ratio which is not considered in the previous method. Furthermore, adaptive method has been used to compute the threshold levels and to reduce the interference. The results show that the proposed detector acheives much better performance than the previous one.

ANALYSIS OF THYRISTOR CONTROLLED SERIES COMPENSATION (TCSC) BEHAVIOR AT SUBSYNCHRONOUS FREQUENCIES AND ITS IMPACT ON DAMPING SUBSYNCHRONOUS RESONANCE (SSR)

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Abstract

In this paper, the performance of TCSC at subsychronous frequencies has been evaluated by calculating its impedance-frequency characteristics, and it has been shown that the impedance is resistive-inductive at this frequency range. Then, it is illustrated that unlike fixed series compensation, TCSC inherently removes the risk of SSR phenomenon. Besides, appropriate control of TCSC can effectively damp the SSR oscillations in a network mainly compensated by fixed series capacitors. Analytical results are verified by digital simulation using PSCAD/EMTDC software.

PERFORMANCE ANALYSIS AND IMPROVEMENT OF MOTION ESTIMATION TECHNIQUES WITH APPLICATION TO VIDEO RESTORATION

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Abstract

The existence of blotches in old movies is one of their main degradations. The intensity of these blotches is almost constant and they do not appear in the same location in two successive frames. To detect and restore these blotches, the information of the previous and subsequent frames is used. In order to obtain a more precise estimation of the original intensity, the probable motion in the field should be considered and the estimation should be applied after implementing the motion compensation process. In this paper, after giving a performance analysis of the most efficient block motion estimation methods for both degraded and not degraded images, a new search schedule method for block matching is proposed. This algorithm uses the motion estimation and a curve search method to achieve the desirable precision by enlarging the motion search area without a noticeable increase in the search time. Furthermore, by applying the proposed algorithm in the first stage of a multiresolution analysis, more efficient results have been obtained when compared with other available algorithms.

THE EFFECTS OF AUDITORY FEEDBACK ON FUNDAMENTAL FREQUENCY CONTOURS OF FARSI-SPEAKING HEARING-IMPAIRED ADULTS AFTER MULTICHANNEL COCHLEAR IMPLANTATION

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Abstract

In this paper, the F0-contours have been extracted from the speech of 5 postlingual hearing-impaired adults who are multichannel cochlear implant users, and 10 normal-hearing male and female adults. Regularity of each contour have been measured using the absolute value of average differences between F0 in successive syllables of each sentence (MSD, Mean Successive Differences) and used as a quantiative cue for determination of auditory feedback effects on improvement of patient's contours. Results show that:

1) After cochlear implantation, changes in patient F0 contours would be decreased and their MSD features would converge to its normal value.

2) Dependency of MSD feature to patient continuoue access to the auditory feedback would decrease by time. On the other hand, patients could learn to produce this feature correctly by time. So, they could produce it correctly after 12 months of implantation without need to access to auditory feedback.