Preface

This is the second issue of papers presented at the Platinum Jubilee Conference on Systems and Signal Processing organised by the Department of Electrical Engineering, Indian Institute of Science in December 1986. There are six papers in this issue. The first three papers generally fall within the area of signal processing while the others are concerned with various aspects of dynamic systems.

The first paper in the issue by Diwan gives a new method for approximating the step response of RC networks. The computational time in the method depends only on the topology of the network and is independent of the values of the network parameters. The method is useful in VLSI design, where there is a necessity to estimate the delay introduced by an interconnection RC network.

Rational approximants are widely used in the design of digital filters. Karan and Srivastava develop Padé-type rational approximants for two- and multi-dimensional power series. The approximants match the series at the nodal points of a raster structure different from those in earlier contributions.

Roy, Paulraj and Kailath advocate a new technique called ESPRIT for the estimation of signal parameters. The technique exploits an underlying rotational invariance among signal subspaces induced by an array of sensors with a translational invariance structure. There are several advantages such as reduced sensitivity to array perturbations and the technique can be applied to a wide variety of problems including spectral estimation.

When there are N players each extremizing his individual payoff function and dynamically interacting with each other, the situation is modelled by nonzero-sum differential games. While there are many concepts of solution for such games, the paper by Bharathan examines open-loop, closed-loop and suboptimal Nash equilibrium strategies. The paper considers the introduction of proportional as well as integral state feedback.

N. P. Singh and Y. P. Singh consider the topic of design of proportional plus integral controllers for singularly perturbed linear dynamic systems with constant disturbances. They present a two-step design of the controller and demonstrate the procedure on a synchronous machine connected to infinite bus.

The theme of controller design is continued in the paper by Sarkar and Athani, but now in the context of very large scale linear systems. The optimal control laws are formulated in terms of multiechelon dynamical hierarchical structure. The stability of such a hierarchical structure is established through Lyapunov theory.

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Guest Editors