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An Overview of Polynomic System Theory

by W. A. PORTER

Department of Electrical Engineering, University of Michigan, Ann Arbor, Michigan

ABSTRACT: *During the past 5 yr multilinear, multipower and polynomic systems have become a most important area of applications and theoretical development. This paper starts with some typical examples and historical remarks. Using this background, it then proceeds to put the recent literature in perspective and to quantify partially some broad problem categories where intensive work is underway.*

Scattering Theory and Linear Least Squares Estimation Part I: Continuous-time Problems

by L. LJUNG, T. KAILATH *and* B. FRIEDLANDER

Information Systems Laboratory
Department of Electrical Engineering
Stanford University, California

ABSTRACT: *The Riccati equation plays an equally important role in scattering theory as in linear least-squares estimation theory. However, in the scattering literature, a somewhat different framework of treating the Riccati equation has been developed. We show that this framework is very appropriate also for estimation problems, and that it enables us to give simple derivations of known results as well as to obtain several new results. Examples include the derivation of backwards equations to solve forwards Riccati equations; an analysis of the asymptotic behaviour of the Riccati equation; the derivation of backwards Markovian representations of stochastic processes; and new derivations and new insights into the Chandrasekhar and related Levinson and Cholesky equations.*