

Book Announcements

COOK, P. A., *Nonlinear Dynamical Systems*, Prentice-Hall, Englewood Cliffs, NJ, 1986, 216 pages.

Purpose: This book presents methods for understanding nonlinear system behavior without delving into detailed treatments available in other texts in this area.

Contents: State-space models; harmonic analysis; piecewise-linear models; stability; control system performance; discrete-time systems.

JOHNSON, C. R., Jr., *Lectures on Adaptive Parameter Estimation*, Prentice-Hall Advanced Reference Series, Prentice-Hall, Englewood Cliffs, NJ, 1988, 185 pages.

Purpose: This set of lectures has been developed for a graduate level course or independent study in adaptive parameter estimation for discrete-time dynamical systems.

Contents: Integer guessing games; gradient search minimization and LMS; equation error formulation and normalized LMS; Recursive least squares; persistent excitation and parameter convergence; frequency response fit paradigm; gradient search minimization of the output error; homogeneous error systems; armax modeling; mismodeling, persistent excitation, and robustness; averaging analysis; simultaneous identification and control; MRAC; linear boundedness lemma and adaptive controller stability; nonideal misbehavior examples in adaptive control; tuned error system formulation; guidelines for adaptive control engineering; regressor signal prefiltering; leakage; deadzones.

IVANISHCHEV, V. V. and KRASNOSHCHEKOV, A. D., *Control of Variable Structure Networks*, Optimization Software, Inc., New York, 1987, 137 pages.

Purpose: This book deals with the control of discrete systems on a network as well as the structure of the network itself.

Contents: Hierarchical structure of discrete-unit traffic flow control models on a network; network structure model; network simulation models; principles of optimization based on simulation models.

RAZUMIKHIN, B. S., *Classical Principles and Optimization Problems*, D. Reidel Publishing, Kluwer Academic, Norwell, MA, 1987, 513 pages.

Purpose: This book deals with methods and algorithms for the numerical solution of constrained optimization problems associated with classical principles of analytical mechanics and thermodynamics.

Contents: Principle of virtual displacement; detachment principle and optimization methods; energy theorem; models of system of linear equations; hodograph methods for linear programming; method of shifting elastic constraints for linear programming; problem of maximum flow in networks; models and methods for solving transportation problems; methods of decomposition; gradient methods; method of aggregation of constraints; foundations of thermodynamics; equilibrium and distribution of resources; models of economic equilibrium; Von Neumann's model of economic growth; analytical dynamics; dynamics of systems under elastic constraints; dynamical problems of optimal control.

FLEMING, W. and LIONS, P.-L. (Eds.), *Stochastic Differential Systems, Stochastic Control Theory and Applications*, Springer-Verlag, New York, 1988, 609 pages.

Purpose: This volume is a collection of papers presented at the 1986-87 IMA program on stochastic differential equations and their applications.

Contents: Mathematical theory of stochastic differential systems, stochastic control, and nonlinear filtering for Markov diffusion processes; applications of stochastic differential system theory; stochastic scheduling, queueing networks, and related topics; simulated annealing and related stochastic gradient algorithms.

PALLET, E. H. J., *Automatic Flight Control*, 3rd ed., BSP Professional Books, Palo Alto, CA, 1987, 320 pages.

Purpose: This is a fully updated edition of the well-known introduction to the principles involved in automatic flight of fixed-wing and rotary-wing aircraft.

Contents: Principles of flight; servomechanisms and automatic control fundamentals; sensing of attitude changes; command signal detection; command signal processing; outer loop control; conversion of command signals to powered control; automatic control of helicopters; flight director and integrated flight control systems; logic circuits and diagrams; automatic landing.