Book Announcements

KRASOVSKII, N. N. and **SUBBOTIN, A. I.,** Sverdlovsk, USSR, ***Game Theoretical Control Problems,*** Translated from Russian by S. Kotz, Springer-Verlag, New York, 1987, 577 pages.

Purpose: This book is devoted to an investigation of control problems that can be described by ordinary differential equations and expressed in terms of game theoretic notations.

Contents: The differential game of convergence-evasion; the existence of a value for positional differential games; dynamic programming; extremal aiming for nonlinear differential games; a priori (prior) stable sets; qualitative problems of the theory of differential games; mixed strategies in differential games; lower and upper differential games; differential-functional games.

NIKRAVESH, P., University of Arizona, ***Computer-Aided Analysis of Mechanical Systems,*** Prentice-Hall, Englewood Cliffs, NJ, 1988, 370 pages.

Purpose: This book introduces fundamental theories and numerical methods for use in computational mechanics of multibody mechanical systems.

Contents: Vectors and matrices; basic concepts of kinematics; planar kinematics; Euler parameters; spatial kinematics; basic concepts of dynamics; planar dynamics; spatial dynamics; equilibrium analysis; numerical methods and Fortran programs.

KOGAN, J., ***Bifurcation of Extremals in Optimal Control,*** Lecture Notes in Mathematics, Volume 1216, Springer-Verlag, New York, 1986, 106 pages, $12.80.

Purpose: The subject matter of this volume has roots going back to the theory of the calculus of variations and the famous Jacobi condition. It is shown that optimal control conjugate points exist even under a natural generalization of the sufficiency condition.

Contents: Branching points in linear control problems; branching pairs in linear control problems; the nonlinear case; linear systems with vector valued performance indices; nonlinear control systems with vector cost; optimal control problems with constraints.

SHUB, M., ***Global Stability of Dynamical Systems,*** with the collaboration of A. Fathi and R. Langevin, Translated from French by C. Joseph, Springer-Verlag, New York, 1987, 150 pages, $32.00.

Purpose: This is an advanced text on the global stability of dynamical systems.

Contents: Generalities; filtrations; sequences of filtrations; hyperbolic sets; stable manifolds; stable manifolds for hyperbolic sets; more consequences of hyperbolicity; stability; potpourri of stability results; Markov partitions.

HIJAB, O., Temple University, Philadelphia, PA, ***Stabilization of Control Systems,*** Applications of Mathematics, Volume 20, Springer-Verlag, New York, 1986, 132 pages, $32.00.

Purpose: This is a unique and concise introduction to certain aspects of the optimal control of linear systems under partial observation.

Contents: Basic linear system theory; the LQ regulator; Brownian motion; stochastic calculus; filtering; consistency of estimators; Shannon information; adaptive control; adaptive stabilization; the adaptive LQ regulator.

RAVEN, R., University of Notre Dame, ***Automatic Control Engineering,*** McGraw-Hill, Hightstown, 1987, 576 pages.

Contents: Introduction to automatic controls. Representation of control components. Representation of control systems. Steady-state operations. Laplace transforms. Transient response. The root-locus method. Analog computers. State-space methods. Digital-control systems. Frequency-response methods. System compensation. Appendices. Index.

REID, G. J., ***Linear System Fundamentals: Continuous and Discrete, Classic and Modern,*** McGraw-Hill, New York, 1983, 484 pages.

Purpose: This book gives a thorough presentation of the foundations of linear time-invariant dynamic systems theory. It goes from classic analyis in the time and frequency domains to the modern state-space techniques. Both continuous and discrete-time analysis as well as digital computation methods are presented.

Contents: Input-output characteristics: time domain; solution of the linear time-invariant ordinary differential equation model; input-output characteristics: frequency domain; Laplace transform analysis; finite difference equation in modeling discrete SISO systems; state variable models; state-space analysis: continuous-time and discrete-time; vector spaces and transformations; eigenvalues and eigenvectors; controllability and observability; linear time-varying state models.