

<sup>10</sup>Kim, B., "Frequency-Shaped Estimation and Robust Controller Design for Aircraft Flight Control in Wind Disturbance," Ph.D. Dissertation, Department of Aeronautics and Astronautics, University of Washington, June 1983.

<sup>11</sup>Bossi, J.A., "Robust Compensator Synthesis by Frequency-Shaped Estimation," AIAA Paper 84-1927, Aug. 1984.

<sup>12</sup>Ulich, B., et al., "The Performance of the Multiple Mirror Telescope," Tech. Rept. 12, MMT Observatory, University of

Arizona, Tucson, Ariz., March 1982; also, private communication from author.

<sup>13</sup>Doyle, J.C. and Stein, G., "Multivariable Feedback Design: Concepts for a Classical/Modern Synthesis," *IEEE Transactions on Automatic Control*, AC-26, 1, Feb. 1981, pp. 4-16.

<sup>14</sup>Safonov, M.G., Laub, A.J., and Hartmann G.L., "Feedback Properties of Multivariable Systems: The Role and Use of the Return Difference Matrix," *IEEE Transactions on Automatic Control*, AC-26, 1, Feb. 1981, pp. 47-66.

## Book Announcements

**FLETCHER, R.**, University of Dundee, *Practical Methods of Optimization: Volume 1, Unconstrained Optimization*. John Wiley and Sons, New York, 1980, 120 pages. \$31.95.

**Purpose:** This book aims to present those aspects of optimization methods which are currently of foremost importance in solving real life problems. Theory, numerical implementation, and experimentation are included. This book, or parts of it, have been used at both the undergraduate and graduate levels.

**Contents:** Introduction. Structure of methods. Newton-like methods. Conjugate-direction methods. Restricted-step methods. Sums of squares and non-linear equations. References. Index.

**FLETCHER, R.**, University of Dundee, *Practical Methods of Optimization: Volume 2, Constrained Optimization*. John Wiley and Sons, New York, 1981, 224 pages. \$34.95.

**Purpose:** Same as for Volume 1.

**Contents:** Introduction. Linear programming. Theory of constrained optimization. Quadratic programming. General linearly constrained optimization. Nonlinear programming. Other optimization problems. Non-differentiable optimization. References. Index.

**VINH, N.X.**, University of Michigan, *Optimal Trajectories in Atmospheric Flight*. Elsevier Science Publishing Co., New York, 1981, 402 pages. \$85.00.

**Purpose:** Even though it is based on lecture notes for a graduate course on trajectory optimization, this book is designed primarily as a reference text. The book is self-contained in that optimization theory is presented prior to applications to aircraft trajectories and atmospheric spacecraft trajectories.

**Contents:** Introduction. Optimization theory. Switching theory. Equations of motion. Aerodynamics and propulsive forces. General properties of optimal trajectories. Flight in a horizontal plane. Optimal coasting flight. Supersonic cruise. Supersonic turn. Supersonic maneuvers in a vertical plane. Energy state approximation. Modified Chapman's formulation for optimal re-entry trajectories. Optimal planar re-entry trajectories. Optimal glide of re-entry vehicles. Orbital aerodynamic maneuvers. Index.

**MEES, A.I.**, Cambridge University, *Dynamics of Feedback Systems*. John Wiley and Sons, New York, 1981, 214 pages. \$44.95.

**Purpose:** This book is directed toward control engineers and applied mathematicians. It has been written so that beginning graduate students can understand the material.

**Contents:** Introduction. Qualitative theory of ordinary differential equations. The feedback system viewpoint. Stability of feedback systems. Periodic solutions and the method of harmonic balance. The Hopf bifurcation. References. Index.

**BARNETT, S.**, University of Bradford, *Matrices in Control Theory*. Robert E. Krieger Publishing Company, Melbourne, Fla., 1984, 192 pages. \$14.50.

**Purpose:** This is a revised edition of the 1971 text. Some of the content of the book has been changed to sharpen the emphasis to the control field. This book is intended as a reference text for engineers, scientists, and applied mathematicians working in control theory and related areas involving applications of matrices.

**Contents:** Polynomial matrices. Polynomials. Rational matrices. Stability and inertia. Matrix Riccati equations. Generalized inverses. Unimodal matrices. Appendices. Index.

**GOODWIN, G.C.**, University of Newcastle, and **SIN, K.S.**, *Digital Equipment, Adaptive Filtering Prediction and Control*. Prentice-Hall Inc., Englewood Cliffs, N.J., 1984, 540 pages. \$41.95.

**Purpose:** This book presents the theory of adaptive filtering, prediction, and control in a unified fashion. The emphasis is primarily on linear discrete-time systems because of the importance of digital computers in the practical application of the theory. The book is aimed at senior undergraduate students, graduate students, and researchers. Relevant background material is summarized in the appendices in order to make the book self-contained.

**Contents:** Introduction to adaptive techniques. Models for deterministic dynamical systems. Parameter estimation for deterministic systems. Deterministic adaptive prediction. Control of linear deterministic systems. Adaptive control of linear deterministic systems. Optimal filtering and prediction. Parameter estimation for stochastic dynamic systems. Adaptive filtering and prediction. Adaptive control of stochastic systems. Appendices. References. Index.