

### References

- <sup>1</sup>Huseyin, K., *Vibrations and Stability of Multiple Parameter Systems*, Noordhoff International Publishing, The Netherlands, 1978, Chap. 1.
- <sup>2</sup>Ogata, K., *State Space Analysis of Control Systems*, 1st Edition, Prentice-Hall, Englewood Cliffs, N.J., 1967, Chap. 7.
- <sup>3</sup>Hughes, P.C. and Skelton, R.E., "Controllability and Observability of Linear Matrix Second-Order Systems," *ASME Journal of Applied Mechanics*, Vol. 47, June 1980, pp 415-420.
- <sup>4</sup>Juang, J.N. and Balas, M.J., "Dynamics and Control of Large Spinning Spacecraft," *Journal of the Astronautical Sciences*, Vol. 28, Jan. 1980, pp. 31-48.
- <sup>5</sup>Inman, D.J. and Hsieh, C.I., "Controllability and Observability of Non-Self-Adjoint Flexible Systems," ASME Paper 83-WA/DSC-16, Nov. 1983.
- <sup>6</sup>Ahmadian, M., "Dynamics and Control of General Linear Lumped-Parameter Systems," Ph.D. Dissertation, State University of New York at Buffalo, Sept. 1984.
- <sup>7</sup>Chen, C.T., *Introduction to Linear System Theory*, 1st ed., Holt, Reinhart and Winston, New York, 1970, p. 362.
- <sup>8</sup>Wonham, W., *Linear Multivariable Control*, Springer-Verlag, 1974, p. 43.
- <sup>9</sup>Balas, M.J., "Feedback Control of Flexible Systems," *IEEE Transactions on Automatic Control*, Vol. AC-23, Aug. 1978, pp. 674-679.
- <sup>10</sup>Paardekooper, M., "An Eigenvalue Algorithm for Skew-Symmetric Matrices," *Numerische Mathematik*, Vol. 17, 1971, pp. 189-202.

## Book Announcements

**KAILATH, T.**, Stanford University, *Lectures on Wiener and Kalman Filtering*, Springer-Verlag, New York, 1981, 187 pages. \$16.90.

**Purpose:** This is a revised edition of the book, *Lectures on Linear Least Squares Estimation*, published in 1975. Several errors have been corrected; a few minor changes have been made, and a survey paper on discrete-time estimation has been added as an appendix. The book is intended as a text for a first course on estimation theory.

**Contents:** Introduction. Least-square estimates, basic properties. Wiener filters. Generalizations of Wiener filtering. Discrete-time recursive estimation and the Kalman filter. Continuous-time Kalman filters. Relations to Wiener filters. Recursive Wiener filters. Fast algorithms for constant parameter models. Some related problems. Appendices.

**KRISHNAN, V.**, Indian Institute of Science and University of Lowell, *Nonlinear Filtering and Smoothing: An Introduction to Martingales, Stochastic Integrals and Estimation*. John Wiley and Sons, New York, 1984, 314 pages. \$34.95.

**Purpose:** This book is the outcome of a course on martingales and estimation theory given to engineering graduate students with a basic knowledge of probability theory. The emphasis is on a concise physical understanding of the principles of martingales, stochastic integrals, and estimation theory from an application point of view.

**Contents:** Basic concepts of probability theory. Stochastic processes. Martingale processes. Classes of martingales and related processes. White noise and white noise integrals. Stochastic integrals and stochastic differential equations. Stochastic differential equations. Optimal nonlinear filtering. Optimal linear nonstationary filtering (Kalman-Bucy filter). Application of nonlinear filtering to fault detection problems. Optimal smoothing. References. Index.

**BLOMBERG, H.**, Helsinki University of Technology, and **YLINEN, R.**, Technical Research Center of Finland, *Algebraic Theory for Multivariable Linear Systems*. Academic Press, San Diego, 1983, 360 pages. \$48.00.

**Purpose:** This book is based on research performed over a number of years on the analysis of linear systems with nonzero initial conditions. The methodology is referred to as polynomial system theory or generalized transfer functions.

**Contents:** Introduction. Systems and system descriptions. Interconnections of systems. Generation of differential systems. The  $C[p]$ -module signal space. Differential input-output relations (generators). Analysis and synthesis problems. The projection method. Interconnections of differential systems. Generation of difference systems. The module structure. Difference input-output relations (generators). Analysis and synthesis problems. The vector space structure, the projection method. Appendices. References. Index.

**BUTKOVSKIY, A.G.**, Academy of Sciences of the USSR, *Structural Theory of Distributed Systems*, translated by L.W. Longdon. Ellis Horwood Limited, Chichester, England, 1983, 314 pages. \$84.95.

**Purpose:** This book is concerned with the development of block diagram techniques for distributed parameter systems, that is, systems described by partial differential equations. It is directed toward specialists in science and engineering.

**Contents:** General theory of structural diagrams for distributed parameter systems. The structural representation of some applied problems. The structural representation of problems on elastic structures. The quenching of oscillations in distributed lines. Controllability, finite control, observability, synthesis of linear distributed systems. Appendix. Bibliography. Index.