

being satisfied. For instance, consider time-invariant circulatory systems where $M' = K' = D = 0$; Eq. (1) becomes

$$\begin{bmatrix} 0 & -A \\ A & 0 \end{bmatrix} \geq 0 \quad \text{for all } t \in [0, \infty) \quad (1)$$

which is trivially satisfied, although L does not exist, owing to the singularity of K' .

References

¹Shrivastava, S.K. and Pradeep, S., "Stability of Multidimensional Linear Time-Varying Systems," *Journal of Guidance, Control, and Dynamics*, Vol. 8, Sept.-Oct. 1985, pp. 579-583.

²Krasovskii, N.N., *Stability of Motion*, Stanford University Press, Stanford, CA, 1963, pp. 66-68.

Book Announcements

ASHWORTH, M.J., Royal Naval Engineering College, *Feedback Design of Systems with Significant Uncertainty*, John Wiley and Sons, New York, 1982, 246 pages. \$40.

Purpose: Feedback control theory is developed allowing for the fact that the mathematical model of the hardware to be controlled is only a theoretical representation of a plant which will manifest all the variations of the manufacturing process and which will change according to age, environment, and its operational mode throughout its life. The analysis is limited to single-input, single-output systems.

Contents: The feedback principle. Considerations of dynamic accuracy. Low order modelling. Plant variation and system sensitivity. Loop synthesis and sensitivity reduction. Noise disturbance. Constraining the control effort. Appendices. References. Index.

BARNETT, S., University of Bradford, *Polynomials and Linear Control Systems*, Marcel Dekker, New York, 1983, 452 pages. \$55.

Purpose: The aims of this book are twofold: first, to develop properties of polynomials and polynomial matrices using matrix techniques and second, to describe related topics in the theory of linear control systems. The book is intended both for study at the senior or graduate level and for reference. Prerequisites include matrix algebra and transform methods for differential or difference equations.

Contents: Polynomials: approaches to the greatest common divisor. Basic properties of control systems. Root location and stability. Feedback, realization, and polynomial matrices. Generalized polynomials and polynomial matrices. Appendices. Index.

RUYMGAART, P.A., University of Technology—Delft, and **SOONG, T.T.**, State University of New York at Buffalo, *Mathematics of Kalman-Bucy Filtering*, Springer-Verlag, New York, 1985, 168 pages. \$29.

Purpose: This book presents a mathematical approach to continuous-time Kalman-Bucy filtering and is an outgrowth of lectures given by the authors. The mathematics consists mainly of operations in Hilbert spaces. Hence, Ito calculus, theory of Martingales, Markov processes, and infinite-dimensional innovations have been omitted.

Contents: Elements of probability theory. Calculus in mean square. The stochastic dynamic system. The Kalman-Bucy filter. A theorem by Lipster and Shirayev. Appendix: solutions to selected exercises. References. Subject index.

CHEN, C.H., Southeastern Massachusetts University, *Nonlinear Maximum Entropy Spectral Analysis Methods for Signal Recognition*, John Wiley and Sons, New York, 1982, 170 pages. \$52.95.

Purpose: This book is a research monograph based primarily on extensions of Burg's maximum entropy spectral analysis, with special emphasis on a non-linear error minimization procedure due to Fougere. Major emphasis is placed on computer implementation and application examples of spectral analysis methods.

Contents: Introduction. The univariate maximum entropy spectral analysis. Computer implementation. Signal classification, detection and resolution. On multichannel (multivariate) maximum entropy spectral analysis. On a two-dimensional maximum entropy spectral analysis method with application to texture analysis. A study of texture classification using spectral features. Bibliography. Appendices. Index.

TORBY, B.J., California State University at Long Beach, *Advanced Dynamics for Engineers*, Holt, Rinehart, and Winston, New York, 1984, 426 pages. \$41.95.

Purpose: The purpose of this text has been to combine the teaching of advanced dynamics with the computer solution of algebraic and ordinary differential equations to enhance the learning of both subjects.

Contents: Introductory remarks. Particle dynamics: kinematics. Particle dynamics: kinetics. Systems of particles. Rigid body dynamics: kinematics. Rigid body motion. Rigid body dynamics. Energy methods. Theory of small oscillations. Digital computer simulation. Appendices. Index.

BALAKRISHNAN, A.V., University of California at Los Angeles, *Kalman Filtering Theory*, Springer-Verlag, New York, 1984, 222 pages. \$26.

Purpose: This book is intended for a one-quarter or one-semester course at the graduate level in engineering. The prerequisites are elementary state-space theory and elementary stochastic process theory. The text develops those aspects of Kalman filtering which can be given a firm mathematical basis.

Contents: Review of linear system theory. Review of signal theory. Statistical estimation theory. The Kalman filter. Likelihood ratios: Gaussian signals in Gaussian noise. Bibliography. Index.