V. Conclusions

A new technique for star identification that does not use magnitude information was presented and its efficacy was demonstrated with typical results. A relative comparison of the estimated computational time on a microprocessor showed that the proposed algorithm offers a viable tool for onboard star identification.

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Book Announcements

HAIRER, E., LUBICH, C., and **ROCHE, M.,** ***The Numerical Solution of Differential-Algebraic Systems by Runge-Kutta Methods,*** Lecture Notes in Mathematics, Vol. 1409, Springer-Verlag, Berlin, Heidelberg, 1989, 139 pages.

Purpose: This volume deals with numerical solution of differential equations with algebraic constraints and singular implicit differential equations, using the Runge-Kutta method.

Contents: Description of differential-algebraic problems; Runge-Kutta methods for differential-algebraic equations; convergence of index 1 problems; convergence of index 2 problems; order conditions of Runge-Kutta methods for index 2 systems; convergence for index 3 problems; solution of nonlinear systems by simplified Newton method; local error estimates; examples of differential-algebraic systems and their solutions.

BRENAN, K. E., CAMPBELL, S. L., and **PETZOLD, L. R.,** ***Numerical Solution of Initial-Value Problems in Differential-Algebraic Equations,*** Elsevier Science Publishing Co., Inc., New York, 1989, 210 pages.

Purpose: This book deals with the mathematical structure of differential-algebraic equations (DAE's) and formulation and numerical methods applied to DAE systems.

Contents: Theory of DAE's; multistep methods; one-step methods; software for DAE's; applications.

MACIEJOWSKI, J. M., ***Multivariable Feedback Design,*** Addison-Wesley Publishing Co., Wokingham, England, U.K., 1989, 424 pages.

Purpose: This is a graduate text dealing with multivariable control design in the frequency domain.

Contents: Single-loop feedback design; poles, zeros, and stability; performance and robustness; multvariable design: Nyquist-like methods, LQG methods; Youla parameterization and H_∞ optimal control; design by parameter optimization; computer-aided design.

SUBRAHMANYAM, M. B., ***Optimal Control with a Worst-Case Performance Criterion and Applications,*** Lecture Notes in Control and Information Sciences, Vol. 145, Springer-Verlag, Berlin, Heidelberg, 1990, 133 pages.

Purpose: This volume deals with optimal control problems in which the cost functional is a product of powers of definite integrals. In particular, cost functionals of the form of a quotient of definite integrals and their relationships to finite-interval H_∞ control, performance robustness, and model reduction are treated.

Contents: Optimization with nonstandard cost functionals; linear control problems and an existence theorem; optimal disturbance rejection and performance robustness; necessary conditions for optimal disturbance rejection in linear systems; synthesis of finite-interval H_∞ controllers by state space methods; worst-case perfomance measures for linear control problems; model reduction with a finite-interval H_∞ criterion.

JUNKINS, J. L., ed., ***Mechanics and Control of Large Flexible Structures,*** Progress in Astronautics and Aeronautics, A. R. Seebass (editor-in-chief), Vol. 129, AIAA, Washington, DC, 1990, 705 pages.

Purpose: This book contains contributions from many authors on the subject. Collectively, the issues of high dimensionality, nonlinearity, and uncertainty are significant features of the 25 chapters of this book.

Contents: Structural modeling, identification, and dynamic analysis; control, stability, and optimization; control/structure interactions; analysis and experiments.

LUHANGA, M. L. and **MWANDOSYA, M. J.,** ***Control System Analysis and Design Using the Smith Chart,*** Wiley Eastern Ltd., New Delhi, India, 1990, 106 pages.

Purpose: This book deals with the analysis and design of classical control systems using the Smith chart. The treatment is at the undergraduate level. The Smith chart is widely used by telecommunication engineers.

Contents: Frequency response plots on the Smith chart; stability; compensation; nonlinear system analysis using describing functions.