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A Shock-Fitting Primer



Manuel D. Salas



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Camilla Rothe

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Group Inverses of M-Matrices and Their Applications Stephen J. Kirkland, Michael Neumann, 2012-12-18 Group inverses for singular M matrices are useful tools not only in matrix analysis but also in the analysis of stochastic processes graph theory electrical networks and demographic models Group Inverses of M Matrices and Their Applications highlights the importance and utility of the group inverses of M matrices in several application areas After introducing sample problems associated with Leslie matrices and stochastic matrices the authors develop the basic algebraic and spectral properties of the group inverse of a general matrix They then derive formulas for derivatives of matrix functions and apply the formulas to matrices arising in a demographic setting including the class of Leslie matrices With a focus on Markov chains the text shows how the group inverse of an appropriate M matrix is used in the perturbation analysis of the stationary distribution vector as well as in the derivation of a bound for the asymptotic convergence rate of the underlying Markov chain It also illustrates how to use the

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appreciate the beauty of the underlying mathematics Updated throughout this second edition of a bestseller shows students how PDEs can model diverse problems including the flow of heat **Optimal Estimation of Dynamic Systems, Second** Edition John L. Crassidis, John L. Junkins, 2011-10-26 Optimal Estimation of Dynamic Systems Second Edition highlights the importance of both physical and numerical modeling in solving dynamics based estimation problems found in engineering systems Accessible to engineering students applied mathematicians and practicing engineers the text presents the central concepts and methods of optimal estimation theory and applies the methods to problems with varying degrees of analytical and numerical difficulty Different approaches are often compared to show their absolute and relative utility The authors also offer prototype algorithms to stimulate the development and proper use of efficient computer programs MATLAB codes for the examples are available on the book s website New to the Second Edition With more than 100 pages of new material this reorganized edition expands upon the best selling original to include comprehensive developments and updates It incorporates new theoretical results an entirely new chapter on advanced sequential state estimation and additional examples and exercises An ideal self study guide for practicing engineers as well as senior undergraduate and beginning graduate students the book introduces the fundamentals of estimation and helps newcomers to understand the relationships between the estimation and modeling of dynamical systems It also illustrates the application of the theory to real world situations such as spacecraft attitude determination GPS navigation orbit determination and aircraft tracking Modeling and Control in Vibrational and Structural Dynamics Peng-Fei Yao, 2011-07-06 With numerous examples and exercises throughout this book describes the control behavior of mechanical objects such as wave equations plates and shells It presents a complete and up to date account of many important advances in the modeling and control of vibrational and structural dynamics. The text applies the differential geometric approach to waves plates shells and quasilinear systems and describes differential geometric energy methods that are generalizations of classical energy methods. To make the book self contained the author gives an introduction to Riemannian geometry

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