



Quadrature, Interpolation and Observability

By National Aeronautics and Space Administration (NASA)

Biblioscholar Mrz 2013, 2013. Taschenbuch. Book Condition: Neu. 246x189x5 mm. This item is printed on demand - Print on Demand Neuware - Methods of interpolation and quadrature have been used for over 300 years. Improvements in the techniques have been made by many, most notably by Gauss, whose technique applied to polynomials is referred to as Gaussian Quadrature. Stieltjes extended Gauss's method to certain non-polynomial functions as early as 1884. Conditions that guarantee the existence of quadrature formulas for certain collections of functions were studied by Tchebycheff, and his work was extended by others. Today, a class of functions which satisfies these conditions is called a Tchebycheff System. This thesis contains the definition of a Tchebycheff System, along with the theorems, proofs, and definitions necessary to guarantee the existence of quadrature formulas for such systems. Solutions of discretely observable linear control systems are of particular interest, and observability with respect to a given output function is defined. The output function is written as a linear combination of a collection of orthonormal functions. Orthonormal functions are defined, and their properties are discussed. The technique for evaluating the coefficients in the output function involves evaluating the definite integral of functions which can...



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