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Nota di contenuto	Part I: The Frequency Approach to the Mathematical Description of Linear Periodic Objects -- Discrete Operational Transformations of Functions of Continuous Argument and Operator Description of LTI Systems -- State-Space Analysis of Finite-Dimensional Linear Continuous Periodic (FDLCP) Objects -- Frequency Method in the Theory of FDLCP Objects -- Floquet–Lyapunov Decomposition and its Application -- Part II: PTM approach to SD systems with FDLCP Objects -- Open-Loop SD System with FDLCP Object -- Open-Loop SD System with FDLCP Object and Delay -- Closed-Loop SD System with FDLCP Object and Delay -- Part III: Determinant Polynomial Equations, SD Modal Control and Stabilization of FDLCP Objects -- Polynomial Matrices -- Rational Matrices -- Determinant Polynomial Equations, Causal Modal Control and Stabilization of Discrete Systems -- 11 Synchronous SD Stabilization of FDLCP Objects -- Asynchronous SD Stabilization of FDLCP Objects -- Part IV Building the Quality Functional for the H2-Optimization Task of the System S -- General PTM Properties of Synchronous Open-Loop SD System with Delay -- 14 PTM of the Closed-Loop SD System with Delay as Function of Argument s -- Calculation of Matrices v0(s), 0(s), 0(s) -- System Function --

Representing the PTM of a Closed-Loop Synchronous SD System by the System Function -- H2-Norm of the Closed-Loop SD System -- Construction of the Quality Functional -- Part V H2-Optimization of the Closed-Loop SD System -- Scalar and Matrix Quasi-polynomials -- Minimization of a Quadratic Functional on the Unit Circle -- Construction of Matrix (s,t) -- Construction of Matrix C T (s,t) -- Transformation of Quality Functional -- H2-Optimization of the System S.

Sommario/riassunto

This book is devoted to the problem of sampled-data control of finite-dimensional linear continuous periodic (FDLCP) objects. It fills a deficit in coverage of this important subject. The methods presented here are based on the parametric transfer matrix, which has proven successful in the study of sampled-data systems with linear time-invariant objects. The book shows that this concept can be successfully transferred to sampled-data systems with FDLCP objects. It is set out in five parts: an introduction to the frequency approach for the mathematical description of FDLCP objects including the determination of their structure and their representation as a serial connection of periodic modulators and a linear time-invariant object; construction of parametric transfer matrix for different types of open and closed sampled-data systems with FDLCP objects; the solution of problems of causal modal control of FDLCP objects based on the mathematical apparatus of determinant polynomial equations; consideration of the problem of constructing a quadratic quality functional for the H2-optimization problem of a single-loop synchronous sampled-data system with control delay; description of the general H2-optimization procedure. Necessary mathematical reference material is included at relevant points in the book. Sampled-Data Control for Periodic Objects is of use to: scientists and engineers involved in research and design of systems of systems with FDLCP objects; graduate students wishing to broaden their scope of competence; their instructors; and mathematicians working in the field of control theory.