1. Record Nr. UNINA9910141235303321

Autore	Farina Lorenzo <1963->
Titolo	Positive linear systems : theory and applications / / Lorenzo Farina, Sergio Rinaldi
Pubbl/distr/stampa	New York, New York : , : John Wiley & Sons, Inc., , 2000 ©2000
ISBN	1-118-03302-7 1-118-03127-X
Descrizione fisica	1 online resource (322 p.)
Collana	Pure and Applied Mathematics: A Wiley-Interscience Series of Texts, Monographs and Tracts
Disciplina	003.74 512.9 512.9434
Soggetti	Positive systems Non-negative matrices Linear systems Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	"A Wiley-Interscience Publication."
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Positive Linear Systems: Theory and Applications; Contents; Preface; PART I DEFINITIONS; 1 Introduction; 2 Definitions and Conditions of Positivity; 3 Influence Graphs; 4 Irreducibility, Excitability, and Transparency; PART II PROPERTIES; 5 Stability; 6 Spectral Characterization of Irreducible Systems; 7 Positivity of Equilibria; 8 Reachability and Observability; 9 Realization; 10 Minimum Phase; 11 Interconnected Systems; PART III APPLICATIONS; 12 Input-Output Analysis; 13 Age-Structured Population Models; 14 Markov Chains; 15 Compartmental Systems; 16 Queueing Systems; Conclusions Annotated BibliographyBibliography; Appendix A: Elements of Linear Algebra and Matrix Theory; A.l Real Vectors and Matrices; A.2 Vector Spaces; A.3 Dimension of a Vector Space; A.4 Change of Basis; A.5 Linear Transformations and Matrices; A.6 Image and Null Space; A.7 Invariant Subspaces, Eigenvectors, and Eigenvalues; A.8 Jordan Canonical Form; A.9 Annihilating Polynomial and Minimal Polynomial;

A.10 Normed Spaces; A.11 Scalar Product and Orthogonality; A.12 Adjoint Transformations; Appendix B: Elements of Linear Systems Theory; B.1 Definition of Linear Systems
B.2 ARMA Model and Transfer FunctionB.3 Computation of Transfer Functions and Realization; B.4 Interconnected Subsystems and Mason's Formula; B.5 Change of Coordinates and Equivalent Systems; B.6 Motion, Trajectory, and Equilibrium; B.7 Lagrange's Formula and Transition Matrix; B.8 Reversibility; B.9 Sampled-Data Systems; B.10 Internal Stability: Definitions; B.11 Eigenvalues and Stability; B.12 Tests of Asymptotic Stability; B.13 Energy and Stability; B.14 Dominant Eigenvalue and Eigenvector; B.15 Reachability and Control Law; B.16 Observability and State Reconstruction
B.17 Decomposition TheoremB.18 Determination of the ARMA Models; B.19 Poles and Zeros of the Transfer Function; B.20 Poles and Zeros of Interconnected Systems; B.21 Impulse Response; B.22 Frequency Response; B.23 Fourier Transform; B.24 Laplace Transform; B.25 Z-Transform; B.26 Laplace and Z-Transforms and Transfer Functions; Index

Sommario/riassunto

A complete study on an important class of linear dynamical systems-positive linear systemsOne of the most often-encountered systems in nearly all areas of science and technology, positive linear systems is a specific but remarkable and fascinating class. Renowned scientists Lorenzo Farina and Sergio Rinaldi introduce readers to the world of positive linear systems in their rigorous but highly accessible book, rich in applications, examples, and figures.This professional reference is divided into three main parts: The first part contains the definitions and basic properties of p