



Linear Discrete-Time Systems

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Features

- Discovers the existence of the system full transfer function matrix $F(z)$ and defines and determines it for IO , ISO , and IIO systems.
- Establishes the full block diagram technique and the full system matrix $P(z)$, both based on the use of $F(z)$.
- Introduces new dynamical system and control tools, which are not available in existing texts.
- Explores the concept and definition of the IO systems and IIO systems state, and uses it in the stability study.

Summary

This book covers crucial lacunae of the linear discrete-time time-invariant dynamical systems and introduces the reader to their treatment, while functioning under real, natural conditions, in forced regimes with arbitrary initial conditions. It provides novel theoretical tools necessary for the analysis and design of the systems operating in stated conditions. The text completely covers two well-known systems, IO and ISO , along with a new system, IIO . It discovers the concept of the full transfer function matrix $F(z)$ in the z -complex domain, which incorporates the Z -transform of the system, input and another variable, vectors, all with arbitrary initial conditions. Consequently, it addresses the full system matrix $P(z)$ and the full block diagram technique based on the use of $F(z)$, which incorporates the Z -transform of the system, input and another variable, vectors, all with arbitrary initial conditions. The book explores the direct relationship between the system full transfer function matrix $F(z)$ and the Lyapunov stability

concept, definitions, and conditions, as well as with the *BI* stability concept, definitions, and conditions. The goal of the book is to unify the study and applications of all three classes of the linear discrete-time time-invariant system, for short systems.