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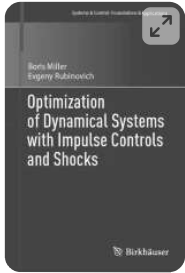☰ Menu   🔍 Search   🛒 Cart

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Optimization of Dynamical Systems with Impulse Controls and Shocks

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Overview

Authors: Boris Miller , Evgeny Rubinovich

> Presents the state-of-the-art in the rapidly developing theory of impulse control
> Introduces the theory of singular space-time transformations, a new method for studying shock mechanical systems
> Considers both traditional and emerging applications

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About this book

This text explores the state-of-the-art in the rapidly developing theory of impulse control and introduces the theory of singular space-time

transformations, a new method for studying shock mechanical systems. Two approaches in the theory of impulse control are presented: The first, more traditional approach defines the impulsive action as a discontinuity of phase coordinates depending on the current time, the state preceding the action, and its magnitude. The second requires the use of modern methods for describing dynamical systems - differential equations with measures. The impulse is treated as an idealization of a very short action of high magnitude, which produces an almost abrupt change of phase coordinates. The relation between these two approaches is also discussed, and several applications, both traditional and emerging, are considered.

This text is intended for graduate students and researchers in control engineering and optimal control theory for dynamical systems. Readers are assumed to be familiar with the theory of ODEs, optimal control, and functional analysis, though an appendix is included that covers many of the necessary mathematical concepts.

Keywords

Impulse control theory   Singular space-time transformations

Shock mechanical systems   Differential equations with measure

Hybrid dynamical systems

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Bibliographic Information

Topics

Systems Theory, Control,
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