



Continuous-Time Markov Jump Linear Systems (Probability and Its Applications)

By Oswaldo Luiz do Valle Costa, Marcelo D. Fragoso, Marcos G. Todorov

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It has been widely recognized nowadays the importance of introducing mathematical models that take into account possible sudden changes in the dynamical behavior of a high-integrity systems or a safety-critical system. Such systems can be found in aircraft control, nuclear power stations, robotic manipulator systems, integrated communication networks and large-scale flexible structures for space stations, and are inherently vulnerable to abrupt changes in their structures caused by component or interconnection failures. In this regard, a particularly interesting class of models is the so-called Markov jump linear systems (MJLS), which have been used in numerous applications including robotics, economics and wireless communication. Combining probability and operator theory, the present volume provides a unified and rigorous treatment of recent results in control theory of continuous-time MJLS. This unique approach is of great interest to experts working in the field of linear systems with Markovian jump parameters or in stochastic control. The volume focuses on one of the few cases of stochastic control problems with an actual explicit solution and offers material well-suited to coursework, introducing students to an interesting and active research area.

The book is addressed to researchers working in control and signal processing engineering. Prerequisites include a solid background in classical linear control theory, basic familiarity with continuous-time Markov chains and probability theory, and some elementary knowledge of operator theory. ?

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Review

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“This book is on the estimation and control of linear continuous-time stochastic systems with jump Markov parameters and additive Wiener processes. ... The book is suitable for introducing jump Markov systems theory to graduate students and practitioners with an appropriately advanced background in linear systems, state space control, probability and random processes. Since it has many of the significant control and estimation results in this field, it can also be used as a versatile reference source by researchers in this field.” (Edwin Engin Yaz, Mathematical Reviews, October, 2013)

From the Back Cover

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