



mathematics



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New Directions on Model Predictive Control

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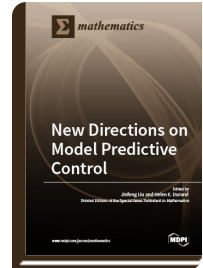
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Model predictive control (MPC) is an advanced control design used in many industries worldwide. An MPC selects control actions which are optimal with respect to a given performance metric as well as any physically-motivated constraints. MPC has therefore gained significant research attention over the past several decades. Advances in MPC continue to unlock its potential to solve a wide variety of practical issues. This book presents some of the state-of-the-art in MPC design from theoretical and applications perspectives. It covers a broad spectrum of MPC application areas, reviewing applications as diverse as air conditioning, pharmaceutical manufacturing, mineral column flotation, actuator faults, and hydraulic fracturing, while also highlighting recent theoretical advancements in control technology that integrate it with data-driven models, zone tracking, or process safety and cybersecurity. Both centralized and distributed MPC formulations are presented. The purpose of this book is to assemble a collection of current research in MPC that handles practically-motivated theoretical issues as well as recent MPC applications, with the aim of highlighting the significant potential benefits of new MPC theory and design.



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