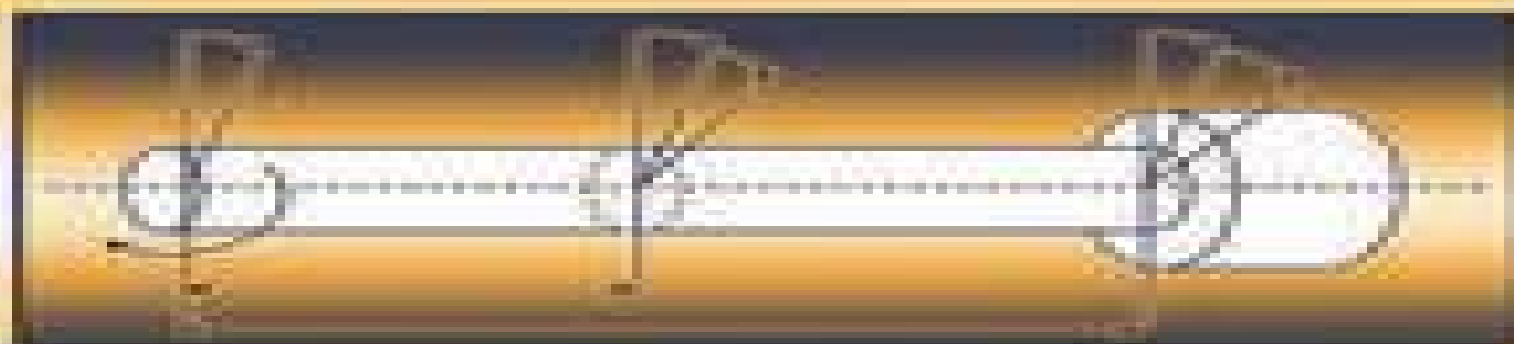


Sliding Mode Control in Electro-Mechanical Systems

Second Edition



Vedim Utkin
Jürgen Guldner
Jingpin Shi



CRC Press
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Sliding Mode Control In Electromechanical Systems

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Sliding Mode Control In Electromechanical Systems:

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because of its discontinuous structure In fact where the hardware of many electromechanical systems such as electric motors prescribes discontinuous inputs SMC becomes the natural choice for direct implementation This book provides a unique combination of theory implementation issues and examples of real life applications reflective of the authors own industry leading work in the development of robotics automobiles and other technological breakthroughs **Sliding Mode Control of Electromechanical Systems** Heide Brandstädt,2009 Sliding Mode Control of Electromechanical Systems Heide Brandstädt,2009 *Variable Structure Systems* Asif Sabanovic,Leonid M. Fridman,Sarah K. Spurgeon,2004-10-08 This unique book fulfils the definite need for an accessible book on variable structure systems and also provides the very latest results in research on this topic Divided into three parts basics of sliding mode control new trends in sliding mode control and applications of sliding mode control the book contains many numerical design examples so that readers can quickly understand the design methodologies and their applications to practical problems Primarily aimed at students and researchers in the field the book will also be useful for practising control engineers **Sliding Mode Control and Observation** Yuri Shtessel,Christopher Edwards,Leonid Fridman,Arie Levant,2013-06-01 The sliding mode control methodology has proven effective in dealing with complex dynamical systems affected by disturbances uncertainties and unmodeled dynamics Robust control technology based on this methodology has been applied to many real world problems especially in the areas of aerospace control electric power systems electromechanical systems and robotics Sliding Mode Control and Observation represents the first textbook that starts with classical sliding mode control techniques and progresses toward newly developed higher order sliding mode control and observation algorithms and their applications The present volume addresses a range of sliding mode control issues including Conventional sliding mode controller and observer design Second order sliding mode controllers and differentiators Frequency domain analysis of conventional and second order sliding mode controllers Higher order sliding mode controllers and differentiators Higher order sliding mode observers Sliding mode disturbance observer based control Numerous applications including reusable launch vehicle and satellite formation control blood glucose regulation and car steering control are used as case studies Sliding Mode Control and Observation is aimed at graduate students with a basic knowledge of classical control theory and some knowledge of state space methods and nonlinear systems while being of interest to a wider audience of graduate students in electrical mechanical aerospace engineering and applied mathematics as well as researchers in electrical computer chemical civil mechanical aeronautical and industrial engineering applied mathematicians control engineers and physicists Sliding Mode Control and Observation provides the necessary tools for graduate students researchers and engineers to robustly control complex and uncertain nonlinear dynamical systems Exercises provided at the end of each chapter make this an ideal text for an advanced course taught in control theory **Sliding Mode Control Using Novel Sliding Surfaces** B. Bandyopadhyay,Fulwani Deepak,Kyung-Soo Kim,2009-09-23 After a survey paper by Utkin in the late 1970s

sliding mode control methodologies emerged as an effective tool to tackle uncertainty and disturbances which are inevitable in most of the practical systems. Sliding mode control is a particular class of variable structure control which was introduced by Emel'yanov and his colleagues. The design paradigms of sliding mode control has now become a mature design technique for the design of robust controller of uncertain system. In sliding mode technique the state trajectory of the system is constrained on a chosen manifold or within some neighborhood thereof by an appropriate control action. This manifold is also called a switching surface or a sliding surface. During sliding mode system dynamics is governed by the chosen manifold which results in a well celebrated invariance property towards certain classes of disturbance and model mismatches. The purpose of this monograph is to give a different dimension to sliding surface design to achieve high performance of the system. Design of the switching surface is vital because the closed loop dynamics is governed by the parameters of the sliding surface. Therefore sliding surface should be designed to meet the closed loop specifications. Many systems demand high performance with robustness. To address this issue of achieving high performance with robustness we propose nonlinear surfaces for different classes of systems. The nonlinear surface is designed such that it changes the system's closed loop damping ratio from its initial low value to a final high value.

Advances in Neural Networks - ISNN 2007 Derong Liu, Shumin Fei, Zeng-Guang Hou, Huaguang Zhang, Changyin Sun, 2007-07-14. This book is part of a three volume set that constitutes the refereed proceedings of the 4th International Symposium on Neural Networks ISNN 2007 held in Nanjing China in June 2007. Coverage includes neural networks for control applications, robotics, data mining and feature extraction, chaos and synchronization, support vector machines, fault diagnosis, detection, image/video processing and applications of neural networks.

Advances and Applications in Sliding Mode Control systems Ahmad Taher Azar, Quanmin Zhu, 2014-11-01. This book describes the advances and applications in Sliding mode control (SMC) which is widely used as a powerful method to tackle uncertain nonlinear systems. The book is organized into 21 chapters which have been organized by the editors to reflect the various themes of sliding mode control. The book provides the reader with a broad range of material from first principles up to the current state of the art in the area of SMC and observation presented in a clear matter of fact style. As such it is appropriate for graduate students with a basic knowledge of classical control theory and some knowledge of state space methods and nonlinear systems. The resulting design procedures are emphasized using Matlab/Simulink software.

Modern Sliding Mode Control Theory Giorgio Bartolini, Leonid Fridman, Alessandro Pisano, Elio Usai, 2008-04-05. This concise book covers modern sliding mode control theory. The authors identify key contributions defining the theoretical and applicative state of the art of the sliding mode control theory and the most promising trends of the ongoing research activities.

The Top Books of the Year Sliding Mode Control In Electromechanical Systems The year 2023 has witnessed a noteworthy surge in literary brilliance, with numerous compelling novels captivating the hearts of readers worldwide. Lets delve into the realm of top-selling books, exploring the engaging narratives that have charmed audiences this year. The Must-Read : Colleen Hoover's "It Ends with Us" This heartfelt tale of love, loss, and resilience has captivated readers with its raw and emotional exploration of domestic abuse. Hoover expertly weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can succeed. Uncover the Best : Taylor Jenkins Reids "The Seven Husbands of Evelyn Hugo" This captivating historical fiction novel unravels the life of Evelyn Hugo, a Hollywood icon who defies expectations and societal norms to pursue her dreams. Reids compelling storytelling and compelling characters transport readers to a bygone era, immersing them in a world of glamour, ambition, and self-discovery. Discover the Magic : Delia Owens "Where the Crawdads Sing" This captivating coming-of-age story follows Kya Clark, a young woman who grows up alone in the marshes of North Carolina. Owens spins a tale of resilience, survival, and the transformative power of nature, entrancing readers with its evocative prose and mesmerizing setting. These bestselling novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of engaging stories waiting to be discovered. The novel begins with Richard Papen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts. The Secret History is a brilliant and thrilling novel that will keep you guessing until the very end. The novel is a warning tale about the dangers of obsession and the power of evil.

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