Athanasios C. Antoulas (Ed.)

Mathematical System Theory

The Influence of R.E. Kalman



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Mathematical System Theory The Influence Of R E Kalman

Fernando García-García

Mathematical System Theory The Influence Of R E Kalman:

Mathematical System Theory Athanasios C. Antoulas, 2013-04-17 Over the past three decades R E Kalman has been one of the most influential personalities in system and control theory His ideas have been instrumental in a variety of areas This is a Festschrift honoring his 60th birthday It contains contributions from leading researchers in the field giving an account of the profound influence of his ideas in a number of areas of active research in system and control theory For example since their introduction by Kalman in the early 60 s the concepts of controllability and observability of dynamical systems with inputs have been the corner stone of the great majority of investigations in the field Mathematical System Theory Athanasios Constantinos Antoulas, 1991 Linear Systems Theory Ben M. Chen, Zongli Lin, Yacov Shamash, 2012-12-06 Structural properties play an important role in our understanding of linear systems in the state space representation The structural canonical form representation of linear systems not only reveals the structural properties but also facilitates the design of feedback laws that meet various control objectives In particular it decomposes the system into various subsystems These subsystems along with the interconnections that exist among them clearly show the structural properties of the system The simplicity of the subsystems and their explicit interconnections with each other lead us to a deeper insight into how feedback control would take effect on the system and thus to the explicit construction of feedback laws that meet our design specifications The discovery of structural canonical forms and their applications in feedback design for various performance specifications has been an active area of research for a long time. The effectiveness of the structural decomposition approach has also been extensively explored in nonlinear systems and control theory in the recent past The aim of this book is to systematically present various canonical represen tations of the linear system that explicitly reveal different structural properties of the system and to report on some recent developments on its utilization in system analysis and design

Mathematical Control Theory John B. Baillieul, J.C. Willems, 2012-12-06 This volume on mathematical control theory contains high quality articles covering the broad range of this field The internationally renowned authors provide an overview of many different aspects of control theory offering a historical perspective while bringing the reader up to the very forefront of current research
Operator Theory and Interpolation Hari Bercovic, Ciprian I. Foias, 2012-12-06 Systems and control theories use sophisticated operator theoretical methods They also provide new ideas and problems in operator theory As a consequence the biannual MTNS Mathematical Theory of Networks and Systems conference is attended by many operator theorists At the initiative of J W Helton and I Gohberg an International Workshop on Operator Theory and Applications IWOTA has been organized since the early 80s as a satellite of MTNS The articles in this volume originated from the IWOTA conference held at Indiana University Bloomington in June 1996 They represent most of the areas that were discussed at the workshop with some emphasis on modern interpolation theory a topic which has seen much progress in recent years The contributions were as usual subject to a thorough refereeing process and will bring the reader to the

forefront of current research in this area Seguential Analysis Alexander Tartakovsky, Igor Nikiforov, Michele Basseville, 2014-08-27 Sequential Analysis Hypothesis Testing and Changepoint Detection systematically develops the theory of sequential hypothesis testing and guickest changepoint detection It also describes important applications in which theoretical results can be used efficiently The book reviews recent accomplishments in hypothesis testing and changepoint detection both in decision theoretic Bayesian and non decision theoretic non Bayesian contexts The authors not only emphasize traditional binary hypotheses but also substantially more difficult multiple decision problems They address scenarios with simple hypotheses and more realistic cases of two and finitely many composite hypotheses. The book primarily focuses on practical discrete time models with certain continuous time models also examined when general results can be obtained very similarly in both cases It treats both conventional i i d and general non i i d stochastic models in detail including Markov hidden Markov state space regression and autoregression models Rigorous proofs are given for the most important results Written by leading authorities in the field this book covers the theoretical developments and applications of sequential hypothesis testing and sequential quickest changepoint detection in a wide range of engineering and environmental domains It explains how the theoretical aspects influence the hypothesis testing and changepoint detection problems as well as the design of algorithms The Control Handbook William S. Levine, 2017-12-19 At publication The Control Handbook immediately became the definitive resource that engineers working with modern control systems required Among its many accolades that first edition was cited by the AAP as the Best Engineering Handbook of 1996 Now 15 years later William Levine has once again compiled the most comprehensive and authoritative resource on control engineering He has fully reorganized the text to reflect the technical advances achieved since the last edition and has expanded its contents to include the multidisciplinary perspective that is making control engineering a critical component in so many fields Now expanded from one to three volumes The Control Handbook Second Edition brilliantly organizes cutting edge contributions from more than 200 leading experts representing every corner of the globe The first volume Control System Fundamentals offers an overview for those new to the field but is also of great value to those across any number of fields whose work is reliant on but not exclusively dedicated to control systems Covering mathematical fundamentals defining principles and basic system approaches this volume Details essential background including transforms and complex variables Includes mathematical and graphical models used for dynamical systems Covers analysis and design methods and stability testing for continuous time systems Delves into digital control and discrete time systems including real time software for implementing feedback control and programmable controllers Analyzes design methods for nonlinear systems As with the first edition the new edition not only stands as a record of accomplishment in control engineering but provides researchers with the means to make further advances Progressively organized the other two volumes in the set include Control System Applications Control System Advanced Methods Current Trends in Nonlinear Systems and Control Laura Menini, Luca Zaccarian, Chaouki T.

Abdallah, 2006-09-13 This volume is an outgrowth of the workshop Applications of Advanced Control Theory to Robotics and Automation organized in honor of the 70th birthdays of Petar V Kokotovic and Salvatore Turi Nicosia Both Petar and Turi have carried out distinguished work in the control community and have long been recognized as mentors as well as experts and pioneers in the field of automatic control covering many topics in control theory and several different applications The variety of their research is reflected in this book which includes contributions ranging from mathematics to laboratory experiments The scope of the work is very broad and although each chapter is self contained the book has been organized into the matically related chapters which in some cases suggest to the reader a convenient reading sequence. The great variety of topics covered and the almost tutorial writing style used by many of the authors will make this book suitable for both experts in the control field and young researchers who seek a more intuitive understanding of these relevant topics in the field European Control Conference 1995, 1995-09-05 Proceedings of the European Control Conference 1995 Rome Italy 5 8 September 1995 Continuous and Discrete Fourier Transforms, Extension Problems and Wiener-Hopf Equations I. Gohberg, 2012-12-06 Stochastic Theory and Control Bozenna Pasik-Duncan, 2003-07-01 This volume contains almost all of the papers that were presented at the Workshop on Stochastic Theory and Control that was held at the Univ sity of Kansas 18 20 October 2001 This three day event gathered a group of leading scholars in the eld of stochastic theory and control to discuss leading edge topics of stochastic control which include risk sensitive control adaptive control mathematics of nance estimation identi cation optimal control nonlinear ltering stochastic di erential equations stochastic p tial di erential equations and stochastic theory and its applications. The workshop provided an opportunity for many stochastic control researchers to network and discuss cutting edge technologies and applications teaching and future directions of stochastic control Furthermore the workshop focused on promoting control theory in particular stochastic control and it promoted collaborative initiatives in stochastic theory and control and stochastic c trol education The lecture on Adaptation of Real Time Seizure Detection Algorithm was videotaped by the PBS Participants of the workshop have been involved in contributing to the documentary being lmed by PBS which highlights the extraordinary work on Math Medicine and the Mind Discovering Tre ments for Epilepsy that examines the e orts of the multidisciplinary team on which several of the participants of the workshop have been working for many years to solve one of the world's most dramatic neurological conditions Invited high school teachers of Math and Science were among the part ipants of this professional meeting Essays on Control H.L. Trentelman, Jan C. Willems, 2012-12-06 This book contains the text of the plenary lectures and the mini courses of the European Control Conference ECC 93 held in Groningen the Netherlands June 2S July 1 1993 However the book is not your usu al conference proceedings Instead the authors took this occasion to take a broad overview of the field of control and discuss its development both from a theoretical as well as from an engineering perpective The first essay is by the key note speaker of the conference AGJ Mac Farlane It consists of a non technical discussion of information processing and

knowledge acquisition as the key features of control engineering tech nology. The next six articles are accounts of the plenary addresses The contribution by R W Brockett concerns a mathematical framework for modelling motion control a central question in robotics and vision In the paper by M Morari the engineering and the economic relevance of chemical process control are considered in particular statistical quality control and the control of systems with constraints The article by A C P M Backx is written from an industrial perspec tive The author is director of an engineering consulting firm involved in the design of industrial control equipment Specifically the possibility of obtaining high performance and reliable controllers by modelling identification and optimizing industrial processes is discussed **Numerical Simulations in the** Environmental and Earth Sciences Fernando García-García, 1997-09-28 A wide ranging account of modelling environmental and earth processes through numerical simulations H∞-Optimal Control and Related Minimax Design *Problems* Tamer Başar, Pierre Bernhard, 2009-05-21 I believe that the authors have written a first class book which can be used for a second or third year graduate level course in the subject Researchers working in the area will certainly use the book as a standard reference SIAM Review Review of the First Edition This book is devoted to one of the fastest developing fields in modern control theory the so called H infinity optimal control theory. In the authors opinion the theory is now at a stage where it can easily be incorporated into a second level graduate course in a control curriculum It seems that this book justifies this claim Mathematical Reviews Review of the First Edition This book is a second edition of this very well known text on H infinity theory This topic is central to modern control and hence this definitive book is highly recommended to anyone who wishes to catch up with this important theoretical development in applied mathematics and control Short Book Reviews Review of the Second Edition A State Space Approach to Canonical Factorization with Applications Harm Bart, Israel Gohberg, Marinus A. Kaashoek, André C.M. Ran, 2011-02-09 The present book deals with canonical factorization of matrix and operator functions that appear in state space form or that can be transformed into such a form A unified geometric approach is used The main results are all expressed explicitly in terms of matrices or operators which are parameters of the state space representation The applications concern different classes of convolution equations A large part the book deals with rational matrix functions only Global Navigation Satellite Systems, Inertial Navigation, and Integration Mohinder S. Grewal, Angus P. Andrews, Chris G. Bartone, 2020-01-22 Covers significant changes in GPS INS technology and includes new material on GPS GNSSs including GPS Glonass Galileo BeiDou QZSS and IRNSS NAViC and MATLAB programs on square root information filtering SRIF This book provides readers with solutions to real world problems associated with global navigation satellite systems inertial navigation and integration It presents readers with numerous detailed examples and practice problems including GNSS aided INS modeling of gyros and accelerometers and SBAS and GBAS This revised fourth edition adds new material on GPS III and RAIM It also provides updated information on low cost sensors such as MEMS as well as GLONASS Galileo BeiDou QZSS and IRNSS NAViC and QZSS Revisions also

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development of the theories of quantum information and complexity This book will be of interest to mathematicians physicists computer scientists as well as electrical engineers working in this field <u>Quantum Information and Complexity</u> Takeyuki Hida,2004 The Winter School and the International Conference on Quantum Information and Complexity was held from 6 to 10 January 2003 at Meijo University Nagoya P v **Tensors of Geophysics for Mavericks and Mongrels** Frank Hadsell,1995

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