

Signal Processing for Active Control

Stephen Elliott



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SIGNAL PROCESSING
AND APPLICATIONS

Signal Processing For Active Control

M. O. Tokhi, R. R. Leitch

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Signal Processing For Active Control:

Signal Processing for Active Control Stephen Elliott, 2000-09-26 Signal Processing for Active Control sets out the signal processing and automatic control techniques that are used in the analysis and implementation of active systems for the control of sound and vibration After reviewing the performance limitations introduced by physical aspects of active control Stephen Elliott presents the calculation of the optimal performance and the implementation of adaptive real time controllers for a wide variety of active control systems Active sound and vibration control are technologically important problems with many applications Active control means controlling disturbance by superimposing a second disturbance on the original source of disturbance Put simply initial noise other specially generated noise or vibration silence or controlled noise This book presents a unified approach to techniques that are used in the analysis and implementation of different control systems It includes practical examples at the end of each chapter to illustrate the use of various approaches This book is intended for researchers engineers and students in the field of acoustics active control signal processing and electrical engineering

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Active Control of Sound P. A. Nelson, S. J. Elliott, 1993 This book describes modern techniques for reducing the level of airborne noise through the introduction of sound radiated by additional secondary sources bringing together the results of contemporary research in this area It is the combination of the physical properties of sound fields and modern digital signal processing technology that has made the active control of sound a practical proposition in a number of important applications The book covers both these aspects of the subject initially at a fundamental level and then in detail in later chapters The structure of the book is such that it should be suitable for both those seeking a basic understanding of the subject and as a reference for researchers in the field A key feature of the work is the unified presentation of material from the two disciplines of acoustics and signal processing

Active Control of Vibration Christopher C. Fuller, Sharon Elliott, P. A. Nelson, 1996-02-08 This book is a companion text to Active Control of Sound by P A Nelson and S J Elliott also

published by Academic Press It summarizes the principles underlying active vibration control and its practical applications by combining material from vibrations mechanics signal processing acoustics and control theory The emphasis of the book is on the active control of waves in structures the active isolation of vibrations the use of distributed strain actuators and sensors and the active control of structurally radiated sound The feedforward control of deterministic disturbances the active control of structural waves and the active isolation of vibrations are covered in detail as well as the more conventional work on modal feedback The principles of the transducers used as actuators and sensors for such control strategies are also given an in depth description The reader will find particularly interesting the two chapters on the active control of sound radiation from structures active structural acoustic control The reason for controlling high frequency vibration is often to prevent sound radiation and the principles and practical application of such techniques are presented here for both plates and cylinders The volume is written in textbook style and is aimed at students practicing engineers and researchers Combines material from vibrations signal processing mechanics and controls Summarizes new research in the field

Active Control of Noise and Vibration Colin Hansen, Scott Snyder, Xiaojun Qiu, Laura Brooks, Danielle Moreau, 2012-11-02 Integrating active control of both sound and vibration this comprehensive two volume set combines coverage of fundamental principles with the most recent theoretical and practical developments The authors explain how to design and implement successful active control systems in practice and detail the pitfalls one must avoid to ensure a reliable and stable system Extensively revised updated and expanded throughout the second edition reflects the advances that have been made in algorithms DSP hardware and applications since the publication of the first edition

Active Noise Control Primer Scott D. Snyder, 2012-09-25 Active noise control the reduction of noise by generating an acoustic signal that actively interferes with the noise has become an active area of basic research and engineering applications The aim of this book is to present all of the basic knowledge one needs for assessing how useful active noise control will be for a given problem and then to provide some guidance for designing setting up and tuning an active noise control system Written for students who have no prior knowledge of acoustics signal processing or noise control but who do have a reasonable grasp of basic physics and mathematics the book is short and descriptive It leaves for more advanced texts or research monographs all mathematical details and proofs concerning vibrations signal processing and the like The book can thus be used in independent study in a classroom with laboratories or in conjunction with a kit for experiment or demonstration Topics covered include basic acoustics human perception and sound sound intensity and related concepts fundamentals of passive noise control strategies basics of digital systems basics of adaptive controllers and active noise control systems

Adaptive Systems in Control and Signal Processing 1986 K.J. Aström, B. Wittenmark, 2016-07-21 This second IFAC workshop discusses the variety and applications of adaptive systems in control and signal processing The various approaches to adaptive control systems are covered and their stability and adaptability analyzed The volume also includes papers taken from two poster sessions to give

a concise and comprehensive overview treatment of this increasingly important field *Signal Processing for Intelligent Sensor Systems with MATLAB®* David C. Swanson, 2011-07-21 *Signal Processing for Intelligent Sensors with MATLAB* Second Edition once again presents the key topics and salient information required for sensor design and application Organized to make it accessible to engineers in school as well as those practicing in the field this reference explores a broad array of subjects and is divided into sections Active Control of Noise and Vibration Colin H. Hansen, Scott D. Snyder, Laura Brooks, Danielle Moreau, 2013 Integrating active control of both sound and vibration this comprehensive two volume set combines coverage of fundamental principles with the most recent theoretical and practical developments The authors explain how to design and implement successful active control systems in practice and detail the pitfalls one must avoid to ensure a reliable and stable system Extensively revised updated and expanded throughout the second edition reflects the advances that have been made in algorithms DSP hardware and applications since the publication of the first edition Handbook of Signal Processing in Acoustics David Havelock, Sonoko Kuwano, Michael Vorländer, 2008-10-26 The Handbook of Signal Processing in Acoustics brings together a wide range of perspectives from over 100 authors to reveal the interdisciplinary nature of the subject It brings the key issues from both acoustics and signal processing into perspective and is a unique resource for experts and practitioners alike to find new ideas and techniques within the diversity of signal processing in acoustics **Signal Processing for Intelligent Sensor Systems with MATLAB, Second Edition** David C. Swanson, 2012 Building on the unique features that made the first edition a bestseller this second edition includes additional solved problems and web access to the large collection of MATLAB™ scripts that are highlighted throughout the text The book offers expanded coverage of audio engineering transducers and sensor networking technology It also includes new chapters on digital audio processing as well as acoustics and vibrations transducers The text addresses the use of meta data architectures using XML and agent based automated data mining and control The numerous algorithms presented can be applied locally or network based to solve complex detection problems **Academic Press Library in Signal Processing** Paulo S.R. Diniz, Patrick A. Naylor, Johan Suykens, 2013-09-21 This first volume edited and authored by world leading experts gives a review of the principles methods and techniques of important and emerging research topics and technologies in machine learning and advanced signal processing theory With this reference source you will Quickly grasp a new area of research Understand the underlying principles of a topic and its application Ascertain how a topic relates to other areas and learn of the research issues yet to be resolved Quick tutorial reviews of important and emerging topics of research in machine learning Presents core principles in signal processing theory and shows their applications Reference content on core principles technologies algorithms and applications Comprehensive references to journal articles and other literature on which to build further more specific and detailed knowledge Edited by leading people in the field who through their reputation have been able to commission experts to write on a particular topic **Active Noise Control Systems** Sen M.

Kuo, Dennis R. Morgan, 1966 Active Noise Control M. O. Tokhi, R. R. Leitch, 1992 In active noise control an artificially generated secondary acoustic field is used to interfere destructively with the unwanted sound field This book deals with the control engineering of generating this secondary field This technique has uses in suppressing machinery noise in particular
Adaptive Signal Processing Strategies with Application to Active Control of Sound and Vibration Steven R. Popovich, 1993
Intelligent Signal Processing for Active Control ,1992 This research is concerned with the use of neural architectures and fuzzy expert systems in nonlinear system identification and in the control of such systems In particular on line identification modeling is considered The research has resulted in a technique where the network can evolve in size in time so as to provide an optimal model controller Also an adaptive algorithm which is less sensitive to initial values of the weights and the learning rate has been developed We have also established a common framework between neural networks and fuzzy expert systems and developed a neuro fuzzy architecture that retains the best of the two areas The use of the architectures and the adaptation algorithm has been demonstrated on a number of applications **Active Control of Acoustic Noise Using Adaptive Signal Processing** Søren Laugesen, Danmarks Tekniske Højskole. Laboratoriet for Akustik, DTH., 1992 *Applied Mechanics Reviews* ,1995 **IEEE Transactions on Circuits and Systems** ,2005 The Journal of the Acoustical Society of America Acoustical Society of America, 2007

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