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Active Noise Control Systems: Algorithms And DSP Implementations (Wiley Series In Telecommunications And Signal Processing)



Synopsis

Active noise control (ANC) is rapidly becoming the most effective way to reduce noises that can otherwise be very difficult and expensive to control. ANC is achieved by introducing a canceling "anti-noise" wave through an appropriate array of secondary sources. When applied accurately, ANC can provide effective solutions to noise-related problems in a broad range of areas, including manufacturing and industrial operations as well as consumer products. Consequently, ANC research and development has become an important focus of both industrial applications and engineering research. *Active Noise Control Systems: Algorithms and DSP Implementations* introduces the basic concepts of ANC with an emphasis on digital signal processing (DSP) hardware and adaptive signal processing algorithms, both of which have come into prominence within the last decade. The authors emphasize the practical aspects of ANC systems by combining the principles of adaptive signal processing with both experimental results and practical implementation. Applications are cited in many fields and encompass all types of noise media, including air-acoustic, hydroacoustic, vibrations, and others. The specific implementation stressed is based on the TMS320 family of signal processors from Texas Instruments, which are the most widely used worldwide. Coverage of theory includes concise derivations and analyses of commonly used adaptive structures and algorithms for active noise control applications, which are enhanced by the inclusion of a floppy disk featuring C and assembly programs for implementing many ANC systems. Mathematical representations are employed and the source code included on the disk is in a form that is easily accessible to anyone using the book. For practicing engineers, researchers, and advanced students in signal processing, *Active Noise Control Systems: Algorithms and DSP Implementations* will serve as a comprehensive, state-of-the-art text/reference on this important and rapidly developing field. The recent development of digital signal processing (DSP) hardware and adaptive signal processing algorithms has resulted in a dynamic new way of achieving active noise control (ANC). To meet the need for a definitive text on both the basic theory and practical applications of these new ANC techniques, Sen M. Kuo and Dennis R. Morgan have written an invaluable, highly accessible book for researchers, engineers, and advanced students in signal processing. A state-of-the-art presentation of ANC from innovators in the field Thorough coverage of the theoretical principles behind ANC techniques with rational and consistent notation Numerous illustrations for easy interpretation of complex algorithms Unique emphasis on the practical applications of ANC systems from the viewpoint of signal processing and DSP implementation within the framework of ANC systems Accompanying software that can be used to implement many ANC systems discussed in the text

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Customer Reviews

This excellent text is written for advanced study and practicing engineers who need to design controllers for active noise control systems. The emphasis is on the algorithms that are usually implemented in a Digital Signal Processor. The book's treatment of acoustics, sensors, and actuators is not as in-depth as texts by Fuller or Nelson. Included in the book is C and assembly code for the most popular adaptive control techniques, but beware of bugs and patent issues. One of the algorithms covered in detail is the Filtered-X Least Mean Squares technique that one of the Authors (Morgan) help to make popular in the community.

This is an excellent book for persons with signal processing background. The book provides only minimum information about acoustics for a signal processing person and does not confuse with too much of details. In this way, the book makes to reader comfortable. Also many aspects of signal processing which can improve the performance of an active noise control (ANC)system are explained and hence the reader feels more confident that he too can work in this field. This is very

much essential as the adaptive algorithms play a crucial role in the ANC implementation. The FXLMS algorithm and its problems are well described. To start with I did not know any thing about ANC, but this book has helped me to get good understanding about it. Presnently, I am able to do research contributions to international journal and to conferences. Further, I have taken up projects at national level in ANC. I feel this book has presented the subject in a simple way retaining all the intricate details. This background enables a reseacher even to follow new developments taking place in this filed. This is a very very useful and excellent book.

This is an excellent book for the signal processing community as the stress is mainly on algorithms and implementation. A reseacher who wants to work in this field without much background in acoustics, finds this book very useful and it enables him to get to know how he can apply his adaptive signal processing skills to active noise control. This book provides in a simple way the active noise control field and its associated problems. As the book provides only required amount of acoustical details and explains the filtered LMS algorithm very clearly unlike other books, for a beginner it is a very good book. I didn't know any thing aboout ANC when I started, but to day I am able to contribute even to international journals and conferences. Further I have under taken projects at national level from government agencies to develop ANC systems. I feel this book is really well written and it makes the reader keen to know about the subject and provides him high level of confidence. I sincerely recommend this book for any person who is new to this field and has signal processing background. It is a very very very excellent book.

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