ADVANCED TOPICS IN SCIENCE AND TECHNOLOGY IN CHINA

Qihu Li

Digital Sonar Design in Underwater Acoustics

Principles and Applications

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Digital Sonar Design In Underwater Acoustics Principles And Applications Advanced Topics In Science And Technology In China

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Digital Sonar Design In Underwater Acoustics Principles And Applications Advanced Topics In Science And Technology In China:

Digital Sonar Design in Underwater Acoustics Qihu Li,2012-03-05 Digital Sonar Design in Underwater Acoustics Principles and Applications provides comprehensive and up to date coverage of research on sonar design including the basic theory and techniques of digital signal processing basic concept of information theory ocean acoustics underwater acoustic signal propagation theory and underwater signal processing theory This book discusses the general design procedure and approaches to implementation the design method system simulation theory and techniques sonar tests in the laboratory lake and sea and practical validation criteria and methods for digital sonar design It is intended for researchers in the fields of underwater signal processing and sonar design and also for navy officers and ocean explorers Qihu Li is a professor at the Institute of Acoustics Chinese Academy of Sciences and an academician of the Chinese Academy of Sciences Index of Conference Proceedings British Library. Document Supply Centre,1997 Conference Papers Index ,1987 *Digital Underwater Acoustic Communications* Lufen Xu,Tianzeng Xu,2016-09-16 Digital Underwater Acoustic Communications focuses on describing the differences between underwater acoustic communication channels and radio channels discusses loss of transmitted sound in underwater acoustic channels describes digital underwater acoustic communication signal processing and provides a comprehensive reference to digital underwater acoustic communication equipment This book is designed to serve as a reference for postgraduate students and practicing engineers involved in the design and analysis of underwater acoustic communications systems as well as for engineers involved in underwater acoustic engineering Introduces the basics of underwater acoustics along with the advanced functionalities needed to achieve reliable communications in underwater environment Identifies challenges in underwater acoustic channels relative to radio channels underwater acoustic propagation and solutions Shows how multi path structures can be thought of as time diversity signals Presents a new robust signal processing system and an advanced FH SS system for multimedia underwater acoustic communications with moderate communication ranges above 20km and rates above 600bps Describes the APNFM system for underwater acoustic communication equipment including both civil and military applications to be employed in active sonar to improve its performance **The Advanced Sonar Course** Rodney F. W. Coates,2001 **Sonar and Underwater Acoustics** Jean-Paul Marage,Yvon Mori,2010-08-23 Sonar and Underwater Acoustics brings together all the concepts necessary for designers and users of sonar systems Unlike other books on this subject which are often too specialized this book is accessible to a wider audience The first part focuses on the acoustic environment antenna structures and electric acoustic interface The latter provides knowledge required to design as well as the development and implementation of chain processes for an active sonar from the conditioning input to output processing The reader will find a comprehensive range of all problems encountered in underwater acoustics for a sonar application from physical phenomena governing the

environment and the corresponding constraints through to the technical definition of transducers and antennas and the types of signal processing involved In one section measures in underwater acoustics are also proposed **Underwater Acoustic Digital Signal Processing and Communication Systems** Robert Istepanian,Milica Stojanovic,2013-03-09 Underwater acoustic digital signal processing and communications is an area of applied research that has witnessed major advances over the past decade Rapid developments in this area were made possible by the use of powerful digital signal processors DSPs whose speed computational power and portability allowed efficient implementation of complex signal processing algorithms and experimental demonstration of their performance in a variety of underwater environments The early results served as a motivation for the development of new and improved signal processing methods for underwater applications which today range from classical of autonomous underwater vehicles and sonar signal processing to remote control underwater wireless communications This book presents the diverse areas of underwater acoustic signal processing and communication systems through a collection of contributions from prominent researchers in these areas Their results both new and those published over the past few years have been assembled to provide what we hope is a comprehensive overview of the recent developments in the field The book is intended for a general audience of researchers engineers and students working in the areas of underwater acoustic signal processing It requires the reader to have a basic understanding of the digital signal processing concepts Each topic is treated from a theoretical perspective followed by practical implementation details We hope that the book can serve both as a study text and an academic reference Underwater Acoustics Richard P. Hodges,2010-07-19 Offering complete and comprehensive coverage of modern sonar spectrum system analysis Underwater Acoustics Analysis Design and Performance of Sonar provides a state of the art introduction to the subject and has been carefully structured to offer a much needed update to the classic text by Urick Expanded to included computational approaches to the topic this book treads the line between the highly theoretical and mathematical texts and the more populist non mathematical books that characterize the existing literature in the field The author compares and contrasts different techniques for sonar design analysis and performance prediction and includes key experimental and theoretical results pointing the reader towards further detail with extensive references Practitioners in the field of sonar design analysis and performance prediction as well as graduate students and researchers will appreciate this new reference as an invaluable and timely contribution to the field Chapters include the sonar equation radiated self and ambient noise active sonar sources transmission loss reverberation transducers active target strength statistical detection theory false alarms contacts and targets variability and uncertainty modelling detections and tactical decision aids cumulative probability of detection tracking target motion analysis and localization and design and evaluation of sonars *Underwater Acoustic Data Processing* Y. T. Chan,1989-03-31 This book contains the papers that were accepted for presentation at the 1988 NATO Advanced Study Institute on Underwater Acoustic Data Processing held at the Royal Military College of Canada from 18 to 29

July 1988 Approximately 110 participants from various NATO countries were in attendance during this two week period Their research interests range from underwater acoustics to signal processing and computer science some are renowned scientists and some are recent Ph D graduates The purpose of the ASI was to provide an authoritative summing up of the various research activities related to sonar technology The exposition on each subject began with one or two tutorials prepared by invited lecturers followed by research papers which provided indications of the state of development in that specific area I have broadly classified the papers into three sections under the titles of I Propagation and Noise II Signal Processing and III Post Processing The reader will find in Section I papers on low frequency acoustic sources and effects of the medium on underwater acoustic propagation Problems such as coherence loss due to boundary interaction wavefront distortion and multipath transmission were addressed Besides the medium corrupting noise sources also have a strong influence on the performance of a sonar system and several researchers described methods of modeling these sources **Underwater Acoustic Channel** Junying Hui,Xueli Sheng,2022-05-19 This book introduces sonar system and acoustic channel model average energy channel coherent multipath channel the theoretical basis for the stochastic time varying space variant channel slowly time varying coherent multipath channel and reverberation channel Based on the basic theory of underwater acoustic channels and the various characteristics of the marine acoustic environment factor this textbook aims to help students understand the impact of the marine acoustic channel on the sonar system It helps students to grasp underwater acoustic signal processing principles and obtain the ability to solve practical problems in underwater acoustic channel engineering Finally it aims at laying a foundation for the further sonar system design This textbook is recommended for graduate or undergraduate students in the field of sonar signal processing underwater acoustic engineering as well as some related subjects of marine technology Underwater Real-Time 3D Acoustical Imaging Cheng Chi,2019-01-22 This book presents the topic of underwater real time 3 D acoustical imaging covering the theory algorithms and system design It summarizes recent advances in wideband and ultra wideband underwater real time 3 D acoustical imaging which will be very useful for developing next generation systems Through simulation techniques readers are able to quickly learn and develop practical underwater real time 3 D acoustical imaging systems of their own *Underwater Acoustic Data Processing* Y T Chan,1989 *Underwater Acoustics* Salah Bourennane,2012-03-28 The field of acoustic engineering has many various potential applications such as in ocean science research and homeland security This book provides cutting edge knowledge in current techniques and technologies such as the adaptive technique for underwater communication array processing and the CI OFDM system One chapter takes inspiration from the natural world in proposing a new bio inspired ranging approach for resolution purposes Technologies such as high resolution array processing methods can also be used to locate underwater objects in sediment as one chapter shows Finally two contributions cover the applications of narrowband interference suppression and iterative equalization and decoding schemes Given the scope of the book it will be required reading for

researchers and engineers in the field Advances inUnderwater Acoustics Andrzej Zak,2017-11-22 Underwater acoustics despite the relatively short history has already found practical application in many areas of human activity It allows among others depth research data transmission and underwater observation and provides maritime transport safety and security against terrorists Moreover underwater acoustic technologies are also widely used in medicine biology and many other fields Therefore it is one of the most developing areas This book is a collection of experiences of scientists from around the world engaged in research design and construction as well as the daily use of underwater acoustic systems Giving this book in the hands of the reader we hope that it will be a treasure trove of knowledge and inspiration for further research in the field of underwater acoustics *Adaptive Methods in Underwater Acoustics* H.G. Urban,2011-10-02 The NATO Advanced Study Institute on Adaptive Methods in Underwater Acoustics was held on 30 July 10 August 1984 in LLineburg Germany The Institute was primarily concerned with signal processing for underwater appl ica tions The majority of the presentations when taken together yield a definite picture of the present status of understanding of adaptive and high resolution processing setting out the progress achieved over the past four years together with the major problem areas remaining Major effort was made to obtain a commensurate contribution of tutorial and advanced research papers It is my hope that the material in this volume may be equally well suited for students getting an introduction to some of the basic problems in underwater signal processing and for the professionals who may obtain an up to date overview of the present state of the art This might be especially useful in view of the controversy and lack of adequate interrelationships which have marked this rapidly expanding field in the past Practical reinforcement of this picture is provided by the material concerning digital and optical processing technology giving some guidance to achievable adaptive and high resolution techniques with current processing devices The formal programme was extended and detailed by a series of six evening work shops on specific topics during which informal discussions took place among the participants Summaries of these workshops are also included in these Proceedings *High-Resolution Methods in Underwater Acoustics* Michel Bouvet,Georges Bienvenu,2014-03-12 *High-resolution Methods in Underwater Acoustics* Michel Bouvet,1991 **Acoustic Signal Processing for Ocean Exploration** J.M.F Moura,Isabel M.G. Lourtie,2012-12-06 Acoustic Signal Processing for Ocean Explortion has two major goals i to present signal processing algorithms that take into account the models of acoustic propagation in the ocean and ii to give a perspective of the broad set of techniques problems and applications arising in ocean exploration The book discusses related issues and problems focused in model based acoustic signal processing methods Besides addressing the problem of the propagation of acoustics in the ocean it presents relevant acoustic signal processing methods like matched field processing array processing and localization and detection techniques These more traditional contexts are herein enlarged to include imaging and mapping and new signal representation models like time frequency and wavelet transforms Several applied aspects of these topics such as the application of acoustics to fisheries sea floor swath mapping by swath

bathymetry and side scan sonar autonomous underwater vehicles and communications in underwater are also considered

Principles and Applications of Underwater Sound United States. Office of Scientific Research and Department. National Defense Research Committee,1968 **OFDM for Underwater Acoustic Communications** Sheng Zhou,Zhaohui Wang,2014-03-21 A blend of introductory material and advanced signal processing and communication techniques of critical importance to underwater system and network development This book which is the first to describe the processing techniques central to underwater OFDM is arranged into four distinct sections First it describes the characteristics of underwater acoustic channels and stresses the difference from wireless radio channels Then it goes over the basics of OFDM and channel coding The second part starts with an overview of the OFDM receiver and develops various modules for the receiver design in systems with single or multiple transmitters This is the main body of the book Extensive experimental data sets are used to verify the receiver performance In the third part the authors discuss applications of the OFDM receiver in i deep water channels which may contain very long separated multipath clusters ii interference rich environments where an unintentional interference such as Sonar will be present and iii a network with multiple users where both non cooperative and cooperative underwater communications are developed Lastly it describes the development of a positioning system with OFDM waveforms and the progress on the OFDM modem development Closely related industries include the development and manufacturing of autonomous underwater vehicles AUVs and scientific sensory equipment AUVs and sensors in the future could integrate modems based on the OFDM technology described in this book Contents includes Underwater acoustic channel characteristics OFDM basics Peak to average ratio control Detection and Doppler estimation Doppler scale and CFO Channel estimation and noise estimation A block by block progressive receiver and performance results Extensions to multi input multi output OFDM Receiver designs for multiple users Cooperative underwater OFDM Physical layer network coding and dynamic coded cooperation Localization with OFDM waveforms Modem developments A valuable resource for Graduate and postgraduate students on electrical engineering or physics courses electrical engineers underwater acousticians communications engineers

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