

Discrete Time Signal Processing 3rd Edition Prentice Hall Signal Processing Series

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Digital Filter Design - T. W. Parks 1987
Introduction to digital filters. Finite impulse-response filters. Design of linear-phase finite impulse-response. Minimum-phases and complex approximation. Implementation of finite impulse-response filters. Properties of infinite impulse-

response filters. Design of infinite impulse-response filters. Implementation of infinite impulse-response filters. Programs.

Discrete-time Signal Processing - Darrell Williamson 2012-12-06

This comprehensive and up-to-date book focuses

on an algebraic approach to the analysis and design of discrete-time signal processors, including material applicable to numeric and symbolic computation programs such as MATLAB. Written with clarity, it contains the latest detailed research results.

Window Functions and Their Applications in Signal Processing - K. M. M. Prabhu 2018-09-03

Window functions—otherwise known as weighting functions, tapering functions, or apodization functions—are mathematical functions that are zero-valued outside the chosen interval. They are well established as a vital part of digital signal processing. *Window Functions and their Applications in Signal Processing* presents an exhaustive and detailed account of window functions and their applications in signal processing, focusing on the areas of digital spectral analysis, design of FIR filters, pulse compression radar, and speech signal processing. Comprehensively reviewing previous research and recent developments, this

book: Provides suggestions on how to choose a window function for particular applications
Discusses Fourier analysis techniques and pitfalls in the computation of the DFT
Introduces window functions in the continuous-time and discrete-time domains
Considers two implementation strategies of window functions in the time- and frequency domain
Explores well-known applications of window functions in the fields of radar, sonar, biomedical signal analysis, audio processing, and synthetic aperture radar
Digital Signal Processing and Statistical Classification - George J. Miao 2002

This is the first book to introduce and integrate advanced digital signal processing (DSP) and classification together, and the only volume to introduce state-of-the-art transforms including DFT, FFT, DCT, DHT, PCT, CDT, and ODT together for DSP and communication applications. You get step-by-step guidance in discrete-time domain signal processing and frequency domain signal analysis; digital filter

design and adaptive filtering; multirate digital processing; and statistical signal classification. It also helps you overcome problems associated with multirate A/D and D/A converters.

Understanding Digital Signal Processing -

Richard G. Lyons 2010-11-01

Amazon.com's Top-Selling DSP Book for Seven Straight Years—Now Fully Updated!

Understanding Digital Signal Processing, Third Edition, is quite simply the best resource for engineers and other technical professionals who want to master and apply today's latest DSP techniques. Richard G. Lyons has updated and expanded his best-selling second edition to reflect the newest technologies, building on the exceptionally readable coverage that made it the favorite of DSP professionals worldwide. He has also added hands-on problems to every chapter, giving students even more of the practical experience they need to succeed.

Comprehensive in scope and clear in approach, this book achieves the perfect balance between

theory and practice, keeps math at a tolerable level, and makes DSP exceptionally accessible to beginners without ever oversimplifying it.

Readers can thoroughly grasp the basics and quickly move on to more sophisticated techniques. This edition adds extensive new coverage of FIR and IIR filter analysis techniques, digital differentiators, integrators, and matched filters. Lyons has significantly updated and expanded his discussions of multirate processing techniques, which are crucial to modern wireless and satellite communications. He also presents nearly twice as many DSP Tricks as in the second edition—including techniques even seasoned DSP professionals may have overlooked. Coverage includes New homework problems that deepen your understanding and help you apply what you've learned Practical, day-to-day DSP implementations and problem-solving throughout Useful new guidance on generalized digital networks, including discrete

differentiators, integrators, and matched filters
Clear descriptions of statistical measures of signals, variance reduction by averaging, and real-world signal-to-noise ratio (SNR) computation
A significantly expanded chapter on sample rate conversion (multirate systems) and associated filtering techniques
New guidance on implementing fast convolution, IIR filter scaling, and more
Enhanced coverage of analyzing digital filter behavior and performance for diverse communications and biomedical applications
Discrete sequences/systems, periodic sampling, DFT, FFT, finite/infinite impulse response filters, quadrature (I/Q) processing, discrete Hilbert transforms, binary number formats, and much more

Digital Signal Processing - Thomas Holton
2021-02-18

Combining clear explanations of elementary principles, advanced topics and applications with step-by-step mathematical derivations, this textbook provides a comprehensive yet

accessible introduction to digital signal processing. All the key topics are covered, including discrete-time Fourier transform, z-transform, discrete Fourier transform and FFT, A/D conversion, and FIR and IIR filtering algorithms, as well as more advanced topics such as multirate systems, the discrete cosine transform and spectral signal processing. Over 600 full-color illustrations, 200 fully worked examples, hundreds of end-of-chapter homework problems and detailed computational examples of DSP algorithms implemented in MATLAB® and C aid understanding, and help put knowledge into practice. A wealth of supplementary material accompanies the book online, including interactive programs for instructors, a full set of solutions and MATLAB® laboratory exercises, making this the ideal text for senior undergraduate and graduate courses on digital signal processing.

An Introduction to Digital Signal Processing - Stanley Mneney
2009-01-10

Mnoney's text focuses on basic concepts of digital signal processing, MATLAB simulation, and implementation on selected DSP hardware.

Signals, Instrumentation, Control, And Machine Learning: An Integrative

Introduction - Joseph Bentsman 2022-03-07

This book stems from a unique and a highly effective approach to introducing signal processing, instrumentation, diagnostics, filtering, control, system integration, and machine learning. It presents the interactive industrial grade software testbed of mold oscillator that captures the distortion induced by beam resonance and uses this testbed as a virtual lab to generate input-output data records that permit unravelling complex system behavior, enhancing signal processing, modeling, and simulation background, and testing controller designs. All topics are presented in a visually rich and mathematically well supported, but not analytically overburdened format. By incorporating software

testbed into homework and project assignments, the narrative guides a reader in an easily followed step-by-step fashion towards finding the mold oscillator disturbance removal solution currently used in the actual steel production, while covering the key signal processing, control, system integration, and machine learning concepts. The presentation is extensively class-tested and refined through the six-year usage of the book material in a required engineering course at the University of Illinois at Urbana-Champaign.

Schaum's Outline of Digital Signal Processing - Monson Hayes 1999

Confusing Textbooks? Missed Lectures? Not Enough Time? Fortunately for you, there's Schaum's Outlines. More than 40 million students have trusted Schaum's to help them succeed in the classroom and on exams. Schaum's is the key to faster learning and higher grades in every subject. Each Outline presents all the essential course information in an easy-to-

follow, topic-by-topic format. You also get hundreds of examples, solved problems, and practice exercises to test your skills. This Schaum's Outline gives you Practice problems with full explanations that reinforce knowledge Coverage of the most up-to-date developments in your course field In-depth review of practices and applications Fully compatible with your classroom text, Schaum's highlights all the important facts you need to know. Use Schaum's to shorten your study time-and get your best test scores! Schaum's Outlines-Problem Solved.

Supplement: Introduction to Signal Processing & Computer Based Exercise Signal Processing Using MATLAB Version 5 Pkg. - Introducti - Sophocles J. Orfanidis
1998-03-01

Discrete-time Signal Processing - Alan V. Oppenheim 2010
For senior/graduate-level courses in discrete-time signal processing. The definitive,

authoritative text on DSP, ideal for those with an introductory-level knowledge of signals and systems. Written by prominent, DSP pioneers, it provides thorough treatment of the fundamental theorems and properties of discrete-time linear systems, filtering, sampling, and discrete-time Fourier analysis. By focusing on the general and universal concepts in discrete-time signal processing, it remains vital and relevant to the new challenges arising in the field, without limiting itself to specific technologies with relatively short life spans.

Digital Signal Processing - Alan V. Oppenheim
1975

The following studies are discussed in the report: Development of a high speed digital processor for speech synthesis; design of two-dimensional recursive digital filters; reconstruction of multi-dimensional signals from their projections; signal analysis by cepstral prediction; speed transformations of speech; and the hardware implementation of a non-recursive

digital filter. (Modified author abstract).

Applied Digital Signal Processing and Applications - Othman Omran Khalifa
2021-09-14

Due to the rapid development of technologies, digital information playing a key role in our daily life. In the past signal processing appeared in various concepts in more traditional courses where the analog and discrete components were used to achieve the various objectives. However, in the 21st century, with the rapid growth of computing power in terms of speed and memory capacity and the intervention of artificial intelligent, machine /deep learning algorithms, IoT, Cloud computing and automation introduced a tremendous growth in signal processing applications. Therefore, digital signal processing has become such a critical component in contemporary science and technology that many tasks would not be attempted without it. It is a truly interdisciplinary subject that draws from

synergistic developments involving many disciplines. The developers should be able to solve problems with an innovation, creativity and active initiators of novel ideas. However, the learning and teaching has been changed from conventional and tradition education to outcome based education. Therefore, this book prepared on a Problem-based approach and outcome based education strategies. Where the problems incorporate most of the basic principles and proceeds towards implementation of more complex algorithms. Students required to formulate in a way to achieve a well-defined goals under the guidance of their instructor. This book follows a holistic approach and presents discrete-time processing as a seamless continuation of continuous-time signals and systems, beginning with a review of continuous-time signals and systems, frequency response, and filtering. The synergistic combination of continuous-time and discrete-time perspectives leads to a deeper appreciation and

understanding of DSP concepts and practices.

Digital Signal Processing Using MATLAB -

Vinay K. Ingle 2007

This supplement to any standard DSP text is one of the first books to successfully integrate the use of MATLAB® in the study of DSP concepts.

In this book, MATLAB® is used as a computing tool to explore traditional DSP topics, and solve problems to gain insight. This greatly expands the range and complexity of problems that students can effectively study in the course.

Since DSP applications are primarily algorithms implemented on a DSP processor or software, a fair amount of programming is required. Using interactive software such as MATLAB® makes it possible to place more emphasis on learning new and difficult concepts than on programming algorithms. Interesting practical examples are discussed and useful problems are explored.

This updated second edition includes new homework problems and revises the scripts in the book, available functions, and m-files to

MATLAB® V7.

Signal Processing for Communications - Paolo

Prandoni 2008-06-17

With a novel, less classical approach to the subject, the authors have written a book with the conviction that signal processing should be taught to be fun. The treatment is therefore less focused on the mathematics and more on the conceptual aspects, the idea being to allow the readers to think about the subject at a higher conceptual level, thus building the foundations for more advanced topics. The book remains an engineering text, with the goal of helping students solve real-world problems. In this vein, the last chapter pulls together the individual topics as discussed throughout the book into an in-depth look at the development of an end-to-end communication system, namely, a modem for communicating digital information over an analog channel.

Introduction to Digital Signal Processing Using MATLAB with Application to Digital

Communications - K.S. Thyagarajan 2018-05-28
This textbook provides engineering students with instruction on processing signals encountered in speech, music, and wireless communications using software or hardware by employing basic mathematical methods. The book starts with an overview of signal processing, introducing readers to the field. It goes on to give instruction in converting continuous time signals into digital signals and discusses various methods to process the digital signals, such as filtering. The author uses MATLAB throughout as a user-friendly software tool to perform various digital signal processing algorithms and to simulate real-time systems. Readers learn how to convert analog signals into digital signals; how to process these signals using software or hardware; and how to write algorithms to perform useful operations on the acquired signals such as filtering, detecting digitally modulated signals, correcting channel distortions, etc. Students are also shown how to

convert MATLAB codes into firmware codes. Further, students will be able to apply the basic digital signal processing techniques in their workplace. The book is based on the author's popular online course at University of California, San Diego.

Digital Signal Processing Using MATLAB - Vinay K. Ingle 2011-01-01

In this supplementary text, MATLAB is used as a computing tool to explore traditional DSP topics and solve problems to gain insight. This greatly expands the range and complexity of problems that students can effectively study in the course. Since DSP applications are primarily algorithms implemented on a DSP processor or software, a fair amount of programming is required. Using interactive software such as MATLAB makes it possible to place more emphasis on learning new and difficult concepts than on programming algorithms. Interesting practical examples are discussed and useful problems are explored. Important Notice: Media content referenced

within the product description or the product text may not be available in the ebook version.

Discrete-time Stochastic Systems - Torsten Söderström 2012-12-06

This comprehensive introduction to the estimation and control of dynamic stochastic systems provides complete derivations of key results. The second edition includes improved and updated material, and a new presentation of polynomial control and new derivation of linear-quadratic-Gaussian control.

Signal Processing First - James H. McClellan 2003

Digital Signal Processing First, Global Edition - 2015

Advanced Signal Processing and Digital Noise Reduction - Saeed V. Vaseghi

1996-07-25

Noise cancellation is particularly important in the new mobile communications field, with

respect to background noise and acoustic interference in moving vehicles. This comprehensive text develops a coherent and structured presentation of a broad range of the theory and application of statistical signal processing, with emphasis on digital noise reduction algorithms. Other applications covered are spectral estimation, channel equalisation, speech coding over noisy channels, speech recognition in adverse environments, active noise control, echo cancellation, restoration of lost filters, and adaptive notch filters.

Discrete Random Signals and Statistical Signal Processing - Charles W. Therrien 1992-01

Real-time Digital Signal Processing - Sen-Maw Kuo 2003

Digital Signal Processing in Communications Systems - Marvin Frerking 2013-03-14

An engineer's introduction to concepts, algorithms, and advancements in Digital Signal Processing. This lucidly written resource makes extensive use of real-world examples as it covers all the important design and engineering references.

Discrete-Time Speech Signal Processing -

Thomas F. Quatieri 2008-11-10

Essential principles, practical examples, current applications, and leading-edge research. In this book, Thomas F. Quatieri presents the field's most intensive, up-to-date tutorial and reference on discrete-time speech signal processing.

Building on his MIT graduate course, he introduces key principles, essential applications, and state-of-the-art research, and he identifies limitations that point the way to new research opportunities. Quatieri provides an excellent balance of theory and application, beginning with a complete framework for understanding discrete-time speech signal processing. Along the way, he presents important advances never

before covered in a speech signal processing text book, including sinusoidal speech processing, advanced time-frequency analysis, and nonlinear aeroacoustic speech production modeling. Coverage includes: Speech production and speech perception: a dual view Crucial distinctions between stochastic and deterministic problems Pole-zero speech models Homomorphic signal processing Short-time Fourier transform analysis/synthesis Filter-bank and wavelet analysis/synthesis Nonlinear measurement and modeling techniques The book's in-depth applications coverage includes speech coding, enhancement, and modification; speaker recognition; noise reduction; signal restoration; dynamic range compression, and more. Principles of Discrete-Time Speech Processing also contains an exceptionally complete series of examples and Matlab exercises, all carefully integrated into the book's coverage of theory and applications.

Applied Digital Signal Processing - Dimitris G.

Manolakis 2011-11-21

Master the basic concepts and methodologies of digital signal processing with this systematic introduction, without the need for an extensive mathematical background. The authors lead the reader through the fundamental mathematical principles underlying the operation of key signal processing techniques, providing simple arguments and cases rather than detailed general proofs. Coverage of practical implementation, discussion of the limitations of particular methods and plentiful MATLAB illustrations allow readers to better connect theory and practice. A focus on algorithms that are of theoretical importance or useful in real-world applications ensures that students cover material relevant to engineering practice, and equips students and practitioners alike with the basic principles necessary to apply DSP techniques to a variety of applications. Chapters include worked examples, problems and computer experiments, helping students to

absorb the material they have just read. Lecture slides for all figures and solutions to the numerous problems are available to instructors. DIGITAL SIGNAL PROCESSING: PRINCIPLES ALGORITHMS AND APPLICATIONS - John G. Proakis 2001

Introduction to Signal Processing, Instrumentation, and Control - Joseph Bentsman 2016-01-11

This book stems from a unique and highly effective approach in introducing signal processing, instrumentation, diagnostics, filtering, control, and system integration. It presents the interactive industrial grade software testbed of mold oscillator that captures the mold motion distortion induced by coupling of the electro-hydraulic actuator nonlinearity with the resonance of the mold oscillator beam assembly. The testbed is then employed as a virtual lab to generate input-output data records that permit unraveling and refining complex

behavior of the actual production system through merging dynamics, signal processing, instrumentation, and control into a coherent problem-solving package. The material is presented in a visually rich, mathematically and graphically well supported, but not analytically overburdened format. By incorporating software testbed into homework and project assignments, the book fully brings out the excitement of going through the adventure of exploring and solving a mold oscillator distortion problem, while covering the key signal processing, diagnostics, instrumentation, modeling, control, and system integration concepts. The approach presented in this book has been supported by two education advancement awards from the College of Engineering of the University of Illinois at Urbana-Champaign.

Digital and Statistical Signal Processing -

Anastasia Veloni 2018-10-03

Nowadays, many aspects of electrical and electronic engineering are essentially

applications of DSP. This is due to the focus on processing information in the form of digital signals, using certain DSP hardware designed to execute software. Fundamental topics in digital signal processing are introduced with theory, analytical tables, and applications with simulation tools. The book provides a collection of solved problems on digital signal processing and statistical signal processing. The solutions are based directly on the math-formulas given in extensive tables throughout the book, so the reader can solve practical problems on signal processing quickly and efficiently. FEATURES Explains how applications of DSP can be implemented in certain programming environments designed for real time systems, ex. biomedical signal analysis and medical image processing. Pairs theory with basic concepts and supporting analytical tables. Includes an extensive collection of solved problems throughout the text. Fosters the ability to solve practical problems on signal processing without

focusing on extended theory. Covers the modeling process and addresses broader fundamental issues.

Digital Signal Processing - Alan V. Oppenheim 1975

Covers the analysis and representation of discrete-time signals and systems, including discrete-time convolution, difference equations, the z-transform, and the discrete-time Fourier transform. Emphasis is placed on the similarities and distinctions between discrete-time and continuous-time signals and systems. Also covers digital network structures for implementation for both recursive (infinite impulse response) and nonrecursive (finite impulse response) digital filters with four videocassettes devoted to digital filter design for recursive and nonrecursive filters. Concludes with a discussion of the fast Fourier transform algorithm for computation of the discrete Fourier transform.

Signals & Systems - Alan V. Oppenheim 1997

This authoritative book, highly regarded for its

intellectual quality and contributions provides a solid foundation and life-long reference for anyone studying the most important methods of modern signal and system analysis. The major changes of the revision are reorganization of chapter material and the addition of a much wider range of difficulties.

Digital Filters - Fred Taylor 2011-09-20

The book is not an exposition on digital signal processing (DSP) but rather a treatise on digital filters. The material and coverage is comprehensive, presented in a consistent that first develops topics and subtopics in terms of their purpose, relationship to other core ideas, theoretical and conceptual framework, and finally instruction in the implementation of digital filter devices. Each major study is supported by Matlab-enabled activities and examples, with each Chapter culminating in a comprehensive design case study.

Foundations of Signal Processing - Martin

Vetterli 2014-09-04

This comprehensive and engaging textbook introduces the basic principles and techniques of signal processing, from the fundamental ideas of signals and systems theory to real-world applications. Students are introduced to the powerful foundations of modern signal processing, including the basic geometry of Hilbert space, the mathematics of Fourier transforms, and essentials of sampling, interpolation, approximation and compression. The authors discuss real-world issues and hurdles to using these tools, and ways of adapting them to overcome problems of finiteness and localization, the limitations of uncertainty, and computational costs. It includes over 160 homework problems and over 220 worked examples, specifically designed to test and expand students' understanding of the fundamentals of signal processing, and is accompanied by extensive online materials designed to aid learning, including Mathematica® resources and interactive

demonstrations.

Digital Signal Processing - Andreas Antoniou
2005-10-10

An up-to-the-minute textbook for junior/senior level signal processing courses and senior/graduate level digital filter design courses, this text is supported by a DSP software package known as D-Filter which would enable students to interactively learn the fundamentals of DSP and digital-filter design. The book includes a free license to D-Filter which will enable the owner of the book to download and install the most recent version of the software as well as future updates.

Discrete-Signal Analysis and Design -
William E. Sabin 2008-02-04

A clear, step-by-step approach to practical uses of discrete-signal analysis and design, especially for communications and radio engineers. This book provides an introduction to discrete-time and discrete-frequency signal processing, which is rapidly becoming an important, modern way

to design and analyze electronics projects of all kinds. It presents discrete-signal processing concepts from the perspective of an experienced electronics or radio engineer, which is especially meaningful for practicing engineers, technicians, and students. The approach is almost entirely mathematical, but at a level that is suitable for undergraduate curriculums and also for independent, at-home study using a personal computer. Coverage includes: First principles, including the Discrete Fourier Transform (DFT) Sine, cosine, and theta Spectral leakage and aliasing Smoothing and windowing Multiplication and convolution Probability and correlation Power spectrum Hilbert transform The accompanying CD-ROM includes Mathcad® v.14 Academic Edition, which is reproduced with permission and has no time limitation for use, providing users with a sophisticated and world-famous tool for a wide range of applied mathematics capabilities. Discrete-Signal Analysis and Design is written in an easy-to-

follow, conversational style and supplies readers with a solid foundation for more advanced literature and software. It employs occasional re-examination and reinforcement of particularly important concepts, and each chapter contains self-study examples and full-page Mathcad® Worksheets, worked-out and fully explained.

Digital Signal Processing Handbook on CD-ROM - VIJAY MADISSETTI 1999-02-26

A best-seller in its print version, this comprehensive CD-ROM reference contains unique, fully searchable coverage of all major topics in digital signal processing (DSP), establishing an invaluable, time-saving resource for the engineering community. Its unique and broad scope includes contributions from all DSP specialties, including: telecommunications, computer engineering, acoustics, seismic data analysis, DSP software and hardware, image and video processing, remote sensing, multimedia applications, medical technology, radar and sonar applications

Digital Signal Processing - Lizhe Tan 2013-01-21
Digital Signal Processing, Second Edition enables electrical engineers and technicians in the fields of biomedical, computer, and electronics engineering to master the essential fundamentals of DSP principles and practice. Many instructive worked examples are used to illustrate the material, and the use of mathematics is minimized for easier grasp of concepts. As such, this title is also useful to undergraduates in electrical engineering, and as a reference for science students and practicing engineers. The book goes beyond DSP theory, to show implementation of algorithms in hardware and software. Additional topics covered include adaptive filtering with noise reduction and echo cancellations, speech compression, signal sampling, digital filter realizations, filter design, multimedia applications, over-sampling, etc. More advanced topics are also covered, such as adaptive filters, speech compression such as PCM, u-law, ADPCM, and multi-rate DSP and

over-sampling ADC. New to this edition: MATLAB projects dealing with practical applications added throughout the book New chapter (chapter 13) covering sub-band coding and wavelet transforms, methods that have become popular in the DSP field New applications included in many chapters, including applications of DFT to seismic signals, electrocardiography data, and vibration signals All real-time C programs revised for the TMS320C6713 DSK Covers DSP principles with emphasis on communications and control applications Chapter objectives, worked examples, and end-of-chapter exercises aid the reader in grasping key concepts and solving related problems Website with MATLAB programs for simulation and C programs for real-time DSP

Speech Enhancement - Philipos C. Loizou
2013-02-25

With the proliferation of mobile devices and hearing devices, including hearing aids and

cochlear implants, there is a growing and pressing need to design algorithms that can improve speech intelligibility without sacrificing quality. Responding to this need, *Speech Enhancement: Theory and Practice, Second Edition* introduces readers to the basic principles of speech enhancement.

Encyclopedia of Microcomputers - Allen Kent 1999-10-29

This encyclopaedia covers Characterization Hierarchy Containing Augmented Characterizations to Video Compression.

Applied Underwater Acoustics - Thomas Neighbors 2017-01-19

Applied Underwater Acoustics meets the needs of scientists and engineers working in underwater acoustics and graduate students solving problems in, and preparing theses on, topics in underwater acoustics. The book is structured to provide the basis for rapidly assimilating the essential underwater acoustic knowledge base for practical application to daily research and analysis. Each chapter of the book

is self-supporting and focuses on a single topic and its relation to underwater acoustics. The chapters start with a brief description of the topic's physical background, necessary definitions, and a short description of the applications, along with a roadmap to the chapter. The subtopics covered within individual subchapters include most frequently used equations that describe the topic. Equations are not derived, rather, assumptions behind equations and limitations on the applications of each equation are emphasized. Figures, tables, and illustrations related to the sub-topic are presented in an easy-to-use manner, and examples on the use of the equations, including appropriate figures and tables are also included. Provides a complete and up-to-date treatment of all major subjects of underwater acoustics. Presents chapters written by recognized experts in their individual field. Covers the fundamental knowledge scientists and engineers need to solve problems in underwater acoustics.

Illuminates, in shorter sub-chapters, the modern applications of underwater acoustics that are described in worked examples Demands no prior knowledge of underwater acoustics, and the

physical principles and mathematics are designed to be readily understood by scientists, engineers, and graduate students of underwater acoustics Includes a comprehensive list of literature references for each chapter