

Advanced Signal Processing Handbook Theory And Implementation For Radar Sonar And Medical Imaging Real Time Systems Electrical Engineering Applied Signal Processing Series

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Signal and Image Processing in Navigational Systems - Vyacheslav Tuzlukov 2018-10-03

Classical and modern theories have given us a degree of noise immunity by defining the sufficient statistic of the mean of the likelihood function. The generalized theory moves beyond these limitations to determine the jointly sufficient statistics of the mean and variance of the likelihood function. *Signal and Image Processing in Navigational Systems* introduces us to the generalized approach, and then delves rigorously into the theory and practical applications of this approach. This volume represents the most in-depth discussion of the generalized approach to date, providing many examples and computer models to demonstrate how this approach raises the upper limits of noise immunity for navigation systems, leading to better detection performances. This book is vital for signal and image processing experts, radar, communications,

acoustics, and navigational systems designers, as well as professionals in the fields of statistical pattern recognition, biomedicine, astronomy, and robotics who wish to extend the boundaries of noise immunity and improve qualitative performance of their systems.

Adaptation and Cross Layer Design in Wireless Networks - Mohamed Ibnkahla 2018-10-08

Adaptive techniques play a key role in modern wireless communication systems. The concept of adaptation is emphasized in the *Adaptation in Wireless Communications Series* through a unified framework across all layers of the wireless protocol stack ranging from the physical layer to the application layer, and from cellular systems to next-generation wireless networks. *Adaptation and Cross Layer Design in Wireless Networks* is devoted to adaptation in the data link layer, network layer, and application layer. The book presents state-of-the-art adaptation

techniques and methodologies, including cross-layer adaptation, joint signal processing, coding and networking, selfishness in mobile ad hoc networks, cooperative and opportunistic protocols, adaptation techniques for multimedia support, self-organizing routing, and tunable security services. It presents several new theoretical paradigms and analytical findings which are supported with various simulation and experimental results. Adaptation in wireless communications is needed in order to achieve high capacity and ubiquitous communications. The current trend in wireless communication systems is to make adaptation dependent upon the state of the relevant parameters in all layers of the system. Focusing on simplified cross layer design approaches, this volume describes advanced techniques such as adaptive resource management, adaptive modulation and coding, 4G communications, QoS, diversity combining, and energy and mobility aware MAC protocols. The first volume in the series, *Adaptive Signal Processing in Wireless Communications* (cat no.46012) covers adaptive signal processing at the physical layer.

Signal Processing Noise - Vyacheslav Tuzlukov 2018-10-08

Additive and multiplicative noise in the information signal can significantly limit the potential of complex signal processing systems, especially when those systems use signals with complex phase structure. During the last few years this problem has been the focus of much research, and its solution could lead to profound improvements in applications of complex signals and coherent signal processing. *Signal Processing Noise* sets forth a generalized approach to signal processing in multiplicative and additive noise that represents a remarkable advance in signal processing and detection theory. This approach extends the boundaries of the noise immunity set by classical and modern signal processing theories, and systems constructed on this basis achieve better detection performance than that of systems currently in use. Featuring the results of the author's own research, the book is filled with examples and applications, and each chapter contains an analysis of recent observations obtained by computer modelling and experiments. Tables and illustrations clearly show the superiority of the generalized approach

over both classical and modern approaches to signal processing noise. Addressing a fundamental problem in complex signal processing systems, this book offers not only theoretical development, but practical recommendations for raising noise immunity in a wide range of applications.

Adaptive Signal Processing in Wireless Communications - Mohamed Ibnkahla 2008-08-19

Adaptive techniques play a key role in modern wireless communication systems. The concept of adaptation is emphasized in the *Adaptation in Wireless Communications Series* through a unified framework across all layers of the wireless protocol stack ranging from the physical layer to the application layer, and from cellular systems to next-generation wireless networks. This specific volume, *Adaptive Signal Processing in Wireless Communications* is devoted to adaptation in the physical layer. It gives an in-depth survey of adaptive signal processing techniques used in current and future generations of wireless communication systems. Featuring the work of leading international experts, it covers adaptive channel modeling, identification and equalization, adaptive modulation and coding, adaptive multiple-input-multiple-output (MIMO) systems, and cooperative diversity. It also addresses other important aspects of adaptation in wireless communications such as hardware implementation, reconfigurable processing, and cognitive radio. A second volume in the series, *Adaptation and Cross-layer Design in Wireless Networks*(cat no.46039) is devoted to adaptation in the data link, network, and application layers.

Smart Antennas - Lal Chand Godara 2004-01-27

The use of smart antennas to increase mobile communications channels has re-ignited research and development in the field. Practicing engineers are eager to discover more about this subject, and need a comprehensive book that can provide a learning platform and prevent the loss of time spent on searches through journal literature. *Smart Antennas* examines nearly all aspects of array signal processing and presents them in a logical manner. It delivers a detailed treatment of antenna array processing schemes, adaptive algorithms to adjust

weighting, direction of arrival (DOA) estimation methods, diversity-combining methods that combat fading and reduce errors. The book introduces the various processor structures suitable for the narrowband field, examining the behavior of both element space and beamspace processors. It then explores adaptive processing, focusing on the simple matrix inversion algorithm, constrained least mean squares (LMS), the neural network approach, and more. The text also describes smart antennas that are suitable for broadband signals, and presents analyses and techniques suitable for correlated fields in narrowband and broadband signals. This volume supplements its content with extensive references, enabling you to further investigate smart antenna array schemes and application.

Advances in Intelligent Signal Processing and Data Mining - Petia Georgieva 2012-07-27

The book presents some of the most efficient statistical and deterministic methods for information processing and applications in order to extract targeted information and find hidden patterns. The techniques presented range from Bayesian approaches and their variations such as sequential Monte Carlo methods, Markov Chain Monte Carlo filters, Rao Blackwellization, to the biologically inspired paradigm of Neural Networks and decomposition techniques such as Empirical Mode Decomposition, Independent Component Analysis and Singular Spectrum Analysis. The book is directed to the research students, professors, researchers and practitioners interested in exploring the advanced techniques in intelligent signal processing and data mining paradigms.

Advanced Signal Processing Handbook - Stergios Stergiopoulos 2017-09-08

Advances in digital signal processing algorithms and computer technology have combined to produce real-time systems with capabilities far beyond those of just few years ago. Nonlinear, adaptive methods for signal processing have emerged to provide better array gain performance, however, they lack the robustness of conventional algorithms. The challenge remains to develop a concept that exploits the advantages of both-a scheme that integrates these methods in practical,

real-time systems. The Advanced Signal Processing Handbook helps you meet that challenge. Beyond offering an outstanding introduction to the principles and applications of advanced signal processing, it develops a generic processing structure that takes advantage of the similarities that exist among radar, sonar, and medical imaging systems and integrates conventional and nonlinear processing schemes.

Digital Signal Processing with Examples in MATLAB®, Second Edition - Samuel D. Stearns 2002-08-28

In a field as rapidly expanding as digital signal processing, even the topics relevant to the basics change over time both in their nature and their relative importance. It is important, therefore, to have an up-to-date text that not only covers the fundamentals, but that also follows a logical development that leaves no gaps readers must somehow bridge by themselves. Digital Signal Processing with Examples in MATLAB® is just such a text. The presentation does not focus on DSP in isolation, but relates it to continuous signal processing and treats digital signals as samples of physical phenomena. The author also takes care to introduce important topics not usually addressed in signal processing texts, including the discrete cosine and wavelet transforms, multirate signal processing, signal coding and compression, least squares systems design, and adaptive signal processing. He also uses the industry-standard software MATLAB to provide examples of signal processing, system design, spectral analysis, filtering, coding and compression, and exercise solutions. All of the examples and functions used in the text are available online at www.crcpress.com. Designed for a one-semester upper-level course but also ideal for self-study and reference, Digital Signal Processing with Examples in MATLAB is complete, self-contained, and rigorous. For basic DSP, it is quite simply the only book you need.

Applications in Time-Frequency Signal Processing - Antonia Papandreou-Suppappola 2018-10-03

Because most real-world signals, including speech, sonar, communication, and biological signals, are non-stationary, traditional signal analysis tools such as Fourier transforms are of limited use because they do not provide easily accessible information about the

localization of a given frequency component. A more suitable approach for those studying non-stationary signals is the use of time frequency representations that are functions of both time and frequency. Applications in Time-Frequency Signal Processing investigates the use of various time-frequency representations, such as the Wigner distribution and the spectrogram, in diverse application areas. Other books tend to focus on theoretical development. This book differs by highlighting particular applications of time-frequency representations and demonstrating how to use them. It also provides pseudo-code of the computational algorithms for these representations so that you can apply them to your own specific problems. Written by leaders in the field, this book offers the opportunity to learn from experts. Time-Frequency Representation (TFR) algorithms are simplified, enabling you to understand the complex theories behind TFRs and easily implement them. The numerous examples and figures, review of concepts, and extensive references allow for easy learning and application of the various time-frequency representations.

Mobile Internet - Apostolis K. Salkintzis 2004-04-13

Consumers want it, businesses are demanding it. The migration of Internet services to a mobile environment is inevitable. But while the ability to be on the go and connected to the Internet sets the stage for increased efficiency and productivity, many technical challenges associated with user mobility and wireless connectivity remain. *Mobil Advanced Signal Processing* - Stergios Stergiopoulos 2017-09-29 Discover the Applicability, Benefits, and Potential of New Technologies As advances in algorithms and computer technology have bolstered the digital signal processing capabilities of real-time sonar, radar, and non-invasive medical diagnostics systems, cutting-edge military and defense research has established conceptual similarities in these areas. Now civilian enterprises can use government innovations to facilitate optimal functionality of complex real-time systems. *Advanced Signal Processing* details a cost-efficient generic processing structure that exploits these commonalities to benefit commercial applications. Learn from a Renowned Defense Scientist, Researcher, and Innovator The author

preserves the mathematical focus and key information from the first edition that provided invaluable coverage of topics including adaptive systems, advanced beamformers, and volume visualization methods in medicine. Integrating the best features of non-linear and conventional algorithms and explaining their application in PC-based architectures, this text contains new data on: Advances in biometrics, image segmentation, registration, and fusion techniques for 3D/4D ultrasound, CT, and MRI Fully digital 3D/ (4D: 3D+time) ultrasound system technology, computing architecture requirements, and relevant implementation issues State-of-the-art non-invasive medical procedures, non-destructive 3D tomography imaging and biometrics, and monitoring of vital signs Cardiac motion correction in multi-slice X-ray CT imaging Space-time adaptive processing and detection of targets interference-intense backgrounds comprised of clutter and jamming With its detailed explanation of adaptive, synthetic-aperture, and fusion-processing schemes with near-instantaneous convergence in 2-D and 3-D sensors (including planar, circular, cylindrical, and spherical arrays), the quality and illustration of this text's concepts and techniques will make it a favored reference.

Revival - Stergios Stergiopoulos 2019-01-21

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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.

Propagation Handbook for Wireless Communication System Design - Robert K. Crane 2003-07-11

Data and models for better systems design Atmospheric gases, building materials, the weather The propagation of wireless communications signals depends upon a whole range of factors, any or all of which can have a significant impact on the quality of a signal. Data generated by careful measurement of signals propagating under various environments
Advanced Digital Signal Processing and Noise Reduction - Saeed V. Vaseghi 2000-09-20

A young man begins a journey from Saudi Arabia, believing it will end

with his death in England. If his mission succeeds, he will go to his god a martyr - and many innocents will die with him. For David Banks, an armed protection officer, charged with neutralizing the threat to London's safety, his role is no longer clear-cut: one man's terrorist is another man's freedom fighter: dangerous distinctions to a police officer with his finger on the trigger. Soon the two men's paths will cross. Before then, their commitment will be shaken by the journeys that take them there. The suicide bomber and the policeman will have cause to question the roads they've chosen. Win or lose, neither will be the same again...

Pattern Recognition in Speech and Language Processing - Wu Chou 2003-02-26

Over the last 20 years, approaches to designing speech and language processing algorithms have moved from methods based on linguistics and speech science to data-driven pattern recognition techniques. These techniques have been the focus of intense, fast-moving research and have contributed to significant advances in this field. Pattern Recognition
Nonlinear Signal and Image Processing - Kenneth E. Barner 2003-11-24
Nonlinear signal and image processing methods are fast emerging as an alternative to established linear methods for meeting the challenges of increasingly sophisticated applications. Advances in computing performance and nonlinear theory are making nonlinear techniques not only viable, but practical. This book details recent advances in nonlinear
Handbook of Multisensor Data Fusion - Martin Liggins II 2017-01-06

In the years since the bestselling first edition, fusion research and applications have adapted to service-oriented architectures and pushed the boundaries of situational modeling in human behavior, expanding into fields such as chemical and biological sensing, crisis management, and intelligent buildings. *Handbook of Multisensor Data Fusion: Theory and Practice, Second Edition* represents the most current concepts and theory as information fusion expands into the realm of network-centric architectures. It reflects new developments in distributed and detection fusion, situation and impact awareness in complex applications, and human cognitive concepts. With contributions from the world's leading

fusion experts, this second edition expands to 31 chapters covering the fundamental theory and cutting-edge developments that are driving this field. New to the Second Edition— · Applications in electromagnetic systems and chemical and biological sensors · Army command and combat identification techniques · Techniques for automated reasoning · Advances in Kalman filtering · Fusion in a network centric environment · Service-oriented architecture concepts · Intelligent agents for improved decision making · Commercial off-the-shelf (COTS) software tools From basic information to state-of-the-art theories, this second edition continues to be a unique, comprehensive, and up-to-date resource for data fusion systems designers.

Digital Signal Processing Techniques and Applications in Radar Image Processing - Bu-Chin Wang 2008-08-29

A self-contained approach to DSP techniques and applications in radar imaging The processing of radar images, in general, consists of three major fields: Digital Signal Processing (DSP); antenna and radar operation; and algorithms used to process the radar images. This book brings together material from these different areas to allow readers to gain a thorough understanding of how radar images are processed. The book is divided into three main parts and covers: * DSP principles and signal characteristics in both analog and digital domains, advanced signal sampling, and interpolation techniques * Antenna theory (Maxwell equation, radiation field from dipole, and linear phased array), radar fundamentals, radar modulation, and target-detection techniques (continuous wave, pulsed Linear Frequency Modulation, and stepped Frequency Modulation) * Properties of radar images, algorithms used for radar image processing, simulation examples, and results of satellite image files processed by Range-Doppler and Stolt interpolation algorithms The book fully utilizes the computing and graphical capability of MATLAB[®] to display the signals at various processing stages in 3D and/or cross-sectional views. Additionally, the text is complemented with flowcharts and system block diagrams to aid in readers' comprehension. Digital Signal Processing Techniques and Applications in Radar Image Processing serves as an ideal textbook for graduate students and

practicing engineers who wish to gain firsthand experience in applying DSP principles and technologies to radar imaging.

XII Mediterranean Conference on Medical and Biological

Engineering and Computing 2010 - Nicolas Pallikarakis 2010-05-28

Over the past three decades, the exploding number of new technologies and applications introduced in medical practice, often powered by advances in biosignal processing and biomedical imaging, created an amazing account of new possibilities for diagnosis and therapy, but also raised major questions of appropriateness and safety. The accelerated development in this field, alongside with the promotion of electronic health care solutions, is often on the basis of an uncontrolled diffusion and use of medical technology. The emergence and use of medical devices is multiplied rapidly and today there exist more than one million different products available on the world market. Despite the fact that the rising cost of health care, partly resulting from the new emerging technological applications, forms the most serious and urgent problem for many governments today, another important concern is that of patient safety and user protection, issues that should never be compromised and expelled from the Biomedical Engineering research practice agenda.

Advanced Signal Processing for Communication Systems - Tadeusz Wysocki 2006-04-18

Advanced Signal Processing for Communication Systems consists of 20 contributions from researchers and experts. The first group of chapters deals with the audio and video processing for communications applications, including topics ranging from multimedia content delivery over the Internet, through the speech processing and recognition to recognition of non-speech sounds that can be attributed to the surrounding environment. The book also includes sections on applications of error control coding, information theory, and digital signal processing for communication systems like modulation, software-defined radio, and channel estimation. Advanced Signal Processing for Communication Systems is written for researchers working on communication systems and signal processing, as well as

telecommunications industry professionals.

Computational Intelligence in Biomedical Engineering - Rezaul Begg
2007-12-04

As in many other fields, biomedical engineers benefit from the use of computational intelligence (CI) tools to solve complex and non-linear problems. The benefits could be even greater if there were scientific literature that specifically focused on the biomedical applications of computational intelligence techniques. The first comprehensive field-specific reference, *Computational Intelligence in Biomedical Engineering* provides a unique look at how techniques in CI can offer solutions in modelling, relationship pattern recognition, clustering, and other problems particular to the field. The authors begin with an overview of signal processing and machine learning approaches and continue on to introduce specific applications, which illustrate CI's importance in medical diagnosis and healthcare. They provide an extensive review of signal processing techniques commonly employed in the analysis of biomedical signals and in the improvement of signal to noise ratio. The text covers recent CI techniques for post processing ECG signals in the diagnosis of cardiovascular disease and as well as various studies with a particular focus on CI's potential as a tool for gait diagnostics. In addition to its detailed accounts of the most recent research, *Computational Intelligence in Biomedical Engineering* provides useful applications and information on the benefits of applying computation intelligence techniques to improve medical diagnostics.

Digital Signal Processing with Field Programmable Gate Arrays - Uwe Meyer-Baese
2013-03-09

Starts with an overview of today's FPGA technology, devices, and tools for designing state-of-the-art DSP systems. A case study in the first chapter is the basis for more than 30 design examples throughout. The following chapters deal with computer arithmetic concepts, theory and the implementation of FIR and IIR filters, multirate digital signal processing systems, DFT and FFT algorithms, and advanced algorithms with high future potential. Each chapter contains exercises. The VERILOG source code and a glossary are given in the appendices, while

the accompanying CD-ROM contains the examples in VHDL and Verilog code as well as the newest Altera "Baseline" software. This edition has a new chapter on adaptive filters, new sections on division and floating point arithmetics, an up-date to the current Altera software, and some new exercises.

Algorithm Designs -

Phonocardiography Signal Processing - Abbas K. Abbas
2022-05-31

The auscultation method is an important diagnostic indicator for hemodynamic anomalies. Heart sound classification and analysis play an important role in the auscultative diagnosis. The term phonocardiography refers to the tracing technique of heart sounds and the recording of cardiac acoustics vibration by means of a microphone-transducer. Therefore, understanding the nature and source of this signal is important to give us a tendency for developing a competent tool for further analysis and processing, in order to enhance and optimize cardiac clinical diagnostic approach. This book gives the reader an inclusive view of the main aspects in phonocardiography signal processing. Table of Contents: Introduction to Phonocardiography Signal Processing / Phonocardiography Acoustics Measurement / PCG Signal Processing Framework / Phonocardiography Wavelets Analysis / Phonocardiography Spectral Analysis / PCG Pattern Classification / Special Application of Phonocardiography / Phonocardiography Acoustic Imaging and Mapping

Digital Color Imaging Handbook - Gaurav Sharma
2017-12-19

Digital technology now enables unparalleled functionality and flexibility in the capture, processing, exchange, and output of color images. But harnessing its potential requires knowledge of color science, systems, processing algorithms, and device characteristics-topics drawn from a broad range of disciplines. One can acquire the requisite background with an armload of physics, chemistry, engineering, computer science, and mathematics books and journals- or one can find it here, in the *Digital Color Imaging Handbook*. Unprecedented in scope, this handbook presents, in a single concise and authoritative publication, the elements

of these diverse areas relevant to digital color imaging. The first three chapters cover the basics of color vision, perception, and physics that underpin digital color imaging. The remainder of the text presents the technology of color imaging with chapters on color management, device color characterization, digital halftoning, image compression, color quantization, gamut mapping, computationally efficient transform algorithms, and color image processing for digital cameras. Each chapter is written by world-class experts and largely self-contained, but cross references between chapters reflect the topics' important interrelations. Supplemental materials are available for download from the CRC Web site, including electronic versions of some of the images presented in the book.

Adaptation in Wireless Communications - 2 Volume Set - Mohamed Ibnkahla 2018-10-08

The widespread use of adaptation techniques has helped to meet the increased demand for new applications. From adaptive signal processing to cross layer design, *Adaptation in Wireless Communications* covers all aspects of adaptation in wireless communications in a two-volume set. Each volume provides a unified framework for understanding adaptation and relates various specializations through common terminologies. In addition to simplified state-of-the-art cross layer design approaches, they also describe advanced techniques, such as adaptive resource management, 4G communications, and energy and mobility aware MAC protocols.

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.

Noise Reduction in Speech Applications - Gillian M. Davis
2018-10-03

Noise and distortion that degrade the quality of speech signals can come from any number of sources. The technology and techniques for dealing with noise are almost as numerous, but it is only recently, with the development of inexpensive digital signal processing hardware, that the implementation of the technology has become practical. *Noise Reduction in Speech Applications* provides a comprehensive introduction to modern techniques for removing or reducing background noise from a range of speech-related applications. Self-contained, it starts with a tutorial-style chapter of background material, then focuses on system aspects, digital algorithms, and implementation. The final section explores a variety of applications and demonstrates to potential users of the technology the results possible with the noise reduction techniques presented. The book offers chapters contributed by international experts, a practical, systems approach, and numerous references. For electrical, acoustics, signal processing, communications, and bioengineers, *Noise Reduction in Speech Applications* is a valuable resource that shows you how to decide whether noise reduction will solve problems in your own systems and how to make the best use of the technologies available.

Handbook of Signal Processing Systems - Shuvra S. Bhattacharyya
2013-06-20

Handbook of Signal Processing Systems is organized in three parts. The first part motivates representative applications that drive and apply state-of-the-art methods for design and implementation of signal processing systems; the second part discusses architectures for implementing these applications; the third part focuses on compilers and

simulation tools, describes models of computation and their associated design tools and methodologies. This handbook is an essential tool for professionals in many fields and researchers of all levels.

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

Handbook of Neural Network Signal Processing - Yu Hen Hu 2018-10-03

The use of neural networks is permeating every area of signal processing. They can provide powerful means for solving many problems, especially in nonlinear, real-time, adaptive, and blind signal processing.

The Handbook of Neural Network Signal Processing brings together applications that were previously scattered among various publications to provide an up-to-date, detailed treatment of the subject from an engineering point of view. The authors cover basic principles, modeling, algorithms, architectures, implementation procedures, and well-designed simulation examples of audio, video, speech, communication, geophysical, sonar, radar, medical, and many other signals. The subject of neural networks and their application to signal processing is constantly improving. You need a handy reference that will inform you of current applications in this new area. The Handbook of Neural Network Signal Processing provides this much needed service for all engineers and scientists in the field.

Detection Theory - Ralph D. Hippenstiel 2017-12-19

Using simplified notation and a practical approach, Detection Theory: Applications and Digital Signal Processing introduces the principles of detection theory, the necessary mathematics, and basic signal processing methods along with some recently developed statistical techniques. Throughout the book, the author keeps the needs of practicing engineers firmly in mind. His presentation and choice of topics allows students to quickly become familiar with the detection and signal processing fields and move on to more advanced study and practice. The author also presents many applications and wide-ranging examples that demonstrate how to apply the concepts to real-world problems.

Advanced Signal Processing Handbook - Stergios Stergiopoulos 2017-07-13

Advances in digital signal processing algorithms and computer technology have combined to produce real-time systems with capabilities far beyond those of just few years ago. Nonlinear, adaptive methods for signal processing have emerged to provide better array gain performance, however, they lack the robustness of conventional algorithms. The challenge remains to develop a concept that exploits the advantages of both-a scheme that integrates these methods in practical, real-time systems. The Advanced Signal Processing Handbook helps you meet that challenge. Beyond offering an outstanding introduction to the

principles and applications of advanced signal processing, it develops a generic processing structure that takes advantage of the similarities that exist among radar, sonar, and medical imaging systems and integrates conventional and nonlinear processing schemes.

Signals and Systems Primer with MATLAB - Alexander D. Poularikas
2018-10-03

Signals and Systems Primer with MATLAB® equally emphasizes the fundamentals of both analog and digital signals and systems. To ensure insight into the basic concepts and methods, the text presents a variety of examples that illustrate a wide range of applications, from microelectromechanical to worldwide communication systems. It also provides MATLAB functions and procedures for practice and verification of these concepts. Taking a pedagogical approach, the author builds a solid foundation in signal processing as well as analog and digital systems. The book first introduces orthogonal signals, linear and time-invariant continuous-time systems, discrete-time systems, periodic signals represented by Fourier series, Gibbs's phenomenon, and the sampling theorem. After chapters on various transforms, the book discusses analog filter design, both finite and infinite impulse response digital filters, and the fundamentals of random digital signal processing, including the nonparametric spectral estimation. The final chapter presents different types of filtering and their uses for random digital signal processing, specifically, the use of Wiener filtering and least mean squares filtering. Balancing the study of signals with system modeling and interactions, this text will help readers accurately develop mathematical representations of systems.

Advanced Signal Processing: A Concise Guide - Amir-Homayoon Najmi
2020-08-28

Publisher's Note: Products purchased from Third Party sellers are not guaranteed by the publisher for quality, authenticity, or access to any online entitlements included with the product. A comprehensive introduction to the mathematical principles and algorithms in statistical signal processing and modern neural networks. This text is an expanded version of a graduate course on advanced signal processing at the Johns

Hopkins University Whiting school program for professionals with students from electrical engineering, physics, computer and data science, and mathematics backgrounds. It covers the theory underlying applications in statistical signal processing including spectral estimation, linear prediction, adaptive filters, and optimal processing of uniform spatial arrays. Unique among books on the subject, it also includes a comprehensive introduction to modern neural networks with examples in time series and image classification. Coverage includes: Mathematical structures of signal spaces and matrix factorizations linear time-invariant systems and transforms Least squares filters Random variables, estimation theory, and random processes Spectral estimation and autoregressive signal models linear prediction and adaptive filters Optimal processing of linear arrays Neural networks
Handbook of Antennas in Wireless Communications - Lal Chand Godara
2018-10-03

The move toward worldwide wireless communications continues at a remarkable pace, and the antenna element of the technology is crucial to its success. With contributions from more than 30 international experts, the Handbook of Antennas in Wireless Communications brings together all of the latest research and results to provide engineering professionals and students with a one-stop reference on the theory, technologies, and applications for indoor, hand-held, mobile, and satellite systems. Beginning with an introduction to wireless communications systems, it offers an in-depth treatment of propagation prediction and fading channels. It then explores antenna technology with discussion of antenna design methods and the various antennas in current use or development for base stations, hand held devices, satellite communications, and shaping beams. The discussions then move to smart antennas and phased array technology, including details on array theory and beamforming techniques. Space diversity, direction-of-arrival estimation, source tracking, and blind source separation methods are addressed, as are the implementation of smart antennas and the results of field trials of systems using smart antennas implemented. Finally, the hot media topic of the safety of mobile phones receives due attention, including details of

how the human body interacts with the electromagnetic fields of these devices. Its logical development and extensive range of diagrams, figures, and photographs make this handbook easy to follow and provide a clear understanding of design techniques and the performance of finished products. Its unique, comprehensive coverage written by top experts in their fields promises to make the Handbook of Antennas in Wireless Communications the standard reference for the field.

Advanced Signal Processing - Stergios Stergiopoulos 2017-06-16

Discover the Applicability, Benefits, and Potential of New Technologies As advances in algorithms and computer technology have bolstered the digital signal processing capabilities of real-time sonar, radar, and non-invasive medical diagnostics systems, cutting-edge military and defense research has established conceptual similarities in these areas. Now civilian enterprises can use government innovations to facilitate optimal functionality of complex real-time systems. Advanced Signal Processing details a cost-efficient generic processing structure that exploits these commonalities to benefit commercial applications. Learn from a Renowned Defense Scientist, Researcher, and Innovator The author preserves the mathematical focus and key information from the first edition that provided invaluable coverage of topics including adaptive systems, advanced beamformers, and volume visualization methods in medicine. Integrating the best features of non-linear and conventional algorithms and explaining their application in PC-based architectures, this text contains new data on: Advances in biometrics, image segmentation, registration, and fusion techniques for 3D/4D ultrasound, CT, and MRI Fully digital 3D/ (4D: 3D+time) ultrasound system technology, computing architecture requirements, and relevant implementation issues State-of-the-art non-invasive medical procedures, non-destructive 3D tomography imaging and biometrics, and monitoring of vital signs Cardiac motion correction in multi-slice X-ray CT imaging Space-time adaptive processing and detection of targets interference-intense backgrounds comprised of clutter and jamming With its detailed explanation of adaptive, synthetic-aperture, and fusion-processing schemes with near-instantaneous convergence in 2-D and 3-D sensors

(including planar, circular, cylindrical, and spherical arrays), the quality and illustration of this text's concepts and techniques will make it a favored reference.

MIMO System Technology for Wireless Communications - George Tsoulos 2018-10-03

For broadband communications, it was frequency division multiplexing. For optical communications, it was wavelength division multiplexing. Then, for all types of networks it was code division. Breakthroughs in transmission speed were made possible by these developments, heralding next-generation networks of increasing capability in each case. The basic idea is the same: more channels equals higher throughput. For wireless communications, it is space-time coding using multiple-input-multiple-output (MIMO) technology. Providing a complete treatment of MIMO under a single cover, MIMO System Technology for Wireless Communications assembles coverage on all aspects of MIMO technology along with up-to-date information on key related issues. Contributors from leading academic and industrial institutions around the world share their expertise and lend the book a global perspective. They lead you gradually from basic to more advanced concepts, from propagation modeling and performance analysis to space-time codes, various systems, implementation options and limitations, practical system development considerations, field trials, and network planning issues. Linking theoretical analysis to practical issues, the book does not limit itself to any specific standardization or research/industrial initiatives. MIMO is the catalyst for the next revolution in wireless systems, and MIMO System Technology for Wireless Communications lays a thorough and complete foundation on which to build the next and future generations of wireless networks.

Medical Image Analysis Methods - Lena Costaridou 2005-07-13

To successfully detect and diagnose disease, it is vital for medical diagnosticians to properly apply the latest medical imaging technologies. It is a worrisome reality that due to either the nature or volume of some of the images provided, early or obscured signs of disease can go undetected or be misdiagnosed. To combat these inaccuracies, diagno