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Optimal Detection of an Unknown Discrete Waveform which is Recurring in Gaussian Noise Feb 27 2021 The paper determines the recurrence times of an unknown acoustic signal embedded in additive Gaussian noise.

Optimum Filter for Determination of the Position of an Arbitrary Waveform in the Presence of Noise Feb 16 2020 This paper presents a general approach to solving the problem of defining the time of arrival of a signal in the noise, or the similar one of defining the position of a peak in a histogram. In particular, it solves the problem of a signal in white noise, giving the well known result that the optimum filter before a zero crossing discriminator should have an impulse response function equal to the derivative of the waveform to be observed. It then solves the problem of estimating the position of a pea in a histogram in wich the number of counts in each bin has a variance equal to the number of counts in that same bin. The resulting optimum filter is the derivative divided by the function itself. Examples of applying the results are given and the uniqueness of the solution to the set of non-linear simultaneous equations resulting from the problem is demonstrated.

Detection of Signals in Noise Dec 20 2022 The updated revision to the authors' successful and widely used introduction to the principles and applciation of the statistical theory of signal detection. The book emphasizes those theories that have been found to be particularly useful in practice, including principles applied to detection problems encountered in digital communications, radar, and sonar.

Signal Processing in Noise Waveform Radar Jan 21 2023 Radar is a technology used in several facets of modern life, with many different civilian and military applications. Although radars have been around since 1904, much work is still spent today designing, building, testing, and implementing new radars and developing new and more powerful radar signal processing techniques. Radar signal processing is still a very active area of research. Nowadays, there has been substantial interest in noise radar over a wide range of applications, such as through wall surveillance, detection, tracking, Doppler estimation, polarimetry, interferometry, ground-penetrating or subsurface profiling, synthetic aperture radar (SAR) imaging, inverse synthetic aperture radar (ISAR) imaging, foliage penetration imaging, etc. One of the major advantages of the noise radar is its essential immunity from congestion, detection, and external interference. Signal Processing in Noise Waveform Radar brings together comprehensive studies dealing with the emerging technology of noise waveform radar and its signal processing aspects. It discusses the properties, difficulties and potential of noise radar systems, primarily for low-power and short-range civil applications. The contributions of modern signal processing techniques to making noise radar practical are emphasized, and application examples are given. This book covers a diversity of categories in radar signal processing, including radar optimization and system design valuable for both practicing engineers and engineering students.

Application of the Waveform-relaxation-method to Determine Reflection- and Crosstalk Noise on Signal Lines Nov 26 2020

Waveform and Spectrum Distortion of Narrow-band Signals in Noise Caused by Non-linear Memoryless Devices, with Applications to Quantizers Nov 19 2022 The signal waveform and

spectrum distortion caused by non-linear memoryless devices with narrow-band input signals and broad-band input noise are investigated, and numerically evaluated for multi-bit quantizers. The results for general non-linear devices are in the form of single series and integrals amenable to computer evaluation. For both one and two narrow-band input signals in the presence of broad-band noise, results of several kinds have been obtained. They include: the instantaneous harmonic and intermodulation product output signal amplitude- and phase-modulations, their average power, their average envelope, and their RMS bandwidth. Numerical evaluation of these quantities for optimum and optimum-uniform multi-bit quantizers is accomplished; from these results the amount of distortion versus the number of bits can be ascertained. (Author).

Angle and Waveform Estimation in the Presence of Colored Noise Via Relax Dec 28 2020

A Neural Filter for Noise Reduction in Waveform and Image Data Jul 15 2022

Noise Waveform Generation Using GANs and Charged Particle Identification Using Pulse Shape Discrimination in the Belle II Electromagnetic Calorimeter Aug 24 2020

Using a White Noise Source to Characterize a Glottal Source Waveform for Implementation in a Speech Synthesis System Jul 23 2020 A novel speech synthesizer is being developed which needs a source waveform that represents the sound created by the vocal folds before it is shaped by the rest of the vocal cavity. Methods already exist for extracting this waveform, but this report explores a new method. The method involves finding a model for the vocal tract. A system identification technique is applied that uses a white noise audio source emitted into the oral cavity via a tube as the input. The effects of the tube are characterized and accounted for to allow for greater accuracy in the estimation of the true vocal tract properties. The vocal tract model is then used to extract the source waveform from a vocalized speech recording. Common properties of the source waveform will also be characterized and synthesized. These properties include the changes in harmonic content of the source based on vocal effort, and the natural aperiodic punctuations in pitch and amplitude of the source waveform. All of these properties, when properly synthesized, will help to create a more natural-sounding glottal source waveform.

Ultrawideband Radar Oct 14 2019 Providing a practical review of the latest technology in the field, Ultrawideband Radar Applications and Design presents cutting-edge advances in theory, design, and practical applications of ultrawideband (UWB) radar. This book features contributions from an international team of experts to help readers learn about a wide range of UWB topics, including: History of the technology American and European governmental regulations and key definitions Nonsinusoidal wave propagation theory Random signal radar Object detection by ground permittivity measurements Large-target backscattering effects Medical applications Large current radiator antenna design Materials-penetrating theory Radar signal processing Weak-signal detection methods Holographic and real time radar imaging This book ' s contributors use practical information to illustrate the latest theoretical developments and demonstrate UWB radar principles through case studies. Radar system engineers will find ideas for precision electronic sensing systems for use in medical, security, industrial, construction, and geophysical applications, as well as those used in archeological, forensic and transportation operations.

Composing Electronic Music Oct 26 2020 Electronic music evokes new sensations, feelings, and thoughts in both composers and listeners. Opening the door to an unlimited universe of sound, it engages spatialization as an integral aspect of composition and focuses on sound transformation as a core structural strategy. In this new domain, pitch occurs as a flowing and

ephemeral substance that can be bent, modulated, or dissolved into noise. Similarly, time occurs not merely as a fixed duration subdivided by ratios, but as a plastic medium that can be generated, modulated, reversed, warped, scrambled, and granulated. Envelope and waveform undulations on all time scales interweave to generate form. The power of algorithmic methods amplify the capabilities of music technology. Taken together, these constitute game-changing possibilities. This convergence of technical and aesthetic trends prompts the need for a new text focused on the opportunities of a sound oriented, multiscale approach to composition of electronic music. Sound oriented means a practice that takes place in the presence of sound. Multiscale means an approach that takes into account the perceptual and physical reality of multiple, interacting time scales-each of which can be composed. After more than a century of research and development, now is an appropriate moment to step back and reevaluate all that has changed under the ground of artistic practice. Composing Electronic Music outlines a new theory of composition based on the toolkit of electronic music techniques. The theory consists of a framework of concepts and a vocabulary of terms describing musical materials, their transformation, and their organization. Central to this discourse is the notion of narrative structure in composition-how sounds are born, interact, transform, and die. It presents a guidebook: a tour of facts, history, commentary, opinions, and pointers to interesting ideas and new possibilities to consider and explore.

A Two-stage Likelihood-ratio Detection Procedure for an Unknown Waveform which is Randomly Repeating in Noise Sep 17 2022 Suppose we have a stochastic process which is made up of an unknown waveform of finite duration, which is repeated randomly in Gaussian noise with a known covariance function. The rate of recurrence of the waveform is a known constant, and the signal-to-noise ratio of the waveform in the noise is small. A two-stage procedure is developed for detecting the epochs of the waveform based upon efficient large-sample estimates of the autocorrelation of the waveform. The error probabilities are given for this procedure which is based upon approximation of the likelihood-ratio. A bound for the error due to the approximation of the likelihood function is given. (Author).

Noise Contamination in Nanoscale VLSI Circuits Oct 06 2021 This textbook provides readers with a comprehensive introduction to various noise sources that significantly reduce performance and reliability in nanometer-scale integrated circuits. The author covers different types of noise, such as crosstalk noise caused by signal switching of adjacent wires, power supply noise or IR voltage drop in the power line due to simultaneous buffer / gate switching events, substrate coupling noise, radiation-induced transients, thermally induced noise and noise due to process and environmental Coverages also includes the relationship between some of these noise sources, as well as compound effects, and modeling and mitigation of noise mechanisms.

Ultra Wideband Noise Tomography Feb 10 2022 Imaging techniques have been used for a long time in many applications such as nondestructive testing, medical diagnosis, civil infrastructure assessment, and homeland security. Advances in signal and image processing techniques have made considerable progress in a way that the multi-dimensional images of the target object are successfully reconstructed from electromagnetic (EM) scattering; the shape of the object is clearly identified by visual inspection.The dissertation explores the diffraction tomographic imaging of a target object using ultra-wideband (UWB) white Gaussian noise (WGN) waveforms in radar system. The principles and validation of UWB noise radar system for tomography application are presented including the theoretical

analysis, numerical simulations and experimental results.Using WGN waveform as the transmit signal ensures the low probability of intercept (LPI) since the transmitted noise waveform is constantly varying and never repeats exactly. Ideally, such a signal is a stochastic process with a flat spectral density over a wide frequency range; however, the spectral density of WGN cannot be uniform and consistent for all frequencies in reality. In order to obtain a flat spectral density over the desired frequency range, a method of averaging multiple independent and identically distributed (iid) noise waveforms is proposed. From the simulation results, tomographic images of various target scenarios are successfully reconstructed with random noise waveforms. In addition, the hardware system of bistatic UWB noise radar for tomographic imaging application is designed and implemented. The tomographic image processing technique for large sets of collected data samples are also proposed. Both metallic and dielectric target objects are correctly imaged based on measured scattering data, and the experimental results compare well with the numerical simulation results.

Noise Characterization and Treatment on Non-Gaussian Noise in Transient Waveform Analysis Apr 12 2022

Introduction to Random Signals and Noise Sep 24 2020 Random signals and noise are present in many engineering systems and networks. Signal processing techniques allow engineers to distinguish between useful signals in audio, video or communication equipment, and interference, which disturbs the desired signal. With a strong mathematical grounding, this text provides a clear introduction to the fundamentals of stochastic processes and their practical applications to random signals and noise. With worked examples, problems, and detailed appendices, Introduction to Random Signals and Noise gives the reader the knowledge to design optimum systems for effectively coping with unwanted signals. Key features: Considers a wide range of signals and noise, including analogue, discrete-time and bandpass signals in both time and frequency domains. Analyses the basics of digital signal detection using matched filtering, signal space representation and correlation receiver. Examines optimal filtering methods and their consequences. Presents a detailed discussion of the topic of Poisson processes and shot noise. An excellent resource for professional engineers developing communication systems, semiconductor devices, and audio and video equipment, this book is also ideal for senior undergraduate and graduate students in Electronic and Electrical Engineering.

Library-Based Gate-Level Current Waveform Modeling for Dynamic Supply Noise Analysis Jan 17 2020 Library-Based Gate-Level Current Waveform Modeling for Dynamic Supply Noise Analysis.

Waveform Analysis of Sound May 13 2022 What is this sound? What does that sound indicate? These are two questions frequently heard in daily conversation. Sound results from the vibrations of elastic media and in daily life provides informative signals of events happening in the surrounding environment. In interpreting auditory sensations, the human ear seems particularly good at extracting the signal signatures from sound waves. Although exploring auditory processing schemes may be beyond our capabilities, source signature analysis is a very attractive area in which signal-processing schemes can be developed using mathematical expressions. This book is inspired by such processing schemes and is oriented to signature analysis of waveforms. Most of the examples in the book are taken from data of sound and vibrations; however, the methods and theories are mostly formulated using mathematical expressions rather than by acoustical interpretation. This book might therefore

be attractive and informative for scientists, engineers, researchers, and graduate students who are interested in the mathematical representation of signals and the applications of Fourier analysis. The book can be described as being practically self-contained but does assume readers are familiar with introductory topics in discrete signal processing, as in the discrete Fourier transform. Hence this book might be also usable as a textbook in graduate courses in applied mathematics on topics such as complex functions. Almost all scientific phenomena are sensed as waves propagating in some space. Over the years, waveform analysis has therefore been one of the resilient academic areas of study and still is seen as fertile ground for development. In particular, waveform analysis based on the theory of linear systems would be a good example where a physical interpretation can be given to the mathematical theory of complex functions in terms of magnitude, angle, poles, and zeros of complex functions. For readers who are interested in the physical aspects of sound and vibration data or elementary formulation of wave equations and their solutions, the book Sound and Signals by M. Tohyama (Springer 2011) is recommended. It can serve as a complementary companion to this present volume or independently as a good reference.

Simulation and Analysis of Phase Coded Waveforms Plus Noise Mar 31 2021 The matched filter response to a Frank code polyphase waveform combined with noise (jamming and other sources) was determined by a theoretical analysis and through the use of a computer simulation. The theoretical analysis provided a measure of the long term average matched filter output signal-to-noise ratio while the simulation provided an instantaneous measure of the output signal-to-noise ratio on a pulse-to-pulse basis. The analysis in this report was limited to a basic polyphase waveform, but will be extended in future reports to burst waveforms consisting of several contiguous basic polyphase waveforms. The results of this analysis along with future analyses of the burst waveform will provide an insight into the matched filter response of a Frank code polyphase waveform in a noise jamming environment.

Hearing Loss May 01 2021 Millions of Americans experience some degree of hearing loss. The Social Security Administration (SSA) operates programs that provide cash disability benefits to people with permanent impairments like hearing loss, if they can show that their impairments meet stringent SSA criteria and their earnings are below an SSA threshold. The National Research Council convened an expert committee at the request of the SSA to study the issues related to disability determination for people with hearing loss. This volume is the product of that study. Hearing Loss: Determining Eligibility for Social Security Benefits reviews current knowledge about hearing loss and its measurement and treatment, and provides an evaluation of the strengths and weaknesses of the current processes and criteria. It recommends changes to strengthen the disability determination process and ensure its reliability and fairness. The book addresses criteria for selection of pure tone and speech tests, guidelines for test administration, testing of hearing in noise, special issues related to testing children, and the difficulty of predicting work capacity from clinical hearing test results. It should be useful to audiologists, otolaryngologists, disability advocates, and others who are concerned with people who have hearing loss.

Memory, Microprocessor, and ASIC May 21 2020 Timing, memory, power dissipation, testing, and testability are all crucial elements of VLSI circuit design. In this volume culled from the popular VLSI Handbook, experts from around the world provide in-depth discussions on these and related topics. Stacked gate, embedded, and flash memory all receive detailed treatment, including their power cons

Think DSP Oct 18 2022 If you understand basic mathematics and know how to program with Python, you ' re ready to dive into signal processing. While most resources start with theory to teach this complex subject, this practical book introduces techniques by showing you how they ' re applied in the real world. In the first chapter alone, you ' ll be able to decompose a sound into its harmonics, modify the harmonics, and generate new sounds. Author Allen Downey explains techniques such as spectral decomposition, filtering, convolution, and the Fast Fourier Transform. This book also provides exercises and code examples to help you understand the material. You ' ll explore: Periodic signals and their spectrums Harmonic structure of simple waveforms Chirps and other sounds whose spectrum changes over time Noise signals and natural sources of noise The autocorrelation function for estimating pitch The discrete cosine transform (DCT) for compression The Fast Fourier Transform for spectral analysis Relating operations in time to filters in the frequency domain Linear time-invariant (LTI) system theory Amplitude modulation (AM) used in radio Other books in this series include Think Stats and Think Bayes, also by Allen Downey.

An Introduction to Music Technology Jul 03 2021 An Introduction to Music Technology, Second Edition provides a clear overview of the essential elements of music technology for today ' s musician. This book focuses on the topics that underlie the hardware and software in use today: Sound, Audio, MIDI, Computer Notation, and Computer- Assisted Instruction. Appendices cover necessary computer hardware and software concepts. Written for both music technology majors and non-majors, this textbook introduces fundamental principles and practices so students can learn to work with a wide range of software programs, adapt to new music technologies, and apply music technology in their performance, composition, teaching, and analysis. Features: Thorough explanations of key topics in music technology Content applicable to all software and hardware, not linked to just one piece of software or gear In-depth discussion of digital audio topics, such as sampling rates, resolutions, and file formats Explanations of standard audio plug-ins including dynamics processors, EQs, and delay based effects Coverage of synthesis and sampling in software instruments Pedagogical features, including: Further Reading sections that allow the student to delve deeper into topics of interest Suggested Activities that can be carried out with a variety of different programs Key Terms at the end of each chapter What Do I Need? Chapters covering the types of hardware and software needed in order to put together Audio and MIDI systems A companion website with links to audio examples that demonstrate various concepts, step-by-step tutorials, relevant hardware, software, and additional audio and video resources. The new edition has been fully updated to cover new technologies that have emerged since the first edition, including iOS and mobile platforms, online notation software, alternate controllers, and Open Sound Control (OSC).

Ocean Acoustics Apr 19 2020 This Topics volume is devoted to a study of sound propagation in the ocean. The effect of the interior of the ocean on underwater sound is analogous to the effect of a lens on light. The oceanic lens is related, as in light propagation, to the index of refraction of the medium. The latter is giv~n by the ratio of the sound frequency to the speed of sound in water, typi ca lly about 1500 m s -1. It is the vari ation of the sound speed due to changing temperature, density, salinity, and pres sure in the complex ocean environment which creates the lens effect. Many oceanic processes such as currents, tides, eddies (circulating, translating regions of wa ter), and internal waves (the wave-like structure of the oceanic density variabil ity) contri bute in turn to the changes in sound speed'. The net effect of the ocean lens is to trap and guide sound waves in a channel created

by the lens. The trapped sound can then propagate thousands of miles in this oceanic waveguide. In addition to the propagation in the interior of the ocean, sound can propagate into and back out of the ocean bottom as well as scatter from the ocean surface. Just as the sound produced by a loudspeaker in a room is affected by the walls of the room, so the ocean boundaries and the material properties below the ocean bottom are essential ingredients in the problem.

Analysis and Simulation of Noise in Nonlinear Electronic Circuits and Systems Jun 21 2020 In electronic circuit and system design, the word noise is used to refer to any undesired excitation on the system. In other contexts, noise is also used to refer to signals or excitations which exhibit chaotic or random behavior. The source of noise can be either internal or external to the system. For instance, the thermal and shot noise generated within integrated circuit devices are in ternal noise sources, and the noise picked up from the environment through electromagnetic interference is an external one. Electromagnetic interference can also occur between different components of the same system. In integrated circuits (Ies), signals in one part of the system can propagate to the other parts of the same system through electromagnetic coupling, power supply lines and the Ie substrate. For instance, in a mixed-signal Ie, the switching activity in the digital parts of the circuit can adversely affect the performance of the analog section of the circuit by traveling through the power supply lines and the substrate. Prediction of the effect of these noise sources on the performance of an electronic system is called noise analysis or noise simulation. A methodology for the noise analysis or simulation of an electronic system usually has the following four components: 2 NOISE IN NONLINEAR ELECTRONIC CIRCUITS • Mathematical representations or models for the noise sources. • Mathematical model or representation for the system that is under the in fluence of the noise sources.

Large-sample Estimation of an Unknown Discrete Waveform which is Randomly Repeating in Gaussian Noise Mar 11 2022

Acoustic Signals and Hearing Aug 16 2022 Understanding acoustics – the science of sound -- is essential for audio and communications engineers working in media technology. It is also extremely important for engineers to understand what allows a sound to be heard in the way it is, what makes speech intelligible, and how a particular sound is recognized within a multitude of sounds. Acoustic Signals and Hearing: A Time-Envelope and Phase Spectral Approach is unique in presenting the principles of sound and sound fields from the perspective of hearing, particularly through the use of speech and musical sounds. Acoustic Signals and Hearing: A Time-Envelope and Phase Spectral Approach is an ideal resource for researchers and acoustic engineers working in today ' s environment of media technology, and graduate students studying acoustics, audio engineering, and signal processing. Presents unique sounds and sound fields from the perspective of hearing Covers source-signature and sound-path analysis Gives a reconstruction of the basics of acoustics and audio engineering via timeless topics such as linear system theory in the time and frequency domains Uses the new envelope and phase analysis approach to signal and waveform analysis Provides new perspectives via phase properties on ways to solve acoustical problems Presents straightforward mathematical formulations that give familiarity to discrete expressions of sound waves Gives a seamless and intuitive understanding — from mathematical expressions to a subjective impression of sound

Signals, Noise, and Active Sensors Jan 29 2021 Sonar, radar and laser radar have evolved to the point where many commercial, scientific and military applications exist for these sensing

systems. Each of these sensors involves problems peculiar to themselves. Deals with solutions to the problems currently associated with signal detection by the application of a variety of subsets of Communication and Estimation Theory. Covers such topics as noise and random processes; noise statistics; how to detect signals in noise; waveform analysis; non-coherent detection of a single pulse and more.

Millimeter-Wave Radio-over-Fiber Links based on Mode-Locked Laser Diodes Dec 16 2019 Radio communications in the range of 60 GHz enable multi-Gigabit/s network access in indoor environments. Due to the propagation characteristics of such signals only very short range radio transmission is feasible. In order to distribute these signals across large distances, analog transmission over optical fiber is considered. In this work, mode-locked laser diodes serve as optoelectronic oscillators for the generation of such signals. Their system-relevant properties are studied in detail.

How to Make a Noise Jun 14 2022 How To Make A Noise-perhaps the most widely read book about synthesizer programming-is a comprehensive, practical guide to sound design and synthesizer programming techniques using subtractive (analog) synthesis, frequency modulation synthesis, additive synthesis, wave-sequencing, and sample-based synthesis. The book looks at programming using examples from six software synthesizers: Cameleon 5000 from Camel Audio, Rhino 2 from BigTick, Surge from Vember Audio, Vanguard from reFX, Wusikstation from Wusik dot com, and Z3TA+ from Cakewalk. Simon Cann is a musician and writer based in London. He is author of Cakewalk Synthesizers: From Presets to Power User, Building a Successful 21st Century Music Career, and Sample This!! (with Klaus P Rausch). You can contact Simon through his website: www.noisesculpture.com.

Introduction to Sound Aug 04 2021

Dynamic Waveform Selection for Target Tracking in Low Signal-to-noise Ratio Environments Sep 05 2021

Parameter Estimation for Waveforms in Additive Gaussian Noise Dec 08 2021 A method is developed for computing the greatest lower bound for the variance of unbiased estimates of waveform parameters, when the waveform is observed in additive Gaussian noise. The greatest lower bound is approximately evaluated in several illustrative cases. The waveform parameters occurring in these examples are amplitude, time delay, and doppler shift. (Author).

Signal Processing in Noise Waveform Radar Feb 22 2023 This book is devoted to the emerging technology of noise waveform radar and its signal processing aspects. It is a new kind of radar, which use noise-like waveform to illuminate the target. The book includes an introduction to basic radar theory, starting from classical pulse radar, signal compression, and wave radar. The book then discusses the properties, difficulties and potential of noise radar systems, primarily for low-power and short-range civil applications. The contribution of modern signal processing techniques to making noise radar practical are emphasized, and application examples are given.

From Sound to Synapse Mar 19 2020 This comprehensive introduction to the functions of the mammalian ear describes the major steps by which sound is transformed into nerve impulses. The author leads the reader along the pathway followed by the acoustic signal. He starts with the collection of sound by the outer ear, proceeds to its transfer by the middle ear, and finally analyzes its modification in the inner ear, where the sound waves are transformed into nerve impulses. The book concludes with descriptions of some common ear impairments and a brief survey of the treatments available for them. At each stage of the ear's sound

processing, Professor Geisler discusses the basic mechanisms, covering current theories and illustrating the discussions with experimental data. Although he uses an extensive array of analogies and mathematical models, he considers only the basic theory and the outputs of the models, not their derivation or formal usage. Where appropriate, related mechanisms in the ears of other vertebrates are considered. From Sound to Synapse is written in lucid, accessible style that makes no assumptions about the scientific background of the reader apart from a basic familiarity with pulse generation by neurons. It will be of value to researchers and students in sensory physiology, neurophysiology, acoustics, bioengineering, psychoacoustics, and neuroscience. It will also benefit neurologists, audiologists, otolaryngologists, and other clinicians interested in a more detailed description of sound processing.

Analysis and Solutions for Switching Noise Coupling in Mixed-Signal ICs Nov 07 2021 Modern microelectronic design is characterized by the integration of full systems on a single die. These systems often include large high performance digital circuitry, high resolution analog parts, high driving I/O, and maybe RF sections. Designers of such systems are constantly faced with the challenge to achieve compatibility in electrical characteristics of every section: some circuitry presents fast transients and large consumption spikes, whereas others require quiet environments to achieve resolutions well beyond millivolts. Coupling between those sections is usually unavoidable, since the entire system shares the same silicon substrate bulk and the same package. Understanding the way coupling is produced, and knowing methods to isolate coupled circuitry, and how to apply every method, is then mandatory knowledge for every IC designer. Analysis and Solutions for Switching Noise Coupling in Mixed-Signal ICs is an in-depth look at coupling through the common silicon substrate, and noise at the power supply lines. It explains the elementary knowledge needed to understand these phenomena and presents a review of previous works and new research results. The aim is to provide an understanding of the reasons for these particular ways of coupling, review and suggest solutions to noise coupling, and provide criteria to apply noise reduction. Analysis and Solutions for Switching Noise Coupling in Mixed-Signal ICs is an ideal book, both as introductory material to noise-coupling problems in mixed-signal ICs, and for more advanced designers facing this problem.

Propagation and Clutter Considerations for Long Range Radar Surveillance Using Noise Waveforms Jan 09 2022 The use of noise waveforms is investigated for long range radar surveillance. In addition to the noise signal, a chirp waveform was also simulated for the various scenarios to act as a direct comparison of traditional radar signals. The correlation and relative ratio of received to transmitted power was found for the two waveforms after reflecting from simple targets and terrain. For the simple shapes, the correlation of the two signals were similar in value and pattern with respect to incidence angle. The reflection from terrain gave smaller correlations for the noise waveform indicating that it may be less susceptible to false alarms when terrain is considered clutter. Advanced simulations were then run with a realistic hummer target and terrain clutter model. Accounting for the atmospheric propagation loss, system gains, and receiver noise, the probability of detection and false alarm were found to create receiver operating characteristic curves. It was found that the noise waveform performs as well as the chirp for cases of strong clutter response, and much better for cases of weak clutter response. Next, modeling radar propagation as a series of cascaded two-port devices was explored. This allowed different sections of propagation, such as through air or rain, to be computed separately for a particular wavelength and then combined together to form a set of system parameters. The first radar

that was modeled was forward-looking which examined an air-rain-air-target scenario. The system parameters for this case were computed for various rain rates and rain path lengths then applied to the noise and chirp waveforms. It was found the both the noise and chirp signals resulted in similar correlations with respect to path length and rain rate. The final radar that was modeled was down-looking where the waveforms were reflected and transmitted through different layers of soil with various moisture content. The correlation of both waveforms were similar in that they varied with path length due to the phase introduced by the system S11 parameter. However, the noise signal correlation was consistently lower than the chirp's. This again indicates that the noise waveform may be a better alternative for reducing clutter false alarms. Finally, the use of double spectral processing for determining target ranges was investigated in comparison to the use of cross-correlation. It was found that while the double spectral processing method efficiently determines target range, it produces echo responses in the case of multiple targets which may cause false alarms. Additionally, this method has lower peak-to-average responses than the correlation for noisy return signals, again increasing the false alarm rate.

Advanced Signal Processing and Digital Noise Reduction Nov 14 2019 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.

Waveform Distortion in a Maximum-likelihood Darlington Detector for M-ary PFM Signals Jun 02 2021

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