

Microwave Passive Direction Finding

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Introduction to Electronic Defense Systems Microwave Passive Direction Finding
Operating principles - Performance definition - Direction-finding error sources - System level descriptions - Representative operational small-aperture - Passive geolocation - Subsystem considerations - Calibration and test of direction-finding systems.

Smart Systems Artech House

We have investigated biological inspired RF direction finding techniques with the goal to learn and utilize the amazing acoustic direction finding capabilities of human and achieve compact, high performance and low-cost RF direction finding devices. Our initial simulation and experimental results are very encouraging. Through the 9-month STIR program "Human Ears Inspired Microwave Passive Direction Finding", prototype direction finding systems including antennas, human head like low-pass scatter and digital receiver have been successfully designed and built. Several biological inspired hardware configurations (i.e., head-like scatters of various properties, omni-directional antennas) and preliminary algorithms have been theoretically and experimentally tested. The effectiveness of the novel human head-like scatter has been clearly demonstrated. In addition, we have performed initial investigation of single antenna direction finding for broadband RF signals. The most important goal of the STIR program, which is to develop an experimental test bed so that it can be used in the near future to study and develop novel RF direction finding techniques inspired by the amazing human auditory system, has been achieved.

NASA SP. SciTech Publishing

Of related interest ... Microwave Passive Direction Finding Stephen E. Lipsky This breakthrough work answers the need of every engineer in search of a comprehensive, single source on DF technology. Microwave Passive Direction Finding succinctly unifies DF theory, provides representative block diagrams of working equipment, and details the methods of calculating and predicting system performance. Sections cover evolution and use of monopulse passive DF receiver theory, design of antenna elements for conformal DF coverage, receiver configurations, DF antenna arrays, computation methods for signal detection, and much more. Never before published material includes new systems concepts such as digital preprocessing, supercommutation, and wide RF bandwidth noise detection methods. With tips on preparing proposals for new business, this reference covers every aspect of the principles and practice of DF technology. 1987 (0 471-83454-8) 298 pp. Radar Principles Nadav Levanon With this first published textbook on the subject, practicing engineers and graduate students will quickly master the basic concepts of radar science. A clear, straightforward introduction to the discipline through an analytical and problem-solving mode, this unique book features mathematical analysis and proofs, fully analyzed examples, and problem sections—all selected from the author's course assignments. Key topics include propagation, radar cross section, clutter, radar signals, the ambiguity function, measurement accuracy, coherent processing, Synthetic Aperture Radar and monopulse. The text's tutorial format, consistent terminology, and 141 illustrations (including 3-D plots of ambiguity functions) make it an optimal self-study tool, classroom text, and professional reference. 1988 (0 471-85881-1) 308 pp. Optimal Radar Tracking Systems George Biernson Here is a systematic unveiling of the methods and means underlying the design of radar tracking technology. Topics covered include issues essential to an understanding of Altair radar as well as target-tracking systems. Kalman filter theory, feedback control, modulation and demodulation of signals, digital sampled-data systems, digital computer simulation, statistical analysis of random signals, detection and tracking processes in a radar system are developed first from their rudiments toward a more advanced discussion. Offering a breadth of technical detail unusual in the unclassified literature, this study is of paramount importance to those involved in tracking applications that use optical signal, sonar signal, or RF telemetry signals. 1989 (0 471-50673-7) 560 pp.

Scientific and Technical Aerospace Reports Artech House on Demand

Classical and Modern Direction of Arrival Estimation contains both theory and practice of direction finding by the leading researchers in the field. This unique blend of techniques

used in commercial DF systems and state-of-the-art super-resolution methods is a valuable source of information for both practicing engineers and researchers. Key topics covered are: Classical methods of direction finding Practical DF methods used in commercial systems Calibration in antenna arrays Array mapping, fast algorithms and wideband processing Spatial time-frequency distributions for DOA estimation DOA estimation in threshold region Higher order statistics for DOA estimation Localization in sensor networks and direct position estimation Brings together in one book classical and modern DOA techniques, showing the connections between them Contains contributions from the leading people in the field Gives a concise and easy-to-read introduction to the classical techniques Evaluates the strengths and weaknesses of key super-resolution techniques Includes applications to sensor networks

Radar Principles for the Non-Specialist SciTech Publishing

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in Scientific and technical aerospace reports (STAR) and International aerospace abstracts (IAA).

Microwave Passive Direction Finding Peninsula Publishing

This practical reference shows SAR system designers and remote sensing specialists how to produce higher quality SAR images using data-driven algorithms, and apply powerful new techniques to measure and analyze SAR image content.

Radar Principles with Applications to Tracking Systems SciTech Publishing

The leading text and reference on radar cross section (RCS) theory and applications, this work presents a comparison of two radar signal strengths. One is the strength of the radar beam sweeping over a target, the other is the strength of the reflected echo sensed by the receiver. This book shows how the RCS "gauge" can be predicted for theoretical objects.

Small-aperture Radio Direction-finding Artech House Radar Library (Ha

This book is a current, comprehensive design guide for your digital processing work with today's complex receiver systems. This book brings you up-to-date with the latest information on wideband electronic warfare receivers, the ADC testing procedure, frequency channelization and decoding schemes, and the operation of monobit receivers.

Practical ESM Analysis Springer Science & Business Media

This is a reference work for EW engineers which is also intended for university use in advanced undergraduate or graduate-level courses in EW, radar, and aerospace systems. This text reviews the fundamental concepts and physical principles underlying EW receiving systems design analysis, and performance evaluation. The main discussion focuses on radar signals in military applications.

Conference Proceedings Artech House Radar Library (Ha

Microwave Passive Direction Finding SciTech Publishing

International Symposium Digest, Antennas and Propagation Artech House

This book aims to highlight the strength and state-of-art of some techniques and methods applied to intelligent systems. Rather to cover the variety of techniques and methods available in the literature, which is out of scope of this book, it focuses on those consolidated and applied and on those with high potential of implementation to smart systems. This book has fourteen chapters covering a broad range of topics in communications. The first three chapters are devoted to state-of-art and review papers on planar filters, unmanned aerial vehicles (UAV), negative group delay, nanoclusters, and tunable lights, while the remaining chapters cover specific topics such as smart monitoring, V2I, high-speed links, RF and Optical sensors, composite material, metamaterial, energy harvesting, radar, SWIPT, and electromagnetic sources.

Antenna Systems and Electronic Warfare Applications Artech House

Highly respected authors have reunited to update the well known 1981 edition which is still hailed as one of the best in its field. This edition includes recent

antenna innovations and applications. It features a succinct treatment of the finite difference, time domain (FDTD) computational technique. It is also the first text to treat physical theory of diffraction (PTD).

The Microwave Engineering Handbook Wiley-Interscience

Receivers systems are considered the core of electronic warfare (EW) intercept systems. Without them, the fundamental purpose of such systems is null and void. This book considers the major elements that make up receiver systems and the receivers that go in them. This resource provides system design engineers with techniques for design and development of EW receivers for modern modulations (spread spectrum) in addition to receivers for older, common modulation formats. Each major module in these receivers is considered in detail. Design information is included as well as performance tradeoffs of various components. Major factors that influence the functioning of the modules are identified and discussed. Key performance parameters are identified as well, and approaches to achieving design goals are considered.

Classical and Modern Direction-of-Arrival Estimation Academic Press

A world list of books in the English language.

Analog Automatic Control Loops in Radar and EW SciTech Publishing

This updated edition provides a solid understanding of radar fundamentals and applications with far less of the mathematical rigor and technical data presented in engineering books for specialists.

Microwave Receivers with Electronic Warfare Applications Artech House

In the high frequency world, the passive technologies required to realize RF and microwave functionality present distinctive challenges. SAW filters, dielectric resonators, MEMS, and waveguide do not have counterparts in the low frequency or digital environment. Even when conventional lumped components can be used in high frequency applications, their behavior does not resemble that observed at lower frequencies. RF and Microwave Passive and Active Technologies provides detailed information about a wide range of component technologies used in modern RF and microwave systems. Updated chapters include new material on such technologies as MEMS, device packaging, surface acoustic wave (SAW) filters, bipolar junction and heterojunction transistors, and high mobility electron transistors (HMETs).

The book also features a completely rewritten section on wide bandgap transistors.

Digital Techniques for Wideband Receivers SciTech Publishing

Written by a prominent expert in the field, this authoritative resource considers radar parameters and how they affect ESM systems. It describes the ESM environment, including types of radar, pulse density, the latest radar developments and how they will be seen by ESM systems. Different types of ESM systems are described, with methods of calculation of Direction of Arrival (DOA) of pulses. Conventional wisdom about RF scan strategies for narrow-band receivers will be challenged and new methods (proven to be effective in trials) will be proposed. The book describes ESM Antenna separation, which plays a significant part in the generation of DOA errors, with examples of the effects for different situations. The book will explain the common phenomena seen in ESM systems with many examples of how to recognize issues in the ESM data and solutions for their mitigation. Techniques for visualizing ESM data and how to set up ESM trials will be given, including the simulation of the electromagnetic environment. The book also presents detailed calculations for generating emitter beam-shapes for use in simulations of pulse trains and the calculation of detection range will be useful for data analysts, trials engineers and system assessors, which are not published elsewhere. The identification of radars by ESM systems is considered in detail with ideas presented on how to generate an effective radar library.

Introduction to RF and Microwave Passive Components Artech House on Demand

In answer to great demand, Artech House is proud to bring professionals a newly revised and updated edition of the bestselling book Introduction to Modern EW Systems. The Second Edition has been greatly expanded to include a wealth of new material, from remote piloted airborne systems,

directed energy weapons, and non-cooperative air surveillance...to EW radar band sensor next generation architectures, real-time data links, and smart jamming. This authoritative resource provides engineers and students with the latest electronic warfare (EW) techniques and technologies related to on-board military platforms. Practitioners gain expert design guidance on technologies and equipment used to detect and identify emitter threats, offering an advantage in the never-ending chess game between sensor guided weapons and EW systems. This unique book provides deeper insight into EW systems principles of operation and their mathematical descriptions, arming professionals with better knowledge for their specific design applications. Moreover, readers get practical information on how to counter modern communications data links which provide connectivity and command flow among the armed forces in the battlefield. Taking a sufficiently broad perspective, this comprehensive volume offers a panoramic view of the various physical domains RF, Infrared, and electronics that are present in modern electronic warfare systems. This in-depth book is supported with over 340 illustrations and more than 450 equations.

Human Ears Inspired Passive Microwave Direction Finding John Wiley & Sons Incorporated

Disk contains: MATLAB/SIMULINK programs to be used for the problem exercises.

Conference Publication Artech House

A comprehensive and accessible introduction to electronic warfare and defense systems. Description of electronic defense systems and weapons systems. Explains vulnerable parts of radar and the limitations of weapons systems. Details effectiveness of defense systems.