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# Antenna Based Matlab Projects With Codes

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*Basic Antenna & Wave  
Propagation with its  
MATLAB Volume I*

Springer Science &  
Business Media

The discipline of antenna  
theory has experienced  
vast technological

changes. In response, Constantine Balanis has updated his classic text, *Antenna Theory*, offering the most recent look at all the necessary topics. New material includes smart antennas and fractal antennas, along with the latest applications in wireless communications. Multimedia material on an accompanying CD presents PowerPoint viewgraphs of lecture notes, interactive review questions, Java animations and applets, and MATLAB features. Like the previous editions,

*Antenna Theory, Third Edition* meets the needs of electrical engineering and physics students at the senior undergraduate and beginning graduate levels, and those of practicing engineers as well. It is a benchmark text for mastering the latest theory in the subject, and for better understanding the technological applications. An Instructor's Manual presenting detailed solutions to all the problems in the book is available from the Wiley editorial department.

*PBG based Terahertz Antenna for Aerospace Applications* Cengage Learning  
 An introduction to technical details related to the Physical Layer of the LTE standard with MATLAB®. The LTE (Long Term Evolution) and LTE-Advanced are among the latest mobile communications standards, designed to realize the dream of a truly global, fast, all-IP-based, secure broadband mobile access technology. This book examines the Physical

Layer (PHY) of the LTE standards by incorporating three conceptual elements: an overview of the theory behind key enabling technologies; a concise discussion regarding standard specifications; and the MATLAB® algorithms needed to simulate the standard. The use of MATLAB®, a widely used technical computing language, is one of the distinguishing features of this book. Through a series of MATLAB® programs, the author explores each of

the enabling technologies, pedagogically synthesizes an LTE PHY system model, and evaluates system performance at each stage. Following this step-by-step process, readers will achieve a deeper understanding of LTE concepts and specifications through simulations. Key Features: • Accessible, intuitive, and progressive; one of the few books to focus primarily on the modeling, simulation, and implementation of the LTE PHY standard • Includes case studies and

testbenches in MATLAB®, which build knowledge gradually and incrementally until a functional specification for the LTE PHY is attained

- Accompanying Web site includes all MATLAB® programs, together with PowerPoint slides and other illustrative examples

Dr Houman Zarrinkoub has served as a development manager and now as a senior product manager with MathWorks, based in Massachusetts, USA. Within his 12 years at MathWorks, he has

been responsible for multiple signal processing and communications software tools. Prior to MathWorks, he was a research scientist in the Wireless Group at Nortel Networks, where he contributed to multiple standardization projects for 3G mobile technologies. He has been awarded multiple patents on topics related to computer simulations. He holds a BSc degree in Electrical Engineering from McGill University and MSc and PhD degrees in Telecommunications from

the Institut Nationale de la Recherche Scientifique, in Canada. <http://www.wiley.com/go/zarrinkoub> [www.wiley.com/go/zarrinkoub/a-Information-Systems-and-Design](http://www.wiley.com/go/zarrinkoub/a-Information-Systems-and-Design) Springer Nature This book contains original, peer-reviewed research articles from the Second International Conference on Recent Trends in Machine Learning, IoT, Smart Cities and Applications, held in March 28-29th 2021 at CMR Institute of Technology, Hyderabad, Telangana India. It covers

the latest research trends and developments in areas of machine learning, artificial intelligence, neural networks, cyber-physical systems, cybernetics, with emphasis on applications in smart cities, Internet of Things, practical data science and cognition. The book focuses on the comprehensive tenets of artificial intelligence, machine learning and deep learning to emphasize its use in modelling, identification, optimization, prediction, forecasting and control of

future intelligent systems. Submissions were solicited of unpublished material, and present in-depth fundamental research contributions from a methodological/application perspective in understanding artificial intelligence and machine learning approaches and their capabilities in solving a diverse range of problems in industries and its real-world applications.

**Introduction to Radar Using Python and MATLAB** Wiley  
The Latest Resource for

the Study of Antenna Theory! In a discipline that has experienced vast technological changes, this text offers the most recent look at all the necessary topics. Highlights include: \* New coverage of microstrip antennas provides information essential to a wide variety of practical designs of rectangular and circular patches, including computer programs. \* Applications of Fourier transform (spectral) method to antenna radiation. \* Updated material on

moment methods, radar cross section, mutual impedances, aperture and horn antennas, compact range designs, and antenna measurements. A New Emphasis on Design! Balanis features a tremendous increase in design procedures and equations. This presents a solid solution to the challenge of meeting real-life situations faced by engineers. Computer programs contained in the book-and accompanying software-have been developed to help engineers analyze,

design, and visualize the radiation characteristics of antennas.

Design and Characterization of a Mobile GPR Antenna Assembly Springer

Ground penetrating radars have been tested for detecting trapped alive victims from the ruins of collapsed building, for example due to a mining disaster, rock slide or natural catastrophe. The priority of the rescue teams is to find alive people as fast as they can. Rescue radars are designed with

the primary objective of quickly finding survivors trapped beneath the surface. Researchers in the Department of Microsystems Engineering (IMTEK), at the Albert-Ludwigs University of Freiburg, have been working on experiments about antenna designing and measuring systems for rescue radar through the years. Currently, IMTEK is working in a project which objective is to develop a sensor system for the localization of buried people. This thesis has been

developed there, that is why it is focused on their needs and possibilities. The aim of the thesis is to develop a mobile GPR antenna assembly which can be used as a rescue radar. The project is composed of three fundamental parts: different kinds of HF-simulations software for GPR applications comparison, while verifying if MATLAB openEMS open free source can be used for designing antennas in IMTEK department projects; designing and

optimizing the GPR antenna assembly while analyzing different techniques for crosstalk isolation enhancement such as adding rings, meander-line and Electromagnetic Band Gap; and once the prototype is defined and manufactured, testing the GPR antenna in different scenarios. As a conclusion of the work, the simulations results of both software used were very close from the antenna prototype datasheet diagrams as well as from the experimental tests

did. Therefore, Matlab openEMS software has also proved to be very competent in antenna designing sector, obtaining practically identical results as the CST Studio Suit software. Furthermore, after analyzing the performance of different GPR antenna modifications and the isolation enhancement structures added to the design, we concluded that the Electromagnetic Band Gap technique with square sides equal to 15 mm is the best isolation

enhancement, therefore, we manufactured and tested a replica of the GPR antenna design with EBG structure.  
Software-Defined Radio for Engineers Springer Nature  
Discover the concepts and techniques needed to design millimeter-wave circuits for current and emerging wireless system applications.  
Applied Signal Processing IGI Global  
"Digital Signal Processing: A Computer-Based Approach" is intended for a two-semester course on

digital signal processing for seniors or first-year graduate students. Based on user feedback, a number of new topics have been added to the second edition, while some excess topics from the first edition have been removed. The author has taken great care to organize the chapters more logically by reordering the sections within chapters. More worked-out examples have also been included. The book contains more than 500 problems and 150 MATLAB exercises.

New topics in the second edition include: finite-dimensional discrete-time systems, correlation of signals, inverse systems, system identification, matched filter, design of analog and IIR digital highpass, bandpass and bandstop filters, more on FIR filters, spectral analysis of random signals and sparse antenna array design. A corrected version of the main text is now packaged with Digital Signal Processing Laboratory Using MATLAB, which is intended for a computer-based DSP

laboratory course that supplements a lecture course on Digital Signal Processing. The lab book includes 11 laboratory exercises, with each exercise containing a number of projects to be carried out on a computer. The book assumes that the reader has no background in MATLAB and teaches the reader, through tested programs in the first half of the book, the basics of this powerful language in solving important problems in signal processing. In the second



half of the book, the student is asked to write the necessary MATLAB programs to carry out the projects.

A First Course in Fuzzy and Neural Control CRC Press

This volume presents selected contributions from the “Advanced Research Workshop on Explosives Detection” hosted by the Department of Information Engineering of the University of Florence, Italy in 2018. The main goal of the workshop was to find out how Science

for Peace and Security projects in the field of Explosives Detection contribute to the development and/or refinement of scientific and technical knowledge and competencies. The findings of the workshop, presented in the last section of the book, determine future actions and direction of the SPS Programme in the field of explosives detection and management. The NATO Science for Peace and Security (SPS) Programme, promotes dialogue and practical

cooperation between NATO member states and partner nations based on scientific research, technological innovation and knowledge exchange. Several initiatives were launched in the field of explosive detection and clearance, as part of NATO’s enhanced role in the international fight against terrorism. Experts and scientists from NATO members and partner countries have been brought together in multi-year projects, within the framework of the SPS Programme, to cooperate

in the scientific research in explosive detection field, developing new technologies and methods to be implemented in order to detect explosive substances in different contexts.

**Advances in Multimedia, Software Engineering and Computing Vol.1** John

Wiley & Sons

MIMO-OFDM is a key technology for next-generation cellular communications (3GPP-LTE, Mobile WiMAX, IMT-Advanced) as well as wireless LAN (IEEE

802.11a, IEEE 802.11n), wireless PAN (MB-OFDM), and broadcasting (DAB, DVB, DMB). In MIMO-OFDM Wireless Communications with MATLAB®, the authors provide a comprehensive introduction to the theory and practice of wireless channel modeling, OFDM, and MIMO, using MATLAB® programs to simulate the various techniques on MIMO-OFDM systems. One of the only books in the area dedicated to explaining simulation aspects Covers implementation to help

cement the key concepts Uses materials that have been classroom-tested in numerous universities Provides the analytic solutions and practical examples with downloadable MATLAB® codes Simulation examples based on actual industry and research projects Presentation slides with key equations and figures for instructor use MIMO-OFDM Wireless Communications with MATLAB® is a key text for graduate students in wireless communications. Professionals and

technicians in wireless communication fields, graduate students in signal processing, as well as senior undergraduates majoring in wireless communications will find this book a practical introduction to the MIMO-OFDM techniques. Instructor materials and MATLAB® code examples available for download at [www.wiley.com/go/chomimo](http://www.wiley.com/go/chomimo)  
International Conference on Innovative Computing and Communications CRC Press  
Enabling Technologies for

Next Generation Wireless Communications provides up-to-date information on emerging trends in wireless systems, their enabling technologies and their evolving application paradigms. This book includes the latest trends and developments toward next generation wireless communications. It highlights the requirements of next generation wireless systems, limitations of existing technologies in delivering those requirements and the need to develop radical

new technologies. It focuses on bringing together information on various technological developments that are enablers vital to fulfilling the requirements of future wireless communication systems and their applications. Topics discussed include spectrum issues, network planning, signal processing, transmitter, receiver, antenna technologies, channel coding, security and application of machine learning and deep learning for wireless

communication systems. The book also provides information on enabling business models for future wireless systems. This book is useful as a resource for researchers and practitioners worldwide, including industry practitioners, technologists, policy decision-makers, academicians, and graduate students.

*Double Difference Carrier Phase GPS Using Least Square Technique to Resolve Integer Ambiguity*  
John Wiley & Sons

This volume constitutes

selected papers from the Second International Conference on Information Systems and Design, ICID 2021, held as a virtual event in September 2021. The 24 full papers and 4 short papers presented were thoroughly reviewed and selected from 51 submissions. They are organized in topical sections on digital transformation of enterprises based on analysis and management tools: practical-focused research; methodological support of analysis and

management tools: theoretical-focused research; young scientists research in the areas of enterprise digitalization.

Electrical Engineering in Context: Smart Devices, Robots & Communications  
John Wiley & Sons

ELECTRICAL ENGINEERING IN CONTEXT: SMART DEVICES, ROBOTS & COMMUNICATIONS by bestselling author Roman Kuc describes the basic components and technologies that make today's computer-assisted systems operate and cooperate, inviting the

reader to understand by participating in the design process. Directed at the undergraduate electrical engineering student, this book starts with the basics and requires a working knowledge of algebra. Rather than simple plug-and-chug exercises, the book teaches sophisticated problem-solving and design tools. Students will learn through designing digital displays, extracting information from signals, and optimizing system performance through parameter value selection

and observing graphical data displays. Animations showing dynamic system behavior and relating to the book figures are available through the book's companion site. At the completion of the course, students will have an understanding of the capabilities of current digital devices and ideas for possible new applications. This will benefit students in other courses requiring quantitative skills and in their profession. To help accomplish this tall order, the book is written in a

graduated intensity that can be adapted to the specific needs and talents of each student: Basic commands and graphs are used in first-level problems that illustrate device performance while varying parameter values and in designs that are open-ended, driven by student curiosity. Some problems can be solved using software packages, but many exercises are for paper and pencil solution. MATLAB based examples and problems are also included for users comfortable with

computer programming. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Introduction to Synthetic Aperture Radar Using Python and MATLAB®

Springer Nature

Based on the popular Artech House classic, Digital Communication Systems Engineering with Software-Defined Radio, this book provides a practical approach to quickly learning the software-defined radio

(SDR) concepts needed for work in the field. This up-to-date volume guides readers on how to quickly prototype wireless designs using SDR for real-world testing and experimentation. This book explores advanced wireless communication techniques such as OFDM, LTE, WLA, and hardware targeting. Readers will gain an understanding of the core concepts behind wireless hardware, such as the radio frequency front-end, analog-to-digital and digital-to-analog converters, as well

as various processing technologies. Moreover, this volume includes chapters on timing estimation, matched filtering, frame synchronization message decoding, and source coding. The orthogonal frequency division multiplexing is explained and details about HDL code generation and deployment are provided. The book concludes with coverage of the WLAN toolbox with OFDM beacon reception and the LTE toolbox with downlink reception. Multiple case

studies are provided throughout the book. Both MATLAB and Simulink source code are included to assist readers with their projects in the field. [MATLAB for Engineers](#) Springer Science & Business Media ANTENNA AND EM MODELING WITH MATLAB ANTENNA TOOLBOX™ An essential text to MATLAB Antenna Toolbox™ as accessible and easy-to-use full-wave antenna modeling tool Antenna and EM Modeling with MATLAB Antenna Toolbox™ is a textbook on

antennas intended for a one semester course. The core philosophy is to introduce the key antenna concepts and follow them up with full-wave modeling and optimization in the MATLAB Antenna Toolbox™. Such an approach will enable immediate testing of theoretical concepts by experimenting in software. It also provides the direct path to research work. The fundamental families of antennas — dipoles, loops, patches, and

traveling wave antennas — are discussed in detail, together with the respective antenna arrays. Using antenna parameters such as impedance, reflection coefficient, efficiency, directivity, and gain, the reader is introduced to the different ways of understanding the performance of an antenna. Written for senior undergraduates, graduates as well as RF/Antenna engineers, Antenna and EM Modeling with Antenna Toolbox™ is a resource that: Provides

14 video assisted laboratories on using Antenna Toolbox™ Includes approximately 50 real-world examples in antenna and array design Offers approximately 200 homework problems Provides multiple ready-to-use standalone MATLAB® scripts *Digital Signal Processing* Artech House This volume collects the main results of the Author's Ph.D. course in Electromagnetics and Mathematical Models for Engineering, attended at 'Sapienza' University of

Rome from November 2011 to February 2015, in the Electromagnetic Fields 1 Lab of the Department of Information Engineering, Electronics and Telecommunications, under the tutoring of Prof. Alessandro Galli. **Antenna Theory** Springer Nature The lack of clear communication, especially internationally, plagues the modern world in a variety of fields. Researchers and practitioners within the modern networking and communication industries

strive to discover new and innovative ways for humans to better contact one another. Strategic Innovations and Interdisciplinary Perspectives in Telecommunications and Networking provides emerging research exploring the theoretical and practical aspects of network management and security, as well as applications within computer science, mobile and wireless computing, and multimedia technology. Featuring coverage on a broad



range of topics such as coding theory, mobile devices, and contextual advertising, this book is ideal for students, researchers, social media marketers, brand managers, networking professionals, and engineers seeking current research on cross-disciplinary applications of electrical engineering, computer science, and information technology. [Antenna and Em Modeling with Matlab](#) Artech House This comprehensive introduction to synthetic aperture radar (SAR) is a

practical guide to the analysis, simulation, and design of SAR systems. The video eBook uses constructive examples and real-world collected datasets to demonstrate image registration and autofocus methods. Both two- and three-dimensional image formation algorithms are presented. Hardware, software, and environmental parameters are used to estimate performance limits for SAR operation and utilization. A set of Python and MATLAB

software tools is included and provides you with an effective mechanism to analyze and predict SAR performance for various imaging scenarios and applications. Examples which use the software tools are provided at the end of each chapter to reinforce critical SAR imaging topics such as clutter-to-noise ratio, mapping rate, spatial resolution, Doppler bandwidth, pulse repetition frequency, and coherency. This is an excellent resource for engineering professionals

working in areas of radar signal processing and imaging as well as students interested in studying SAR.

Small Machine Tools for Small Workpieces John Wiley & Sons

This book gathers high-quality research papers presented at the Second International Conference on Innovative Computing and Communication (ICICC 2019), which was held at the VSB - Technical University of Ostrava, Czech Republic, on 21-22 March 2019. Highlighting innovative

papers by scientists, scholars, students, and industry experts in the fields of computing and communication, the book promotes the transformation of fundamental research into institutional and industrialized research, and the translation of applied research into real-world applications.

**Applications of Metamaterials** Springer Nature

This book focuses on high-gain antennas in the terahertz spectrum and their optimization. The

terahertz spectrum is an unallocated EM spectrum, which is being explored for a number of applications, especially to meet increasing demands of high data rates for wireless space communications. Space communication systems using the terahertz spectrum can resolve the problems of limited bandwidth of present wireless communications without radio-frequency interference. This book describes design of such high-gain antennas and their performance

enhancement using photonic band gap (PBG) substrates. Further, optimization of antenna models using evolutionary algorithm based computational engine has been included. The optimized high-performance compact antenna may be used for various wireless applications, such as inter-orbital communications and on-vehicle satellite communications.

### **Proceedings of the 2nd International Conference on Recent**

### **Trends in Machine Learning, IoT, Smart Cities and Applications**

John Wiley & Sons

This is the first textbook that contains a holistic treatment of antennas both for traditional antennas mounted on masts (Line-of-Sight antenna systems) and for small antennas used on modern wireless devices such as smart phones being subject to signal variations (fading) due to multipath propagation. The focus is on characterization, as well as describing classical

antennas by modern complex vector theory - thereby linking together many disciplines such as electromagnetic theory, classical antenna theory, wave propagation, and antenna system performance. Overall, this book represents a rethinking of the way basic antenna theory is presented. The book contains many references to important old and new papers and books on the analysis and design of the most useful antenna types, for the most interested readers.