Analogue and Digital Communication Lab

(EL-3003)

LABORATORY MANUAL

Dr. Farhan Khalid

Engr. Ibad Ur Rahman

Analogue Conventional Amlitude Modulation and Demodulation using Matlab

(LAB # 06, LLO 02)

Student Name: FAIZAN IRFAN

Roll No: 201-1006 Section: B

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Digital Communication Lab Manual Using Matlab Bpsk

S Ashworth

Digital Communication Lab Manual Using Matlab Bpsk:

Digital Communications With Lab Manual, 3/E Bhat K. N. Hari,2010-09 **LAB PRIMER THROUGH MATLAB®** NAVAS, K. A.,JAYADEVAN, R.,2014-02-19 This systematically designed laboratory manual elucidates a number of techniques which help the students carry out various experiments in the field of digital signal processing digital image processing digital signal processor and digital communication through MATLAB in a single volume A step wise discussion of the programming procedure using MATLAB has been carried out in this book The numerous programming examples for each digital signal processing lab image processing lab signal processor lab and digital communication lab have also been included The book begins with an introductory chapter on MATLAB which will be very useful for a beginner The concepts are explained with the aid of screenshots Then it moves on to discuss the fundamental aspects in digital signal processing through MATLAB with a special emphasis given to the design of digital filters FIR and IIR Finally digital communication and image processing sections in the book help readers to understand the commonly used MATLAB functions At the end of this book some basic experiments using DSP trainer kit have also been included Audience This book is intended for the undergraduate students of electronics and communication engineering electronics and instrumentation engineering and instrumentation and control engineering for their laboratory courses in digital signal processing image processing and digital communication Key Features Includes about 115 different experiments Contains several figures to reinforce the understanding of the techniques discussed Gives systematic way of doing experiments such as Aim Theory Programs Sample inputs and outputs Viva voce questions and Examination questions **MATLAB/Simulink for Digital Communication** Won Y. Yang,2018-03-02 Chapter 1 Fourier Analysis 1 1 1 CONTINUOUS TIME FOURIER SERIES CTFS 2 1 2 PROPERTIES OF CTFS 6 1 2 1 Time Shifting Property 6 1 2 2 Frequency Shifting Property 6 1 2 3 Modulation Property 6 1 3 CONTINUOUS TIME FOURIER TRANSFORM CTFT 7 1 4 PROPERTIES OF CTFT 13 1 4 1 Linearity 13 1 4 2 Conjugate Symmetry 13 1 4 3 Real Translation Time Shifting and Complex Translation Frequency Shifting 14 1 4 4 Real Convolution and Correlation 14 1 4 5 Complex Convolution Modulation Windowing 14 1 4 6 Duality 17 1 4 7 Parseval Relation Power Theorem 18 1 5 DISCRETE TIME FOURIER TRANSFORM DTFT 18 1 6 DISCRETE TIME FOURIER SERIES DFS DFT 19 1 7 SAMPLING THEOREM 21 1 7 1 Relationship between CTFS and DFS 21 1 7 2 Relationship between CTFT and DTFT 27 1 7 3 Sampling Theorem 27 1 8 POWER ENERGY AND CORRELATION 29 1 9 LOWPASS EQUIVALENT OF BANDPASS SIGNALS 30 Chapter 2 PROBABILITY AND RANDOM PROCESSES 39 2 1 PROBABILITY 39 2 1 1 Definition of Probability 39 2 1 2 Joint Probability and Conditional Probability 40 2 1 3 Probability Distribution Density Function 41 2 1 4 Joint Probability Density Function 41 2 1 5 Condtional Probability Density Function 41 2 1 6 Independence 41 2 1 7 Function of a Random Variable 42 2 1 8 Expectation Covariance and Correlation 43 2 1 9 Conditional Expectation 47 2 1 10 Central Limit Theorem Normal Convergence Theorem 47 2 1 11 Random Processes 49 2 1 12 Stationary Processes and Ergodic Processes 51 2 1 13 Power Spectral Density PSD 53 2 1 14

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AND BANDWIDTH EFFICIENCY OF OFDM 363 11 3 CARRIER RECOVERY AND SYMBOL SYNCHRONIZATION 364 11 4 CHANNEL ESTIMATION AND EQUALIZATION 381 11 5 INTERLEAVING AND DEINTERLEAVING 384 11 6 PUNCTURING AND DEPUNCTURING 386 11 7 IEEE STANDARD 802 11A 1999 388 **Digital Signal Processing Laboratory Experiments Using MATLAB** Hardik Modi,2014-03-24 Technical Report from the year 2014 in the subject Computer Science Technical Computer Science language English abstract This is Laboratory Manual of Digital Signal Processing All experiments are performed on MATLAB e g List of Experiments 1 To represent basic signals like Unit Impulse Ramp Unit Step Exponential 2 To generate discrete sine and cosine signals with given sampling frequency 3 To represent complex exponential as a function of real and imaginary part 4 To determine impulse and step response of two vectors using MATLAB 5 To perform convolution between two vectors using MATLAB 6 To perform cross correlation between two vectors using MATLAB **Problem-Based Learning in Communication Systems Using MATLAB and Simulink** Kwonhue Choi,Huaping Liu,2016-02-10 Designed to help teach and understand communication systems using a classroom tested active learning approach Discusses communication concepts and algorithms which are explained using simulation projects accompanied by MATLAB and Simulink Provides step by step code exercises and instructions to implement execution sequences Includes a companion website that has MATLAB and Simulink model samples and templates password matlab **Advance Communication Lab Manual** Dr. Preeta Sharan,2009 *Digital Signal Processing for Wireless Communication using Matlab* E.S. Gopi,2021-10-21 The updated book presents Matlab illustrations on various digital signal processing DSP techniques such as random process time varying wireless system model and detection and estimation theory used in wireless communication The book also covers recent wireless techniques like OFDM massive MIMO techniques non orthogonal multiple access millimeter wave MIMO full duplex cognitive radio co operating communication unmanned aerial vehicles etc This book is suitable for those who are doing basic and applied research in digital signal processing for wireless communication Communication Systems Principles Using MATLAB John W. Leis,2018-07-31 Discover the basic telecommunications systems principles in an accessible learn by doing format Communication Systems Principles Using MATLAB covers a variety of systems principles in telecommunications in an accessible format without the need to master a large body of theory The text puts the focus on topics such as radio and wireless modulation reception and transmission wired networks and fiber optic communications The book also explores packet networks and TCP IP as well as digital source and channel coding and the fundamentals of data encryption Since MATLAB is widely used by telecommunications engineers it was chosen as the vehicle to demonstrate many of the basic ideas with code examples presented in every chapter The text addresses digital communications with coverage of packet switched networks Many fundamental concepts such as routing via shortest path are introduced with simple and concrete examples The treatment of advanced telecommunications topics extends to OFDM for wireless modulation and public key exchange algorithms for data encryption Throughout the book the

author puts the emphasis on understanding rather than memorization The text also Includes many useful take home skills that can be honed while studying each aspect of telecommunications Offers a coding and experimentation approach with many real world examples provided Gives information on the underlying theory in order to better understand conceptual developments Suggests a valuable learn by doing approach to the topic Written for students of telecommunications engineering Communication Systems Principles Using MATLAB is the hands on resource for mastering the basic concepts of telecommunications in a learn by doing format **Digital Modulations Using Matlab** Mathuranathan Viswanathan,2017-06-14 Digital Modulations using Matlab is a learner friendly practical and example driven book that gives you a solid background in building simulation models for digital modulation systems in Matlab This book an essential guide for understanding the implementation aspects of a digital modulation system shows how to simulate and model a digital modulation system from scratch The implemented simulation models shown in this book mostly will not use any of the inbuilt communication toolbox functions and hence provide an opportunity for an engineer to understand the basic implementation aspects of modeling various building blocks of a digital modulation system It presents the following key topics with required theoretical background along with the implementation details in the form of Matlab scripts Basics of signal processing essential for implementing digital modulation techniques generation of test signals interpreting FFT results power and energy of a signal methods to compute convolution analytic signal and applications Waveform and complex equivalent baseband simulation models Digital modulation techniques covered BPSK and its variants QPSK and its variants M ary PSK M ary QAM M ary PAM CPM MSK GMSK M ary FSK Monte Carlo simulation for ascertaining performance of digital modulation techniques in AWGN and fading channels Eb N0 Vs BER curves Design and implementation of linear equalizers Zero forcing and MMSE equalizers using them in a communication link Simulation and performance of modulation systems with receiver impairments **Contemporary Communication Systems Using MATLAB** John G. Proakis,Masoud Salehi,2000 This supplement to any standard communication systems text is one of the first books to successfully integrate the use of MATLAB in the study of communication systems concepts and problems It has been developed for instructors and students who wish to make use of MATLAB as an integral part of their study The former will find the means by which to use MATLAB as a powerful tool to motivate students and illustrate essential theory without having to customize the applications themselves the latter will find relevant problems quickly and easily The book includes numerous MATLAB based simulations and examples of communication systems while providing a good balance of theory and hands on computer experience This Updated Printing revises the book and MATLAB files available for downloading from the Brooks Cole Bookware Companion Resource Center Web Site to MATLAB V5 **MATLAB/Simulink for Digital Communication** ,2009 *Essentials of Digital Signal Processing Using MATLAB* Vinay K. Ingle,John G. Proakis,2011-03 In this supplementary text MATLAB is used as a computing tool to explore traditional DSP topics and solve problems to gain insight This greatly expands the range and

complexity of problems that students can effectively study in the course Since DSP applications are primarily algorithms implemented on a DSP processor or software a fair amount of programming is required Using interactive software such as MATLAB makes it possible to place more emphasis on learning new and difficult concepts than on programming algorithms Interesting practical examples are discussed and useful problems are explored **Digital Communications With Lab Manual** Kn Hari Bhat,2009-01-01 **Introduction to Digital Signal Processing Using MATLAB with Application to Digital Communications** K.S. Thyagarajan,2018-05-28 This textbook provides engineering students with instruction on processing signals encountered in speech music and wireless communications using software or hardware by employing basic mathematical methods The book starts with an overview of signal processing introducing readers to the field It goes on to give instruction in converting continuous time signals into digital signals and discusses various methods to process the digital signals such as filtering The author uses MATLAB throughout as a user friendly software tool to perform various digital signal processing algorithms and to simulate real time systems Readers learn how to convert analog signals into digital signals how to process these signals using software or hardware and how to write algorithms to perform useful operations on the acquired signals such as filtering detecting digitally modulated signals correcting channel distortions etc Students are also shown how to convert MATLAB codes into firmware codes Further students will be able to apply the basic digital signal processing techniques in their workplace The book is based on the author s popular online course at University of California San Diego **Digital Signal Processing with MATLAB Manual** MD Ariful Islam,2022-08-12 This laboratory manual deals with the basics of Digital Signal Processing DSP Lab experiment I hope this manual will be very useful for those who want to learn DSP by solving various problems Each program has been written in the MATLAB software according to the various questions and the output is shown step by step Digital Communication Systems Using MATLAB and Simulink Dennis Silage,2009 Digital Communication using MATLAB and Simulink is intended for a broad audience For the student taking a traditional course the text provides simulations of the MATLAB and Simulink systems and the opportunity to go beyond the lecture or laboratory and develop investigations and projects For the professional the text facilitates an expansive review of and experience with the tenets of digital communication systems *Digital Signal Processing Using MATLAB* Vinay Ingle,John Proakis,2006-08-10 This supplement to any standard DSP text is one of the first books to successfully integrate the use of MATLAB in the study of DSP concepts In this book MATLAB is used as a computing tool to explore traditional DSP topics and solve problems to gain insight This greatly expands the range and complexity of problems that students can effectively study in the course Since DSP applications are primarily algorithms implemented on a DSP processor or software a fair amount of programming is required Using interactive software such as MATLAB makes it possible to place more emphasis on learning new and difficult concepts than on programming algorithms Interesting practical examples are discussed and useful problems are explored This updated second edition includes new homework problems and revises the

scripts in the book available functions and m files to MATLAB V7 Important Notice Media content referenced within the product description or the product text may not be available in the ebook version **Digital Signal Processing Using MATLAB** Vinay K. Ingle,John G. Proakis,2011-01-01 In this supplementary text MATLAB is used as a computing tool to explore traditional DSP topics and solve problems to gain insight This greatly expands the range and complexity of problems that students can effectively study in the course Since DSP applications are primarily algorithms implemented on a DSP processor or software a fair amount of programming is required Using interactive software such as MATLAB makes it possible to place more emphasis on learning new and difficult concepts than on programming algorithms Interesting practical examples are discussed and useful problems are explored Important Notice Media content referenced within the product description or the product text may not be available in the ebook version *A Practical Guide to Error-control Coding Using Matlab* Yuan Jiang,2010 This practical resource provides you with a comprehensive understanding of error control coding an essential and widely applied area in modern digital communications The goal of error control coding is to encode information in such a way that even if the channel or storage medium introduces errors the receiver can correct the errors and recover the original transmitted information This book includes the most useful modern and classic codes including block Reed Solomon convolutional turbo and LDPC codes You find clear guidance on code construction decoding algorithms and error correcting performances Moreover this unique book introduces computer simulations integrally to help you master key concepts Including a companion DVD with MATLAB programs and supported with over 540 equations this hands on reference provides you with an in depth treatment of a wide range of practical implementation issues *Digital Signal Processing Using MATLAB: A Problem Solving Companion* Vinay K. Ingle,John G. Proakis,2016-01-01 Learn to use MATLAB as a useful computing tool for exploring traditional Digital Signal Processing DSP topics and solving problems to gain insight DIGITAL SIGNAL PROCESSING USING MATLAB A PROBLEM SOLVING COMPANION 4E greatly expands the range and complexity of problems that learners can effectively study Since DSP applications are primarily algorithms implemented on a DSP processor or software they typically require a significant amount of programming Using interactive software such as MATLAB enables readers to focus on mastering new and challenging concepts rather than concentrating on programming algorithms This edition discusses interesting practical examples and explores useful problems to provide the groundwork for further study Important Notice Media content referenced within the product description or the product text may not be available in the ebook version

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Validation of Cleaning Processes (7/93) Aug 26, 2014 — Examine the detail and specificity of the procedure for the (cleaning) process being validated, and the amount of documentation required. We ... PDA Technical Report No. 29, Revised 2012 (TR 29) ... 49, Points to Consider for Biotechnology Cleaning Validation. It presents updated information that is aligned with lifecycle approaches to validation and ... Guidance on aspects of cleaning validation in active ... The PDA Technical Report No. 29 – Points to Consider for Cleaning Validation4 is also recommended as a valuable guidance document from industry. The following ... Annex 2 Visually clean is an important criterion in cleaning validation. It should be one of the acceptance criteria used on a routine basis. Personnel responsible for ... Points to Consider for Biotechnology Cleaning Validation 49, Points to Consider for Biotechnology Cleaning Validation aligns cleaning validation practices with the life cycle approaches to validation, as enabled by ... What is Cleaning Validation in the Pharmaceutical Industry? Cleaning validation is a process used in the pharmaceutical, biotech, and medical device industries to provide documented evidence that equipment and facilities ... draft working document for comments Sep 21, 2020 — Aspects of cleaning validation and cleaning verification should be considered in quality metrics, with. 471 performance indicators identified ... Cleaning Validation Guidelines - A Complete List 2022 [May 2020] Points to consider on the different approaches –including HBEL – to establish carryover limits in cleaning validation for identification of ... Technical Report No. 49 Points to Consider for ... by TF Contributors — Cleaning validation plays an important role in reducing the possibility of product contamination from biopharmaceutical manufacturing equipment. It demonstrates ... Cleaning Validation: Protocol & Guidelines Cleaning validation is a procedure of establishing evidence that cleaning processes for manufacturing equipment prevents product contamination. Cleaning ... The Bedford Handbook The eighth edition features new coverage that models how students use their own language and ideas to position sources in an academic con- versation. Finally, ... The Bedford Handbook An x-Book version of The Bedford Handbook, fully online, helps you engage your students and keep the course organized. Learn more at bedfordstmartins.com ... The Bedford Handbook by Hacker, Diana Get the most recent updates on MLA citation in a convenient, 40-page resource based on The MLA Handbook, 8th Edition, with plenty of models. Browse our catalog ... The Bedford Handbook, 8th Edition - PDF Free Download ... Bedford e-Handbook, a series of online video tutorials, Preface for ... Point of view U Is the draft free of distracting shifts in point of view (from I to ... The Bedford Handbook by Hacker, Diana Edition: 8th. ... Synopsis: Built on Diana Hackerâ€™s vision and developed with the help of expert composition teachers, the seventh edition of The Bedford ... The Bedford Handbook Best Uses & Practices Look at the 'Revision Symbols' page on the next to last page of the book or inside the back cover at the 'detailed menu'. There you'll see the abbreviations in ... St. Martin's Handbook Martin's Handbook, Seventh Edition, as a textbook for a course are authorized to duplicate portions of this manual for their students. Manufactured in the ... A Pocket Style Manual by Diana Hacker MLA Handbook for Writers of

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