

<<信号系统和变换>>

图书基本信息

书名：<<信号系统和变换>>

13位ISBN编号：9787111268949

10位ISBN编号：7111268946

出版时间：2009-5

出版时间：机械工业出版社

作者：菲利普斯

页数：772

版权说明：本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问：<http://www.tushu007.com>

前言

The basic structure and philosophy of the previous editions of Signals , System and Transforms are retained in the third edition. New examples have been added and some examples have been revised to demonstrate key concepts more clearly. New figures have been added to better illustrate concepts such as aliasing , orthogonality of exponentials , data reconstruction , etc. The wording of many passages throughout the text has been revised to ease reading and improve clarity. In particular , we have greatly simplified the development of convolution , the Fourier Transform , and the Discrete Fourier Transform. Further , we use δ in Sections 2.1 and 2.7 to demonstrate real world applications of the material. Chapters 5 , 6 , and 12 have been reorganized to consolidate the presentation on sampling and data construction and to reduce redundancy. Many end of chapter problems have been revised and numerous new problems are provided. Several of these new problems illustrate real world concepts in digital communications , filtering , and control theory. In addition , in response to requests from students at our universities , we have included answers to selected problems in Appendix H. We hope that this will enable the student to obtain immediate feedback about his/her understanding of new material and concepts. All MATLAB examples have been updated to ensure compatibility with Student Version Release 12. Several new MATLAB examples have been added. New to this edition is a third co author , Professor Eve Riskin from the University of Washington. Professor Riskin has contributed many ideas for the text including a companion web site at [http : //www , ee. washington.edu/class/SST_textbook/textbook , html](http://www.ee.washington.edu/class/SST_textbook/textbook.html).

This web site contains sample laboratories , lecture notes for Chapters 1 7 and Chapters 9 12 , and the MATLAB files listed in the textbook as well as several additional MATLAB files. It also contains a link to a second web site at [http : //www.ee.washington.edu/class/235dl/](http://www.ee.washington.edu/class/235dl/) , which contains interactive versions of the lecture notes for Chapters 1 7. Here , students and professors can find workedout solutions to all the examples in the lecture notes , as well as animated demonstrations of various concepts including transformations of continuous time signals , properties of continuous time systems (including numerous examples on time invariance) , convolution , sampling , and aliasing. Additional examples for discrete time material will be added as they are developed. In addition to the website listed above , the Department of Electrical Engineering , University of Washington , maintains an electronic mail list server for your use. For information on how to subscribe and unsubscribe , simply send a plain text E mail message with the word HELP as the message body (and nothing else) to [sstextbook_request@ee , washington , edu](mailto:sstextbook_request@ee.washington.edu). This list server will be used to communicate any typos found in the book or solution manual as well as point out new updates to the above mentioned web pages. This book is intended to be used primarily as a text for junior level students in engineering curricula and for self study by practicing engineers. It is assumed that the reader has had some introduction to signal models , system models , and differential equations (as in , for example , circuits courses and courses in mathematics) , and some laboratory work with physical systems.

<<信号系统和变换>>

内容概要

《信号、系统和变换（英文版）（第4版）》对关于信号、系统和变换的理论与应用进行了清晰而全面的阐述。

介绍了有关信号与系统的数学背景知识，主要包括：傅里叶变换、傅里叶级数、拉普拉斯变换、离散时间、离散傅里叶变换以及z变换等。

本版在课程体系的组织上可以灵活地应对读者的不同侧重需求。

MATLAB示例贯穿于全书各章，同时MATLAB学生版本的高级功能也在例题和习题的应用中有所体现。

。

全书包含了350多道习题和150多道例题。

给出的习题答案可使读者获得关于新概念理解的即时反馈。

<<信号系统和变换>>

作者简介

CharlesL . Phillips奥本大学工程学院教授。

JohnM . Parr现任教于艾温斯维尔大学。

EveA . Riskin分别于1985年和1986年获斯坦福大学电气工程和运筹学硕士学位，1990年获斯坦福大学电气工程博士学位，现为华盛顿大学工程学院教授。

<<信号系统和变换>>

书籍目录

PREFACE 1 INTRODUCTION 1.1 Modeling 11.2 Continuous-Time Physical Systems 4 Electric Circuits , 4 Operational Amplifier Circuits , 6 Simple Pendulum , 9 DC Power Supplies , 10 Analogous Systems , 12.1.3 Samplers and Discrete-Time Physical Systems 14 Analog-to-Digital Converter , 14 Numerical Integration , 16 Picture in a Picture , 17 Compact Disks , 18 Sampling in Telephone Systems , 19 Data-Acquisition System , 21.1.4 MATLAB and SIMULINK 22.1.5 Signals and Systems References 23 References 23.2 CONTINUOUS-TIME SIGNALS AND SYSTEMS 2.1 Transformations of Continuous-Time Signals 25 Time Transformations , 25 Amplitude Transformations , 31.2.2 Signal Characteristics 33 Even and Odd Signals , 33 Periodic Signals , 35.2.3 Common Signals in Engineering 40.2.4 Singularity Functions 46 Unit Step Function , 46 Unit Impulse Function , 50.2.5 Mathematical Functions for Signals 55.2.6 Continuous-Time Systems 60 Interconnecting Systems , 62 Feedback System , 64.2.7 Properties of Continuous-Time Systems 66 Stability 70 Linearity 75 Summary 77 References 79 Problems 79.3 CONTINUOUS-TIME LINEAR TIME-INVARIANT SYSTEMS 3.1 Impulse Representation of Continuous-Time Signals 90.3.2 Convolution for Continuous-Time LTI Systems 93.3.3 Properties of Convolution 105.3.4 Properties of Continuous-Time LTI Systems 109 Memoryless Systems , 110 Invertibility , 110 Causality , 111 Stability , 112 Unit Step Response , 113.3.5 Differential-Equation Models 114 Solution of Differential Equations , 116 General Case , 118 Relation to Physical Systems , 120.3.6 Terms in the Natural Response 121 Stability , 122.3.7 System Response for Complex-Exponential Inputs 125 Linearity , 125 Complex Inputs for LTI Systems , 126 Impulse Response , 130.3.8 Block Diagrams 131 Direct Form I , 135 Direct Form II , 135 nth-Order Realizations , 135 Practical Considerations , 137 Summary 139 References 141 Problems 141.4 FOURIER SERIES 4.1 Approximating Periodic Functions 153 Periodic Functions , 153 Approximating Periodic Functions , 154.4.2 Fourier Series 158 Fourier Series , 159 Fourier Coefficients , 160.4.3 Fourier Series and Frequency Spectra 163 Frequency Spectra , 164.4.4 Properties of Fourier Series 173.4.5 System Analysis 176.4.6 Fourier Series Transformations 183 Amplitude Transformations , 184 Time Transformations , 186 Summary 188 References 189 Problems 189.5 THE FOURIER TRANSFORM 5.1 Definition of the Fourier Transform 199.5.2 Properties of the Fourier Transform 208 Linearity , 208 Time Scaling , 210 Time Shifting , 213 Time Transformation , 214 Duality , 215 Convolution , 218 Frequency Shifting , 219 Time Differentiation , 221 Time Integration , 226 Frequency Differentiation , 229 Summary , 229.5.3 Fourier Transforms of Time Functions 230 DC Level , 230 Unit Step Function , 230 Switched Cosine , 231 Pulsed Cosine , 231 Exponential Pulse , 233 Fourier Transforms of Periodic Functions , 233 Summary , 239.5.4 Sampling Continuous-Time Signals 239 Impulse Sampling , 240 Shannons Sampling Theorem , 242 Practical Sampling , 244.5 Application of the Fourier Transform 244 Frequency Response of Linear Systems , 244 Frequency Spectra of Signals , 253 Summary , 256.5.6 Energy and Power Density Spectra 256 Energy Density Spectrum , 256 Power Density Spectrum , 259 Power and Energy Transmission , 262 Summary , 264 Summary 265 References 267 Problems 267.6 APPLICATIONS OF THE FOURIER TRANSFORM 6.1 Ideal Filters 275.6.2 Real Filters 282 RC Low-Pass Filter , 283 Butterworth Filter , 285 Chebyshev and Elliptic Filters , 291 Bandpass Filters , 295 Summary , 296.6.3 Bandwidth Relationships 296.6.4 Reconstruction of Signals from Sample Data 300 Interpolating Function , 302 Digital-to-Analog Conversion , 304.6.5 Sinusoidal Amplitude Modulation 307 Frequency-Division Multiplexing , 316.6 Pulse-Amplitude Modulation 318 Time-Division Multiplexing , 320 Flat-Top PAM , 322 Summary 325 References 325 Problems 326.7 THE LAPLACE TRANSFORM 7.1 Definitions of Laplace Transforms 338.7.2 Examples 341.7.3 Laplace Transforms of Functions 346.7.4 Laplace Transform Properties 350 Real Shifting , 351 Differentiation , 355 Integration , 357.7.5 Additional Properties 358 Multiplication by t , 358 Initial Value , 359 Final Value , 360 Time Transformation , 361.7.6 Response of LTI Systems 364 Initial Conditions , 364 Transfer Functions , 365 Convolution ,

<<信号系统和变换>>

370Transforms with Complex Poles , 372Functions with Repeated Poles , 3757.7 LTI Systems Characteristics 376Causality , 376Stability , 377Invertibility , 379Frequency Response , 3807.8 Bilateral Laplace Transform 382Region of Convergence , 384Bilateral Transform from Unilateral Tables , 386Inverse Bilateral Laplace Transform , 3887.9 Relationship of the Laplace Transform to the Fourier Transform 390Summary 391References 392Problems 3928 STATE VARIABLES FOR CONTINUOUS-TIME SYSTEMS 4008.1 State-Variable Modeling 4018.2 Simulation Diagrams 4058.3 Solution of State Equations 410Laplace-Transform Solution , 411Convolution Solution , 416Infinite Series Solution , 4178.4 Properties of the State Transition Matrix 4208.5 Transfer Functions 422Stability , 4248.6 Similarity Transformations 426Transformations , 426Properties , 432Summary 434References 436Problems 4369 DISCRETE-TIME SIGNALS AND SYSTEMS 4459.1 Discrete-Time Signals and Systems 447Unit Step and Unit Impulse Functions , 449Equivalent Operations , 4519.2 Transformations of Discrete-Time Signals 452Time Transformations , 453Amplitude Transformations , 4589.3 Characteristics of Discrete-Time Signals 461Even and Odd Signals , 461Signals Periodic in n , 464Signals Periodic in , 4679.4 Common Discrete-Time Signals 4689.5 Discrete-Time Systems 474Interconnecting Systems , 4759.6 Properties of Discrete-Time Systems 477Systems with Memory , 477Invertibility , 478Inverse of a System , 479Causality , 479Stability , 480Time Invariance , 480Linearity , 481Summary 483References 485Problems 48510 DISCRETE-TIME LINEAR TIME-INVARIANT SYSTEMS 49310.1 Impulse Representation of Discrete-Time Signals 49410.2 Convolution for Discrete-Time Systems 495Properties of Convolution , 50410.3 Properties of Discrete-Time LTI Systems 507Memory , 508Invertibility , 508Causality , 508Stability , 509Unit Step Response , 51110.4 Difference-Equation Models 512Difference-Equation Models , 512Classical Method , 514Solution by Iteration , 51910.5 Terms in the Natural Response 520Stability , 52110.6 Block Diagrams 523Two Standard Forms , 52510.7 System Response for Complex-Exponential Inputs 529Linearity , 530Complex Inputs for LTI Systems , 530Stability , 535Sampled Signals , 535Impulse Response , 535Summary 537Reference 538Problems 53811 THE z-TRANSFORM 54711.1 Definitions of z-Transforms 54711.2 Examples 550Two z-Transforms , 550Digital-Filter Example , 55311.3 z-Transforms of Functions 555Sinusoids , 55711.4 z-Transform Properties 560Real Shifting , 560Initial and Final Values , 56311.5 Additional Properties 565Time Scaling , 565Convolution in Time , 56711.6 LTI System Applications 568Transfer Functions , 569Inverse z-Transform , 571Complex Poles , 574Causality , 575Stability , 576Invertibility , 57911.7 Bilateral z-Transform 580Bilateral Transforms , 585Regions of Convergence , 586Inverse Bilateral Transforms , 588Summary 590References 591Problems 59112 FOURIER TRANSFORMS OF DISCRETE-TIME SIGNALS 59912.1 Discrete-Time Fourier Transform 600z-Transform , 60212.2 Properties of the Discrete-Time Fourier Transform 605Periodicity , 605Linearity , 606Time Shift , 606Frequency Shift , 607Symmetry , 608Time Reversal , 608Convolution in Time , 609Convolution in Frequency , 609Multiplication by n , 610Parsevals Theorem , 61012.3 Discrete-Time Fourier Transform of Periodic Sequences 61112.4 Discrete Fourier Transform 617Shorthand Notation for the DFT , 620Frequency Resolution of the DFT , 621Validity of the DFT , 622Summary , 62612.5 Fast Fourier Transform 627Decomposition-in-Time Fast Fourier Transform Algorithm , 627Decomposition-in-Frequency Fast Fourier Transform , 632Summary , 63512.6 Applications of the Discrete Fourier Transform 635Calculation of Fourier Transforms , 635Convolution , 646Filtering , 653Correlation , 660Energy Spectral Density Estimation , 666Summary , 66712.7 The Discrete Cosine Transform , 667Summary 669References 671Problems 67113 STATE VARIABLES FOR DISCRETE-TIME SYSTEMS 67713.1 State-Variable Modeling 67813.2 Simulation Diagrams 68213.3 Solution of State Equations 688Recursive Solution , 688z-Transform Solution , 69013.4 Properties of the State Transition Matrix 69513.5 Transfer Functions 697Stability , 69913.6 Similarity Transformations 700Properties , 704Summary 705References 706Problems 707APPENDICES 714A.

<<信号系统和变换>>

Integrals and Trigonometric Identities 714Integrals , 714Trigonometric Identities , 715B. Leibnitzs
 and LHopitals Rules 716Leibnitzs Rule , 716LHopitals Rule , 717C. Summation Formulas for Geometric
 Series 718D. Complex Numbers and Eulers Relation 719Complex-Number Arithmetic , 720Eulers
 Relation , 723Conversion Between Forms , 724References , 725E. Solution of Differential Equations
 726Complementary Function , 726Particular Solution , 727General Solution , 728Repeated Roots ,
 728Reference , 729F. Partial-Fraction Expansions 730Reference , 732G. Review of Matrices
 733Algebra of Matrices , 737Other Relationships , 738References , 739H. Answers to Selected
 Problems 740INDEX 759

<<信号系统和变换>>

版权说明

本站所提供下载的PDF图书仅提供预览和简介，请支持正版图书。

更多资源请访问:<http://www.tushu007.com>