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Autore	Leis John <1966->
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Nota di contenuto	DIGITAL SIGNAL PROCESSING USING MATLAB FOR STUDENTS AND RESEARCHERS; CONTENTS; PREFACE; CHAPTER 1: WHAT IS SIGNAL PROCESSING?; 1.1 CHAPTER OBJECTIVES; 1.2 INTRODUCTION; 1.3 BOOK OBJECTIVES; 1.4 DSP AND ITS APPLICATIONS; 1.5 APPLICATION CASE STUDIES USING DSP; 1.6 OVERVIEW OF LEARNING OBJECTIVES; 1.7 CONVENTIONS USED IN THIS BOOK; 1.8 CHAPTER SUMMARY; CHAPTER 2: MATLAB FOR SIGNAL PROCESSING; 2.1 CHAPTER OBJECTIVES; 2.2 INTRODUCTION; 2.3 WHAT IS MATLAB?; 2.4 GETTING STARTED; 2.5 EVERYTHING IS A MATRIX; 2.6 INTERACTIVE USE; 2.7 TESTING AND LOOPING; 2.8 FUNCTIONS AND VARIABLES 2.9 PLOTTING AND GRAPHING 2.10 LOADING AND SAVING DATA; 2.11 MULTIDIMENSIONAL ARRAYS; 2.12 BITWISE OPERATORS; 2.13 VECTORIZING CODE; 2.14 USING MATLAB FOR PROCESSING SIGNALS; 2.15 CHAPTER SUMMARY; CHAPTER 3: SAMPLED SIGNALS AND DIGITAL PROCESSING; 3.1 CHAPTER OBJECTIVES; 3.2 INTRODUCTION; 3.3 PROCESSING SIGNALS USING COMPUTER ALGORITHMS; 3.4 DIGITAL REPRESENTATION OF NUMBERS; 3.5 SAMPLING; 3.6 QUANTIZATION; 3.7

IMAGE DISPLAY; 3.8 ALIASING; 3.9 RECONSTRUCTION; 3.10 BLOCK
 DIAGRAMS AND DIFFERENCE EQUATIONS; 3.11 LINEARITY,
 SUPERPOSITION, AND TIME INVARIANCE
 3.12 PRACTICAL ISSUES AND COMPUTATIONAL EFFICIENCY
 3.13 CHAPTER SUMMARY; CHAPTER 4: RANDOM SIGNALS; 4.1 CHAPTER
 OBJECTIVES; 4.2 INTRODUCTION; 4.3 RANDOM AND DETERMINISTIC
 SIGNALS; 4.4 RANDOM NUMBER GENERATION; 4.5 STATISTICAL
 PARAMETERS; 4.6 PROBABILITY FUNCTIONS; 4.7 COMMON
 DISTRIBUTIONS; 4.8 CONTINUOUS AND DISCRETE VARIABLES; 4.9
 SIGNAL CHARACTERIZATION; 4.10 HISTOGRAM OPERATORS; 4.11
 MEDIAN FILTERS; 4.12 CHAPTER SUMMARY; CHAPTER 5: REPRESENTING
 SIGNALS AND SYSTEMS; 5.1 CHAPTER OBJECTIVES; 5.2 INTRODUCTION;
 5.3 DISCRETE-TIME WAVEFORM GENERATION; 5.4 THE z TRANSFORM
 5.5 POLYNOMIAL APPROACH
 The previous section showed how to
 iterate a difference equation in order to determine the output sequence.
 It is particularly important to understand the relationship between
 difference equations and their transforms. The z transform of a linear
 system gives us the key to combining systems together to form more
 complex systems, since the z transforms in combined blocks are able to
 be multiplied or added together as necessary. We now give another
 insight into this approach.
 5.6 POLES, ZEROS, AND STABILITY; 5.7
 TRANSFER FUNCTIONS AND FREQUENCY RESPONSE
 5.8 VECTOR INTERPRETATION OF FREQUENCY RESPONSE
 5.9
 CONVOLUTION; 5.10 CHAPTER SUMMARY; CHAPTER 6: TEMPORAL AND
 SPATIAL SIGNAL PROCESSING; 6.1 CHAPTER OBJECTIVES; 6.2
 INTRODUCTION; 6.3 CORRELATION; 6.4 LINEAR PREDICTION; 6.5 NOISE
 ESTIMATION AND OPTIMAL FILTERING; 6.6 TOMOGRAPHY; 6.7 CHAPTER
 SUMMARY; CHAPTER 7: FREQUENCY ANALYSIS OF SIGNALS; 7.1
 CHAPTER OBJECTIVES; 7.2 INTRODUCTION; 7.3 FOURIER SERIES; 7.4
 HOW DO THE FOURIER SERIES COEFFICIENT EQUATIONS COME ABOUT?;
 7.5 PHASE-SHIFTED WAVEFORMS; 7.6 THE FOURIER TRANSFORM; 7.7
 ALIASING IN DISCRETE-TIME SAMPLING
 7.8 THE FFT AS A SAMPLE INTERPOLATOR

Sommario/riassunto

"This book uses an active learning approach to the topic of digital
 signal processing (DSP). DSP is a fundamental technology with wide
 ranging applications as, for example, digital downloads of movies,
 mobile and broadband communications, digital television, and many
 other areas. In this book the subject is taught using a "hands-on"
 experimental approach with MATLAB examples throughout the text to
 illustrate the mathematical concepts and DSP algorithms developed and
 explained. Existing books in this area tends to fall into one of two
 camps - either a highly mathematical treatment with few practical
 examples of the everyday uses of DSP, or else very verbose and
 descriptive treatments with little or no mathematical content to back up
 the topics. The former type of text is excellent as a standard reference,
 but poor as a learning vehicle. The latter type of text is good for
 general knowledge, but fails to meet the needs of University students
 and practicing industry professionals. Students need a learn-by-doing
 approach, and industry professionals need to come up to speed as
 rapidly as possible. The book uses MATLAB throughout, in an
 established industry and University programming environment.
 Furthermore, it requires that the reader only have access to the
 Student/Educational version of MATLAB, not the full commercial
 version, which is out of reach of most students"--