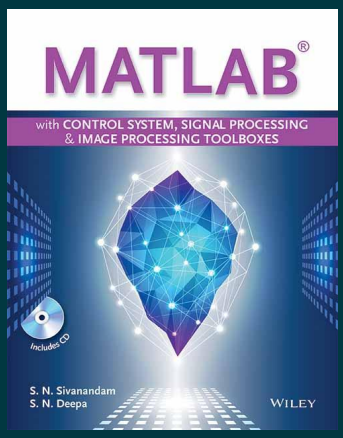
WILEY



MATLAB with Control System, Signal Processing and Image Processing Toolboxes

By S.N. Sivanandam, S.N. Deepa

Paperback 9788126554751 ₹2,099.00

Pages: 760

Description

This book is developed with an idea to enable the readers to be well versed with the basic MATLAB® functions and specialized toolboxes like Control System, Signal Processing and Image Processing used for problem solving in scientific and engineering domain. MATLAB functions are discussed in a lucid manner with their appropriateness for usage in computing solutions. The syntax to be followed for each of the defined MATLAB functions is also included in a detailed manner. The intention is to make the readers use the presented MATLAB functions directly for respective applications on their own.

About the Author

S.N. Sivanandam, S.N. Deepa

Dr. S. N. Sivanandam has a total teaching experience (UG and PG) of 47 years. He has guided a number of undergraduate and postgraduate projects for both Computer Science and Engineering and Electrical and Electronics Engineering. He has been identified as an outstanding person in the field of Computer Science and Engineering in MARQUIS “Who’s Who”

Table of Contents

1 MATLAB: An Introduction

1.1 Introduction

1.2 History of MATLAB

1.3 Need of MATLAB for Problem Solving

1.4 Running MATLAB on Computers

1.5 Features of MATLAB

1.6 MATLAB Basics

1.7 Toolboxes - An Introduction

1.8 Basic Simulink

1.9 Graphical User Interface Feature of MATLAB

1.10 Few MATLAB Product Lists

2 Getting Started to MATLAB

2.1 Introduction

2.2 Data Types

2.3 Variable Definition
2.4 Arrays
2.5 Matrices
2.6 Strings
2.7 User-Defined Functions
2.8 Input and Output Statements
2.9 File Input and Output Statements
2.10 Operators and Their Operations
2.11 Keywords
2.12 Dynamic Arrays
2.13 Exchanging Data with Other Programs
2.14 Recursive Functions
2.15 Miscellaneous MATLAB Functions
3 Programming in MATLAB
3.1 Introduction
3.2 Script M-File
3.3 Flow Control Statements in MATLAB
3.4 Efficient Programming in MATLAB
3.5 MATLAB Classes and Objects
3.6 Debugging in MATLAB
4 Mathematics in MATLAB: Working with Differential Equations and Polynomials
4.1 Introduction
4.2 Elementary Mathematic Operations
4.3 MATLAB Polynomial and Interpolation Operations
4.4 Statistics and Analysis of Data
4.5 MATLAB Functions for Ordinary Differential Equations
4.6 MATLAB Functions for Optimization
4.7 Specialized MATLAB Math Functions
4.8 Special Functions with the Command mfun
4.9 Sparse Matrices
4.10 Linear Algebra Approaches in MATLAB
4.11 Mathematical Constant Representation in MATLAB
5 MATLAB Graphical Environment
5.1 Introduction
5.2 Building Two-Dimensional Plots
5.3 Building Three-Dimensional Plots
5.4 Additional Specialized Plots
5.5 Printing and Exporting MATLAB Graphics

5.6 Handle Graphics Objects
5.7 Three-Dimensional Modeling and Visualization
6 MATLAB Control Systems Toolbox
6.1 Introduction
6.2 Basic Control System Concepts
6.3 MATLAB Commands for Creation of Linear Models and Computing Data
6.4 Time Domain and Frequency Response Analysis Commands
6.5 Commands for Conversion of Domains in Control Systems
6.6 System Dynamic Operational Commands
6.7 MATLAB Commands for Control System Design and Model Reduction
6.8 MATLAB Commands for State-Space Modeling, Frequency Response Models and Time Delay Approaches
6.9 Graphical User Interface and Other General Commands in Control System Toolbox
7 Signal Processing Toolbox in MATLAB
7.1 Introduction
7.2 Fundamentals of Signal Processing
7.3 Basic Signal Processing Functions in MATLAB
7.4 Transforms in MATLAB
7.5 Waveform Generation
7.6 Linear System Transformation
7.7 Digital Filtering Commands in MATLAB
7.8 Analog Filter Design Commands in MATLAB
7.9 MATLAB Commands for Windows in Filtering
7.10 Cepstrum Analysis in MATLAB
7.11 MATLAB Commands for Statistical Signal Processing
7.12 Parametric Modeling in MATLAB
7.13 Linear Prediction
7.14 Multirate Signal Processing in MATLAB
7.15 Special Signal Processing Operations
7.16 GUI MATLAB Commands for Signal Processing
8 Image Processing Toolbox in MATLAB
8.1 Introduction
8.2 Fundamentals of Image Processing
8.3 Image Types and Image Conversions in MATLAB Environment
8.4 MATLAB Image Arithmetic and Array Operations
8.5 Transformation of Images in MATLAB
8.6 Display of Images in MATLAB Environment
8.7 MATLAB File I/O Operations of Images
8.8 Image Registration in MATLAB

8.9 Analysis of Images in MATLAB
8.10 Image Enhancement in MATLAB Environment
8.11 MATLAB Image Filtering Process
8.12 Image Deblurring in MATLAB
8.13 MATLAB Image Neighborhood Operations and Region-Based Processing
8.14 MATLAB Image Morphological Operations
8.15 MATLAB Texture Analysis Functions
8.16 MATLAB Color map Operations
8.17 Various Image Samples Considered for Problem Solving
9 Simulink Environments in MATLAB: An Introduction
9.1 Introduction
9.2 Features and Need of Simulink Environment
9.3 Products of Simulink in MATLAB Environment
9.4 A Fundamental Simulink Model
9.5 Starting Simulink and Simulink Library Browser
9.6 Constructing a Simulink Block Diagram Model
Review Questions
Exercises
Bibliography
Index

To purchase this product, please visit:
https://www.wileyindia.com/matlab-with-control-system-signal-processing-and-image-processing-toolboxes.html

Scan to buy