

1. Record Nr.	UNINA9910793827903321
Autore	Parkeh Ranjan
Titolo	Fundamentals of graphics using MATLAB // by Ranjan Parkeh
Pubbl/distr/stampa	Boca Raton, : CRC Press LLC, 2019
ISBN	0-429-58979-4 0-429-59173-X 0-429-19656-3
Edizione	[1st edition]
Descrizione fisica	1 online resource (426 pages)
Disciplina	006.6869
Soggetti	Computer graphics - Computer programs
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record. 8.9 TEXTURE MAPPING
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Half Title; Title Page; Copyright Page; Contents; Preface; Author; CHAPTER 1 Interpolating Splines; 1.1 INTRODUCTION; 1.2 LINEAR SPLINE (STANDARD FORMS); 1.3 LINEAR SPLINE (PARAMETRIC FORM); 1.4 QUADRATIC SPLINE (STANDARD FORM); 1.5 QUADRATIC SPLINE (PARAMETRIC FORM); 1.6 CUBIC SPLINE (STANDARD FORM); 1.7 CUBIC SPLINE (PARAMETRIC FORM); 1.8 PIECEWISE SPLINES (STANDARD FORM); 1.9 PIECEWISE SPLINES (PARAMETRIC FORM); 1.10 CHAPTER SUMMARY; 1.11 REVIEW QUESTIONS; 1.12 PRACTICE PROBLEMS; CHAPTER 2 Blending Functions and Hybrid Splines; 2.1 INTRODUCTION; 2.2 BLENDING FUNCTIONS 2.3 BLENDING FUNCTIONS OF INTERPOLATING SPLINES 2.4 HERMITE SPLINE; 2.5 CARDINAL SPLINE; 2.6 CATMULL-ROM SPLINE; 2.7 BEZIER SPLINE; 2.8 SPLINE CONVERSIONS; 2.9 CHAPTER SUMMARY; 2.10 REVIEW QUESTIONS; 2.11 PRACTICE PROBLEMS; CHAPTER 3 Approximating Splines; 3.1 INTRODUCTION; 3.2 LINEAR UNIFORM B-SPLINE; 3.3 CHANGING NUMBER OF CONTROL POINTS; 3.4 QUADRATIC UNIFORM B-SPLINE; 3.5 JUSTIFICATION FOR KNOT-VECTOR VALUES; 3.6 QUADRATIC OPEN-UNIFORM B-SPLINE; 3.7 QUADRATIC NON-UNIFORM B-SPLINE; 3.8 CUBIC UNIFORM B-SPLINE; 3.9 CHAPTER SUMMARY; 3.10 REVIEW QUESTIONS; 3.11 PRACTICE PROBLEMS CHAPTER 4 2D Transformations 4.1 INTRODUCTION; 4.2

HOMOGENEOUS COORDINATES; 4.3 TRANSLATION; 4.4 SCALING; 4.5 ROTATION; 4.6 FIXED-POINT SCALING; 4.7 FIXED-POINT ROTATION; 4.8 REFLECTION; 4.9 FIXED-LINE REFLECTION; 4.10 SHEAR; 4.11 AFFINE TRANSFORMATIONS; 4.12 PERSPECTIVE TRANSFORMATIONS; 4.13 VIEWING TRANSFORMATIONS; 4.14 COORDINATE SYSTEM TRANSFORMATIONS; 4.15 CHAPTER SUMMARY; 4.16 REVIEW QUESTIONS; 4.17 PRACTICE PROBLEMS; CHAPTER 5 Spline Properties; 5.1 INTRODUCTION; 5.2 CRITICAL POINTS; 5.3 TANGENT AND NORMAL; 5.4 LENGTH OF A CURVE; 5.5 AREA UNDER A CURVE; 5.6 CENTROID 5.7 INTERPOLATION AND CURVE FITTING 5.8 NOTES ON 2D PLOTTING FUNCTIONS; 5.9 CHAPTER SUMMARY; 5.10 REVIEW QUESTIONS; 5.11 PRACTICE PROBLEMS; CHAPTER 6 Vectors; 6.1 INTRODUCTION; 6.2 UNIT VECTOR; 6.3 DIRECTION COSINES; 6.4 DOT PRODUCT; 6.5 CROSS PRODUCT; 6.6 VECTOR EQUATION OF A LINE; 6.7 VECTOR EQUATION OF PLANE; 6.8 VECTOR ALIGNMENT (2D); 6.9 VECTOR EQUATIONS IN HOMOGENEOUS COORDINATES (2D); 6.10 VECTOR EQUATIONS IN HOMOGENEOUS COORDINATES (3D); 6.11 NORMAL VECTOR AND TANGENT VECTOR; 6.12 CHAPTER SUMMARY; 6.13 REVIEW QUESTIONS; 6.14 PRACTICE PROBLEMS; CHAPTER 7 3D Transformations 7.1 INTRODUCTION 7.2 TRANSLATION; 7.3 SCALING; 7.4 ROTATION; 7.5 FIXED-POINT SCALING; 7.6 FIXED-POINT ROTATION; 7.7 ROTATION PARALLEL TO PRIMARY AXES; 7.8 VECTOR ALIGNMENT (3D); 7.9 ROTATION AROUND A VECTOR; 7.10 ROTATION AROUND AN ARBITRARY LINE; 7.11 REFLECTION; 7.12 SHEAR; 7.13 CHAPTER SUMMARY; 7.14 REVIEW QUESTIONS; 7.15 PRACTICE PROBLEMS; CHAPTER 8 Surfaces; 8.1 INTRODUCTION; 8.2 PARAMETRIC SURFACES; 8.3 BEZIER SURFACES; 8.4 IMPLICIT SURFACES; 8.5 EXTRUDED SURFACES; 8.6 SURFACES OF REVOLUTION; 8.7 NORMAL VECTOR AND TANGENT PLANE; 8.8 AREA AND VOLUME OF SURFACE OF REVOLUTION

Sommario/riassunto

This book introduces fundamental concepts and principles of 2D and 3D graphics and is written for undergraduate and postgraduate students of computer science, graphics, multimedia, and data science. It demonstrates the use of MATLAB programming for solving problems related to graphics and discusses a variety of visualization tools to generate graphs and plots. The book covers important concepts like transformation, projection, surface generation, parametric representation, curve fitting, interpolation, vector representation, and texture mapping, all of which can be used in a wide variety of educational and research fields. Theoretical concepts are illustrated using a large number of practical examples and programming codes, which can be used to visualize and verify the results. Key Features
Covers fundamental concepts and principles of 2D and 3D graphics
Demonstrates the use of MATLAB programming for solving problems on graphics
Provides MATLAB codes as answers to specific numerical problems
Provides codes in a simple copy and execute format for the novice learner
Focuses on learning through visual representation with extensive use of graphs and plots
Helps the reader gain in-depth knowledge about the subject matter through practical examples
Contains review questions and practice problems with answers for self-evaluation

"This book introduces fundamental concepts and principles of 2D and 3D graphics and illustrates the use of MATLAB for this purpose. The objectives are to demonstrate how MATLAB can be used to solve graphics problems and to help the reader gain an in-depth knowledge about the subject matter through visual representations and practical examples"--
