Introduction to computer graphics.

Subject Area: Computer Graphics, Digital Image Processing in CIDEC Library.

INTRODUCTION TO COMPUTER GRAPHICS

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- Computer graphics

DESCRIPTION :

This new introductory text to computer graphics is an adaptation of Computer Graphics: Principles and Practice, Second Edition, which remains the most comprehensive and authoritative work in the field. While retaining the currency and accuracy of the larger book, this abbreviated version focuses on topics essential for all beginners in computer graphics and provides expanded explanations for readers with little or no technical background. Worked examples have been added to illustrate important concepts and techniques, and program code has been written in the C language to enhance the book's usefulness. In addition, the book contains an extensive illustration program, with more than 50 full-color images.

Topic coverage includes basic graphics programming, hardware, and applications. Important algorithms are included to facilitate implementation of both 2D and 3D graphics. A separate chapter covers SPHIGS--a simplified dialect of the PHIGS 3D standard--and coincides with the availability of an updated version of the software. Chapter 9 and presents a concise overview of interaction issues and techniques. Advanced material from the larger book has been condensed, and the mathematics needed for it has been explained carefully.

The result is an accessible introduction to computer graphics, crafted to provide a solid foundation for further work in this exciting field.

FEATURES:

- Adaptation of the definitive computer graphics book in the field--half the length.
- Presents key concepts geared toward students with minimal technical background.
- Provides worked examples in C.
- Retains the high level of teaching standards of the parent graphics text.

CONTENTS :

PREFACE

1. Introducing: Computer Graphics. A Few Uses of Computer Graphics * A Brief History of Computer Graphics * Output Technology * Input Technology * Software Portability * The Advantages of Interactive Graphics * Conceptual Framework for Interactive Graphics * Application Modeling * Display of the Model * Interaction Handling * Summary * Exercises

2. Programming in the Simple Raster Graphics Package (SRGP). Drawing with SRGP * Specification of Graphics Primitives * Attributes * Filled Primitives and Their Attributes * Saving and Restoring Attributes * Text * Basic Interaction Handling * Human Factors * Logical Input Devices * Sampling Versus Event-Driven Processing * Sample Mode * Event Mode * Pick Correlation for Interaction Handling * Setting Device Measure and Attributes * Raster Graphics Features * Canvases * Clipping Rectangles * The SRGP_copyPixel Operation * Write Mode or RasterOp * Limitation of SRGP * Application Coordinate Systems * Storage of Primitives for Respecification * Summary * Exercises

3. Basic Raster Graphics Algorithms for Drawing 2D Primitives. Overview * Implications of Display-System Architectures * The Output Pipeline in Software * Scan Converting Lines * The Basic Incremental Algorithm * Midpoint Line Algorithm * Additional Issues * Scan Converting Circles * Eight-Way Symmetry * Midpoint Circle Algorithm * Filling Rectangles * Filling Polygons * Horizontal Edges * Slivers * Edge Coherence and the Scan-Line Algorithm * Pattern Filling Using Scan Conversion * Pattern Filling Without Repeated Scan Conversion * Thick Primitives * Replicating Pixels * The Moving Pen * Clipping in a Raster World * Clipping Lines * Clipping Endpoints * Clipping Lines by Solving Simultaneous Equations * The Cohen-Sutherland Line-Clipping Algorithm * A Parametric Line-Clipping Algorithm * Clipping Circles * Clipping Circles * The Sutherland-Hodgman Polygon-Clipping Algorithm * Generating Characters * Defining and Clipping Characters * Implementing a Text Output Primitive * SRGP_copyPixel * Antialiasing * Increasing Resolution * Unweighted Area

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6. Viewing in 3D. The Synthetic Camera and Steps * Projections * Perspective Projections * Parallel Projections * Specifying an Arbitrary 3D View * Examples of 3D Viewing * Perspective Projections * Parallel Projections * Finite View Volumes * The Mathematics of Planar Geometric Projections * Implementing Planar Geometric Projections * Parallel Projection * Perspective Projection * Clipping Against a Canonical View Volume in 3D * Clipping in Homogeneous Coordinates * Mapping into a Viewpoint * Implementation Summary * Coordinate Systems * Exercises

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Includes bibliographical references (p. 527-543) and index.

SUPPLEMENTS to the book are available at publishers site. See http://heg-school.aw.com/cseng/authors/foley/compgrafix/compgrafix.sup.html.

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