Preface

The *XGL Programmer's Guide* provides information on programming with the XGL™ graphics library. For additional information on writing application programs that make efficient use of XGL primitives on Sun accelerators, see the *XGL Accelerator Guide for Reference Frame Buffers*.

Audience

This manual is for C programmers developing XGL applications. The reader should have a basic understanding of UNIX®, the C programming language, and the OpenWindows™ windowing environment. The reader should be familiar with basic computer science concepts (such as data abstraction) and the principles of 2D and 3D computer graphics.

This manual includes discussion and example programs to assist an application programmer in writing XGL programs. It is not a comprehensive tutorial on programming with the XGL library. Examples are provided to illustrate concepts. Refer to the *XGL Reference Manual* for complete descriptions of the XGL operators, attributes, data structures, and macros. For more information on specific graphics concepts, see the references listed at the end of this preface.

About This Document

This manual is organized into the chapters listed below. In most chapters, the example programs are located at the end of the chapter.

Chapter 1, “Introduction to XGL,” provides an overview of XGL functionality and features.

Chapter 2, “Installation Issues,” presents information on installation and system administrator issues for the XGL library.

Chapter 3, “Getting Started with XGL Programming,” summarizes commands used to compile, link, and run XGL applications in the OpenWindows environment. The chapter also provides an overview of basic XGL concepts and includes a simple example program that introduces XGL programming.

Chapter 4, “System State Information and Generic Operators,” provides XGL system state information and describes XGL generic functions.

Chapter 5, “Devices,” explains XGL interaction with display devices, stream devices, and the window system.

Chapter 6, “Color,” explains the XGL color model. Topics discussed are RGB and indexed color spaces, color ramps, color cubes, dithering, and color map double buffering.

Chapter 7, “Contexts,” provides details about the Context object. It discusses the operators and attributes that manage graphics and environment state information.

Chapter 8, “Primitives and Graphics Context Attributes,” discusses XGL drawing primitives and lists the Context attributes that define how images are rendered.

Chapter 9, “Rendering NURBS Curves and Surfaces with XGL,” explains the XGL implementation of NURBS curves and surfaces.

Chapter 10, “Transforms,” details the XGL implementation of matrix transformations such as scale, rotate, translate, and provides information on the transformation operators.

Chapter 11, “View Model,” discusses the XGL 2D and 3D view models, and describes coordinate systems, clipping, and related transforms.

Chapter 12, “Text,” discusses the XGL implementation of stroke text, details the operators and attributes for rendering stroke fonts, and discusses how to render raster text using bitmap fonts.

Chapter 13, “Line Patterns,” describes the Line Pattern object. Line Pattern objects create patterned lines and patterned surface edges.

Chapter 14, “Markers,” describes the Marker object. The operators and attributes for creating and manipulating markers are discussed.

Chapter 15, “Picking,” discusses the XGL picking implementation and describes operators and attributes for fine-tuning an application’s picking capabilities.

Chapter 16, “Lighting, Shading, and Depth Cueing,” discusses the general concepts of the 3D rendering pipeline—lighting, shading, depth cueing, and color mapping. It discusses in detail XGL-specific information such as lighting techniques, equations, operators, and attributes.

Chapter 17, “Caching Geometry,” discusses the Pcache object, which provides XGL’s display list functionality, and the Gcache object, which simplifies complex primitives to accelerate their rendering..

Chapter 18, “Texture Mapping,” presents XGL’s texture mapping functionality .

Appendix A, “Changes to the XGL 3.2 Library,” provides information on the differences between the XGL 3.2 library and the previous version.

Appendix B, “Changes to the XGL Library From XGL 3.0 through XGL 3.1” provides information on changes in the XGL product from XGL 3.0 to XGL 3.1.

Appendix C, “Software Rendering Characteristics,” provides information on rendering through XGL’s software implementation.

Appendix D, “The Utility and Main Example Programs,” lists the utility programs and main program used by the example programs in this manual.

Appendix E, “XGL Errors,” contains a list of all the XGL errors.

“A Glossary of XGL Terms” defines commonly-used XGL terms.

Related Documents

- *XGL Reference Manual*
- *XGL Accelerator Guide for Reference Frame Buffers*
- *XGL Accelerator Guide for Sun Frame Buffers*
- Angel, E. *Computer Graphics*, Addison-Wesley Publishing Company, Reading, Massachusetts, 1990.
- Bartels, R., et al. *An Introduction to Splines for Use in Computer Graphics and Geometric Modeling*, Morgan Kaufmann Publishers, Los Altos, California, 1987.
- Burger, P., and D. Gilles. *Interactive Computer Graphics*, Addison-Wesley Publishing Company, Reading, Massachusetts, 1989.
- Farin, Gerald. *Curves and Surfaces for Computer Aided Geometric Design*, Second Edition, Academic Press, Inc., San Diego, CA, 1990.
- Foley, J., A. van Dam, S. Feiner, and J. Hughes. *Computer Graphics: Principles and Practice*, Second Edition, Addison-Wesley Publishing Company, Reading, Massachusetts, 1990.
- Gaskins, Tom. *PHIGS Programming Manual*, O'Reilly and Associates, Sebastopol, California, 1992.
- International Standard ISO/IEC 9592-4, Information Processing Systems - Computer Graphics - Programmer's Hierarchical Interactive Graphics System (PHIGS), Part 4 - Plus Lumiere Und Surfaces, February 1991.
- Newman, W., and R. Sproull. *Principles of Interactive Computer Graphics*, Second Edition, McGraw-Hill Book Company, New York, 1979.
- Watt, A. *Fundamentals of Three-Dimensional Computer Graphics*, Addison-Wesley Publishing Company, Reading, Massachusetts, 1989.