

# OpenGL<sup>®</sup> Reference Manual

*Fourth Edition*

*The Official Reference Document to  
OpenGL, Version 1.4*



OpenGL Architecture Review Board  
Editor: Dave Shreiner

# Opengl Reference Manual

**Satya Komatineni, Dave MacLean**



## OpenGL Reference Manual:

**OpenGL Reference Manual** OpenGL Architecture Review Board, 2004 The Official Reference Document to OpenGL Version 1.4 OpenGL is a powerful software interface used to produce high quality computer generated images and interactive graphics applications by rendering 2D and 3D geometric objects bitmaps and color images Officially sanctioned by the OpenGL Architecture Review Board ARB The OpenGL Reference Manual Fourth Edition is the comprehensive and definitive documentation of all core OpenGL functions This fourth edition has been completely revised and updated for OpenGL Versions 1.3 and 1.4 It features coverage of cube mapped textures multisampling depth textures and shadowing multitexturing and register combiners In addition this book documents all OpenGL Utility Library functions GLU 1.3 and the OpenGL extension to the X Window System GLX 1.3 A comprehensive reference section documents each set of related OpenGL commands Each reference page contains A description of the command's parameters The command's effect on rendering and how OpenGL's state is modified Examples References to related functions Errors generated by each function This book also includes a conceptual overview of OpenGL a summary of commands and routines a chapter on defined constants and associated commands and descriptions of the multitexturing and imaging subset ARB extensions The OpenGL Technical Library provides tutorial and reference books for OpenGL The Library enables programmers to gain a practical understanding of OpenGL and shows them how to unlock its full potential Originally developed by SGI the Library continues to evolve under the auspices of the Architecture Review Board ARB an industry consortium responsible for guiding the evolution of OpenGL and related technologies The OpenGL ARB is composed of leaders in the computer graphics industry 3DLabs Apple ATI Dell Evans Sutherland Hewlett Packard IBM Intel Matrox NVIDIA SGI and Sun Microsystems **OpenGL reference manual** OpenGL Architecture Review Board, 1997 Providing an overview of how OpenGL works this text also contains detailed reference page descriptions of each OpenGL function The edition includes functions used by the new features recently approved by the Architecture Review Board for inclusion in OpenGL Release 1.1 This book is an essential tool for every programmer working with the OpenGL library **OpenGL Reference Manual** Dave Shreiner, OpenGL Architecture Review Board, 2000 The reference section documents each set of related OpenGL commands Each reference page covers a description of the command's parameters the effects on rendering and the OpenGL state by the command examples errors generated by functions and references to related functions BOOK JACKET *OpenGL Reference Manual* OpenGL Architecture Review Board, 1992 The reference comprehensively documents each group of functions in OpenGL Release 1 It is essential for every programmer working with the OpenGL standard OpenGL reference manual, 1992 *NAS Architecture Reference Manual* Leo Laverdure, Patricia Srite, John Colonna-Romano, 1993 Designed for anyone interested in learning about the NAS architecture including application developers technical consultants Independent Software Vendors ISVs Value Added

Resellers VARs and Digital s Integrated Business Units IBUs NAS Architecture Reference Manual provides information on the NAS services and the key public interfaces supported by each service Part I introduces NAS and provides overview information on the NAS services Part II provides detailed information on the NAS services the key interfaces for those services and information on how the services support the NAS pervasive attributes Web, Graphics & Perl/Tk Programming Jon Orwant,2003 This volume covers topics not covered in O Reilly s other Perl books Half of the articles in this volume deal with essential issues faced by Web developers using Perl **Open Inventor C++ Reference Manual** Open Inventor Architecture Group,1994 This reference comprehensively documents the over 250 C classes in OpenInventor It also provides complete information on OpenInventor s interchange file format which allows data exchange among a wide variety of popular 3D graphics formats **Computer Graphics** Neeta Nain, This book adopts a conceptual approach to computer graphics with emphasis on mathematical concepts and their applications It introduces an abstract paradigm that relates the mathematical concepts with computer graphic techniques and implementation methods This model is intended to help the reader understand the mathematical concepts and their practical use However mathematical complexity has not been allowed to dominate The haul mark of the book is its profuse solved examples which aid in the understanding of mathematical concepts The text is supplemented with introduction to various graphics standards animation multimedia techniques and fractals These topics are of immense use in each of the three visual disciplines modeling transformations projections and multi view geometry for computer vision Geometry of lines vectors and planes is essential for any geometric computation problem light and illumination for image based rendering and hidden surface removal Almost every chapter has the working source code to illustrate the concepts which could be written and used as small programs for better understanding of the topics A concise appendix of open source OpenGL is also included to showcase programming concepts of computer graphics and visualization The text is completely platform independent and the only prerequisite is the knowledge of coordinate geometry and basic algebra It will be useful both as a text and reference thus it can easily be used by novices and experienced practitioners alike Expert Android Satya Komatineni,Dave MacLean,2013-08-24 From the leading publisher of Android books Apress Expert Android gives you advanced techniques for customizing views controls and layouts You ll learn to develop apps in record time using JSON Advanced Form Processing and the BaaS Backend As A Service platform Parse The book also includes extensive coverage on OpenGL Search and Telephony With these advanced and time saving technologies you ll be able to release compelling mobile applications in Google Play and the Amazon Appstore at a rapid pace In Expert Android you ll learn to Borrow reuse or build custom Android UI components Create 3D experiences using OpenGL ES 2 0 Write collaborative applications in the Parse cloud and communicate with your app user community through Parse Push Technology Reduce the time to market while creating rock solid apps for multiple devices Whether you are an individual or enterprise developer in Expert Android you ll find the advanced techniques and practices to

take your mobile apps to the next level Regardless of the Android release this book serves as your definitive capstone reference for your Apress Android experience      **Compaq Visual Fortran** Norman Lawrence, 2002-01-08 Compaq Visual Fortran A Guide to Creating Windows Applications is the only book that shows developers how to create Windows applications using Visual Fortran software It complements Digital Press's successful reference the Digital Visual Fortran Programmer's Guide Lawrence details development methods and techniques for creating Fortran applications for Windows the platform upon which developers can use Compaq Visual Fortran CVF to be Intel Visual Fortran in the future to create applications The book teaches CVF programming progressively beginning with simple tasks and building up to writing professional level Win32 applications Readers will learn about the powerful new CVF graphical user interface as well as the intricacies of Windows development from a CVF perspective They can master QuickWin the Win32 APIs including multiple document interfaces and Open GL with 3D and interactive graphics Provides practical step by step instructions for developing Visual Fortran applications Only tutorial text for Compaq Visual Fortran CVF Doesn't require the programmer to learn C or C++      Course Notes ,1995      **OpenGL Programming Guide** Dave Shreiner, 2010 OpenGL is a powerful software interface used to produce high quality computer generated images and interactive applications using 2D and 3D objects bitmaps and color images The OpenGL Programming Guide Seventh Edition provides definitive and comprehensive information on OpenGL and the OpenGL Utility Library The previous edition covered OpenGL through Version 2.1 This seventh edition of the best selling red book describes the latest features of OpenGL Versions 3.0 and 3.1 You will find clear explanations of OpenGL functionality and many basic computer graphics techniques such as building and rendering 3D models interactively viewing objects from different perspective points and using shading lighting and texturing effects for greater realism In addition this book provides in depth coverage of advanced techniques including texture mapping antialiasing fog and atmospheric effects NURBS image processing and more The text also explores other key topics such as enhancing performance OpenGL extensions and cross platform techniques This seventh edition has been updated to include the newest features of OpenGL Versions 3.0 and 3.1 including Using framebuffer objects for off screen rendering and texture updates Examples of the various new buffer object types including uniform buffer objects transform feedback buffers and vertex array objects Using texture arrays to increase performance when using numerous textures Efficient rendering using primitive restart and conditional rendering Discussion of OpenGL's deprecation mechanism and how to verify your programs for future versions of OpenGL This edition continues the discussion of the OpenGL Shading Language GLSL and explains the mechanics of using this language to create complex graphics effects and boost the computational power of OpenGL The OpenGL Technical Library provides tutorial and reference books for OpenGL The Library enables programmers to gain a practical understanding of OpenGL and shows them how to unlock its full potential Originally developed by SGI the Library continues to evolve under the auspices of the Khronos OpenGL ARB Working Group an industry consortium responsible for

guiding the evolution of OpenGL and related technologies      *OpenGL Distilled* Paul Martz,2006 OpenGL opens the door to the world of high quality high performance 3D computer graphics The preferred application programming interface for developing 3D applications OpenGL is widely used in video game development visualization and simulation CAD virtual reality modeling and computer generated animation OpenGL R Distilled provides the fundamental information you need to start programming 3D graphics from setting up an OpenGL development environment to creating realistic textures and shadows Written in an engaging easy to follow style this book makes it easy to find the information you re looking for You ll quickly learn the essential and most often used features of OpenGL 2 0 along with the best coding practices and troubleshooting tips Topics include Drawing and rendering geometric data such as points lines and polygons Controlling color and lighting to create elegant graphics Creating and orienting views Increasing image realism with texture mapping and shadows Improving rendering performance Preserving graphics integrity across platforms A companion Web site includes complete source code examples color versions of special effects described in the book and additional resources

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