

---

# Opengl Superbible 6th

---

OpenGL Programming on Mac OS X  
 Introduction to Computer Graphics  
 3D Computer Graphics  
 C++ Primer Plus  
 Internet & World Wide Web  
 OpenGL SuperBible  
 OpenGL Development Cookbook  
 Computer Graphics Through OpenGL®  
 OpenGL Distilled  
 Foundations of 3D Computer Graphics  
 Computer Graphics Programming in OpenGL with C++  
 Introduction to Computer Graphics with OpenGL ES  
 3D Graphics for Game Programming  
 Professional C++  
 OpenGL Programming Guide  
 OpenGL Programming Guide  
 Mathematics for 3D Game Programming and Computer Graphics  
 WebGL Programming Guide  
 OpenGL Shading Language  
 Computer Vision - ACCV 2010  
 Real-Time Rendering  
 Interactive Computer Graphics  
 OpenGL Superbible  
 OpenGL ES 3.0 Programming Guide  
 Graphics Shaders  
 Interactive Computer Graphics  
 OpenGL Insights  
 Learn OpenGL  
 OpenGL Programming Guide  
 Vulkan Programming Guide  
 Computer Graphics Programming in OpenGL with Java  
 OpenGL 4 Shading Language Cookbook  
 OpenGL Programming Guide  
 CMake Cookbook  
 Computer Graphics Through OpenGL  
 Learning Vulkan  
 OpenGL ES 2 for Android  
 OpenGL Superbible  
 3D Game Engine Design  
 Effective Modern C++

*Downloaded from*  
[hl.uconnect.hlu.edu.vy](http://hl.uconnect.hlu.edu.vy)  
*Opengl Superbible 6th* **guest**

---

## LILLY SHANE

---

OpenGL Programming on Mac OS X  
 Addison-Wesley Professional  
 OpenGL ES is the standard graphics API used for mobile and embedded systems. Despite its widespread use, there is a lack of material that addresses the balance of both theory and practice in OpenGL ES. JungHyun Han's Introduction to Computer Graphics with OpenGL ES achieves this perfect balance. Han's depiction of theory and practice illustrates how 3D graphics fundamentals are implemented. Theoretical or mathematical details around real-time graphics are also presented in a way that allows readers to quickly move on to practical programming.

Additionally, this book presents OpenGL ES and shader code on many topics. Industry professionals, as well as, students in Computer Graphics and Game Programming courses will find this book of importance. Key Features: Presents key graphics algorithms that are commonly employed by state-of-the-art game engines and 3D user interfaces Provides a hands-on look at real-time graphics by illustrating OpenGL ES and shader code on various topics Depicts troublesome concepts using elaborate 3D illustrations so that they can be easily absorbed Includes problem sets, solutions manual, and lecture notes for those wishing to use this book as a course text.  
Introduction to Computer Graphics Packt Publishing Ltd  
 The Definitive Vulkan™ Developer's Guide and Reference: Master the Next-

Generation Specification for Cross-Platform Graphics The next generation of the OpenGL specification, Vulkan, has been redesigned from the ground up, giving applications direct control over GPU acceleration for unprecedented performance and predictability. Vulkan™ Programming Guide is the essential, authoritative reference to this new standard for experienced graphics programmers in all Vulkan environments. Vulkan API lead Graham Sellers (with contributions from language lead John Kessenich) presents example-rich introductions to the portable Vulkan API and the new SPIR-V shading language. The author introduces Vulkan, its goals, and the key concepts framing its API, and presents a complex rendering system that demonstrates both Vulkan's uniqueness and its exceptional power. You'll find

authoritative coverage of topics ranging from drawing to memory, and threading to compute shaders. The author especially shows how to handle tasks such as synchronization, scheduling, and memory management that are now the developer's responsibility. Vulkan™ Programming Guide introduces powerful 3D development techniques for fields ranging from video games to medical imaging, and state-of-the-art approaches to solving challenging scientific compute problems. Whether you're upgrading from OpenGL or moving to open-standard graphics APIs for the first time, this guide will help you get the results and performance you're looking for. Coverage includes Extensively tested code examples to demonstrate Vulkan's capabilities and show how it differs from OpenGL Expert guidance on getting started and working with Vulkan's new memory system Thorough discussion of queues, commands, moving data, and presentation Full explanations of the SPIR-V binary shading language and compute/graphics pipelines Detailed discussions of drawing commands, geometry and fragment processing, synchronization primitives, and reading Vulkan data into applications A complete case study application: deferred rendering using complex multi-pass architecture and multiple processing queues Appendixes presenting Vulkan functions and SPIR-V opcodes, as well as a complete Vulkan glossary Example code can be found here: <https://github.com/vulkanprogrammingguide/examples>

### 3D Computer Graphics Addison-Wesley Professional

From geometric primitives to animation to 3D modeling to lighting, shading, and texturing, *Computer Graphics Through OpenGL: From Theory to Experiments, Second Edition* presents a comprehensive introduction to computer graphics that uses an active learning style to teach key concepts. Equally emphasizing theory and practice, the book provides an und *C++ Primer Plus* Addison Wesley Publishing Company

*Interactive Computer Graphics* is the only introduction to computer graphics text for undergraduates that fully integrates OpenGL® and emphasizes application-based programming. *Graphics Systems and Models; Graphics Programming; Input and Interaction; Geometric Objects and Transformations; Viewing; Shading; From Vertices to Fragments; Discrete Techniques; Programmable Shaders; Modeling; Curves and Surfaces; Advanced Rendering; Sample Programs; Spaces; Matrices; Synopsis of OpenGL Functions.*

MARKET: For all readers interested in computer animation and graphics using OpenGL®.

**Internet & World Wide Web** Cambridge University Press

Using WebGL®, you can create sophisticated interactive 3D graphics inside web browsers, without plug-ins. WebGL makes it possible to build a new generation of 3D web games, user interfaces, and information visualization solutions that will run on any standard web browser, and on PCs, smartphones, tablets, game consoles, or other devices. *WebGL Programming Guide* will help you get started quickly with interactive WebGL 3D programming, even if you have no prior knowledge of HTML5, JavaScript, 3D graphics, mathematics, or OpenGL. You'll learn step-by-step, through realistic examples, building your skills as you move from simple to complex solutions for building visually appealing web pages and 3D applications with WebGL. Media, 3D graphics, and WebGL pioneers Dr. Kouichi Matsuda and Dr. Rodger Lea offer easy-to-understand tutorials on key aspects of WebGL, plus 100 downloadable sample programs, each demonstrating a specific WebGL topic. You'll move from basic techniques such as rendering, animating, and texturing triangles, all the way to advanced techniques such as fogging, shadowing, shader switching, and displaying 3D models generated by Blender or other authoring tools. This book won't just teach you WebGL best practices, it will give you a library of code to jumpstart your own projects. Coverage includes: • WebGL's origin, core concepts, features, advantages, and integration with other web standards • How and basic WebGL functions work together to deliver 3D graphics • Shader development with OpenGL ES Shading Language (GLSL ES) • 3D scene drawing: representing user views, controlling space volume, clipping, object creation, and perspective • Achieving greater realism through lighting and hierarchical objects • Advanced techniques: object manipulation, heads-up displays, alpha blending, shader switching, and more • Valuable reference appendixes covering key issues ranging from coordinate systems to matrices and shader loading to web browser settings This is the newest text in the OpenGL Technical Library, Addison-Wesley's definitive collection of programming guides and reference manuals for OpenGL and its related technologies. The Library enables programmers to gain a practical understanding of OpenGL and the other Khronos application-programming libraries including OpenGL ES and OpenCL. All of

the technologies in the OpenGL Technical Library evolve under the auspices of the Khronos Group, the industry consortium guiding the evolution of modern, open-standards media APIs.

**OpenGL SuperBible** Addison-Wesley Over 70 recipes that cover advanced techniques for 3D programming such as lighting, shading, textures, particle systems, and image processing with OpenGL 4.6 Key Features Explore techniques for implementing shadows using shadow maps and shadow volumes Learn to use GLSL features such as compute, geometry, and tessellation shaders Use GLSL to create a wide variety of modern, realistic visual effects Book Description *OpenGL 4 Shading Language Cookbook, Third Edition* provides easy-to-follow recipes that first walk you through the theory and background behind each technique, and then proceed to showcase and explain the GLSL and OpenGL code needed to implement them. The book begins by familiarizing you with beginner-level topics such as compiling and linking shader programs, saving and loading shader binaries (including SPIR-V), and using an OpenGL function loader library. We then proceed to cover basic lighting and shading effects. After that, you'll learn to use textures, produce shadows, and use geometry and tessellation shaders. Topics such as particle systems, screen-space ambient occlusion, deferred rendering, depth-based tessellation, and physically based rendering will help you tackle advanced topics. *OpenGL 4 Shading Language Cookbook, Third Edition* also covers advanced topics such as shadow techniques (including the two of the most common techniques: shadow maps and shadow volumes). You will learn how to use noise in shaders and how to use compute shaders. The book provides examples of modern shading techniques that can be used as a starting point for programmers to expand upon to produce modern, interactive, 3D computer-graphics applications. What you will learn Compile, debug, and communicate with shader programs Use compute shaders for physics, animation, and general computing Learn about features such as shader storage buffer objects and image load/store Utilize noise in shaders and learn how to use shaders in animations Use textures for various effects including cube maps for reflection or refraction Understand physically based reflection models and the SPIR-V Shader binary Learn how to create shadows using shadow maps or shadow volumes Create particle systems that simulate smoke, fire, and other effects Who this book is for If you

are a graphics programmer looking to learn the GLSL shading language, this book is for you. A basic understanding of 3D graphics and programming experience with C++ are required.

*OpenGL Development Cookbook* CRC Press

The goal of this volume is to enumerate the various ways of accessing OpenGL on the Mac, creating and setting up OpenGL prototypes under various APIs available. From this foundation, the book moves into detailed discussions of each of these APIs.

*Computer Graphics Through OpenGL®* Addison-Wesley Professional

This new edition provides step-by-step instruction on modern 3D graphics shader programming in OpenGL with C++, along with its theoretical foundations. It is appropriate both for computer science graphics courses and for professionals interested in mastering 3D graphics skills. It has been designed in a 4-color, "teach-yourself" format with numerous examples that the reader can run just as presented. Every shader stage is explored, from the basics of modeling, textures, lighting, shadows, etc., through advanced techniques such as tessellation, normal mapping, noise maps, as well as new chapters on simulating water, stereoscopy, and ray tracing. **FEATURES:** Covers modern OpenGL 4.0+ shader programming in C++, with instructions for both PC/Windows and Macintosh Adds new chapters on simulating water, stereoscopy, and ray tracing Includes companion files with code, object models, figures, and more (also available for downloading by writing to the publisher) Illustrates every technique with running code examples. Everything needed to install the libraries, and complete source code for each example Includes step-by-step instruction for using each GLSL programmable pipeline stage (vertex, tessellation, geometry, and fragment) Explores practical examples for modeling, lighting, and shadows (including soft shadows), terrain, water, and 3D materials such as wood and marble Explains how to optimize code for tools such as Nvidia's Nsight debugger. The companion files and instructor resources are available online by emailing the publisher with proof of purchase at [info@merclearning.com](mailto:info@merclearning.com).

*OpenGL Distilled* Mercury Learning and Information

Learn OpenGL will teach you the basics, the intermediate, and tons of advanced knowledge, using modern (core-profile) OpenGL. The aim of this book is to show you all there is to modern OpenGL in an easy-to-understand fashion, with clear examples and step-by-step instructions,

while also providing a useful reference for later studies.

**Foundations of 3D Computer Graphics** CRC Press

"As the 'Red Book' is known to be the gold standard for OpenGL, the 'Orange Book' is considered to be the gold standard for the OpenGL Shading Language. With Randi's extensive knowledge of OpenGL and GLSL, you can be assured you will be learning from a graphics industry veteran. Within the pages of the second edition you can find topics from beginning shader development to advanced topics such as the spherical harmonic lighting model and more." —David Tommeraasen, CEO/Programmer, Plasma Software

"This will be the definitive guide for OpenGL shaders; no other book goes into this detail. Rost has done an excellent job at setting the stage for shader development, what the purpose is, how to do it, and how it all fits together. The book includes great examples and details, and good additional coverage of 2.0 changes!" —Jeffery Galinovsky, Director of Emerging Market Platform Development, Intel Corporation

"The coverage in this new edition of the book is pitched just right to help many new shader-writers get started, but with enough deep information for the 'old hands.'" —Marc Olano, Assistant Professor, University of Maryland

"This is a really great book on GLSL—well written and organized, very accessible, and with good real-world examples and sample code. The topics flow naturally and easily, explanatory code fragments are inserted in very logical places to illustrate concepts, and all in all, this book makes an excellent tutorial as well as a reference."

—John Carey, Chief Technology Officer, C.O.R.E. Feature Animation

*OpenGL® Shading Language, Second Edition*, extensively updated for OpenGL 2.0, is the experienced application programmer's guide to writing shaders. Part reference, part tutorial, this book thoroughly explains the shift from fixed-functionality graphics hardware to the new era of programmable graphics hardware and the additions to the OpenGL API that support this programmability. With OpenGL and shaders written in the OpenGL Shading Language, applications can perform better, achieving stunning graphics effects by using the capabilities of both the visual processing unit and the central processing unit. In this book, you will find a detailed introduction to the OpenGL Shading Language (GLSL) and the new OpenGL function calls that support it. The text begins by describing the syntax and semantics of this high-level programming language. Once this foundation has been

established, the book explores the creation and manipulation of shaders using new OpenGL function calls. *OpenGL® Shading Language, Second Edition*, includes updated descriptions for the language and all the GLSL entry points added to OpenGL 2.0; new chapters that discuss lighting, shadows, and surface characteristics; and an under-the-hood look at the implementation of RealWorldz, the most ambitious GLSL application to date. The second edition also features 18 extensive new examples of shaders and their underlying algorithms, including Image-based lighting Lighting with spherical harmonics Ambient occlusion Shadow mapping Volume shadows using deferred lighting Ward's BRDF model The color plate section illustrates the power and sophistication of the OpenGL Shading Language. The API Function Reference at the end of the book is an excellent guide to the API entry points that support the OpenGL Shading Language. Also included is a convenient Quick Reference Card to GLSL.

**Computer Graphics Programming in OpenGL with C++** Addison-Wesley Professional

The first edition of *3D Game Engine Design* was an international bestseller that sold over 17,000 copies and became an industry standard. In the six years since that book was published, graphics hardware has evolved enormously. Hardware can now be directly controlled through techniques such as shader programming, which requires an entirely new thought process of a programmer. In a way that no other book can do, this new edition shows step by step how to make a shader-based graphics engine and how to tame this new technology. Much new material has been added, including more than twice the coverage of the essential techniques of scene graph management, as well as new methods for managing memory usage in the new generation of game consoles and portable game players. There are expanded discussions of collision detection, collision avoidance, and physics—all challenging subjects for developers. The mathematics coverage is now focused towards the end of the book to separate it from the general discussion. As with the first edition, one of the most valuable features of this book is the inclusion of Wild Magic, a commercial quality game engine in source code that illustrates how to build a real-time rendering system from the lowest-level details all the way to a working game. Wild Magic Version 4 consists of over 300,000 lines of code that allows the results of programming experiments to be seen

immediately. This new version of the engine is fully shader-based, runs on Windows XP, Mac OS X, and Linux, and is only available with the purchase of the book.

**Introduction to Computer Graphics with OpenGL ES** Mercury Learning and Information

Printed in full color. Android is booming like never before, with millions of devices shipping every day. It's never been a better time to learn how to create your own 3D games and live wallpaper for Android. You'll find out all about shaders and the OpenGL pipeline, and discover the power of OpenGL ES 2.0, which is much more feature-rich than its predecessor. If you can program in Java and you have a creative vision that you'd like to share with the world, then this is the book for you. This book will teach you everything you need to know to create compelling graphics on Android. You'll learn the basics of OpenGL by building a simple game of air hockey, and along the way, you'll see how to initialize OpenGL and program the graphics pipeline using shaders. Each lesson builds upon the one before it, as you add colors, shading, 3D projections, touch interaction, and more. Then, you'll find out how to turn your idea into a live wallpaper that can run on the home screen. You'll learn about more advanced effects involving particles, lighting models, and the depth buffer. You'll understand what to look for when debugging your program, and what to watch out for when deploying to the market. OpenGL can be somewhat of a dark art to the uninitiated. As you read this book, you'll learn each new concept from first principles. You won't just learn about a feature; you'll also understand how it works, and why it works the way it does. Everything you learn is forward-compatible with the just-released OpenGL ES 3, and you can even apply these techniques to other platforms, such as iOS or HTML5 WebGL.

**3D Graphics for Game Programming**

Addison-Wesley Professional

Sooner or later, all game programmers run into coding issues that require an understanding of mathematics or physics concepts such as collision detection, 3D vectors, transformations, game theory, or basic calculus. Unfortunately, most programmers frequently have a limited understanding of these essential mathematics and physics concepts. **MATHEMATICS AND PHYSICS FOR PROGRAMMERS, THIRD EDITION** provides a simple but thorough grounding in the mathematics and physics topics that programmers require to write algorithms and programs using a non-language-

specific approach. Applications and examples from game programming are included throughout, and exercises follow each chapter for additional practice. The book's companion website provides sample code illustrating the mathematical and physics topics discussed in the book.

**Professional C++** Springer Nature  
**OpenGL® SuperBible, Seventh Edition**, is the definitive programmer's guide, tutorial, and reference for OpenGL 4.5, the world's leading 3D API for real-time computer graphics. The best introduction for any developer, it clearly explains OpenGL's newest APIs; key extensions; shaders; and essential, related concepts. You'll find up-to-date, hands-on guidance for all facets of modern OpenGL development—both desktop and mobile. The authors explain what OpenGL does, how it connects to the graphics pipeline, and how it manages huge datasets to deliver compelling experiences. Step by step, they present increasingly sophisticated techniques, illuminating key concepts with worked examples. They introduce OpenGL on several popular platforms, and offer up-to-date best practices and performance advice. This revised and updated edition introduces many new OpenGL 4.5 features, including important ARB and KHR extensions that are now part of the standard. It thoroughly covers the latest Approaching Zero Driver Overhead (AZDO) performance features, and demonstrates key enhancements with new example applications. Coverage includes A practical introduction to real-time 3D graphics, including foundational math Core techniques for rendering, transformations, and texturing Shaders and the OpenGL Shading Language (GLSL) in depth Vertex processing, drawing commands, primitives, fragments, and framebuffers Compute shaders: harnessing graphics cards for more than graphics Pipeline monitoring and control Managing, loading, and arbitrating access to data Building larger applications and deploying them across platforms Advanced rendering: light simulation, artistic and non-photorealistic effects, and more Reducing CPU overhead and analyzing GPU behavior Supercharging performance with persistent maps, bindless textures, and fine-grained synchronization Preventing and debugging errors New applications: texture compression, text drawing, font rendering with distance fields, high-quality texture filtering, and OpenMP Bonus material and sample code are available at [openglsuperbible.com](http://openglsuperbible.com).

**OpenGL Programming Guide** Addison-Wesley Professional

OpenGL® ES™ is the industry's leading software interface and graphics library for rendering sophisticated 3D graphics on handheld and embedded devices. The newest version, OpenGL ES 3.0, makes it possible to create stunning visuals for new games and apps, without compromising device performance or battery life. In the **OpenGL® ESTM 3.0 Programming Guide, Second Edition**, the authors cover the entire API and Shading Language. They carefully introduce OpenGL ES 3.0 features such as shadow mapping, instancing, multiple render targets, uniform buffer objects, texture compression, program binaries, and transform feedback. Through detailed, downloadable C-based code examples, you'll learn how to set up and program every aspect of the graphics pipeline. Step by step, you'll move from introductory techniques all the way to advanced per-pixel lighting and particle systems. Throughout, you'll find cutting-edge tips for optimizing performance, maximizing efficiency with both the API and hardware, and fully leveraging OpenGL ES 3.0 in a wide spectrum of applications. All code has been built and tested on iOS 7, Android 4.3, Windows (OpenGL ES 3.0 Emulation), and Ubuntu Linux, and the authors demonstrate how to build OpenGL ES code for each platform. Coverage includes EGL API: communicating with the native windowing system, choosing configurations, and creating rendering contexts and surfaces Shaders: creating and attaching shader objects; compiling shaders; checking for compile errors; creating, linking, and querying program objects; and using source shaders and program binaries OpenGL ES Shading Language: variables, types, constructors, structures, arrays, attributes, uniform blocks, I/O variables, precision qualifiers, and invariance Geometry, vertices, and primitives: inputting geometry into the pipeline, and assembling it into primitives 2D/3D, Cubemap, Array texturing: creation, loading, and rendering; texture wrap modes, filtering, and formats; compressed textures, sampler objects, immutable textures, pixel unpack buffer objects, and mipmapping Fragment shaders: multitexturing, fog, alpha test, and user clip planes Fragment operations: scissor, stencil, and depth tests; multisampling, blending, and dithering Framebuffer objects: rendering to offscreen surfaces for advanced effects Advanced rendering: per-pixel lighting, environment mapping, particle systems, image post-processing, procedural textures, shadow mapping, terrain, and projective texturing Sync objects and

fences: synchronizing within host application and GPU execution This edition of the book includes a color insert of the OpenGL ES 3.0 API and OpenGL ES Shading Language 3.0 Reference Cards created by Khronos. The reference cards contain a complete list of all of the functions in OpenGL ES 3.0 along with all of the types, operators, qualifiers, built-ins, and functions in the OpenGL ES Shading Language.

**OpenGL Programming Guide** CRC Press  
An introduction to the basic concepts of 3D computer graphics that offers a careful mathematical exposition within a modern computer graphics application programming interface. Computer graphics technology is an amazing success story. Today, all of our PCs are capable of producing high-quality computer-generated images, mostly in the form of video games and virtual-life environments; every summer blockbuster movie includes jaw-dropping computer generated special effects. This book explains the fundamental concepts of 3D computer graphics. It introduces the basic algorithmic technology needed to produce 3D computer graphics, and covers such topics as understanding and manipulating 3D geometric transformations, camera transformations, the image-rendering process, and materials and texture mapping. It also touches on advanced topics including color representations, light simulation, dealing with geometric representations, and producing animated computer graphics. The book takes special care to develop an original exposition that is accessible and concise but also offers a clear explanation of the more difficult and subtle mathematical issues. The topics are organized around a modern shader-based version of OpenGL, a widely used computer graphics application programming interface that provides a real-time "rasterization-based" rendering environment. Each chapter concludes with exercises. The book is suitable for a rigorous one-semester introductory course in computer graphics for upper-level undergraduates or as a professional reference. Readers should be moderately competent programmers and have had some experience with linear algebra. After mastering the material presented, they will be on the path to expertise in an exciting and challenging field.

**Mathematics for 3D Game Programming and Computer Graphics**  
Pragmatic Bookshelf

The four-volume set LNCS 6492-6495 constitutes the thoroughly refereed post-proceedings of the 10th Asian Conference on Computer Vision, ACCV 2009, held in

Queenstown, New Zealand in November 2010. All together the four volumes present 206 revised papers selected from a total of 739 Submissions. All current issues in computer vision are addressed ranging from algorithms that attempt to automatically understand the content of images, optical methods coupled with computational techniques that enhance and improve images, and capturing and analyzing the world's geometry while preparing the higher level image and shape understanding. Novel gemometry techniques, statistical learning methods, and modern algebraic procedures are dealt with as well.

**WebGL Programming Guide** CRC Press  
OpenGL® SuperBible, Fifth Edition is the definitive programmer's guide, tutorial, and reference for the world's leading 3D API for real-time computer graphics, OpenGL 3.3. The best all-around introduction to OpenGL for developers at all levels of experience, it clearly explains both the API and essential associated programming concepts. Readers will find up-to-date, hands-on guidance on all facets of modern OpenGL development, including transformations, texture mapping, shaders, advanced buffers, geometry management, and much more. Fully revised to reflect ARB's latest official specification (3.3), this edition also contains a new start-to-finish tutorial on OpenGL for the iPhone, iPod touch, and iPad. Coverage includes A practical introduction to the essentials of real-time 3D graphics Core OpenGL 3.3 techniques for rendering, transformations, and texturing Writing your own shaders, with examples to get you started Cross-platform OpenGL: Windows (including Windows 7), Mac OS X, GNU/Linux, UNIX, and embedded systems OpenGL programming for iPhone, iPod touch, and iPad: step-by-step guidance and complete example programs Advanced buffer techniques, including full-definition rendering with floating point buffers and textures Fragment operations: controlling the end of the graphics pipeline Advanced shader usage and geometry management A fully updated API reference, now based on the official ARB (Core) OpenGL 3.3 manual pages New bonus materials and sample code on a companion Web site, [www.starstonesoftware.com/OpenGL](http://www.starstonesoftware.com/OpenGL) Part of the OpenGL Technical Library—The official knowledge resource for OpenGL developers 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 OpenGL Architecture Review Board (ARB) Steering Group (now part of the Khronos Group), an industry consortium responsible for guiding the evolution of OpenGL and related technologies.

**OpenGL Shading Language** Addison-Wesley Professional

A basic understanding of the key techniques in computer graphics can open the door to this exciting field and its many applications, including for video games and for augmented and virtual reality. This easy-to-follow textbook and reference introduces the fundamental concepts of computer graphics, integrating both technical background and theory with practical examples and applications throughout. Thoroughly revised and updated, this new edition continues to present a user-friendly approach to creating images and animations, complementing the expanded coverage of topics with usage of example programs and exercises. Topics and features:  
Contains pedagogical tools, including easy-to-understand example programs and end-of-chapter exercises Presents a practical guide to basic computer graphics programming using the Open Graphics Library (OpenGL) and the widely used Java programming language Includes new and expanded content on the OpenGL graphics pipelines, shader programming, drawing basic objects using the OpenGL, three-dimensional modelling, quaternions, rasterisation, antialiasing and more Supplies complete Java project examples as supplementary material This reader-friendly textbook is an essential tool for second-year undergraduate students and above, providing clear and concise explanations of the basic concepts of computer graphics. It will enable readers to immediately implement these concepts using the OpenGL and Java (with only elementary knowledge of the programming language). Prof. Dr.-Ing. Karsten Lehn works at the Faculty of Information Technology at Fachhochschule Dortmund, University of Applied Sciences and Arts. Prof. Dr. Merijam Gotzes is teaching at Hamm-Lippstadt University of Applied Sciences. Prof. Dr. Frank Klawonn is head of the Data Analysis and Pattern Recognition Laboratory at the Ostfalia University of Applied Sciences and heads the Biostatistics Research Group at the Helmholtz Centre for Infection Research. *Computer Vision - ACCV 2010* Packt Publishing Ltd  
C++ Primer Plus, Sixth Edition New C++11 Coverage C++ Primer Plus is a carefully crafted, complete tutorial on one

of the most significant and widely used programming languages today. An accessible and easy-to-use self-study guide, this book is appropriate for both serious students of programming as well as developers already proficient in other languages. The sixth edition of C++ Primer Plus has been updated and expanded to cover the latest developments in C++, including a detailed look at the new C++11 standard. Author and educator Stephen Prata has created an introduction to C++ that is instructive, clear, and insightful. Fundamental programming concepts are explained along with details of the C++ language. Many short, practical examples illustrate just one or two concepts at a time, encouraging readers to master new topics by immediately putting them to use. Review questions and programming exercises at the end of each chapter help readers zero in on the most critical

information and digest the most difficult concepts. In C++ Primer Plus, you'll find depth, breadth, and a variety of teaching techniques and tools to enhance your learning: A new detailed chapter on the changes and additional capabilities introduced in the C++11 standard Complete, integrated discussion of both basic C language and additional C++ features Clear guidance about when and why to use a feature Hands-on learning with concise and simple examples that develop your understanding a concept or two at a time Hundreds of practical sample programs Review questions and programming exercises at the end of each chapter to test your understanding Coverage of generic C++ gives you the greatest possible flexibility Teaches the ISO standard, including discussions of templates, the Standard Template Library, the string class, exceptions, RTTI, and namespaces Table of Contents 1: Getting

Started with C++ 2: Setting Out to C++ 3: Dealing with Data 4: Compound Types 5: Loops and Relational Expressions 6: Branching Statements and Logical Operators 7: Functions: C++'s Programming Modules 8: Adventures in Functions 9: Memory Models and Namespaces 10: Objects and Classes 11: Working with Classes 12: Classes and Dynamic Memory Allocation 13: Class Inheritance 14: Reusing Code in C++ 15: Friends, Exceptions, and More 16: The string Class and the Standard Template Library 17: Input, Output, and Files 18: The New C++11 Standard A Number Bases B C++ Reserved Words C The ASCII Character Set D Operator Precedence E Other Operators F The stringTemplate Class G The Standard Template Library Methods and Functions H Selected Readings and Internet Resources I Converting to ISO Standard C++ J Answers to Chapter Reviews