VULKAN API GRAPHICS



understanding, developing and debugging projects and applications

Owner's Workshop Manual



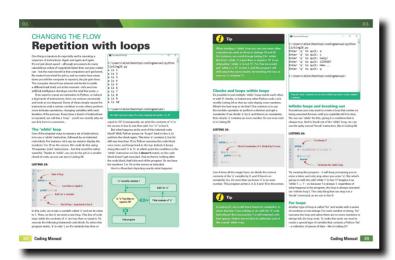
A no-nonsense beginners guide to Vulkan programming Kenwright

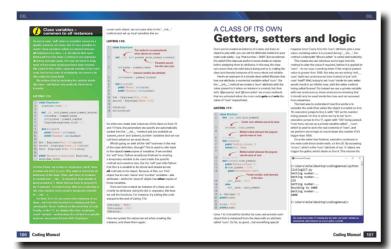


VULKAN API **GRAPHICS**



Vulkan Programming (Beginners Onwards)





Haynes Publishing Author: Kenwright

Email: bkenwright@ieee.org

The Vulkan Programming manual teaches you everything you need to become a proficient Vulkan programmer. Whether you want to expand your graphical API knowledge for university, work or just as a hobby, this comprehensive guide introduces the tools, terms and concepts that will take you from knowing nothing to a competent Vulkan developer. Simple explanations and step-by-step guides ease you through the features of the Vulkan API and C++ to provide you with everything you need to write software applications in the real-world. The Vulkan Programming manual includes 62 annotated code listings, demonstrating features of the API and inspiring you to write your own

- Introduction what is Vulkan, why is it important and why it's becoming more popular
- Setting up installing Vulkan and how to compile and link a simple program
- Vulkan API basics naming convention, structure and debugging
- Basic Implementation demonstrate a barebone implementation to get you started
- Data and Loading Models vertices, faces, textures and geometry
- Shaders manipulating data on the GPU (vertex, pixel, geometry and tesselation stages)
- Graphical Principles importance of lighting and the different models/types
 - Appendices useful resources and additional material

Benjamin Kenwright is an experienced researcher and developer who has been programming and working with graphical software applications for over 20 years.

Contents

	introduction	ь
01.	Setting up	8
	How to Install Vulkan Wrigni and running Programs What error messages mean	11 12 17
02.	Vulkan API basics	13
	Libraries Variable Naming API Components	14 15 16
03.	Basic Implementation	17
	Hello Triangle - Vulkan up and running Extended initialization Vulkan Shaders Vertex Buffer Objects	18 19 20 21
04.	Mathematical Concepts	22
	Vectors and Matrices Cameras Quaternions Ray-Based Picking	23 24 25 26
05.	Graphical Principles	27
	Why is lighting so important? Types of lighting Phong Lighting Texture Maps	28 29 30 31
06.	Mesh Data	32
	Generating Geometric (Procedurally) Importing Mesh Objects from Files	33 34
07.	Advanced Lighting and Texture Effects	35
	Multi-Texturing Embeding Lighting Coefficients in Textures Alpha Blending and Transparency Splotlights and Directional Lights	36 37 38 39

	Distance Fog Normal Mapping Cube Maps, Sky Boxes and Environmental	40 41
) 8.	Mapping Further Shaders	42 43
	Geometry Shaders Tesselation Shader	44 45
9.	2D Rendering	46
	2D GUI Panels Sprite Sheets and 2D Animations Bitmap Fonts Making a Font Atlas Generator	47 48 49 50
10.	Animations	51
	Particle System Skinning Part 1: Bones Skinning Part 2: Skeleton Hierarchies Skinning Part 3: Key-Frame Animation	52 53 54 55
11.	Multi-Pass Rendering	56
	Switching Framebuffers Image Processing with a Kernal Color-Based Picking Deferred Shading Texture Projection Shadows	57 58 59 60 61
	Appendices	62
	Managing Larger Applications Useful resources Index	63 64 65