OpenGL

Open Graphics Library

History

OpenGL 1.0 (1992)

Basic Features for all Graphics Cards

Want support for your graphics card feature?
Write Extensions

OpenGL 1.0 (1992)

Want support for your graphics card feature?
Write Extensions!!!

OpenGL 1.1 (1997)

Texture Objects

What is Texture?

What is Texture?

Nothing better than christmas chocolates to explain #UVmapping to your kids #CGI #3D #material #texture

OpenGL 1.2 (1998)

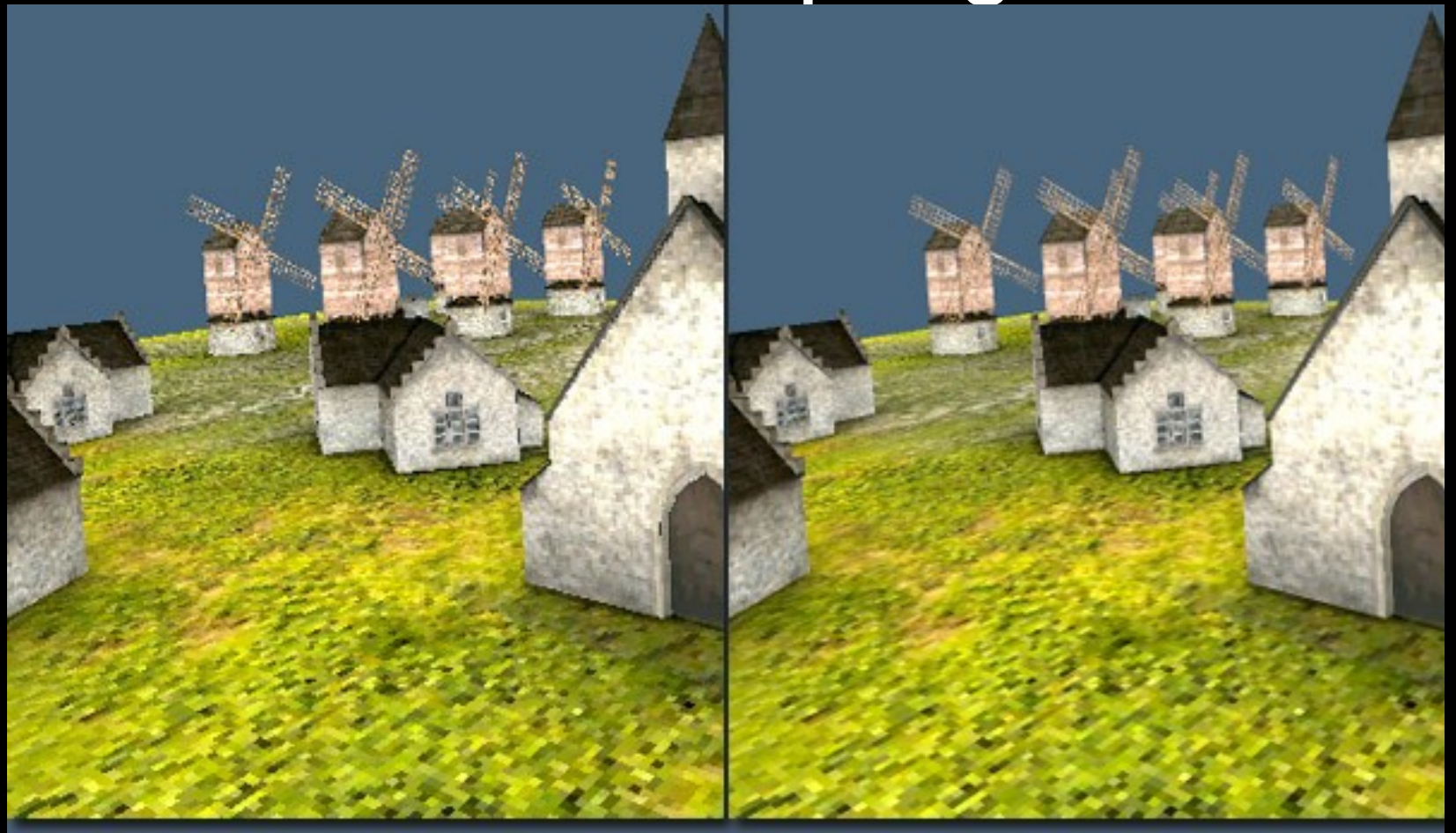
“Image Subset” for image processing

OpenGL 1.3 (2001)

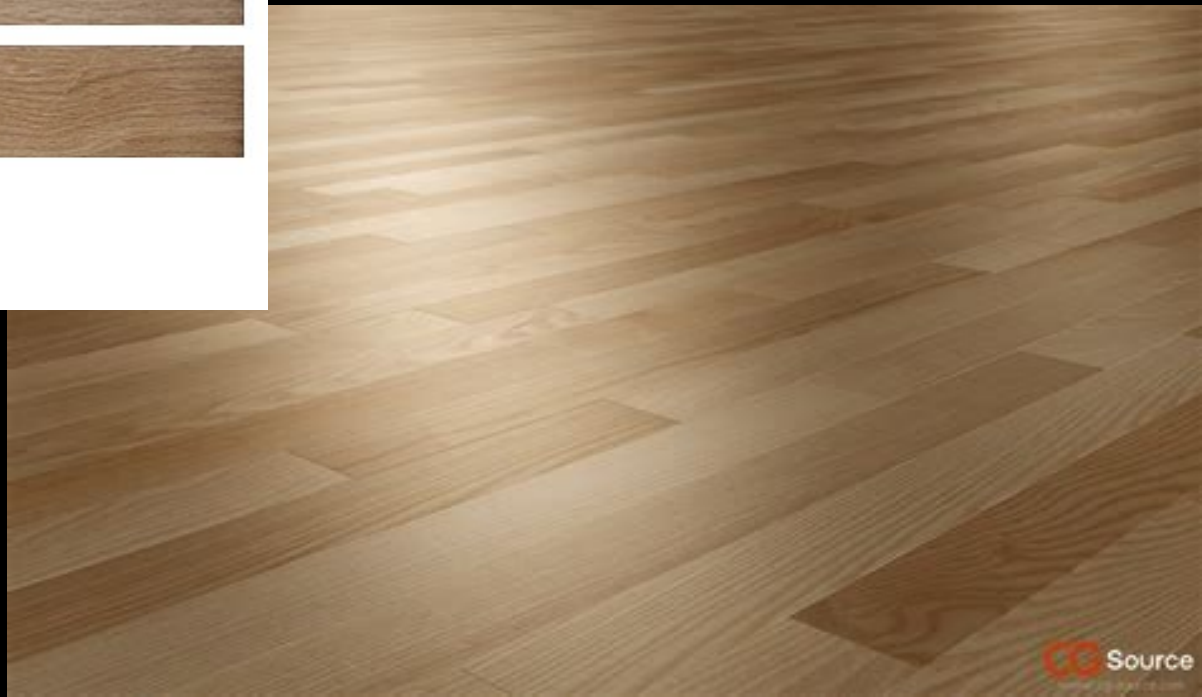
More Texturing Features

- Texture Compression
- Multisampling
- Multitexturing

Multisampling



Multi-Texturing



OpenGL 1.5 (2003)

- GLSL (OpenGL Shading Language)

OpenGL 2.0(2004)

- C-like GLSL

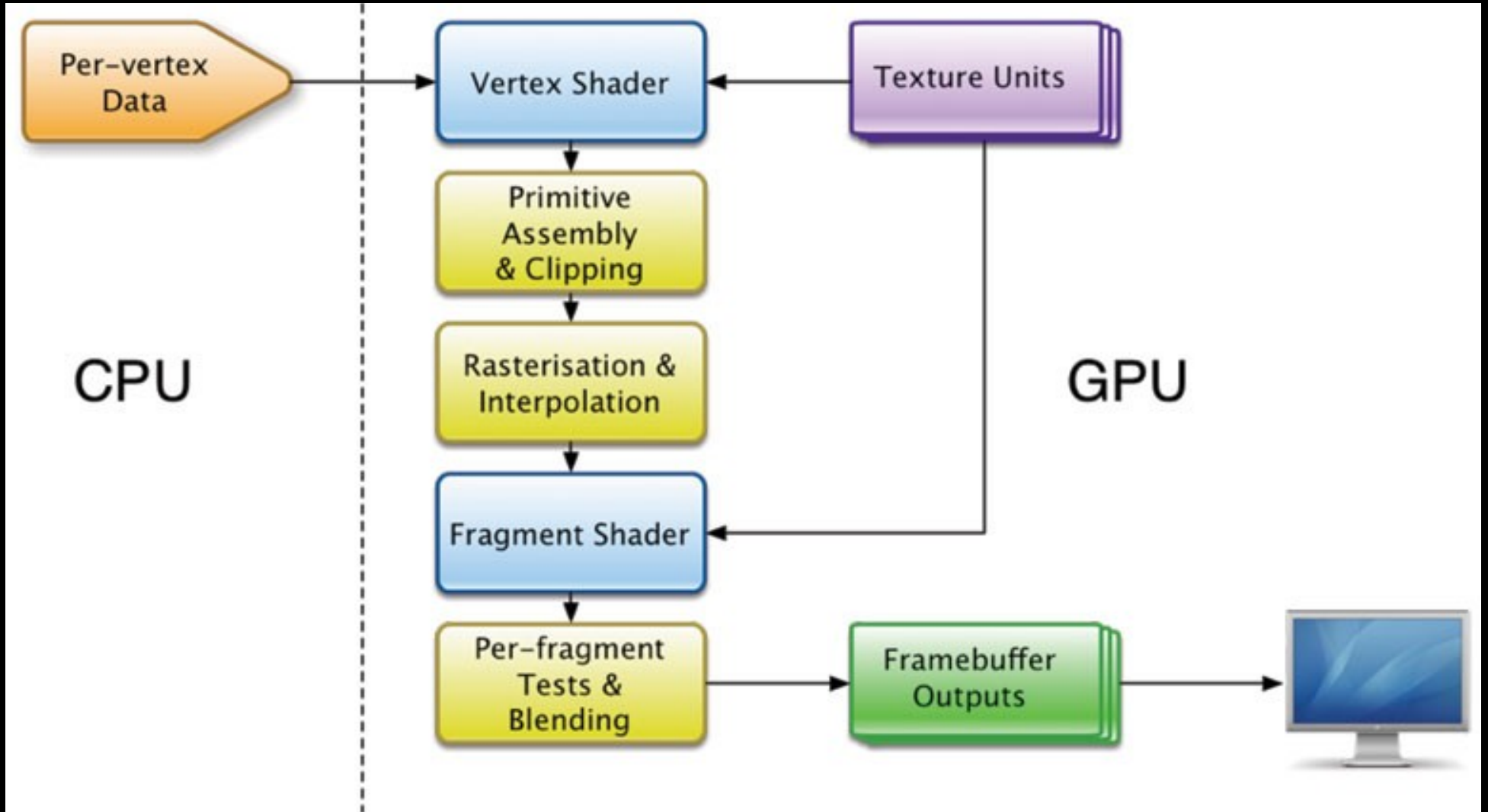
OpenGL 3.0 (2008)

- Deprecating Features
  - Fixed Functions
  - glBegin and glEnd
  - GLSL v1.1 and v1.2

older <- 3.0 VS 3.1 -> newer

- Traditional (Fixed ☹)
  - 1. glBegin
  - 2. Give data to GPU
  - 3. glEnd
- NEW! (programmable)
  - VAO & VBO
  - Vertex Shader!!!!
  - Fragment Shader!!!!
  - And So much Fun!

Simple Graphics Pipline



Demo Time!

https://www.shadertoy.com

GUI System

- Win32 (legacy)
- QT Framework (old but has nice features)
- GTK+
- GLUT or FreeGLUT or GLFW
- X Windows System (oldest)

What about Android and IOS?

OpenGL ES!!!

OpenGL ES 1.0 (2003)

- It only supports Fixed Function Pipeline
- Features are same as OpenGL 1.3

OpenGL ES 2.0 (2007)

- Same features as Destop’s OpenGL 2.0
- But with Programmable Pipeline
  - Vertex Shader
  - Fragment Shader

OpenGL ES 3 (2012-2014-2015)

- Acceleration for advanced visual effects
- Ericsson Texture Compression (ETC2)
- Enhanced Texturing
- Easier to write portable applications
- Geometry and Tessellation Shaders

GLES 2.0 vs GLES 3.*

Which one is better?

OpenGL ES 3.0 and 3.1 and 3.2 and..?

- Bad Implementations
- Not Optimized
- Poor mobile support

https://godotengine.org/news/5

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Maintenance release: Godot 3.0.2

By: Hein-Pieter van Braam Mar 04 - 2018

We've found [illegible] regressions in Godot 3.0.1. This maintenance release addresses [illegible] and also a[illegible]tures for our C# users.

Moving to Vulkan (and ES 2.0) instead of OpenGL ES 3.0

By: Juan Linietsky Feb 26 - 2018

The rationale for the OpenGL ES 3 renderer was having a single codebase for targeting all platforms. Th[illegible]sounds really good in theory and we could say it *almost* works, but...

Maintenance release: Godot 3.0.1

https://godotengine.org/article/abandoning-gles3-vulkan-and-gles2

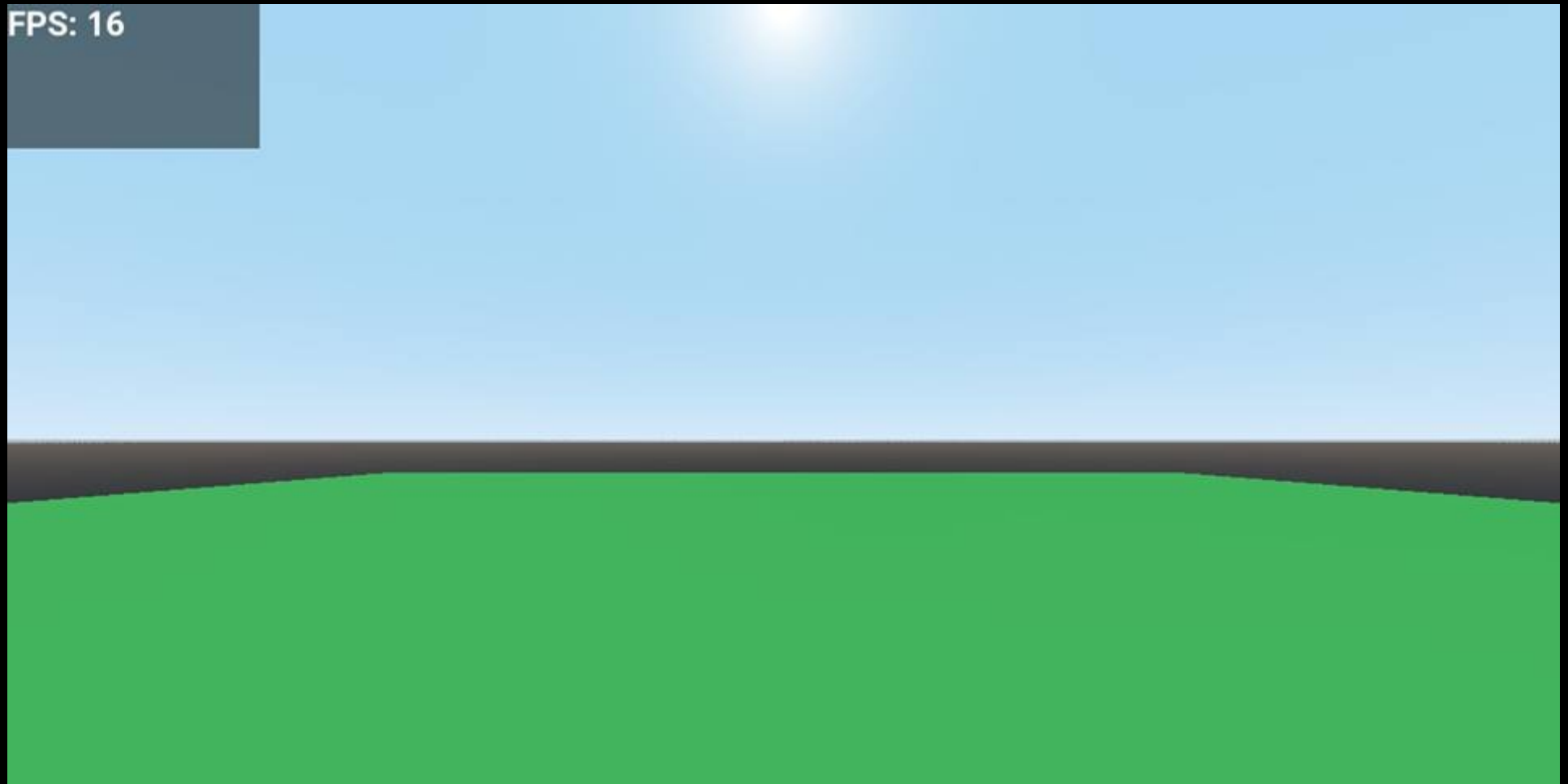
Radu Bolovan

January 6 at 8:10 AM

Testing 3.1 alpha 5:
3D project exported to Android with GLES 3.
The project contains:
- a plane
- a camera
- a directional light with shadows enabled
- a sprite + a label as debug info

Phone details: LG K10 (2017), Android 8.1.0, 2GB RAM, OpenGL ES 3.2.
The result: 15-17 FPS. Please see screenshot for details. Is this normal?

https://www.facebook.com/groups/godotengine/permalink/1455540687915854/


FPS: 16

Dylan Warlus Use GLES2 1

Like · Reply · 1w

Radu Bolovan On it!

Like · Reply · 1w

Radu Bolovan I got 25-30 FPS with GLES 2. Waiting for the Beta and re-test this.

Like · Reply · 1w · Edited

Write a reply...

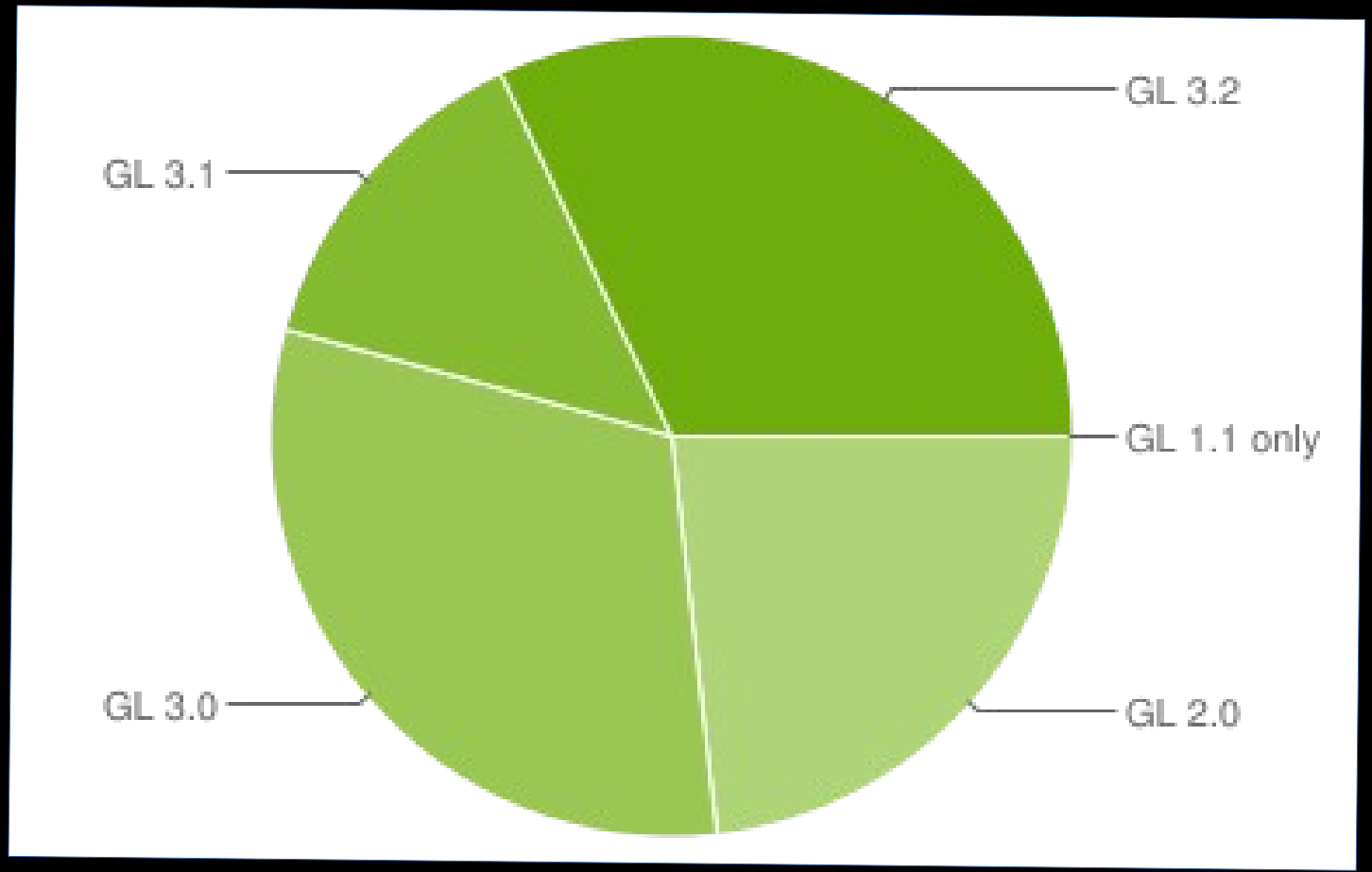
Radu Bolovan

January 6 · Edited

I got 25-30 FPS with GLES 2. Waiting for the Beta and re-test this.

Like

Open GL ES for Android

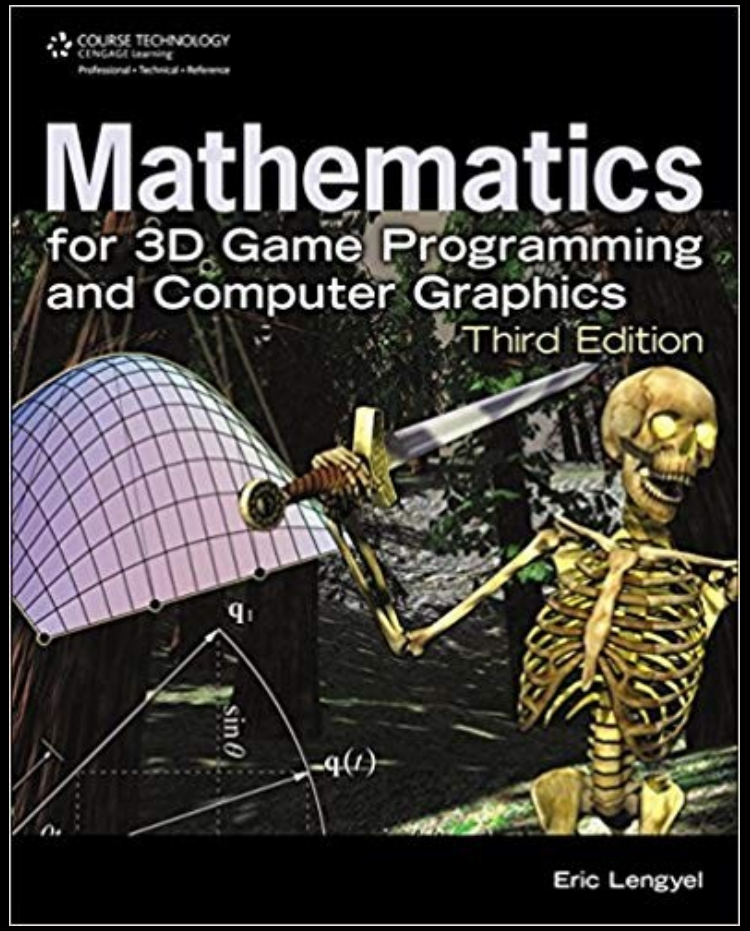


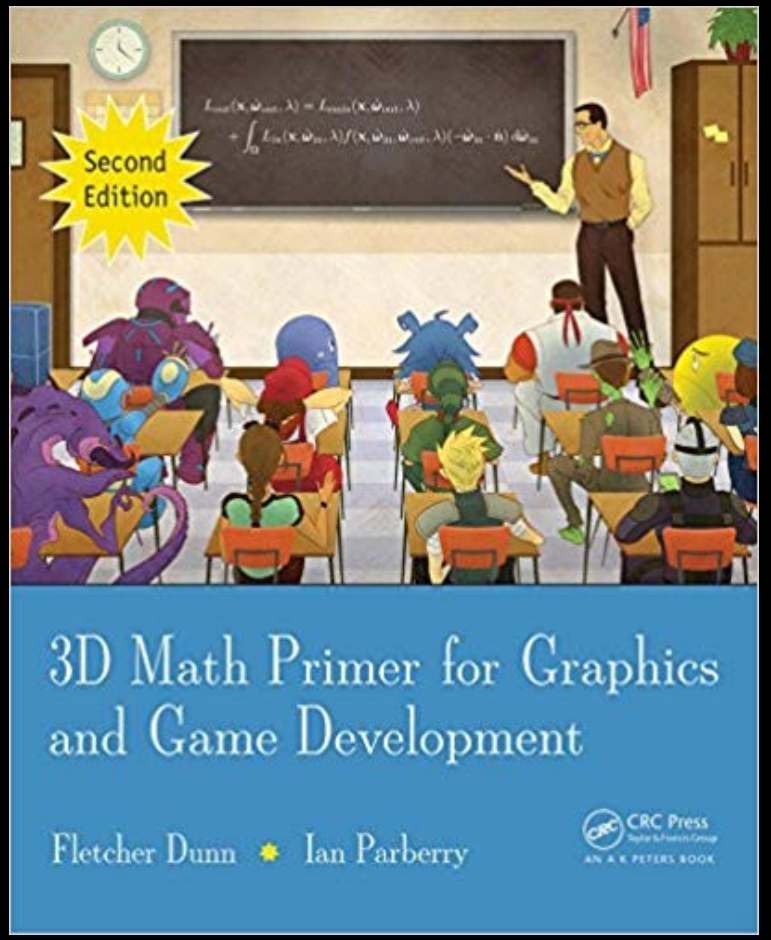
Alternatives To OpenGL

- DirectX (Only Windows and Xbox…. Not really)
- Metal (Apple)
- Vulkan (new)

Are you book worm?

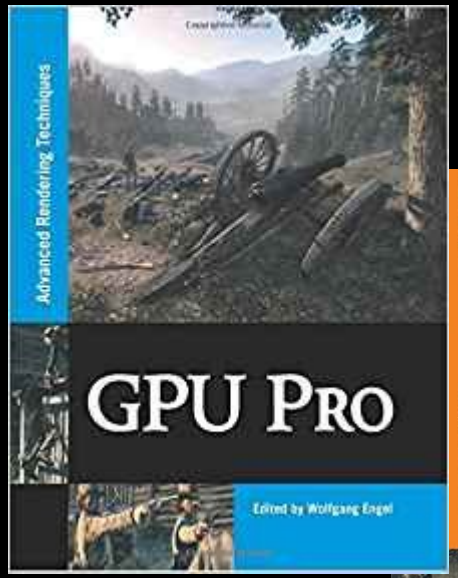
Beginner

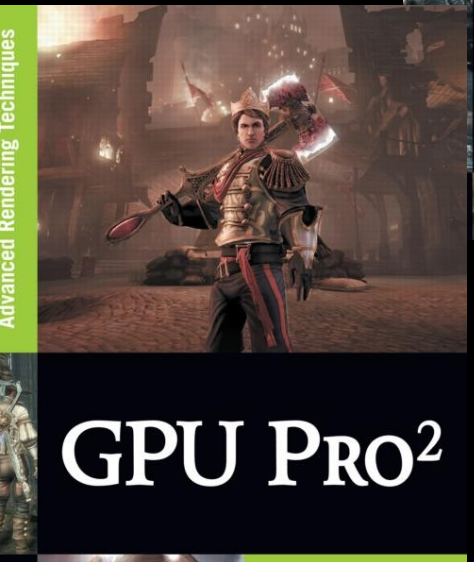


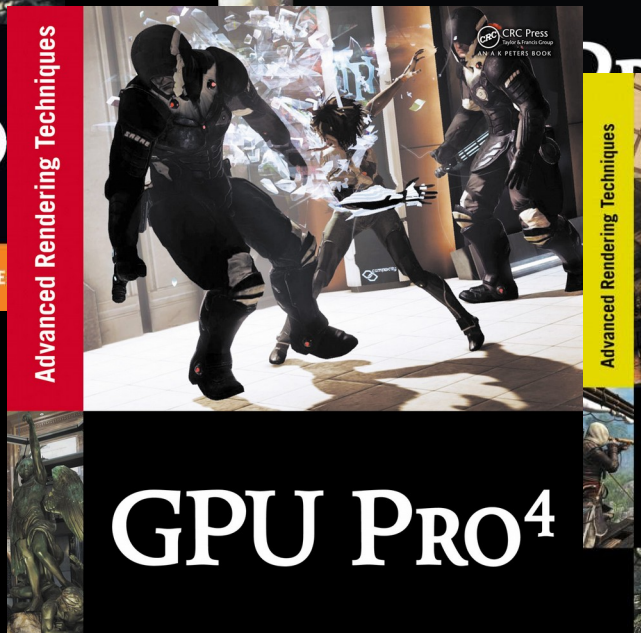


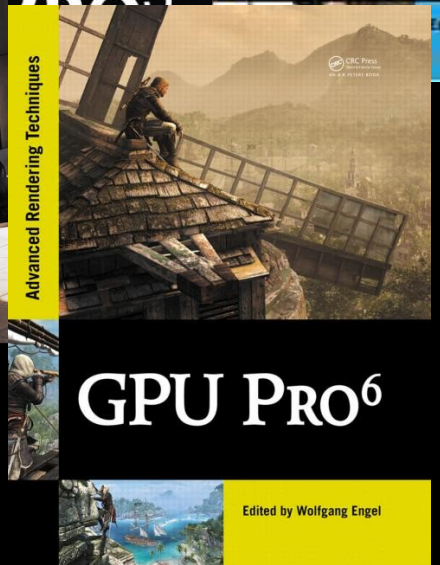
Are you book worm?

For Shaders!!

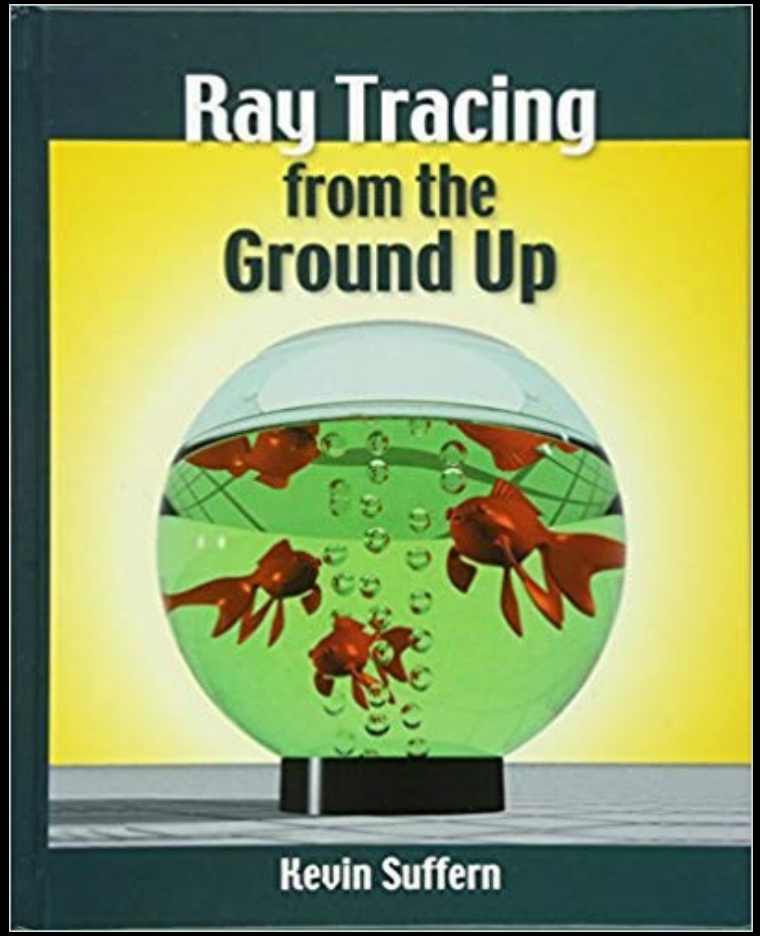




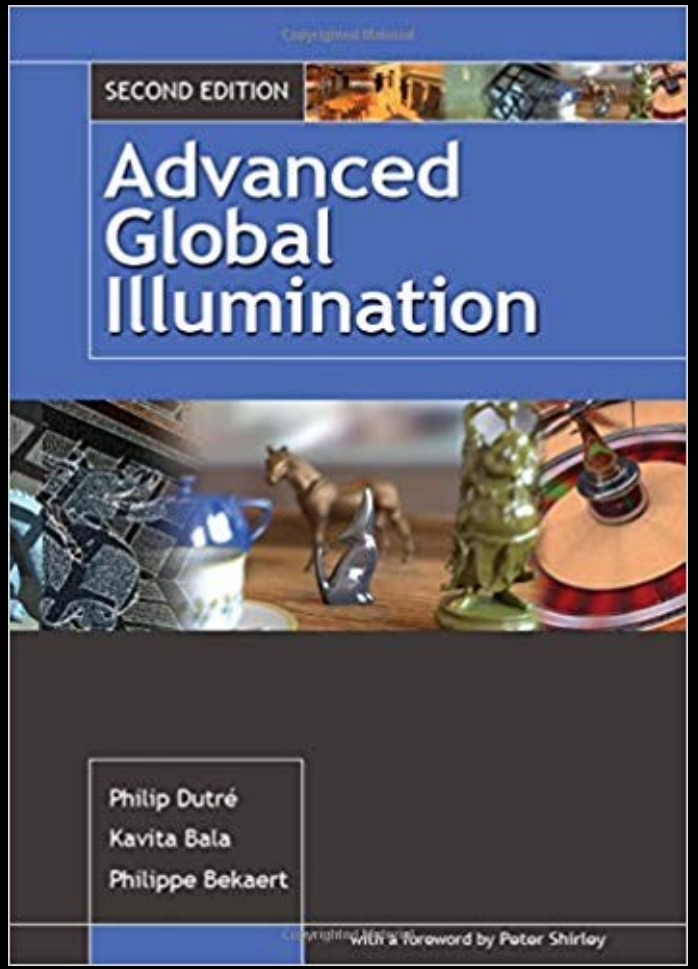




Are you book worm?



Advanced!!



We are …..

Thanks

Now go make some cool stuffs