Graham Wihlidal

Engineering Fellow (Graphics)

SUMMARY

Graham is an engineering fellow (graphics) developing Unreal Engine 5 at Epic Games.

📍 : **Edmonton, Canada**

📞 : **(780) 718-4503**

🏠 : **https://www.wihlidal.ca**

𝕏 : **gwihlidal** (https://twitter.com/gwihlidal)

in : **gwihlidal**
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f : **gwihlidal**
(https://www.facebook.com/gwihlidal)

Experience 💼

Jul 2019 – *present*

Engineering Fellow (Graphics) at Epic Games (https://www.unrealengine.com)

SUMMARY

Researching and developing next generation rendering techniques for Unreal Engine.

- Key developer on Nanite and other UE5 technologies
- Engine architecture and development
- Modern graphics abstraction
- Next generation rendering techniques
- Collaboration with IHVs and partners
- Technical leadership and coaching
- Active in recruitment and interviewing efforts

Jul 2016 – Jun 2019

Senior Rendering Engineer II at SEED, Electronic Arts (https://www.ea.com/seed)

SUMMARY

Developed forward-looking experiences and cutting-edge technology in the research group SEED at Electronic Arts.

- Implemented and architected significant components of Halcyon, SEED's R&D engine
- Cloud hosted microservices
- Real-time ray tracing
- Massive scene rendering
- Machine learning
- Procedural content generation
- Remote rendering and streaming
- Texture and mesh compression and transcoding
- Vulkan API collaboration with Khronos and IHVs
- Technical leadership and coaching
- Active in recruitment and interviewing efforts

Languages 💬

English : ★★★
French : ★☆☆
Swedish : ★☆☆

Jul 2013 – Jul 2016

Senior Rendering Engineer II at Frostbite, Electronic Arts (https://www.ea.com/frostbite)

SUMMARY

Worked on the rendering and low level engine technology, and provided direct features and support, for numerous titles.

- Significant role in transtion of EA and Frostbite to next generation consoles
- Implemented and architected significant components of Frostbite 3 on Xbox One and PlayStation 4
- Researched GPU driven pipelines, shader compilers, AMD GCN hardware tricks, culling, and 4k checkerboard
- Worked with many teams on Frostbite to develop and launch their titles
- Collaborated extensively with IHVs, Microsoft, Sony, and other partners
- Presented a number of significant technical contributions at a number of events
- Major contributor to AMD Mantle, Direct3D 12, and Vulkan
- Technical leadership and coaching
- Active in recruitment and interviewing efforts

Jun 2006 – Oct 2013

Senior Rendering Engineer at BioWare, Electronic Arts Inc. (https://www.ea.com/frostbite)

SUMMARY

In charge of a number of critical systems including multiplayer backends, 3D graphics\shaders, low-level platform optimization, and engine architecture.

- Significant role in transition of studio to Frostbite 3
- Architected custom SPU RHI for UE3
- Architected custom SPU GC for UE3
- Architected custom SPU animation for UE3
- Implemented custom SPU LZ4 decompressor
- Implemented SPU LZO shader microcode decompression and cache
- Implemented custom SPU policy module and compiler (vtable patching, staged pow2 lru dma cache, etc.)
- Implemented RSX transfer manager that moved animations, string tables, audio, rendering between host and local memory
- Extensive optimizations and improvements for UE3
- Ported internal Eclipse engine to PS3 and Xbox 360
- Extensive optimizations and improvements for Eclipse
- Extensive optimizations and improvements for HeroEngine
- Massively multiplayer game development - SWTOR
- Implemented custom VM for Scaleform GFx
- Content and code build systems
- Art tools & pipelines
- Multiplayer architect
- Technical leadership and coaching
- Active in recruitment and interviewing efforts

Skills 🔧

Languages :

HLSL GLSL PSSL C C++ Rust Python Assembly

Graphics :

Drivers DirectX 12 Vulkan Mantle SIMT DXR GNM AMD GCN Shaders Optimization Abstractions Image Quality

Game Development :

Technical Lead Certification Cross Platform PlayStation 3 PlayStation 4 Xbox 360 Xbox One Art Tools

Systems Programming :

Low Level Data Oriented Concurrency Allocators Networking & IO SIMD & Vectorization x86/x64/PPC Assembly Optimization Cross Platform Build Systems Content Pipelines

Infrastructure :

Kubernetes Docker Grafana Prometheus Terraform Google Cloud Helm gRPC Protobuf Jaeger

Interests ♥

Music :

Guitar Bass Trumpet Digital Mixing Recording

Snowboarding :

Scuba diving :

Sky diving :

Board games :

Apr 2005 – May 2006

Consultant & Partner at CGI Group (https://www.cgi.com)

SUMMARY

Developer on the APPRES project for Alberta Government Services. In charge of general
development and also the design and implementation of a custom reporting framework and
processing\rendering engine. Interacted both directly and indirectly with the client to assess
business needs and anticipate required functionality related to reporting. Also served as the
configuration manager on the project, and performed numerous tasks like the delivery of
integration baselines alongside development work. Was also in charge of keeping developer
machines operational and productive, including setting up new machines and source control
accounts (Rational ClearCase, ClearQuest, and Requisite Pro). Occasionally coached other
developers as required.

- Microsoft BizTalk
- Microsoft SQL Server
- Microsoft ASP.NET
- Microsoft SQL Reporting Services
- Rational ClearCase
- Rational ClearQuest
- Rational Rose
- Rational RequisitePro

Jul 2004 – Feb 2005

Lead Business Application Developer at eWorkflow Biz

SUMMARY

Lead developer of a workflow automation framework and application using C# .NET,
Windows Forms, ASP.NET, SQL Server 2000, Exchange API, and Windows SharePoint Services.
The workflow was modeled from the BPML specification (Business Process Modeling
Language).

- Microsoft ASP.NET
- Microsoft SQL Server
- Microsoft SharePoint
- Microsoft Exchange API

Dec 2002 – Feb 2004

Independent Consultant at InfoPath Service Assurance

SUMMARY

Large scale financial software in Java and also Microsoft .NET.

- Apache Tomcat
- Java Servlets
- Microsoft Jet
- Microsoft ASP.NET
- Microsoft WinForms

Apr 2001 – Apr 2003

Independent Consultant at Self-Employed

SUMMARY

Variety of database architecture, data analytics, Java, Perl and C/C++ application development.

- Apache Tomcat
- Java Servlets
- Oracle Forms 6i
- Oracle Database
- Microsoft SQL Server
- SQL Reporting Services
- Metrowerks PowerPlant

Education   🏛

Jan 2005 – Dec 2005

Professional Designations in Architecture and Engineering from Microsoft Certifications with GPA of

- Microsoft .NET 2.0 Early Adopter
- Microsoft Certified Professional
- Microsoft Certified Application Developer
- Microsoft Certified Solution Developer
- Microsoft Certified Database Administrator
- Microsoft Certified Solution Architect

Jan 2003 – Jan 2005

in Game Development Courses from Game Institute with GPA of

- Game Mathematics
- Artificial Intelligence for Game Developers
- Graphics Programming with DirectX 9
- Real-Time 3D Terrain Rendering
- Advanced 3D BSP, PVS and CSG Techniques

Mar 2002 – Feb 2004

Honours in Computer Systems Technology from Northern Alberta Institute of Technology with GPA of

Awards   🏆

Jan 2003

Jason Lang Scholarship Award from Alberta Heritage Scholarship Fund

SUMMARY

Awarded for outstanding academic achievement of Alberta post-secondary students.

Publications

Feb 2019

Ray Tracing Gems: High-Quality and Real-Time Rendering with DXR and Other APIs (http://www.realtimerendering.com/raytracinggems/) **by Apress**

SUMMARY

Chapter titled "Hybrid Rendering for Real-Time Ray Tracing"

May 2017

GPU Zen: Advanced Rendering Techniques (http://gpuzen.blogspot.com/) **by Black Cat Publishing**

SUMMARY

Chapter titled "Optimizing the Graphics Pipeline with Compute"

Oct 2014

Advanced Game Programming: A GameDev.net Collection (https://www.amazon.com/gp/product/1598638068/ref=dbs_a_def_rwt_hsch_vapi_taft_p1_i1) **by Course Technology Ptr**

SUMMARY

Article titled "Box Filtering Height Maps for Smooth Rolling Hills"

Apr 2006

Game Engine Toolset Development (https://www.amazon.com/Engine-Toolset-Development-Graham-Wihlidal/dp/1592009638) **by Course Technology Ptr**

SUMMARY

Game Engine Toolset Development provides you with a core set of skills and a comprehensive insight that will aid you in the development of game engine utilities, significantly reducing the time period associated with the construction phase of a project. The book starts off with topics regarding development methodologies and best practices, and then proceeds into advanced topics like swap chain management and MVC object model automation with CodeDom. The companion Web site provides downloads of all source code from the book, as well as several bonus chapters.