Jeremy Shopf

Experienced Rendering Engineer

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Stewartstown, PA, USA

EXPERIENCE

Zenimax Online Studios, Hunt Valley, MD — *Principal Graphics Programmer*

April 2020-July 2025

Core contributor to raytracing-first, in-house renderer for DX12 PC/XBOX. Key art and tools team collaborator and communicator.

Firaxis Games, Sparks, MD — *Lead/Principal Graphics Programmer*

April 2009-April 2020

Developed rendering and engine technology across multiple engines (UE3/UE4/CivTech) for XCOM and Civilization franchises. Served as Lead Graphics Programmer on several shipped products (XCOM: Enemy Unknown, XCOM: Enemy Within, XCOM 2, XCOM: Chimera Squad) across PC and console platforms.

Advanced Micro Devices, Marlborough, MA — *Senior Software Engineer*

August 2006 - April 2009

Worked on both the Demo Team and Research team developing novel rendering techniques and real-time demos for new hardware. Authoring and delivering presentations at industry events. Maintaining and extending internal multi-API demo engine.

SKILLS

- **C++, DirectX 12, HLSL, GLSL**
- Proficient in graphics profiling and optimization (**PIX, Nsight, RenderDoc, Radeon GPU Analyzer**)
- Proven communicator with invited speaking engagements (**GDC, SIGGRAPH, I3D**) and publications (ShaderX/GPU Pro articles, academic journals)
- Current with recent graphics algorithms and techniques
- Extensive experience translating technical information to non-technical teammates through presentations and documentation
- Self-motivated, responsible, highly collaborative, quick to learn, and adaptable
- Familiarity with art tools: **Photoshop, Houdini, Substance Designer/Painter, Marmoset Toolbag**

EDUCATION

University of Maryland Baltimore County, Baltimore, MD — *M.S. Computer Science*

Sept 2004 - April 2007

Master's Thesis: Interactive Rendering of Heterogeneous Translucent Objects

Millersville University, Lancaster, PA — *B.S. Computer Science*

September 2000 - June 2004

SELECTED PROJECTS

Unreleased MMO — Principal Graphics Engineer, Proprietary engine (4/20-7/25)

- Core contributor to new, internal DX12 SM6.6+ renderer for PC and XBOX Series X/S
- Implemented real-time, raytraced Global Illumination system for large open-world environments
- Technical owner of materials (shaders, pipelines, and related systems)
- Key art team collaborator and communicator
- Geometry processing tools (tangent generation, decal processing, vertex welding, etc.)
- Developed multiple additional graphics features: GPU-Driven Scene Management, Geometry and Projected Decals, RT Materials, Octahedral Screen Probe AO

Civilization 6 — Graphics Programmer, Proprietary CivTech engine (8/15-10/16)

- Implemented DX12 rendering backend: parallel command list generation, automatic resource barrier generation, buffer resource management
- Developed multiple graphics features: dynamic lighting system, terrain ambient occlusion, coastal wave system, particle system lighting and translucency shadow casting, screen-space water refraction, terrain bounce lighting

XCOM 2 — Lead Graphics Programmer, UE3 (8/14-8/15)

- Complete renderer pipeline overhaul including transition to deferred shading, DX11, physically-based shading and corresponding asset pipeline changes
- Implemented rendering features such as SSAO, screen-space reflections, image-based lighting, dynamic translucency lighting, cloth shading, area lights, bokeh depth of field

XCOM: Enemy Unknown — Lead Graphics Programmer, UE3 (4/09-10/13)

- Established performance and asset budgets and worked with art team to achieve them across all platforms (PC, XBOX360, PS3)
- Graphics systems: Dynamic 3D Fog of War, occluder hiding system, building/material destruction
- Extended rendering API to support 3D textures, vertex texture fetch, and others
- Weather system with dynamic rain collision and splash generation

XCOM: Chimera Squad — Lead Graphics Programmer, UE4 (04/18-04/20)

- Progressive multi-layer destruction material system
- Multi-threaded visibility determination
- Temporal AA implementation
- Dynamic shadow map caching

Unreleased Project "Pez"— Lead Graphics Programmer, UE4 (10/16-03/18)

- Established bespoke geometry pipeline including automatic optimization
- Facial animation system
- Procedural terrain generation using Wave Function Collapse