Matthew Bieda
Graphics Programmer | Vulkan / OpenGL / Unreal Engine

Personal Website / GitHub / ArtStation
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Technical skills & Certifications

Graphics & Game Dev: Vulkan, OpenGL, WebGPU, GLSL/HLSL, Unreal Engine
Programming Languages: C++, C, C#, Python, JavaScript/TypeScript, Go
Tools: Visual Studio, Git, CMake, RenderDoc, Nvidia Nsight, Blender, Substance Painter, Lys, Cakewalk, GIMP

DevOps: Kubernetes, Azure, AWS, Terraform, Ansible, GitHub Actions, Docker, Linux/Bash
Certifications: AZ-900, AZ-104, AZ-204, CKA
Languages: English (Native), Japanese (Fluent), Polish (Beginner)

Graphics / Game Projects

VKEngine - Vulkan Game Engine (C++ 20)

A modern Vulkan-based engine built from scratch using advanced optimization techniques and modern GPU features.

- Bindless texture system using descriptor indexing, supports 1000+ textures without rebinding.
- CPU-driven rendering pipeline: Frustum culling with AABBs, per-mesh instanced rendering, and material-based batching with index buffer merging. This system minimizes pipeline state changes and the number of draw calls needed.
- Dual-level AABB system - coarse mesh-level bounds for visibility culling, fine submesh-level bounds for collision detection.
- Industry-standard normal mapping using MikkTSpace tangent calculations during model loading.
- Blinn-Phong dynamic lighting (Directional/Point), environment mapping with Fresnel reflections, transparency (alpha test/blend).
- 3D spatial audio (SoLoud), skybox rendering, MSAA, mipmap generation & robust swapchain recreation.
- ImGui editor allows real-time editing of dynamic pipeline state and scene parameters.
- Configured RenderDoc/Nsight debugging information with GPU labels and object naming via VK_EXT_debug_utils.
- Leverages modern Vulkan features: Dynamic Rendering, Descriptor Indexing, Dynamic SSBOs with per-frame offsets

(*In Progress*: Cascaded shadowmaps, FastGLTF integration, PBR + IBL, skeletal animation, tiled deferred rendering)

OGLRenderer - Physically Based OpenGL Renderer (C++ 17)

- Implemented Phong -> Cook-Torrance PBR pipeline with metallic-roughness workflow, HDR rendering, tone mapping and gamma correction.
- Added Image Based Lighting via precomputed irradiance maps, environment prefiltering and BRDF LUT integration.
- Normal mapping, PCF Shadow maps, instanced rendering demonstrated with Crytek Sponza scene.
- Integrated ImGui editor with dynamic scene construction, add/remove objects & lights with automatic instancing, and edit object transforms and light properties directly in the engine.
- Skybox rendering, gamepad support, CMake build system, MSAA and multi-resolution support including borderless/exclusive fullscreen.

GraphVis - JavaScript and C++

An interactive tool for visualizing graph algorithms such as Dijkstra's, A*, Bellman-Ford, Prim's, and Kruskal's. It offers step-by-step demonstrations to make complex algorithms easy to understand and intuitive, helping users grasp how they work in real-time.

Software Ray-Tracer - C++ / CPU Path Tracer

Implemented BVH acceleration, reflections and materials based on *Ray Tracing in One Weekend*.

Professional Experience

Insight Enterprises(EMEA): Site Reliability Engineer (December 2023 - November 2024)

- Deployed Azure Red Hat OpenShift (ARO) cluster via Infrastructure-as-code (Azure Bicep).
- Migrated internal web apps to containers with Kubernetes, GitHub Actions, and ACR.
- Built PowerShell automations for Azure Entra ID and Graph API, improving developer workflows.
- Created CI/CD pipelines and automations supporting multi-team reliability.

Phlexglobal(AmerisourceBergen): Site Reliability Engineer (June 2023 - November 2023)

- Enhanced observability with New Relic GraphQL API, cutting downtime alerts during maintenance.
- Automated Kubernetes deployments and optimized compute cost using AI-driven scaling tools
- Resolved distributed-systems issues (RabbitMQ, Redis, AKS), stabilizing production workloads

Insight Enterprises(EMEA): Site Reliability Engineer (June 2022 - June 2023)

- Developed automations with Ansible, Terraform, and GitHub Actions to manage Azure environments.
- Built an internal secret-sharing web app that was widely used within the organization

The Software Institute: Cloud Engineer (April - June 2022)

- Completed a 3-month intensive DevOps training course covering cloud infrastructure, CI/CD and professional client interactions.

FCI Multiple Services (United States): Technical Translator (December 2019 – September 2020)

- Produced accurate technical and legal translations under strict deadlines from Japanese to English.

Education

Queen Mary University of London - MSc Computing and Information Systems (Distinction - 80%)
Dissertation title: Refining the state-of-the-art in Machine Translation, optimizing NMT for the JA <-> EN language pair by leveraging personal domain expertise.

University of Sheffield - BA Japanese Studies (2.1 Honours)
Including exchange year at Seijo University (Tokyo, Japan)
Dissertation title: Re-evaluating the role of Industrial Policy in Japan's "Economic Miracle" 1955-1973

Harvard University - CS50 Series (Computer Science, Web, Mobile Development)
Stanford University - CS106A Code In Place (Python Programming):
Final Project (Space Invaders game): https://compedu.stanford.edu/codeinplace/public/projects/0135.html