

# MATTHEW DIBBLE

Highly motivated and passionate graphics engineer with 3+ years AAA experience

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## SKILLS

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Languages	C++, Rust, C, HLSL, Slang, Python, Lua, C#
Tech	DX12, Agc, Vulkan, Metal, PIX, Razor GPU, NSIGHT, RenderDoc, Visual Studio, Perforce, Git
Skillset	Ray tracing, GPU debugging & profiling, multithreaded programming, large codebases
Platforms	PS5, XB4, Windows, macOS

## EXPERIENCE

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<b>Activision</b> Software Engineer, Graphics	September 2022 - Present <i>Toronto, Canada</i>
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- Improving Call of Duty's internal tools renderer that powers editing and baking workflows
- Integrating **real time ray tracing** to the renderer (path tracing, reflections, and ambient occlusion modes)
- Added **volumetric lighting**, screen space shadows/reflection/refraction, GTAO, and subsurface scattering
- Revised post processing pipeline by adding **DLSS**, SMAA, ACES 2.0, DoF, and temporal accumulation
- Transitioned the renderer to a **bindless architecture** for materials and geometry, as needed by ray tracing
- Converted the renderer to use a **render graph** to automate dependency and barrier management
- Developed a suite of **HLSL shaders** to **visualize performance metrics** directly within the game's editor
- Implemented an **API** for creating prefab derivatives, **accelerating the creation process** for certain assets
- **Refactored** the editor's **entity filtration system** to offer better **performance** and usability in large maps
- Games: *Call of Duty: Modern Warfare III*, *Call of Duty: Black Ops 6*, *Call of Duty: Black Ops 7*

<b>BlackBerry</b> Software Engineer Intern	September 2021 - December 2021 <i>Waterloo, Canada</i>
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- Developed a flexible metric collection framework using **Rust**, also implementing a **C** interface via bindings
- Enhanced threat-detection software by developing a **metadata parser** that aggregates crucial information
- Implemented **HTTP/2** support in a component of software allowing for a **15% decrease** in request times

## PROJECTS

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<b>Real-time Physically Based Renderer</b> — C++, Metal, Vulkan	<a href="#">Source</a>
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- Scalable PBR renderer built from the ground up containing backends for **Metal and Vulkan**
- Includes support for TAA, bloom, soft shadows (PCSS), auto-exposure, tonemapping, and HDR rendering

<b>Nintendo Entertainment System (NES) Emulator</b> — Rust, SDL2	<a href="#">Source</a>
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- Cycle-accurate emulator of the *NES* that takes advantage of **Rust**'s unique properties
- Degree of accuracy allows for play of *Super Mario Bros.*, *The Legend of Zelda*, and much more

## EDUCATION

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<b>Bachelor of Science in Computer Science</b> , Wilfrid Laurier University	September 2018 - August 2023
<b>Bachelor of Business Administration</b> , Wilfrid Laurier University	<i>Waterloo, Canada</i>

- Dual Degree — 3.9/4.0 GPA
- Teaching Assistant & Grader, Data Structures II