Oliver Clarke

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Education

University of Manitoba Sep. 2022 – Present
Bachelor of Science in Computer Engineering *Anticipated Graduation: 04/28*
GPA: **4.11** (President's Scholars Society) Winnipeg, MB

Experience

Software Engineer Intern May 2025 – August 2026
Advanced Micro Devices (AMD) *Markham, ON*

- Develop C++ **DirectX 12** user-mode driver features for next generation RDNA and MI400 GPU ASICs, with a focus on major areas like Graphics and Compute pipelines, GPU memory management, and synchronization.
- Work with kernel **WDDM** team to debug and resolve performance issues throughout the Windows graphics stack
- Use and contribute to the internal **C++** platform abstraction layer library, improving support for RDNA
- Collaborate with IP teams to investigate driver and hardware mismatches, debug integration issues, and validate driver behavior against new ASIC functionality
- Trace performance regressions using Radeon Graphics Profiler for next generation ASICs, in one case resolving a **50% regression** due to a bug in DCC Texture Barriers

Junior Software Engineer December 2022 – February 2025
Birchwood Automotive Group *Winnipeg, MB*

- Built a custom **CSS compiler** that was **10x** faster than alternative solutions, and provided ergonomic developer features such as namespacing, a preprocessor system, and composability primitives.
- Lead a major refactor from an internal PHP framework to **Laravel** for better developer productivity and familiarity
- Develop and maintain **full-stack** web applications using PHP, JavaScript, MySQL, and Docker for internal information sharing and collaborating information (ERP)
- Maintained the internal PHP web framework, fixing vulnerabilities and adding housekeeping features to make developer's lives easier
- Extensively used the **Agile** management methodology supported by Jira, Bitbucket and git

Projects

Custom Language Compiler | *C, Parsing, LLVM, Semantic Analysis* | GitHub May 2025 - August 2026

- Compiler for a C-like language with modern and ergonomic features. Main focus is compile-time evaluation
- Uses **data oriented** principles for instant compilation times, minimizing developer turnaround time
- Implemented a lightweight **x86_64** backend to speed up developer iteration, compared to the **LLVM** backend
- Sophisticated dependency system, allowing order independent code and **compile time evaluation** of bytecode
- Constructed an **LSP** for smooth IDE integration to increase developer experience (DX)

Custom Text Editor | *Zig, Text Editing, VIM, Data Structures* | GitHub May 2026 - Present

- Built a text editor based on VIM, using **data oriented** concepts for efficient text editing
- Implements a paged **Rope** data structure for efficient text manipulation in large files (>**1 Million** lines)
- Uses **DirectX** for smooth GUI rendering, and enabling custom shader effects

Wayland Compositor | *Linux, DRM, Rendering* May 2025 - October 2025

- Implement a C++ display server and window manager using the **Wayland** protocol for a frame-perfect desktop
- Built everything from scratch including a wayland protcol XML scanner, the network stack using *io_uring* for asynchronous client communication, DRM swapchain rendering and presentation, etc.
- Work closely with the Linux graphics stack: DRM, EGL/GBM/MESA, and dissect GPU driver source code (AMDGPU)
- Use the Linux **DBUS** system to drive communication with desktop elements such as the taskbar, window properties, and compositor configuration

Technical Skills

Languages and Technologies: C, C++, Rust, Verilog, Valgrind, DirectX, DRM, x86-64, ARM64, Git, Atlassian Products
Operating Systems:

- Linux (have programmed simple device driver, familiar with overall kernel and user structure)
- Windows (Win32 app development, WDDM driver development)