

## SUMMARY

Software Engineer with 8+ years creating high-performance applications for automotive, aerospace, and games industries. Specialized in C++ & C# development, game engines (Unreal/Unity/Godot), and XR technologies. Currently optimizing vehicle avatar rendering for HMI systems at Ford Motors while teaching advanced game programming at Algonquin College.

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## SKILLS

### Languages:

*Proficient In:* C++, C#, GDScript, GLSL, HLSL, Python, SQL, Kotlin, Java

*Experience With:* C, JavaScript, TypeScript,

### Tools:

*Proficient With:* Visual Studio, Visual Studio Code, UML, Unity Engine, Unreal Engine, Godot, Raylib, Git, Android Studio, Android, Jira, Claude Code, Gemini CLI, ChatGPT Codex

*Experience With:* Perforce, Docker, QT, Node.JS, CUDA, DOTS, Gradle, Robolectric, Junit, Nunit, Jenkins, SonarQube

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## EXPERIENCE

### Ford Motor Company - Sync Tech Canada (EV Digital & Design)

*Unreal Engine Developer - Ottawa ON*

*April 2023 to Present*

- Entrusted to lead development and maintenance of 3D vehicle avatar rendering system for PHX Ford/Lincoln HMIs, supporting 15+ vehicle models across Android Automotive OS dashboard implementations
- Optimized Unreal Engine initialization sequence, reducing cold-start presentation delay by 92.75% (5250ms to 250ms) through asset streaming improvements and render thread optimization
- Architected bi-directional messaging protocol between Android (Kotlin) and Unreal Engine layers, enabling real-time vehicle state visualization and user interaction response
- Integrated Unreal Engine projects with Android using Epic's MakeAAR build system, packaging vehicle renderer as Android Archive (AAR) library for embedded "Unreal-as-a-Service" architecture within Android Automotive OS
- Successfully migrated entire Unreal Engine codebase from 4.25 to 4.27 to 5.6, resolving version-specific rendering issues and maintaining backwards compatibility with existing vehicle programs
- Automated AAR build pipeline through custom scripts, orchestrating Epic's MakeAAR toolchain and managing artifact deployment to appropriate Android project locations
- Collaborated with Epic Games engineering team to resolve proprietary Android Automotive integration bugs, participating in technical deep-dives on render target handling and EGL context management
- Extended avatar system functionality including dynamic camera systems (360° orbital, interior views, detail zoom), lighting adaptation based on time-of-day, and vehicle customization rendering
- Refactored Android-Unreal integration library, implementing JNI optimization techniques and reducing message passing latency by 60% while maintaining thread safety
- Configured MakeAAR project settings for automotive constraints, optimizing memory footprint and startup performance for Unreal Engine running as background Android service
- Implemented new vehicle programs for upcoming Ford/Lincoln models, including mesh optimization, LOD configuration, and material setup for real-time rendering on embedded hardware
- Developed comprehensive CI/CD pipeline using GitHub Actions for cross-repository builds, automated testing, and deployment validation across multiple vehicle platforms
- Created and maintained high-traffic internal tooling repositories and documentation wikis used by 200,000+ Ford employees globally for build automation and development workflows
- Authored Bash/Python automation scripts for complex build processes, reducing manual deployment time from hours to minutes and eliminating human error in production releases
- Implemented telemetry collection and visualization system for vehicle HMI performance metrics, processing analytics from global Ford fleet for performance optimization insights
- Performed root cause analysis and post-mortem investigations for production issues, documenting findings and implementing preventive measures across the codebase

- Established coding standards and architectural patterns for Android-Unreal integration, improving code maintainability and reducing onboarding time for new developers
- Mentored co-op students and junior developers through hands-on training, code reviews, and development of comprehensive onboarding documentation
- Conducted performance profiling and optimization across both Android and Unreal layers, achieving consistent 60fps rendering on target automotive hardware
- Managed proprietary software deployments to vehicle test benches and performed validation testing on production hardware configurations

### **Algonquin College - Educators**

*Instructor of High Level Development & Professor of Advanced Game Programming - Ottawa ON*

*September 2023 to September 2025*

- Instructed senior students in advanced C++ and Unreal Engine, focusing on complex game designs and multiplayer game implementation through rapid prototyping.
- Developed a 3D voxel game on top of Raylib to teach students core concepts of data structures, algorithms and threading.
- Taught networking fundamentals, including Internet architecture and third-party networking tiers, as they relate to game programming.
- Guided multidisciplinary teams through the entire game development lifecycle in Capstone projects, simulating industry practices from concept to completion.
- Facilitated in-depth analyses of game engine components, including main game loops, rendering engines, physics engines, and AI systems.
- Emphasized cross-platform development, focusing on porting techniques and platform-specific optimizations.
- Instructed on crucial software engineering practices including performance optimization, stress testing, unit testing, and effective bug reporting and fixing.
- Led AGILE Scrum meetings, reinforcing the importance of game development pipelines, workflows, and best practices in a team environment.
- Fostered a collaborative learning environment, emphasizing constructive peer review and effective group work dynamics.
- Regularly assessed complex C++ and Unreal Engine projects, providing detailed feedback to enhance students' technical skills and project outcomes.
- Developed and designed intermediate to advanced C++ usage concepts and programming patterns.
- Developed and delivered 800 slides, 6 assignments and 2 projects covering modern relevant programming topics.
- Worked extensively with Unreal Engine 5.3, Unity 2022, Raylib, modern C++ and C# to develop solid teaching material.
- Collaborated with students to improve legacy educational material with topics they were interested in while also aligning with current popular hiring topics.

### **Leia Inc. - Software Engineering**

*Unity SDK Software Engineer - Menlo Park CA*

*July 2022 to July 2023*

- Architected and implemented Unity plugin integrating proprietary C++/C lightfield display library across multiple rendering APIs (Vulkan, DirectX 11/12, OpenGL/Metal), achieving universal RHI compatibility for 3D displays
- Developed render pipeline interception system that hooks into Unity's native rendering path, extracting framebuffer data pre-presentation for real-time lightfield interlacing processing
- Achieved 5x performance improvement over previous SDK iteration by optimizing memory management, eliminating redundant buffer copies, and implementing asynchronous GPU-CPU data transfers
- Designed backwards-compatible SDK architecture with legacy API preservation, enabling existing developer clients to migrate with zero code changes while accessing new performance benefits
- Implemented cross-platform render target normalization layer to handle format disparities between graphics APIs (RGBA/BGRA, linear/sRGB, HDR formats)
- Created efficient P/Invoke marshalling layer between managed C# and unmanaged C++ code, minimizing interop overhead through strategic caching of function pointers and pinned memory buffers

- Integrated proprietary lightfield algorithms processing stereoscopic 60fps content in real-time on mobile/tablet hardware with locked-16.67ms frame times
- Built comprehensive Unity Package Manager distribution including automated setup, platform detection, and fallback rendering modes for unsupported hardware
- Developed render texture capture system compatible with Unity's Universal Render Pipeline (URP), High Definition Render Pipeline (HDRP), and Built-in Render Pipeline
- Implemented thread-safe command buffer injection for GPU-side processing, maintaining Unity's multi-threaded rendering architecture integrity
- Created developer-facing API with extensive documentation, sample projects, and integration guides reducing client onboarding time from days to hours
- Supported enterprise clients including General Motors, GameLoft, Hewlett-Packard, and Continental AG through technical integration assistance and custom feature development
- Presented technical demonstrations at CES 2023 and AWE USA, explaining lightfield display technology to developers, investors, and potential partners
- Participated in technical interviews for engineering candidates, assessing C++ and graphics programming expertise
- Performed code reviews focusing on performance optimization, memory management, and graphics API best practices

### **CAE (Canadian Aviation Electronics) - Simfinity Trax**

*VR/AR Specialist Consultant - Montreal QC*

*August 2021 to August 2022*

- Leveraged UltraLeap's hand tracking technologies to implement gesture-based interactions.
- Designed and implemented flexible networked XR pilot avatar with IK driven movements.
- Networked a solution for handling multiple pilot/copilot pairs.
- Implemented high fidelity hand tracking using Ultraleap technologies.
- Leveraged OpenXR via Varjo hardware to deliver a simulation quality body presence system.
- Implemented, designed, and assessed various body proportion systems for intelligent pilot scaling.
- Delivered presentations of new systems to audiences of 100+ people.
- Translated concepts and ideas into interactable real-time systems.
- Used OOP principles to design tools that are cohesive for designers & other team members to use or configure.
- Recipient of "Diligence & Integrity" award for guaranteeing TRAX demo success at I/ITSEC
- Recipient of "Success & Collaboration" award for internally presenting technologies developed/utilized for VR sim avatar pilots to 500+ engineers.
- Worked in a hybrid position with both in-person and remote work assignments.
- Translated UNIX GCC bound C & C++ code to modern MSVCv142 compilable code.
- Backported existing code to earlier (C++11/MSVC v110) compatible code to facilitate deployment targets.
- Adapted an open-source, multi-threaded KCP networking stack to create a client and server solution tailored for continuous "big data" transmission across multiple simultaneous clients.

### **Department of National Defence Canada - MCSC HRMS**

*Full Stack Developer Consultant - Ottawa ON*

*September 2020 to September 2021*

- Contributed to all parts of a Win32-based HRMS application, from backend database design to frontend MFC client features.
- Designed and implemented new functionality to support evolving HR requirements, ensuring changes fit seamlessly into existing workflows.
- Optimized PL/SQL database functions to improve query performance and reduce system load.
- Reworked existing features and fixed long-standing issues, improving system stability and reducing support overhead.
- Built and refined client-side functionality in C++ with Microsoft MFC, improving usability and data access for end users.
- Collaborated with users and analysts to translate requirements into practical solutions and implement them efficiently.

- Developed and ran thorough test cases to validate new features, bug fixes, and database changes before deployment.
- Created and maintained data models in PL/SQL (via SQL Navigator) to support HR processes and reporting needs.

### **Algonquin College Simulations Lab (ACSL) / Canadian Aviation and Space Museum (CASM)**

*Lead Programmer - Ottawa ON*

*May 2019 to July 2020*

- Used C++, C#, and MS Visual Studio to develop various application prototypes and tools.
- Using a SCRUM framework, led a strong and collaborative VR programming team that met all project goals through effective communication and conflict resolution.
- Designed programs and diagrams that included mathematical equations and sequence of operations to ensure consistent and successfully executed code.
- Leveraged expansive codebases from previous teams to create new tools and maintain cohesion with modern technologies.
- Presented VR technology demonstrations at CASM and Ingenium Science & Tech Museum on a regular basis. Coordinated all demo coordination.
- Developed game and tool prototypes with XR technologies (AR, VR) using C# and Unity.
- Translated UML designs into code and confirmed results with the team during the QA process.
- Developed, designed, and produced diagrammatic team plans that simplified technical problems for game systems of significant computational complexity and storage requirements.
- Created a collaborative agile environment, leading a programming team to meet project goals through effective communication and conflict resolution.
- Collected user/system requirements, extensively designed, and documented the User Interface (UI/UX), cross-platform networking, and core game systems via UML and modules.
- Functioned as the resident rendering pipeline specialist for Unity's SRP (then URP).
- Managed, implemented, and performed, using created test cases, system/unit testing and verification of all code produced by the team ensuring quality assurance.
- Consulted with users to collect and document system and assistive requirements.
- Analyzed, designed, and documented the software game system using standard UML.
- Programmed, modified, integrated, and evaluated game software using vector mathematics and all aspects of network communications including controller devices.

### **RHEA Inc.**

*IT Generalist, Junior Software Programmer - Ottawa ON*

*December 2016 to December 2018*

- Designed and documented conceptual, logical, and physical data models for rapidPHIRE using UML.
- Supported rapidPHIRE beta software development of a two-tiered client-server architecture using Oracle PL/SQL and C++ with MS Visual Studio.
- Assisted in data migration and integration to Cassandra big database architecture for the final rapidPHIRE commercial release.
- Participated in Agile software development (SCRUM) to plan, track, and deliver rapidPHIRE product features.
- Collaborated with cross-functional teams to implement software enhancements and integrate database-driven solutions.
- Provided IT generalist support by configuring and maintaining essential infrastructure components (firewalls, routers, switches) in smaller-scale deployments.

### **Phirelight Security Solutions Inc.**

*Network Security Analyst, IT Support - Ottawa ON*

*January 2014 to December 2016*

- Implemented, configured, and maintained enterprise infrastructure components including Fortigate firewalls, Cisco Catalyst switches, and Cisco routers.
- Monitored, remediated, and optimized network and security issues across a heterogeneous operational environment.
- Coordinated customer support services to a global clientele, ensuring timely response and resolution of IT incidents.

- Assisted the technical support team with troubleshooting complex networking and security problems to resolution.
- Deployed and supported rapidPHIRE network security product releases in collaboration with senior management, project managers, and consultants.
- Contributed to early-stage testing of rapidPHIRE's network traffic analytics platform to validate performance and stability before broader rollout.

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## EDUCATION

**Advanced Diploma  
Game Development**  
*Algonquin College, Ottawa ON*

**Bachelor  
IT - Network Technology**  
*Carleton University, Ottawa ON*

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## REFERENCES

**Joseph Lang**  
*Unity SDK Engineering Manager  
Leia Inc.*  
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