JASON ERB

Senior Software Developer & Architect

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# SUMMARY

Over 25 years of professional experience delivering desktop/mobile/embedded/web software in a wide range of platforms/languages/technologies/domains, including robotics, geospatial analysis, brain-computer interfaces, and distributed computing. Creator of the [Om programming language](https://www.om-language.com).

# SPECIALTIES

Modern C++ (over 22 years, along with STL, Boost, Qt/QtQuick/QML, and others), C, CMake/CPack/CTest, JavaScript, internationalization, creative problem solving and complexity elimination, elegant architecture/code/UI design, and fast proficiency in whatever is required to ship a high-quality product.

# EXPERIENCE

## Distributive

### Senior Software Developer (Contract)

##### August 2019 - September 2024 Kingston, Ontario, Canada

* Architected, developed, and owned [DCP Native](https://gitlab.com/Distributed-Compute-Protocol/dcp-native), the native layer of the Distributive Compute Protocol, enabling users to install/configure/run workers for a distributed computer on x64/arm64 variants of Ubuntu, MacOS, Windows, and Docker (via multi-architecture image)
* Designed and implemented a cross-platform, multithreaded, multiprocess, socket-based native V8-embedded JavaScript evaluation server with WebGPU capabilities
* Created a Windows screensaver that performed distributed work, accompanied by a graphical configuration application
* Managed DCP Native releases: implemented a CI process that built and deployed graphical installers and containers to alpha/beta/release channels for manual/automatic download on all platforms
* Mentored junior developers, pair-programmed, and reviewed code
* **Used:** C++, CMake, CPack, CTest, Google V8, Google Dawn, Google Omaha, Node API, JavaScript, WiX Toolset, Win32 API, Bash, Batch Script, Sockets, Linux, Windows, MacOS, Docker, GitLab CI
* **Contributed to:** Google Dawn, Google Omaha, Google V8, Uncrustify

## Suitable Technologies

### Senior Software Developer (Contract)

##### May 2013 - January 2020 Palo Alto, California, United States (Remote)

* As the first hire after spin-off from Willow Garage, worked on the team responsible for both embedded on-device software and user-facing pilot software for the acclaimed Beam remote presence robot
* Played a key role in porting pilot software to iOS and Android, including successfully designing and implementing a mobile driving paradigm and UI that achieved both safety and usability
* Took the lead in the addition of a high-definition point/tilt/zoom camera and laser pointer: delegated tasks, collaborated on the design, and wrote supporting code
* Internationalized software (including right-to-left language support), instituted coding guidelines for internationalization best practices, and coordinated with translators
* Designed and implemented a network diagnostics tool and accompanying UI, and took code ownership of the pseudo-TCP implementation and relay-related code
* Fixed bugs, wrote unit tests, reviewed code, conducted job interviews, and did whatever else needed
* **Used:** C++, CMake, Qt, QtQuick, QML, Python, Linux, Windows, MacOS, Android, iOS, Objective-C++
* **Contributed to:** Qt

## PrintFleet Inc.

### Senior Software Developer

##### July 2012 - May 2013 Kingston, Ontario, Canada

* Worked on the software team developing an asset management web software suite
* Internationalized the software: implemented automated text extraction and run-time translation lookup, coordinated with translators, and integrated localizations
* Redesigned and rewrote the core distributed scheduling architecture for device notifications
* Designed and implemented a significant portion of the public REST API
* **Used:** ASP, ASP.NET, C#, SQL, JavaScript, HTML, CSS, Windows

## Endetec (Veolia Water Solutions & Technologies North America)

### Software Developer

##### March 2011 - July 2012 Kingston, Ontario, Canada

* Constituted half of the software team developing embedded software for a touch-screen water-testing device, taking it through the first several production releases
* Internationalized the software: switched strings to Unicode, localized date/time formats, and automated string extraction/substitution
* Implemented a touch-screen keyboard with configurable layouts (including Korean, requiring learning the Hangul alphabet and all combining character logic)
* Added HTML reporting, implemented as XSLT transforms on XML data
* Fixed all resource leaks
* **Used:** C++, CMake, Boost, Python, XML, XSLT, HTML, CSS, wxWidgets, Linux
* **Contributed to:** Boost, CMake, wxWidgets

## PYXIS Innovation

### Software Developer

##### September 2006 - October 2008, September 2009 - January 2011 Kingston, Ontario, Canada

* Worked on the team developing a geospatial grid technology, browser, and SDK
* Co-wrote the core of a peer-to-peer geospatial data sharing service
* Fixed memory usage bugs when marshalling between managed and unmanaged code
* Reduced large dataset import time from minutes to seconds, and added point feature dataset support
* Coined the "WorldView" product name and metaphor
* **Used:** C++, Boost, C#, SWIG, Windows

## Dunne and Associates

### Senior Software Developer

##### November 2008 - September 2009 Kingston, Ontario, Canada

* Architected and implemented a neurofeedback training software system
* Developed networked games for the system, controlled by the brain via real-time EEG and EMG data
* Composed and recorded in-game music
* **Used:** C++, Boost, TTL SDKs, MFC, C#, XNA, WCF, Lidgren, ActionScript, Windows, Xbox

## Hummingbird

### Software Developer

##### April 2002 - September 2006 Kingston, Ontario, Canada

* Worked on the software team for a BI reporting product
* Implemented a multi-dimensional OLAP reporting and interaction feature
* Maintained a large part of the code, including user interface design and implementation
* **Used:** C++, MFC, OLAP, Windows

## Hilton Consulting Group

### Software Developer (Team Lead), Product Development Manager, Software Tester

##### September 1998 - April 2002 Kingston, Ontario, Canada

* Managed a team of developers: trained members, assigned tasks, instituted coding/usability standards, and oversaw application modifications
* Designed and developed a commercial, web-based multi-dimensional data source browser and API
* Built the database and web UI for an automated asset auditing and management application
* Coded and tested applications for Hotel Dieu Hospital and the Ministry of Health and Long-Term Care
* **Used:** SQL Server, Microsoft Analysis Services, OLAP, SQL, MDX, XML, ASP, JavaScript, HTML, CSS, Visual Basic, COM, XML, XSLT, Windows

# PROJECTS

## Om Language

#### [https://github.com/sparist/om](https://github.com/sparist/Om)

Creator of the Om Language, an experimental high-level, concatenative, functional, homoiconic, embeddable programming language, implemented in C++, with minimal syntax (only three elements), prefix notation (whereby functions manipulate the remainder of the program itself), and novel "panmorphic" typing (allowing programming without data types). A full rewrite is currently in progress.

## Om Tree

#### <https://gitlab.com/impossibilium/om-tree>

Creator of the Om Tree, an efficient associative array implemented in modern, portable C17 as a binary compact prefix tree with novel optimizations that allow it to significantly outperform std::map on most operations. It was implemented for use by the forthcoming rewrite of the Om Language and has [100% line, function, and branch unit test coverage](https://impossibilium.gitlab.io/om-tree/gcovr/index.html).