
Education

Jan 2013 – present **B.Sc Mathematics**, *Université Laval*, Québec.

Experience

- 2014 - present **C++ freelancing**, (finance, embedded systems).
Development of C++ libraries to retain a high level of abstraction in applications where both performance and correctness matter. Also some refactoring of existing systems to add new features and/or improve performance.
- 2014 - present **Development of Hana**, a [Boost](#) library for metaprogramming in C++14.
Design and implementation of a library to manipulate heterogeneous sequences at compile-time and at runtime. The library introduces a new paradigm for expressing meta-computations allowing a very high level of expressiveness with little to no performance penalty.
- 2014 - 2015 **GSoC student with Boost**, [Google Summer of Code](#).
Work on [Boost.Hana](#) during the summers of 2014 and 2015 as part of the Google Summer of Code program. I also received a grant from the [Boost](#) Steering Committee to continue working during the winter of 2015, which had never been done before for a GSoC student.
- 2012 **Intern**, [Coveo Solutions](#), Québec.
 - Conception and implementation of a deadlock detection system for internal use
 - Presentations on C++ techniques and idioms to co-workers:
 - The Boost.ConceptCheck library and associated TMP techniques
 - C++11 rvalue references

Talks

- 2015 **Metaprogramming: a paradigm shift** ([slides](#)), [CppCon](#), Seattle.
- 2015 **Metaprogramming: a paradigm shift** ([slides](#)), [C++Now](#), Aspen.
Awards for the best presentation and the most inspiring presentation
- 2014 **Metaprogramming in C++14** ([french only slides](#)), [OpenCode XXII](#), Québec.
- 2014 **Hana: Expressive metaprogramming** ([slides/video](#)), [CppCon](#), Seattle.
- 2014 **Towards painless metaprogramming** ([slides/video](#)), [C++Now](#), Aspen.
- 2013 **A system for resource deadlock prevention** ([slides/video](#)), [C++Now](#), Aspen.
- 2013 **Deadlock detection with d2** ([slides](#)), [OpenCode XII](#), Québec.
- 2013 **Concept based overloading in C++** ([slides](#)), [OpenCode IX](#), Québec.

Personal Projects

- [mpl11](#) **Conception and implementation of a C++11 replacement for the Boost.MPL**
Reimplemented the functionality of the Boost.MPL library using new template metaprogramming techniques made possible by C++11. Redesigned the API of the library using ideas from Haskell to make it more powerful, easier to use and to extend.
- [d2](#) **Conception and implementation of a deadlock detection system in C++**
Detects deadlocks that would have happened under different thread scheduling conditions by performing intrusive dynamic analysis on a non-deadlocking run of a program. Additionally, provides statistics about lock and thread usage.
- [joy](#) **Implementation of a preprocessor metaprogramming library**
Implemented associative sequences and other utilities for preprocessor metaprogramming on top of the [Chaos preprocessor library](#).

- [nsth](#) **Conception and implementation of a generic algorithm library in pure C**
Implemented a basic name mangling system and “preprocessor-based classes” using PMP techniques. Using these facilities, implemented a subset of the C++ standard library algorithms. The result is a collection of generic algorithms instantiable and usable from pure C without sacrificing type safety or performance by using traditional techniques like pointers to void.
- [duck](#) **Implementation of a minimal concept-based overloading library**
Implemented a subset of Boost.ConceptCheck’s concepts as metafunctions, which allows overloading based on the modeling of a concept by a type.
- [cisp](#) **Implementation of a minimalist object system with the preprocessor**
Created a system to manipulate complex preprocessor objects using associative sequences imbued with object semantics.
- [nsth-lang](#) **Implementation of a translator for a toy language in Python**
Implemented basic parsing, semantic analysis and code generation to C.
- Contributions to other projects**
- Contribution of the [hawick_circuits](#) algorithm to Boost.Graph
 - Occasional patches to Boost (Spirit, Graph, Archive, MPL and others)
 - Active on the [Boost.Dev](#) mailing list
 - CMake port of the [FastPFor](#) integer compression library’s build system
 - Too frequent bug reports against the [Clang](#) and [GCC](#) compilers.