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## Education

- Jan 2013 – Dec 2015 **B.Sc. Mathematics**, *Université Laval*, Québec.  
Sep 2011 – May 2012 **B.Sc. Software Engineering (not completed)**, *Université Laval*, Québec.

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## Experience

- Jun 2016 – present **Software Development Engineer**, [A9.com](http://A9.com), Palo Alto.  
Part of the search infrastructure team powering Amazon's search engine.
- 2014 – present **Development of Hana**, a [Boost](http://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.
- Dec 2014 – Jun 2016 **C++ consulting**, (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 – 2015 **GSoC student with Boost**, [Google Summer of Code](http://Google Summer of Code).  
Work on [Boost.Hana](http://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](http://Boost) Steering Committee to continue working during the winter of 2015, which had never been done before for a GSoC student.
- Sep 2012 – Dec 2012 **Software Developer**, [Coveo Solutions](http://Coveo Solutions), Québec.  
Work on a MIME parser in C++. Resigned to pursue a degree in mathematics.
- May 2012 – Aug 2012 **Intern**, [Coveo Solutions](http://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](http://Boost.ConceptCheck) library and associated template metaprogramming techniques
    - C++11 rvalue references

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## Talks

- 2016 **Metaprogramming for the brave** ([slides](#)), [C++Now](http://C++Now), Aspen.
- 2016 **Metaprogramming for dummies** ([slides](#)), [C++Now](http://C++Now), Aspen.
- 2016 **Podcast about Boost.Hana** ([audio](#)), [CppCast](http://CppCast).
- 2015 **Metaprogramming: a paradigm shift** ([slides](#)/[video](#)), [CppCon](http://CppCon), Seattle.
- 2015 **Metaprogramming: a paradigm shift** ([slides](#)/[video](#)), [C++Now](http://C++Now), Aspen.  
Awards for the best presentation and the most inspiring presentation
- 2014 **Metaprogramming in C++14** ([french only slides](#)), [OpenCode XXII](http://OpenCode XXII), Québec.
- 2014 **Hana: Expressive metaprogramming** ([slides](#)/[video](#)), [CppCon](http://CppCon), Seattle.
- 2014 **Towards painless metaprogramming** ([slides](#)/[video](#)), [C++Now](http://C++Now), Aspen.
- 2013 **A system for resource deadlock prevention** ([slides](#)/[video](#)), [C++Now](http://C++Now), Aspen.
- 2013 **Deadlock detection with d2** ([slides](#)), [OpenCode XII](http://OpenCode XII), Québec.
- 2013 **Concept based overloading in C++** ([slides](#)), [OpenCode IX](http://OpenCode IX), Québec.

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## 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.