Hello,

Introduction:
I have a keen interest in programming language theory and design, high performance computing, compiler technologies, the interface of hardware with software and all things math related. I have a strong combination of academic and work experience pointing towards the above mentionned fields and challenges.

Education:
I started as a Math-Physics student at McGill, transferred to Polytechnique Montréal for a degree in electrical engineering. After completing two years in the latter I returned to McGill to finish a Bsc in Math-CS for wanting to have a deeper knolwedge of algorithms and mathematical theories encountered in my engineering degree, such as the ones seen in signal processing and control systems. After graduating I took my first permanent position at GIRO (see below for more details) however I decided to go to Université de Montréal shortly after at the DIRO (acronym expansion translates to department of computer science and operations research) to explore the graduate academic role. During those two years I took various courses in machine learning, operations research and optimization algorithms and programming language theory. I quit to work without finishing my thesis after realizing that I had gathered all I wanted from this university and wasn't looking forward to a career in academia.

Work Experience:
My work experience consists of two internships and two permanent roles.

In the current one I am part of a small team that works on the core of a highly complex product. On the front line we add features and business logic implemented through a in-house scheme interpreter. The core and long run work involves tuning algorithms to solve ILP problems for logistics, improving the custom scheme interpreter and its libraries (including a reactive data model one for efficient and automatic recomputation of values dependent of a another value which has changed.) All those core components beneath the scheme scripting layer are written in C.

Since it is a small independent team (4) which delivers those "core components" to other teams in the larger ecosystem of the company, we also need to be fluent in the devops process (no dedicated engineer to this role) which involves managing a local cluster used for testing, packaging and testing the software from docker containers to helm charts and deploying on the cloud.

My previous permanent position was also in a operations research shop. The delivered product was a C++ monolith which required extensive maintenance and modernization. Most of the details are irrelevant here as they pertain to subtleties of a huge product (millions of lines of code.) The usual challenges of a big C++ code base were there, long build times, difficulty in reaching appropriate test coverage, required knowledge of C++ warts especially performance wise for memory allocation, impedance mismatch between older parts of code base and desire to modernize towards newer C++ versions and features.

My interest in SiFive was triggered by a search for RISC-V processors which in turn can be attributed to the following chain of events: wanting to migrate my laptop to a declarative nix distro, choosing Guix, needing a hardware/firmware combination which would be supported by purely GPL licensed software, general frustration at the state of things for the latter, buying an old Lenovo T400 supported by libreboot, frustration at the state of affairs in the hardware/firmware sector and outrage at Intel's Management Engine and AMD's secure technology systems' pervasiveness.

Conclusion:
This role seems like an excellent fit given my education, where I am in my career and my long-running interests. My machine learning experience is relevant as well, I have read quite a few research papers while in graduate school on providing language constructs their implementations for highly parallel evaluation of computational graphs for deep learning. My ultimate goal was (is?) to generate custom VHDL which matches efficiently with a deep learning problem via a pipeline from the Glascow Haskell Compiler (GHC) to the LLVM backend using category theory concepts for automatic differentiation and compilation. Alas this was a bit ambitious for a master's degree.

I would be excited to relocate for this position near SiFive's offices (currently in Montreal), and as a matter of fact I'd like to express a general interest for this company and any role which would be a potential match.

Sincerely,
Frederic Boileau

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