

Allen Leung

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Objective

Experienced compiler developer seeks a challenging position in system and/or server development on Unix platforms.

I am a finishing Ph.D. student specializing in compiler optimizations for high level languages and deterministic scheduling algorithms. I believe my strong analytic, coding, research, and system design skills will be a valuable asset to your software development team.

Positions Held

System programmer, Tandem division. Information Builders Inc.
New York, NY 1991–1993
Participated in the development and maintenance of FOCUS, a 4GL report language, for the Tandem platform. Development was conducted in C, Fortran and TAL on SUN OS and Tandem.

Participated in the design and implementation of a distributed, heterogeneous database query engine on Unix and Tandem platforms. The system uses SQL to query relational databases and legacy databases on multiple platforms.

Assistant research scientist, Computer Science Department. New York University
New York, NY 1994–1995

As a member of the Griffin Project at NYU, participated in the design and implementation of the Griffin language, a prototyping language for Ada software. My task involved the design of the static semantics of the language and the implementation of the compiler. I am one of the two chief coders and architects of the compiler. Development was conducted in C++ on Solaris.

Summer Intern Bell Laboratories
Murray Hill, NJ Summer 1997
As a student researcher at the Computing Sciences Research Center, participated in a project implementing global instruction scheduling algorithms for the Standard ML of New Jersey compiler.

Summer Intern Bell Laboratories
Murray Hill, NJ Summer 1998
As a student researcher at the Computing Sciences Research Center, participated in the development of an optimizing compiler backend for the Texas Instrument C6xx series of DSPs. My task involved the design and implementation of modulo scheduling and hyperblock scheduling modules for the compiler.

Graduate research assistant. Graduate teaching assistant. New York University
New York, NY 1995-96, 1998-2001
As a member of the ReaCT-ILP laboratory at NYU, participated in research and development projects on real-time systems, scheduling algorithms and compiler optimizations techniques for RISC and VLIW architectures. As part of these projects, I have written and developed compilers, profilers and hardware simulators in C and C++.

My thesis is on machine level optimization techniques applied to code generation of very high level languages. As part of my thesis work, I have implemented an optimizing backend, which includes register allocators, static single assignment form optimizations, and instruction schedulers, for the

Standard ML of New Jersey compiler.

Education

- Ph.D. student in Computer Science. New York University, 1995 to present. Thesis: “*Machine Level Optimizations for High Level Languages*” NOTE: I have successfully defended but have not yet finalized my thesis.
- M.S. in Computer Science, State University of New York at Stony Brook, 1991. Thesis: “*Reasoning with Simple and Exhaustive Demands in Higher Order Languages.*”
- B.S. in Computer Science, State University of New York at Stony Brook, 1989.

Technical Publications

Here are some of my papers in the area of programming languages, compiler optimizations, and algorithm design and analysis:

1. Allen Leung and Prateek Mishra, *Reasoning with Simple and Exhaustive Demand in Higher-order Lazy Languages*. In Functional Programming and Computer Architecture '91. Springer-Verlag, LNCS-523, 1991.
2. Allen Leung, Cristian Ungureanu and Krishna Palem, *Run-Time Versus Compile-Time Instruction Scheduling in Superscalar (RISC) Processors: Performance and Tradeoffs*. In Proceedings of 3rd International Conference on High Performance Computing, 1996. Also appeared in Journal of Parallel and Distributed Computing, vol 43, 1997.
3. Allen Leung, Krishna Palem and Amir Pnueli, *TimeC: A Time Specification Language for ILP Processor Compilation*. In The 5th Annual Australasian Conference on Parallel And Real-Time Systems, 1998.
4. Allen Leung, Krishna Palem and Amir Pnueli, *A Fast Algorithm for Scheduling Time-Constrained Instructions on Processor with ILP*. In the International Conference on Parallel Architectures and Compilation Techniques (PACT '98), Paris, France, 1998.
5. Allen Leung and Lal George, *Static Single Assignment Form for Machine Code*. In ACM Conference on Programming Languages Design and Implementation (PLDI), Atlanta, 1999.
6. Allen Leung, Krishna Palem and Amir Pnueli, *Scheduling Time-Constrained Instructions on Pipelined Processors*, ACM Transactions on Programming Languages and Systems (TOPLAS), 2001.

Development Skills

Here is my skill set:

C more than 15 years experience.

C++ a user since the C-front days.

Unix Solaris and some HP-UX experience; have been a user of Unix and Unix-like systems for over 15 years.

Linux a Linux user/programmer since 1.0.x kernels, with some knowledge of kernel internals.

Shell Scripting sh, ksh, bash, etc.

Perl a programmer since version 4.0.

TCP/IP sockets more than 10 years experience.

X11/gtk+ 2 years.

SQL Tandem and MySQL. With some light Sybase experience on Linux.

Assembly x86, Sparc, Alpha, MIPS, powerpc, PA-RISC. I have written compiler backends for these targets.

Others Java, Standard ML, etc.

Work Status

USA Citizen. NYC resident.

Salary

Open.

Misc

Source code to the systems I have developed (in C++ and Standard ML) and all my technical publications are available on my homepage cited at the beginning of this resume.