

MARCELO SILVA CINTRA
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OBJECTIVE

- An intern position where I can contribute my experience with compiler technologies towards the design and implementation of compiler transformations to enhance application performance.

RESEARCH INTERESTS

- Virtual machines and dynamic compilation
- Compiler techniques for parallelization, code generation and optimization
- Feedback-directed optimizations

SUMMARY OF QUALIFICATIONS

- Extensive knowledge of compiler techniques to enhance application performance.
- Experienced at implementing system software in C, C++ and Java.
- Proven experience working on a production C compiler and a research java virtual machine.
- Knowledgeable with graph theory, algorithms (analysis and design), data structures, compilers, code optimization, computer architecture and assembly language.

EDUCATIONAL BACKGROUND

1. **PhD Candidate - Computer Science - In progress**

University of California Irvine (UCI) – Irvine CA, USA

- Researching trace compilation, a novel Just-in-Time compilation technique that identifies hot execution paths (loops) and dynamically records code traces.
- I am currently investigating how to effectively detect program phase behavior, and use it to guide optimization decisions inside runtime systems, such as virtual machines.

2. **M.S. in Computer Science - April 2000**

University of Campinas (UNICAMP) – Campinas SP, Brazil

- Project: Array Index Allocation using Static Single Assignment Form. A novel technique was implemented to efficiently allocate address registers, taking advantage of auto-increment (decrement) present on most DSP processors.

3. **B.S. in Computer Science – December 1997**

Federal University of Mato Grosso do Sul (UFMS) - Campo Grande MS, Brazil

- Designed and implemented a programming language, named PGL, that generated optimized code for 8088 IBM/PC assembly language.

PROFESSIONAL EXPERIENCE

Systems Software Intern, Sun Microsystems, Santa Clara – CA, USA

Sun Labs

Summer 2009

- Worked on a port of the HotSpot Client Compiler (C1), written in C++, to Java. The ported version of C1 is called C1X, and its used as a JIT compiler by the meta-circular Maxine VM.
- Developed two debugging tools for the high-level intermediate representation (HIR) of C1X: a HIRchecker and a HIRInterpreter. Both tools were heavily used to test C1X.
- Implemented a new optimization for C1X: loop peeling

Systems Software Engineer, Mindspeed Technologies, Newport Beach – CA, USA

Systems on Chip Tools and Technologies Group

May 2000 – Aug 2002

- Responsible for testing, support and maintenance of a C compiler to a DSP processor.
- Fixed bugs, achieving bit accurate results after simulating the code produced by the compiler.
- Improved compiler optimizations, reducing code size and improving execution time of embedded applications.
- Implemented a tool to convert binary files (OMF to ELF), and a disassembler.

Engineering Intern, Conexant Systems Inc., Newport Beach – CA, USA

Systems on Chip and Tools Group

Summer 1999

- Implemented novel optimization technique in a C compiler, to efficiently allocate addressing registers, enhancing the performance of generated code by 11%.
- Evaluated the quality of code generated by Conexant's C compiler.

ACADEMIC TEACHING

Lecturer at the following Universities, in Brazil: FINOM, UCB, UNIEURO, UCDB, and UNAES

Computer Science, Computer Engineering and Information Systems Departments

Nov 2002 – Sept 2007

- Courses taught: Analysis of Algorithms, Compiler Construction, Computer Organization and Design, Operating Systems, Data Structures, Object Oriented Programming in Java, File Compression and Organization, and Paradigms of Programming Languages.
- Coach of the UCB team in the regional phase of ACM South American Collegiate Programming Contest, Brasília - DF (2005)
- Site director of the regional phase of ACM South American Collegiate Programming Contest, Campo Grande MS – September 2006.

TECHNICAL SKILLS

Languages: Java, C++, C, Python, Pascal, Object Pascal, shell scripts, make and ant.

Tools: Eclipse, NetBeans, Visual Studio, gcc, yacc, lex, flex, gdb, emacs, latex, Delphi, UML, CVS, SVN, Mercurial.

OS: Windows (all), Linux (Ubuntu and Debian), Unix and Mac OS.

PUBLICATIONS

Journal Publications

Global Array Reference Allocation. Guido Araujo, Guilherme Ottoni and Marcelo Cintra. ACM Transactions on Design Automation of Electronic Systems, Vol. 7, No. 2, 336-357, April 2002.

Conferences & Workshops

Improving Compiler-Runtime Separation with XIR. Ben Titzer, Thomas Wuerthinger, Doug Simon and Marcelo Cintra. VEE 2010 (to appear).

Phase Detection using Trace Compilation. Christian Wimmer, Marcelo Cintra, Michael Bebenita, Mason Chang, Andreas Gal and Michael Franz. In Proceedings of the International Conference on Principles and Practice of Programming in Java, pages 172–181. ACM Press, 2009.

Array Reference Allocation Using SSA-Form and Live Range Growth. Marcelo Cintra and G. Araujo. Lecture Notes in Computer Science, Vol. 1985, 48+, July 2000.

DISTINCTIONS AND AWARDS

- Current GPA is 3.9, out of 4.0.
- Awarded a graduate scholarship from the Brazilian National Council for Scientific and Technological Development (CNPq), to pursue the PhD degree at University California Irvine. Research proposal was ranked 1st among all Computer Science proposals received by CNPq (nationwide) in the year 2007.
- FAPESP graduate fellowship to pursue the Master Degree in computer science, 1998-2000.
- CNPq fellowship for scientific initiation research on statistics, 1996-1997.
- Ranked 1st in Mathematics Olympic (in town) in the year 1990, and 3rd in the year 1993.
- Ranked 2nd out of 680 applicants in the Undergraduate Selection Exam to the Computer Science Undergraduate Program of Federal University of Mato Grosso do Sul – 1994.
- Ranked 1st in undergraduate class 1997 with GPA 8.3 out of 10.0.
- Honorable mention for representing Federal University of Mato Grosso do Sul in the ACM South American Collegiate Programming Contest, 1997 – Campinas SP Brazil.