

# David L. Presberg

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## SUMMARY PROFILE

A skilled and team-oriented **Senior Software Engineer** with hands-on experience in building compilers and processor development tools, with ability to implement any programming language for a new CPU, or to maintain existing processor development tools. Successful projects ranged from graphics processors (GPUs), communications NPUs, and microprocessors/DSPs, through large scale parallel programming systems (Multiprocessor MIMD, SIMD, and Vector). Excellent performance analysis, tool testing, and debugging skills. Former member of four national, international and ad hoc Standards Committees. Areas of expertise include:

<b>All Compiler Implementation Technologies:</b>	Designed and implemented lexical and syntactic analyses. Designed and coded intermediate representations at multiple levels. Constructed optimizations for efficient runtime, efficient code-space, or multiple-processor utilization. Implemented code generation to machine-code, assemblers, Elf, Dwarf, VMs, and source-code. Built compact and fast symbol tables and debug tables. Versatile with both fast off-line and tight/fast JIT compiler architectures.
<b>Team Player with Interpersonal Skills:</b>	Contributed to a collegial work environment by collaborating with all groups in the enterprise beyond software engineering, from marketing and customer contact pre- and post-sales through hardware engineering. Literate in hardware design languages and notations.
<b>Accuracy:</b>	Reputation for careful analysis and development through precise and correct code that is efficiently maintainable for the long-run.

## Technical Proficiencies

<b>Programming Languages:</b>	C/C++ and predecessors, Perl and other scripting, Shells, Assemblers, Java including JVM internals, Fortran, other imperative and declarative languages
<b>Architectures:</b>	GPUs, NPUs, DSPs, Sparc, MIPS, Intel, PPC; MPI, PVM, other communications
<b>Operating Systems:</b>	Linux, FreeBSD, Solaris, AIX, MacOS-X; embedded OSs; Windows XP/NT
<b>Compiler Targets:</b>	RISC, CISC, SIMD, Parallel, Multicore, ATE; source-to-source translation
<b>Tool Usage Expertise:</b>	Visual2003/2005-C/C++, CodeWarrior IDE/ARM RVDS, Perforce, CVS, Bugzilla, Emacs, Doxygen; Gdb, TotalView
<b>Functional Expertise:</b>	Requirements Analysis, Object-Oriented Design, Implementation, Testing, Quality Improvement, Documentation, Training

## PROFESSIONAL EXPERIENCE

Advanced Micro Devices, Inc. (formerly ATI, Inc.), Marlboro, MA 2005 to 2007  
*Graphics chip division of major computer processor developer and manufacturer.*

### STAFF SOFTWARE ENGINEER in 3D GRAPHICS COMPILER GROUP

Developed and maintained all aspects of GPU compiler including unit-testing facilities.

- Fielded compiler which targeted a processor related to the XBox-360 GPU, to be deployed in handheld devices worldwide. Enhanced test suites and improved international standards-body test details for correct execution of both DirectX and Open-GL 3D graphics shader languages.
- Edited new customer-oriented programming language manual for GPU. This required correlating partial information from internal software and hardware documents with actual compiler code.

Ounce Labs, Inc., Waltham, MA 2004  
*A developer of security analysis and auditing software to assure invulnerability of online-exposed software systems.*

**SENIOR SOFTWARE ENGINEER**

Designed infrastructure for compiler-like tool to analyze C++ and Java source codes.

- Designed, for C++ implementation, an Intermediate Representation of analyzed source code that unified bilingual processing of Java and C++ to yield one efficiently maintainable code-base.

Hewlett-Packard Company, Nashua, NH 2004  
*High performance computing group, technical languages, of major manufacturer of computers and peripheral devices.*

**CONSULTANT ON COMPILER DESIGN**

Researched and documented advanced compiler optimization algorithms.

- Advised development team of new C programming language parallel programming dialect. Co-author of technical report for advanced research and development planning. (NDA limits full description.)

WIND Networking, MA 2003  
*Job-search networking organization.*

**MANAGER OO DESIGN/IMPLEMENTATION GROUP**

Ran project for self-training in Java, TWiki-based design-documentation, for web-interfaced software system.

- Managed online database project in aid of job search networking activities. Co-authored lengthy, web-accessible functional specification.

Mindspeed Technologies, Inc., Framingham, MA 1998 to 2002  
*Network processors group of manufacturer of semiconductor products for wireline and wireless communications.*

**PRINCIPAL SOFTWARE ENGINEER in TOOLS GROUP**

Development and maintenance of tools supporting software application development for network processors.

- Maintained assembler implemented with lex/yacc front-end. Replaced symbol lookup to lower assembly time from hours to minutes for new processor bring-up verification testing.
- Tested and corrected virtual breadboard (SDK) delivered to NPU customers. Rewrote Verilog-coding tutorials for Verilog/Perl/C-based simulator.
- Targeted C compiler (EGCS, GCC) to NPU. Wrote support library. Tuned optimizations and validated compiler. Result produced instruction-count within 19% compared to over-clever, hand-coded, assembly.

**ADDITIONAL PROFESSIONAL EXPERIENCE**

**SENIOR COMPILER ENGINEER** at Analog Devices, Computer Products Division: Retargeted TigerSHARC DSP C compiler control-flow code generation. Converted application code from SHARC to TigerSHARC.

**PARALLEL SYSTEMS SOFTWARE ENGINEER** at Cornell University Supercomputer Center: Cornell's delegate to High Performance Fortran (HPF) standards body. Evangelized for HPF and taught workshops on performance improvement using tools for parallel programming. Built automatic parallelization tool PedLambda.

**SENIOR SOFTWARE ENGINEER** at Massachusetts Computer Associates (COMPASS): Developed compilers for parallel supercomputers, ATE test equipment, and source-to-source translation of special purpose HW simulators and CAD systems. These translators contributed to the rescue of Teradyne and ComputerVision in adapting their products to changed processor and implementation language requirements. Designed internal representations and data dependence modules supporting vectorization and data motion optimizations.

**EDUCATION**

**B.S. Applied Mathematics and Computer Science**, *magna cum laude*, New York University, School of Engineering and Science, Bronx, NY.

**Personal:** Greater Boston Chapter/ACM, Executive Board and IS Committee, 1998-present.  
Founded and led *Programming on the Whiteboard* programming skills maintenance groups.