Robert Kennedy

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Objective:

A challenging position with responsibility for strong technical leadership and direct research or product involvement. System design, implementation, collaboration, and mentorship are my primary interests. Some responsibility for management of project(s) and/or people is welcome but not vital.

Experience:

March, 2007 – present Google

Senior Software Engineer, Staff Software Engineer: Websearch Site Reliability. Technical co-lead for the group that runs Google's search engine. Received Operating Committee award for worldwide machine utilization improvement. (OC awards are Google's second highest employee honor, second only to Founders' Awards.) Designed and implemented monitoring for websearch, planned capacity, developed performance tools, consulted on software architecture for load balancing and new features, mentored new engineers.

July, 2006 – March, 2007 Google

Member of Technical Staff, Compilers. Worked with Google's compiler group to improve performance of GCC's generated code for all Google C/C++ applications. Integrated Google's internal revision control with Free Software Foundation's source tree.

February, 2002 – July, 2006 Tensilica

Senior Software Engineering Manager, DSP software. Project manager, lead instruction set and software designer for Xtensa HiFi2 Audio Engine, the most popular audio DSP core on the market today (see `http://www.tensilica.com/products/audio.htm`). Led codec development by internal and external teams of 2-7 engineers. Conducted training for contractors, partners, customers. Set priorities, gave performance reviews, mentored engineers, and continued prior technical duties. Lead implementer and co-designer of linker for applications to run on multiprocessor systems.

August, 1999 – January, 2002 Tensilica

Member of Technical Staff. Key designer and implementer of software and processor extensions for high performance signal processing, cryptographic, and image processing primitives and applications. Participated in processor architecture and instruction set definition. Technical lead for three-person DSP software group.

September, 1995 – July, 1999 Silicon Graphics

Member of Technical Staff, Compilers. Key designer and implementer of several global optimizer phases involving partial redundancy elimination as well as alias and points-to analysis. Also a main contributor to global optimizer and compiler back end infrastructure.

May, 1995 – September, 1995 Silicon Graphics

Summer Intern, Compilers. Created and enhanced development and debugging tools for global optimizer effort.

1988 – 1989, 1992 – 1995 Stanford University

Research Assistant. Investigated theoretical and practical aspects of combinatorial algorithms.

Fall, 1989; Winter, 1992; Fall, 1994 Stanford University

Teaching Assistant. Gave lectures and help sessions, designed and graded exams and homework assignments, and built model solutions and course notes for theoretical computer science courses.

1993 Sun Microsystems

Consultant. Studied combinatorial problems arising in compiler construction, developed and communicated graph-theoretic results.

Education:

Ph.D., Stanford University, Department of Computer Science; September, 1995.
Dissertation Title: Solving Unweighted and Weighted Bipartite Matching Problems in Theory and Practice.

research student, Computer Laboratory; University of Cambridge, 1987-1988.

Bachelor of Engineering, summa cum laude, in Electrical Engineering, Computer Science, and Mathematics; Vanderbilt University; May, 1987.

Selected Publications:

Robert Kennedy, Sun Chan, Shin-Ming Liu, Raymond Lo, Peng Tu, and Fred Chow, *Partial Redundancy Elimination in SSA Form*, ACM Transactions on Programming Languages and Systems, 21:627–676, 1999.

Raymond Lo, Fred Chow, Robert Kennedy, Shin-Ming Liu, and Peng Tu, *Register Promotion by Sparse Partial Redundancy Elimination of Loads and Stores*, in Proceedings of the 1998 ACM SIGPLAN Conference on Programming Language Design and Implementation, Montréal, pp. 26 – 37, 1998.

Robert Kennedy, Fred Chow, Peter Dahl, Shin-Ming Liu, Raymond Lo, and Mark Streich, *Strength Reduction via SSAPRE*, in Proceedings of the 7th International Conference on Compiler Construction, Lisbon, pp. 144 – 158, 1998.

Fred Chow, Sun Chan, Robert Kennedy, Shin-Ming Liu, Raymond Lo, and Peng Tu, *A New Algorithm for Partial Redundancy Elimination based on SSA Form*, in Proceedings of the 1997 ACM SIGPLAN Conference on Programming Language Design and Implementation, Las Vegas, pp. 273–286, 1997.

Andrew V. Goldberg and Robert Kennedy, *Global Price Updates Help*, SIAM Journal on Discrete Mathematics, 10:551–572, 1997.

Andrew V. Goldberg and Robert Kennedy, *An Efficient Cost Scaling Algorithm for the Assignment Problem*, Mathematical Programming, 71:153–178, 1995.

Patents:

7,376,812: Himanshu A. Sanghavi, Earl A. Killian, James Robert Kennedy, Darin S. Petkov, Peng Tu, William A. Huffman, *Vector co-processor for configurable and extensible processor architecture*; granted 20 May, 2008.

7,219,212: Himanshu A. Sanghavi, Earl A. Killian, James Robert Kennedy, Darin S. Petkov, Peng Tu, William A. Huffman, *Load/Store Operation of Memory Misaligned Vector Data Using Alignment Register Storing Realigned Data Portion for Combining with Remaining Portion*; granted 15 May, 2007.

6,301,704: Fred Chow, Sun Chan, Peter Dahl, Robert Kennedy, Shin-Ming Liu, Raymond Lo, Mark Streich, and Peng Tu, *Method, system, and computer program product for using static single assignment form as a program representation and a medium for performing global scalar optimization*; granted 9 October, 2001.

6,128,775: Fred Chow, Robert Kennedy, Shin-Ming Liu, Raymond Lo, Peng Tu, and Sun Chan, *Method, system, and computer program product for performing register promotion via load and store placement optimization within an optimizing compiler*; granted 3 October, 2000.

6,026,241: Fred Chow, Sun Chan, Robert Kennedy, Shin-Ming Liu, Raymond Lo, and Peng Tu, *System, method, and computer program product for partial redundancy elimination based on static single assignment form during compilation*; granted 15 February, 2000.

Honors:

Google Operating Committee Award for machine utilization, 2010.

American Federation of Motorcyclists 750cc Production class champion, 2003; 250cc Production class champion, 2000 and 2001.

Stanford computer science department award for student service, 1992 – 1993.

National Science Foundation graduate fellowship, 1989 – 1992.

Winston Churchill Foundation scholar, 1987 – 1988.

James Geddes honors scholarship to Vanderbilt University, 1983 – 1987.