Robert Bowdidge

1623 Fairorchard Ave
San Jose CA 95125
(408) 723-1925
e-mail: rbowdidge@mac.com

INTERESTS: Make life better for programmers by improving both their tools and their platforms.

EXPERIENCE:

11/23 - present: **Sabbatical year**. Travel, family, and personal projects that have been put off too long.

2/23 - 11/23: **Principal Software Engineer, Microsoft, Santa Clara CA**. Worked to bring Fungible into the Azure Storage and Azure CHIE teams. Explored work needed to get test hardware into Microsoft labs, builds into Microsoft-standard ways, and figure out our new home.

4/16 - 2/23: **Distinguished Software Engineer, Fungible, Santa Clara CA**. First software engineer at startup building new class of microprocessors for speeding data movement in data center servers. Designed, built, and ran infrastructure for exercising and debugging real and simulated chips with development versions of the "FunOS" operating system running on the chip. Worked with emulation team to allow us to send jobs to the Palladium and Protium chip emulation systems. As tech lead, also helped grow the team and expand our mandate, and hosted our 2022 summer intern. Also implemented hardware timer support in FunOS, FunOS tracing tools, implemented chip simulations and oracles for validating cache coherency correctness. Also did new employee introductions to the chip, wrote documentation and tutorials for FunOS, hack-sawed cases, did voice-overs for promotional videos, learned how to support an always-on service, and made a ton of unauthorized stickers. Fungible was acquired by Microsoft in February 2023.

5/15 - 3/16: **Sabbatical Year.** Started 3d printing company (**www.drycreekmodels.com**), family, travel.

12/08 - 5/15: **Senior Software Engineer, Google, Mountain View CA.**

11/14 - 5/15: Engineer, Google-Wide Profiling team. Developing large-scale distributed system for profiling all jobs running across multiple data centers, dynamically adjusting profiling rates to ensure maximum data with minimum overhead. Built servers handling configuration of profiling rates and gathering of completed profiles. Coded in Go.

12/12 - 11/14: Engineer, Code Cultivation team. Led work to remove all references to an older, widely used C++ API for one of Google's core data structures across Google's entire codebase. Convinced code owners to rewrite code, automatically converted other code using Clang-based refactoring tools, and personally rewrote portions of Google infrastructure when necessary.   Team responsible for around 1 million lines of code changed.

3/12 - 12/12: Manager, Code Health Tooling team. Managed five engineers and three projects finding bugs in Google's Java code, cutting compile and test times by removing unneeded dependencies in our build system, and tracking down performance issues in C++ servers.

7/10 - 9/12: Technical lead/manager, XRay C++ profiling tools team. Developed profiling tools for diagnosing long-latency RPCs on production servers. Implemented web-based trace browser in Python. Worked with teams across Google to adopt the tools and interpret results. Managed two other engineers.

12/08 - 7/10: Technical lead, JavaScript Tools team. Open-sourced Closure Compiler (JavaScript-to-JavaScript compiler used for code minification) as part of Closure Tools launch, developed novel tools to

support internal front-end web development, fixed pain points for current developers. Explored speeding web application startup time by automatically partitioning JavaScript source code into lazily-loaded chunks. Coded in Java.

7/07 - 12/08	**Sabbatical Year.** Travel, family, hiking, projects. Strongly recommended.

7/99 - 6/07   Senior Software Engineer, Apple Computer, Cupertino CA.

3/05 - 6/07   Proposed, prototyped, and implemented refactoring tools for Objective C within the Xcode IDE. Responsible for all parsing, analysis, and transformation code. Participated in design of entire refactoring feature.

6/03 - 3/05   Member of compiler team. Diagnosed and fixed bugs in Apple's version of the gcc compiler. Explored several approaches to speed compiler performance and reduce memory footprint. Responsible for the bringup of gcc-4.0, modifying projects and tracking down bugs encountered when building all of Mac OS X with the new compiler.

10/02 - 6/03   Member of team developing Rosetta PPC emulation environment for Intel port of Mac OS X. Planned and implemented virtual memory layout and kernel virtual memory support.

7/99 - 6/03   Primary developer for application-level performance tools for Mac OS X, consulted and spoke on their use. Also implemented and maintained operating system tools for rewriting binaries to speed application launches.

5/99 - 6/99   **Intrinsa, Mountain View CA.** Static analysis tool vendor. Bought by Microsoft soon after my arrival.

1/96 - 5/99   **Research Staff Member, C++ Compilation Environments, I.B.M. T. J. Watson Research Center, Hawthorne, NY.** Research on programming tools. Created refactoring tools for C++. Designed and implemented syntactic search feature for IBM's VisualAge for C++ 4.0 IDE. Evangelized compiler APIs to university researchers and customers.

1/92 - 12/95   **Research Assistant, Computer Science and Engineering Department, U.C. San Diego.** Designed and implemented user interface for one of the first true restructuring (refactoring) tools, conducted programmer studies to understand how programmers restructure programs.

9/91 - 12/91   **Teaching Assistant, Computer Science and Engineering Department, U.C. San Diego.**

6/89 - 9/91   **Research Assistant, Multimedia Lab, U.C. San Diego.** OS support for multimedia systems.

5/87 - 11/88   **Project Engineer, Berkeley Softworks, Berkeley CA.** Apple II software.

EDUCATION: Ph.D., Computer Science, University of California, San Diego, December 1995.
Thesis title: "Meaning-preserving Program Restructuring through Design-level Manipulation."
Advisor: Dr. William G. Griswold.
B.A., Computer Science, University of California, Berkeley, May 1989.

PUBLICATIONS: Hyunmin Seo, Caitlin Sadowski, Sebastian Elbaum, Edward Aftandillian, Robert Bowdidge, **"Programmers' Build Errors: A Case Study (at Google)"**, 2014 International Conference on Software Engineering, Hyderabad, India.

Brittany Johnson, Yoonki Song, Emerson Murphy Hill, and Robert Bowdidge, **"Why Don't Software Developers Use Static Analysis Tools to Find Bugs?"**, 2013 International Conference on Software Engineering, San Francisco CA.

Robert W. Bowdidge, "**Performance Trade-offs Implementing Refactoring Support for Objective-C"**, 3rd Workshop on Refactoring Tools, OOPSLA 2009, Orlando FL.

Robert W. Bowdidge, **"Refactoring gcc Using Structure Field Access Traces and Concept Analysis"**, 3rd International Workshop on Dynamic Analysis, St. Louis MO, 2005.

Robert W. Bowdidge and William G. Griswold, **"Supporting the Restructuring of Data Abstractions through Manipulation of a Program Visualization."** ACM Transactions on Software Engineering and Methodology 7(2) , 1998.

Robert W. Bowdidge and William G. Griswold, **"How software tools organize programmer behavior during the task of data encapsulation"**, Empirical Software Engineering 2(3):221-268, 1997.

PRESENTATIONS:

GEOS for the Apple][. OpenApple #52 podcast, October 2015.

Google's Closure Tools / Closure Compiler. Presented at Mountain View JavaScript Meetup, (January 13, 2010) and at ACCU meeting in Mountain View (May 12, 2010).

Creating Refactoring Tools in Industry. Presented at U.C. Merced EECS seminar (April 9, 2010) and at systems seminar at U.C. San Diego (May 2, 2008).

Refactoring in Xcode. Apple Worldwide Developer Conference (WWDC), 2006 and 2007.

Apple's Performance Analysis Tools. Apple Worldwide Developer Conference (WWDC) from 2000 to 2003.

ACTIVITIES: Invited participant, Workshop on Future of Refactoring, Dagstuhl, Germany, May 2014. Participant, 3rd Workshop on Refactoring Tools, OOPSLA 2009. Program committee, 2nd Workshop on Refactoring Tools, OOPSLA 2008. Participant, 3rd International Workshop on Dynamic Analysis, ICSE 2005. Invited participant, Workshop on Program Analysis for Object-oriented Evolution, Dagstuhl Germany, February 2003.

PROJECTS: Created SwitchList, an open source project for deciding which freight cars to move on a model railroad. (http://www.vasonabranch.com/railroad/switchlist.html) Sources at http://code.google.com/p/switchlist, available on the Mac App Store.