William C. Benton

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Select Professional Experience

May 2019– | **Engineering Manager and Senior Principal Software Engineer**, *Red Hat, Inc.*, Office of the CTO, AI Center of Excellence.
Founded and led the Forward Deployed AI Engineering Initiative, which has focused on helping Red Hat's customers solve business problems with machine learning in the hybrid cloud. Managed a remote team of engineers and data scientists. Collaborated with Red Hat Consulting to define services offerings for machine learning (ML) on Kubernetes. Developed training content on data engineering, ML workflows on Kubernetes, and the challenges of ML systems; presented peer-reviewed talks and tutorials at industry and academic conferences. Helped customers put ML into production on Kubernetes in industries including insurance, energy, and financial services.

October 2016– April 2019 | **Senior Principal Software Engineer**, *Red Hat, Inc.*.
Developed and popularized the *intelligent applications* concept for ML systems on Kubernetes. Served as overall engineering lead for the *radanalytics.io* open-source effort, which focused on enabling intelligent applications, machine learning frameworks, and data engineering workloads on Kubernetes and OpenShift. Responsible for refining groupwide engineering and agile processes (Kanban, retrospectives), coaching and mentoring across the wider group, and day-to-day direction of a global team of data scientists and engineers. Served as a data science and ML subject matter expert on interview panels for roles across Red Hat.

April 2015– October 2016 | **Principal Software Engineer**, *Red Hat, Inc.*.
Led a team focused on emerging technology and data science consulting; worked with product and engineering management to develop and refine AI/ML strategy.

September 2008 – March 2015 | **Senior Software Engineer**, *Red Hat, Inc.*.
Led a data science team focused on consulting for internal customers. Led emerging-technology efforts to evaluate in-memory analytic processing with Apache Spark. Contributed to the success of several open-source distributed computing communities and delivered enhancements and fixes to many projects including Apache Spark, the SBT build tool, and the HTCondor job scheduling system. Designed and implemented open-source projects including SPQR, a framework for distributed applications in Ruby; *Capricious*, a family of pseudorandom number generators; *Wallaby* and *Wallaroo*, two sophisticated configuration management services; and *Silex*, extensions to Spark for real-world data science. Mentored new contributors to the Fedora Project.

Summer 2003 – Fall 2008 | **Research Assistant**, *University of Wisconsin*, Computer Sciences.
Supervised by Prof. Charles Fischer. Analyzed performance impact of high-level language features. Developed novel program analyses and transformations for Java. Designed and implemented a logic programming environment for program analysis. Developed runtime support for opportunistic parallelism in a Java virtual machine.

Summer 2005 – Fall 2007	**Teaching Assistant/Lecturer**, *University of Wisconsin*, Computer Sciences. Lectured and developed course materials, including slides, handouts, and programming projects, for introductory and senior-level computer science courses. *Awarded departmental (2006) and university-wide (2007) teaching honors.*
Fall 2000 – Spring 2003	**Research Assistant**, *University of Wisconsin*, Computer Sciences. Supervised by Prof. Barton Miller. Assisted with development and maintenance of the Paradyn parallel performance analysis tool and the Dyninst dynamic instrumentation library. Reimplemented Paradyn's concurrency support to use native threads instead of userspace threads. Identified a bug in the sgi irix kernel.
Summer 2000	**Consultant**, *Devon Consulting, Wayne, PA*. Implemented a dynamic document management system that used Java, jdbc, Oracle, and dcom to parse and publish semi-structured natural-language experiment reports for a major global pharmaceutical company.

Select Publications

2019	Benton, William Christian. "Distributed function generation with shared structures." United States Patent 10241767b2.
	Benton, William Christian and Erik Jordan Erlandson. "Repeatable distributed pseudorandom number generation." United States Patent 10474432b2.
2011	Benton, William C, Robert H Rati, and Erik J Erlandson. "Wallaby: a scalable semantic configuration service for grids and clouds." In *SC'11: Proceedings of 2011 International Conference for High Performance Computing, Networking, Storage and Analysis*. IEEE.
2009	Benton, William C. and Charles N. Fischer. "Mostly-functional behavior in Java programs." In *International Conference on Verification, Model Checking, and Abstract Interpretation*. Springer.
2008	Benton, William Christian. *Fast, effective program analysis for object-level parallelism*. PhD dissertation. University of Wisconsin–Madison.
2007	Benton, William C. and Charles N. Fischer. "Interactive, scalable, declarative program analysis: from prototype to implementation." In *Proceedings of the 9th ACM SIGPLAN International Conference on Principles and Practice of Declarative Programming*. ACM.

Select Professional Service

2019–	**Program Committee**, *Berlin Buzzwords*.
2014	**Birds-of-a-Feather Committee**, *The International Conference for High Performance Computing, Networking, Storage, and Analysis (sc14)*.

Education

2008	**PhD (computer sciences)**, *University of Wisconsin–Madison*. My dissertation focused on identifying implicit module-level parallelism in Java programs. I developed (1) a declarative framework for developing static program analyses, (2) a type-and-effect system and analysis to infer methods that can safely execute in parallel, and (3) an evaluation of dynamic opportunities to exploit such parallelism.
2000	**BA with honors (philosophy, music, computer science)**, *St. Olaf College*.