

Phillip J. Windley

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EDUCATION

- 1990 *PhD*** **University of California, Davis, Computer Science**
Davis, CA. Dissertation: The Verification of Generic Interpreters. Advisor: Professor Karl N. Levitt.
- 1988 *MS*** **University of California, Davis, Computer Science**
Davis, CA
- 1982 *BS*** **University of Idaho, Metallurgical Engineering**
Moscow, ID

EXPERIENCE

1993 to present **Brigham Young University, Provo, UT**

1999 – present, Adjunct Professor

1996 – 1999, Associate Professor (tenure)

1993 – 1995, Assistant Professor

- Director and Founder, Laboratory for Applied Logic.
- Conducted research in large scale, enterprise networked applications and formal methods in hardware design. Conducted government and corporate sponsored research in these areas. Received approximately \$650,000 in research funding.
- Designed and taught classes in programming language concepts and theory, hardware design, formal methods, and large-scale system design.
- Member of University Information Technology and Internet committees.
- Consulted with Internet companies in the design and implementation of large scale Internet applications.
- Seven Masters and 2 Ph.D. students supervised.

2001 to 2002 *Chief Information Officer*
Office of the Governor, State of Utah

- Responsible for vision, strategy, direction, guidelines, policies, planning, coordination and oversight of information technology for all executive branch agencies of Utah.
- Report to the Governor, and serve as a member of the Governor's Senior Staff and Cabinet.
- Work with department and IT executives across the state.
- Chair the state's Information and Technology Policy and Strategy Committee, which sets policy and strategy for IT statewide

- Driving change in IT organization to implement Governor's vision for eGovernment.
- Responsible for \$125 million IT budget and coordinating budget with Governor's Office of Planning and Budget.
- Coordinate executive branch IT activities with Legislature and Judiciary.
- Work with IT Commission and Public Utilities and Technology Committees of the Legislature on policy and budget issues.
- Serve as liaison to Utah's high-tech industry.

1999 to 2001

Vice President, Product Development and Operations
Excite@Home, Redwood City, CA

- Lead and manage product management, engineering, customer service, network operations, and software quality assurance groups.
- Responsible for product development in the Excite Business Applications (EBA) group. EBA provided shared, commerce, and managed hosting services for over 35,000 customers.
- Specific accomplishments include:
 - Increased division revenue from \$4 million in 1999 to \$26 million in 2000 with EBIT of \$2.7 million.
 - Development and release of an award winning shared hosting product for AT&T.
 - Development and release of Freetailer e-commerce product on the Excite network.
 - Introduction of activity based costing to product development in EBA.
 - Managed planning and build-out for the new Orem facility, including a 3000 square foot, Class A data center.
- Senior corporate officer in Excite@Home's Utah office, responsible for all employees in Utah (110 employees).

1998 to 1999

Chief Technology Officer
iMALL, Inc., Santa Monica, CA

- Responsible for all technical strategies, activities, plans, and policies for iMALL, Inc., an early Internet e-commerce company that was acquired by Excite@Home in 1999.
- Designed, planned, and built a multi-tier Internet application platform for e-commerce.
- Responsible for all product planning as iMALL developed a market, customers, and strategies.
- Specific accomplishments include:
 - Wrote and developed business plan which resulted in iMALL receiving \$20 million in private placement investments.
 - Opened Provo UT office and built a technical team of over 80 people from scratch to carry out iMALL's product strategy.

- Conceived and developed iMALL's e-commerce products, which included one of the earliest hosted e-commerce applications, a product level search engine (stuff.com), and the imall.com shopping portal.
- Key member of the senior executive team that sold iMALL, Inc. to Excite@Home for \$450 million.

1994 to 1996 *Founder, Partner*
Electronic Marketing Services, Provo, UT

- Founded the imall.com shopping portal, one of the earliest online shopping sites on the Internet.
- Pioneered key concepts in online commerce including shopping carts, online software for site creation, and electronic transactions.
- Built business model for selling services to merchants who wanted to be online.

1990 to 1993 *Assistant Professor*
University of Idaho, Moscow, ID

- Director and Founder, Laboratory for Applied Logic
- Conducted research in microprocessor verification and formal methods.
- Designed and taught classes in microprocessor design and programming language concepts.
- Four Masters students supervised.

1982 to 1986 *Member, Technical Staff, Reactor Materials Division*
Naval Reactors, Department of Energy, Washington D.C

- Oversaw material irradiation testing in Advanced Test Reactor.
- Oversaw irradiation testing evaluation in Expanded Core Facility.
- Conducted reviews of engineering plans for robotic test equipment, HVAC facilities, and other testing gear.
- Responsible for \$60 million/year operating and capital budget for conducting irradiation tests.

FUNDED RESEARCH

National Science Foundation, "A Distributed, Type-Based Library of Abstract Hardware Modules," December 1994—November 1997, \$190,943.

National Security Agency University Programs, "A Verified Microprocessor System," July 1994—June 1996, \$120,000.

Boeing Corporation, "Transaction Modeling in Hardware Verification," June 1992—January 1993, \$14,938.

NASA Space Engineering Research Center for VLSI Design, "Abstract Modules in Hardware Verification," November 1992—October 1993, \$38,658.

NASA Space Engineering Research Center for VLSI Design, “Using Generic Theories to Model Hardware,” November 1991—October 1992, \$36,750.

National Science Foundation, “Integrating Formal Verification with VLSI Design,” September 1991—August 1993, \$69,636.

National Security Agency University Programs, “A Verified Microprocessor with Security Features,” June 1991—May 1993, \$98,795.

Boeing Corporation, “Specification of a Processor Interface Unit,” May 1991—May 1992, \$34,967.

Research Council Seed Grant, “Custom VLSI Devices for Molecular Biology,” \$6000 (with Dr. James F. Frenzel).

NASA Space Engineering Research Center for VLSI Design, “Formal Specification of a High Speed CMOS Correlator,” March 1991—October 1991, \$31,138.

University Travel Grant, January 1991, \$595.

RESEARCH PUBLICATIONS

Windley, Phillip J., “Formal Modeling and Verification of Microprocessors,” IEEE Transactions on Computers, January 1995.

Windley, Phillip J. with Michael Barnett, “Dysfunctional Programming: Teaching Programming using Formal Methods to Non-Computer Science Majors,” Journal of Computer Science Education, Volume 5, 1994, pp. 111—122.

Windley, Phillip J. with Paul E. Black, “Verifying Programs with Side—Effects,” The Thirty-First Hawaii International Conference on on System Sciences (HICSS-31) January, 1998

Windley, Phillip J. with Michael Jones, “Restricted Types for HOL,” Presented at the 1997 International Conference on the Theorem Provers in Higher—Order Logics, Murray Hill, NJ, August, 1997.

Windley, Phillip J. with Trent Larson, “Digitally Signed and Authenticated Theorems on HOL,” Presented at the 1997 International Conference on the Theorem Provers in Higher—Order Logics, Murray Hill, NJ, August, 1997.

Windley, Phillip J. with Annette Bunker and Michael D. Jones and Trent N. Larson, “Alexandria: Libraries of Abstract Verified Hardware Modules,” 2nd Workshop on Libraries, Component Modeling, and Quality Assurance, Toledo, Spain, April, 1997.

Windley, Phillip J. with Paul E. Black, “Verifying Resilient Software,” The Thirtieth Hawaii International Conference on System Sciences (HICSS-30) January, 1997

Windley, Phillip J. with Jerry R. Burch, “Mechanically Checking a Lemma Used in an Automatic Verification Tool,” Proceedings of the 1996 Conference on Formal Methods in Computer Aided Design, Palo Alto CA.

Windley, Phillip J. with Paul E. Black, “Inference Rules for Programming Languages with Side Effects in Expressions,” Proceedings of the 1996 International Conference on the Theorem Provers in Higher—Order Logics, J. von Wright, J. Grundy, and J. Harrison, editors, Springer-Verlag Lecture Notes in Computer Science Volume 1125, 1996.

Windley, Phillip J. with Michael D. Jones and Trent N. Larson, “Toward GHDL_EVAL: A Framework for Deeply Embedding Simple HDLs in HOL” Supplementary Proceedings of the 1996 International Conference on the Theorem Provers in Higher—Order Logics, J. von Wright, J. Grundy, and J. Harrison, editors, Springer-Verlag Lecture Notes in Computer Science Volume 1125, 1996.

Windley, Phillip J. with Robert H. Beers, “Abstracting Signals: The Waveform Library,” Supplementary Proceedings of the 1996 International Conference on the Theorem Provers in Higher—Order Logics, J. von Wright, J. Grundy, and J. Harrison, editors, Springer-Verlag Lecture Notes in Computer Science Volume 1125, 1996.

Windley, Phillip J. with Paul E. Black, Kelly M. Hall, Michael D. Jones, and Trent N. Larson, “A Brief Introduction to Formal Methods,” Proceedings of the Custom Integrated Circuits Conference, San Diego CA, May 1996.

Windley, Phillip J. with Paul E. Black, “Automatically Synthesized Term Denotation Predicates: A Proof Aid,” Proceedings of the 1995 International Workshop on the Higher—Order Logic Theorem Proving and its Applications, E. Thomas Schubert, Phillip J. Windley, and James Alves-Foss, editors, Springer-Verlag Lecture Notes in Computer Science Volume 971, 1995.

Windley, Phillip J., “Verifying Pipelined Microprocessors,” Proceedings of the 1995 IFIP Conference on Hardware Description Languages and their Applications (CHDL), Tokyo Japan, 1995.

Windley, Phillip J. with Michael Coe, “Correctness Models of Pipelined Microprocessors,” Proceedings of the 1994 Conference on Theorem Provers in Circuit Design, Thomas Kropf and Ramayya Kumar, editors, 1994.

Windley, Phillip J., “Specifying Instruction Set Architectures in HOL: A Primer,” Proceedings of the 1994 International Workshop on the Higher—Order Logic Theorem Proving and its Applications, Thomas Melham and Juanito Camilleri, editors, Springer-Verlag Lecture Notes in Computer Science Volume 859, 1994.

Windley, Phillip J., “Using make to Manage Large Proofs ,” Presented at the 1994 International Workshop on the Higher—Order Logic Theorem Proving and its Applications.

Windley, Phillip J., “Correctness Properties for Iterated Hardware Structures,” Proceedings of the 1993 NASA Symposium on VLSI Design, Albuquerque NM, November 1993.

Windley, Phillip J. with Mark Aagard and Miriam Leeser, “Towards a Super Duper Hardware Tactic,” Proceedings of the 1993 International Workshop on the Higher—Order Logic Theorem Proving and its Applications, Jeffery J. Joyce and Carl Seger, editors, August 1993.

Windley, Phillip J. with David A. Fura, “Abstraction Techniques for Modeling Real—World Interface Chips,” Proceedings of the 1993 International Workshop on the Higher—Order Logic Theorem Proving and its Applications, Jeffery J. Joyce and Carl Seger, editors, August 1993.

Windley, Phillip J. with E. Thomas Schubert and Karl Levitt, “Report on the UCD Microcoded Viper Verification Project,” Proceedings of the 1993 International Workshop on the Higher—Order Logic Theorem Proving and its Applications, Jeffery J. Joyce and Carl Seger, editors, August 1993.

Windley, Phillip J., “A Theory of Generic Interpreters,” Proceedings of the 1993 Conference on Correct Hardware Design Methodologies (CHARME), Springer-Verlag Lecture Notes in Computer Science Volume 683, Arles, France, 1993.

Windley, Phillip J. with Jody W. Gambles, “Reasoning about the VHDL Standard Logic Package Signal Data Type,” Proceedings of the 1993 IFIP Conference on Hardware Description Languages and their Applications (CHDL), Ottawa Canada, 1993.

Windley, Phillip J. with Bruce A. Richman, “ACAD: A Hierarchical Approach to CMOS Design Analysis,” Proceedings of the 1993 IEEE Custom Integrated Circuits Conference, May 1993.

Windley, Phillip J. with Kelly Hall, “Simulating Microprocessors from Formal Specifications,” Proceedings of the 1992 International Workshop on the Higher—Order Logic Theorem Proving and its Applications, L. J. M. Calesen and M. J. C. Gordon, editors, North—Holland, 1993.

Windley, Phillip J., “Abstract Theories in HOL,” Proceedings of the 1992 International Workshop on the Higher—Order Logic Theorem Proving and its Applications, L. J. M. Calesen and M. J. C. Gordon, editors, North—Holland, 1993.

Windley, Phillip J., “Instruction Set Commutivity,” Proceedings of the 1992 NASA Symposium on VLSI Design, October 1992.

Windley, Phillip J. with Jody W. Gambles, "Incorporating Formal Verification Into VLSI Design Methodology," Proceedings of the 1992 NASA Symposium on VLSI Design, October 1992.

Windley, Phillip J. with J. Frenzel, S. Alves, and K. Prisbrey, "Genetic Algorithms and Hydrometallurgical Equilibrium," 1992 Society of Metallurgical Engineers Meeting, Phoenix AZ, February 1992.

Windley, Phillip J. with Jody W. Gambles, "A Verification Logic Representation of Indeterministic Signal Strengths," Proceedings of the 1991 NASA Symposium on VLSI Design, October 1991.

Windley, Phillip J. with M. Alahmad, "Specifying and Verifying Reliable VLSI Sequential Controllers," Proceedings of the 1991 NASA Symposium on VLSI Design, October 1991.

Windley, Phillip J., "The Formal Specification of a High—Speed CMOS Correlator," Proceedings of the 1991 NASA Symposium on VLSI Design, October 1991.

Windley, Phillip J., "The Practical Verification of Microprocessor Designs," 1991 INEL Computing Symposium, September 1991.

Windley, Phillip J. with Jody W. Gambles, "An HOL Theory for Logic States with Indeterminate Strengths," Proceedings of the 1991 International Workshop on the HOL Theorem Prover and its Applications, August 1991.

Windley, Phillip J., "Using Correctness Results to Verify Behavioral Properties of Microprocessors," Proceedings of the IEEE Conference on Computer Assurance, Systems Integrity, Software Safety, and Process Security (COMPASS), June 1991.

Windley, Phillip J., "Abstract Hardware," Proceedings of the IFIP WG 10.2 International Workshop in Formal Methods in VLSI Design, January 1991.

Windley, Phillip J., "A Hierarchical Methodology for Verifying Microprogrammed Microprocessors," Proceedings of the IEEE Symposium on Research in Security and Privacy, May 1990.

Windley, Phillip J., "An Approach to Rapidly Prototyping Robot Control Languages," International Journal of Robotics and Automation, Volume 4(1), March 1989.

INVITED PAPERS, BOOKS, AND PROCEEDINGS

Windley, Phillip J., "Dawn of the Application Network," InfoWorld, March 7, 2003.
Online at http://www.infoworld.com/article/03/03/07/10commone-sb_1.html?s=tc

Windley, Phillip J., “Being Smart About Business Intelligence,” InfoWorld, February 24, 2003. Online at http://www.infoworld.com/article/03/02/21/08integ-sb_1.html?s=tc

Windley, Phillip J., “Digital ID and Government,” Digital ID World, January 2003. Online at <http://www.digitalidworld.com/modules.php?op=modload&name=News&file=article&sid=116&mode=chrono&order=0>

Windley, Phillip J. and Ganesh Gopalakrishnan , editors, *Proceedings of the 1998 Formal Methods in Computer-Aided Design*, Lecture Notes in Computer Science, Vol. 1522. Springer Verlag. November, 1998.

Windley, Phillip J., E. Thomas Schubert, and James Alves-Foss, editors, *Proceedings of the 1995 International Workshop on the Higher—Order Logic Theorem Proving and its Applications*, Lecture Notes in Computer Science Volume 971, . Springer Verlag. September 1995.

Windley, Phillip J. and James F. Frenzel, “Microprocessor Applications,” *The Electrical Engineering Handbook*, CRC Press, 1995 (second edition).

Windley, Phillip J. and James F. Frenzel, “Microprocessor Applications,” *The Electrical Engineering Handbook*, CRC Press, 1993.

Windley, Phillip J., “Verification of VLSI Designs,” *Proceedings of the 1991 NASA Symposium on VLSI Design*, October 1991.

Windley, Phillip J., “The Practical Verification of Microprocessor Designs,” *Proceedings of the 1991 International Workshop on the HOL Theorem Prover and its Applications*, August 1991.

Windley, Phillip J., “The Practical Verification of Microprocessor Designs,” *IEEE COMPCON Proceedings*, San Francisco CA, February 1991.

Windley, Phillip J., Myla M. Archer, Karl N. Levitt, and Jeffrey J. Joyce (eds.), *Proceedings of the 1991 International Workshop on the HOL Theorem Prover and its Applications*, IEEE Computer Society Press, August 1991.

PhD DISSERTATIONS SUPERVISED

Larson, Trent N., *A Formal Method to Analyze Framework-Based Software Systems*, 2001.

Black, Paul A., *Verification of a Secure Web Server*, February, 1998

MASTERS THESES SUPERVISED

Zhuang, Yuan, *Formal Specification and Verification of Synchronous Exceptions of a Pipelined Microprocessor*, September, 1999.

Beers, Robert H., *Formal Verification of an Interrupt-Based Computer System in a Theorem Proving Environment*, March 1999.

Bunker, Annette, *A Hardware Combinator for Tree-Shaped Circuits*, September, 1998.

Larsen, Trent N., *Register Transfer Languages for Hardware Abstractions*, December 1997.

Jones, Michael D., *Representing Abstract Theories using Predicate Types*, June 1997.

Bignall, A. Rosina, *Hueristic Path—Analysis of Accesses to a World Wide Web Site*, November, 1996.

Stoddard, Brad, *Annotating Read—Only Documents*, June, 1996.

Coe, Michael L., *Results from Verifying a Pipelined Microprocessor*, November, 1994.

Walters, Derreck D., *Logic for Denotational Semantics Analysis of Algorithms*, March 1994.

Richman, Bruce A., *ACAD: A CMOS Analog Design Tool*, January 1993.

Gambles, Jody W., *Incorporating Formal Verification Into VLSI Design Methodology*, May 1992.

AWARDS AND PROFESSIONAL ACTIVITIES

General Co-Chair, 1998 Formal Methods in Computer-Aided Design, Palo Alto, CA.

General Chair, 1995 International Workshop on the HOL Theorem Proving System and Its Applications, Aspen Grove, UT, September 1995.

Program Committee, 1994 International Workshop on the HOL Theorem Proving System and Its Applications, Malta, September 1994.

Program Committee, Fifth NASA Symposium on VLSI Design, Albuquerque NM, October 1993.

Program Committee, 1993 International Workshop on the HOL Theorem Proving System and Its Applications, Vancouver British Columbia, August 1993.

Program Committee, Fourth NASA Symposium on VLSI Design, Couer d'Alene ID, October 1992.

Program Committee, 1992 International Workshop on the HOL Theorem Proving System and Its Application, Leuven Belgium, September 1992.

Program Committee, Third NASA Symposium on VLSI Design, Moscow ID, September 1992.

Program Committee Chair, 1991 International Workshop on the HOL Theorem Proving System and Its Application, Davis CA, August 1991.

Session Chair, 1991 IEEE Computer Conference (COMPCON), San Francisco CA, February 1991.

Reviewer, International Journal of Robotics and Automation, 1991-1998.

Reviewer, National Science Foundation, Design, Tools, and Test Program, 1992.

Outstanding Teaching Award, University of Idaho Computer Science Department, May 1993.

UNIVERSITY SERVICE

Information Technology Requirements Committee (university committee), Brigham Young University, Winter 1998—1999.

Chair, Department Capital Equipment Committee, Brigham Young University, Fall 1995—Fall 1997.

Computer Legal Requirements Committee (university committee), Brigham Young University, Summer 1996—Fall 1997.

Internet Communication Advisory Committee (university committee), Brigham Young University, Fall 1994—1999.

Chair, Departmental Self Study, Brigham Young University, Fall 1994—1996.

Chair, Department Curriculum Committee, Brigham Young University, Fall 1993—Summer 1994.

Faculty Advisory Committee, National Center for Advanced Transportation Technology, University of Idaho, Spring 1992—Summer 1993.

Department Equipment Committee, University of Idaho, Fall 1990—Summer 1993.
(Chair 1991—1992.)

Department Graduate Committee, University of Idaho, Fall 1991—Spring 1992.

University Computers Services Director Search Committee, University of Idaho, Spring 1991—Fall 1992.

College Computer Curriculum Committee, University of Idaho, Fall 1991—Spring 1992.

College of Business and Economics A. D. Davis Faculty Fellowship Committee, University of Idaho, April 1992—Summer 1993.

Department Faculty Search Committee, University of Idaho, Spring 1992.

Department Chair Review Committee, University of Idaho, Spring 1992.

Department Faculty Search Committee, University of Idaho, Fall 1990—Spring 1991.

OUTSIDE MEMBERSHIP AND SERVICE

Member, PingID Advisory Board, 2003—*present*.

Member, Utah Information Technology Association Board of Directors, 2001—*present*.

Member, College Advisory Council, College of Physical and Mathematical Sciences, Brigham Young University, 2001—*present*.

Member, Advisory Board, School of Computing and Engineering, Utah Valley State College, 2002—*present*.

Member, Utah Education Network Steering Committee, 2001-2002.

OTHER TRAINING

2000 Certificate **University of Michigan, Management Development Program**
Ann Arbor, MI

1983 Certificate **Westinghouse Bettis Reactor Engineering School**
Pittsburgh, PA