Curriculum Vita of
James L. Caldwell

caldwell@cs.cornell.edu
http://www.cs.cornell.edu/Info/People/caldwell/

Department of Computer Science
Cornell University
Ithaca, NY 14853
607/255-3934

Computational Sciences Division
NASA Ames Research Center
Moffett Field, CA, 94035

119 Heights Court
Ithaca, NY 14850
607/257-6742

Education

Ph.D. [expectedAugust 1998] Cornell University (Computer Science, minor in Mathematical Logic)
Thesis *Decidability Extracted: Synthesizing "correct-by-construction" decision procedures.*, under the supervision of Robert Constable, Fred Schneider, and Anil Nerode.

M.S. 1995 Cornell University (Computer Science)
Awarded upon completion of exam for admission to Ph.D. candidacy.

M.S. 1988 State University of New York at Albany (Computer Science)

B.S. 1984 State University of New York at Albany (Computer Science)

Work Experience

1997– now NASA Ames Research Center, Moffett Field, CA. (Computer Scientist)
On leave at Cornell to finish Ph.D.

1988–1997 NASA Langley Research Center, Hampton, VA. (Computer Scientist)

1985–1988 General Electric Corporate Research and Development Center/Infologic Software Inc., Schenectady, N.Y. (VLSI CAD Software Engineer)

1983–1985 Phoenix Data Systems, Albany, N.Y., (VLSI CAD Software Engineer)

1980–1981 CMT Trade Center, N.Y., N.Y. (Systems Programmer)

1979–1980 NPS Automation Services Inc., Secacus, N.J. (CAD Systems Specialist)

To Appear

James L. Caldwell: Classical Propositional Decidability via Nuprl Proof Extraction. TPHOLs'98: The 11th International Conference on Theorem Proving in Higher Order Logics.

James L. Caldwell, Ian Gent and Judith Underwood: Search Algorithms in Type Theory. To Appear in The Journal of Theoretical Computer Science in a special issue devoted to Proof Search in Type-theoretic Languages.

Publications and Reports

James L. Caldwell: Moving Proofs-as-Programs into Practice. In the Proceedings, 12th IEEE International Conference Automated Software Engineering (ASE'97), Incline Village, NV, November 1997.

James L. Caldwell and Judith Underwood: Classical tools for constructive proof search. Proceedings of the CADE-13 Workshop on Proof search in type-theoretic languages, pp.31 – 40. Edited by Didier Galmiche, Rutgers N.J., 30 July 1996.

James L. Caldwell: Formal Methods Technology-Transfer: a View from NASA. *Formal Methods in System Design.* Volume 12, No. 2, pp. 125 – 137, March 1998. An earlier version appears in the Proceedings of the ERCIM Workshop on Formal Methods for Industrial Critical Systems, pp. 1 – 16, Oxford England. Edited by S. Gnesi and D. Latella. 19 March 1996.

Ricky W. Butler, James L. Caldwell, Victor Carreno, Michael Holloway, Paul Miner and Ben L. Di Vito: NASA Langley's Research and Technology Transfer Program in Formal Methods. In 10th Annual Conference on Computer Assurance (COMPASS 95), Gaithersburg, MD, June 1995.

Ricky W. Butler, James L. Caldwell, and Ben L. Di Vito: Design strategy for a formally verified reliable computing platform. In 6th Annual Conference on Computer Assurance (COMPASS 91), Gaithersburg, MD, June 1991.

Ben L. Di Vito,Ricky W. Butler, and James L. Caldwell: High level design proof of a reliable computing platform. In *Dependable Computing for Critical Applications 2, Dependable Computing and Fault-Tolerant Systems*, pages 279–306. Springer Verlag, 1992. Also presented at 2nd IFIP Working Conference on Dependable Computing for Critical Applications, Tucson, AZ, Feb. 18–20, 1991, pp. 124–136.

Paul S. Miner and James L. Caldwell: A HOL theory for voting. In NASA Formal Methods Workshop 1990, pages 442–456, NASA CP-10052, November 1990.

Ben L. Di Vito, Ricky W. Butler, and James L. Caldwell: Formal design and verification of a reliable computing platform for real-time control (Phase 1 results). NASA Technical Memorandum 102716, October 1990.

James L. Caldwell, Ricky W. Butler, and Ben L. Di Vito: Hierarchical approach to specification and verification of fault-tolerant operating systems. In DARPA/Army Workshop on Software Tools for Distributed Intelligent Control Systems, Pacifica, CA., July 1990.

Selected Talks

Formal Methods: Industrial Applications from the NASA Portfolio. An invited talk given at Raytheon Systems Canada Ltd., Richmond, British Columbia, 22 May 1998.

Moving Proofs-as-Programs into Practice. A presentation given at the 12th IEEE International Conference Automated Software Engineering (ASE'97), Incline Village, NV, 5 Nov 1997.

Classical tools for constructive proof search. A presentation given at the Workshop on Proof search in type-theoretic languages held in conjunction with CADE-13, Rutgers N.J., 30 July 1996.

A Constructive account of Correct-by-construction. A talk given at NASA Langley Research Center, 26 April 1996.

Formal Methods Technology Transfer: A View From NASA. An invited presentation given at the Laboratory for Foundations of Computer Science at University of Edinburgh,28 March 1996.

Type theory, λ-calculus, the Curry–Howard Isomorphism and all that. A talk presented at the Formal Methods and Software Engineering Seminar, NASA Langley Research Center, 30 September 1994.

Formal verification of fault–tolerant systems for Hybrid Applications. An invited presentation given at the Hybrid Systems Workshop, Mathematical Sciences Institute, Ithaca, N.Y., June 10–12, 1991.

Close Enough For Government Work: Reflections on Models of Faulty State Machines. Presented at the First NASA Langley Formal Methods Workshop, Langley Research Center, August 1990.

Professional Activities

Invited Reviewer, FormalWARE Project Review, Department of Computer Science, University of British Columbia, Vancouver, Canada, 21 May 1998.

Program Committee, Lfm97, The Fourth NASA LaRC Formal Methods Workshop, Hampton, VA, 1997.

Panel Chair, Researcher Perspectives on Formal Methods. Third NASA LaRC Formal Methods Workshop, Hampton, VA, 1995

Referee: Fourth International Conference on Principles and Practice of Constraint Programming, CP'98; COMPASS 1996; IFIP Working Conference on Dependable Computing for Critical Applications, DCCA-5, 1995; IFIP Working Conference on Dependable Computing for Critical Applications, DCCA-4, 1993; FTCS-19, The Nineteenth International Symposium on Fault Tolerant Computing, 1989.

Session Chair, Workshop on Hardware Specification, Verification and Synthesis: Mathematical Aspects. Mathematical Sciences Institute, Cornell University, July 1989.

Research Interests

Provably correct approaches to digital design via synthesis and/or transformation based approaches. Verified decision procedures. Theorem proving and application of theorem provers to digital verification. The application of formal methods to fault-tolerant system verification.
A two page *Statement of Research* is available.