DAVID B. MACQUEEN

Present Address

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Personal Data

Born March 13, 1946, Denver, Colorado
Married, no children, U.S. citizen

Education

Bachelor of Science with Great Distinction and
Departmental Honors in Mathematics
Stanford University, 1968

Ph.D. in Mathematics
Thesis: "Post's Problem for Recursion in Higher Types"
Supervisor: Gerald Sacks
Massachusetts Institute of Technology, 1972

Professional Associations

Association for Computing Machinery (SIGPLAN)

Employment

7/01–present
Professor,
Computer Science Department,
University of Chicago.

7/03–7/06
Chair and Professor,
Computer Science Department,
University of Chicago.

9/01–12/01
Visiting Professor,
Laboratoire d'Informatique,
Ecole Polytechnique, Paris, France,
and Visiting Researcher,
Institue Nationale de Recherche en Informatique et Automatique,
Rocquencourt, France.

2/91–present
Distinguished Member of Technical Staff,
Computing Sciences Research Center, Bell Laboratories,
Lucent Technologies.

2/91–1/98
Head, Software Principles Research Department,
originally in Software and Systems Research Center,
AT&T Bell Laboratories, since April 1996 in Computing Sciences
Research Center, Bell Laboratories, Lucent Technologies.

1/81–2/91
Member of Technical Staff, Computing Science Research Center,
AT&T Bell Laboratories, Murray Hill, NJ 07974.

12/79–12/80
Member of Technical Staff, USC Information Sciences
Institute, Marina del Rey, CA 90291.

5/75–11/79

Postdoctoral Research Fellow, Departments of Artificial Intelligence and Computer Science, University of Edinburgh, Edinburgh, Scotland.

4/78–7/78
Researcher, Programming Research Group, INRIA Laboria, Racquencourt, France.

9/72–4/75
Military Active Duty with U.S. Air Force.
Instructor/Assistant Professor in Mathematics, Air Force Institute of Technology.

Teaching Experience

Adjunct Professor, Dept. of Computer Science, Princeton University, Spring 1991: Lectured on Semantics of Computation.

Adjunct instructor, Dept. of Computer Science, New York University, Spring 1986: Lectured on Type Theory and Programming Languages.

Adjunct Associate Professor, Dept. of Information and Computer Science, University of Pennsylvania, Spring 1984: Lectured on Advanced Topics in Programming Languages.

Adjunct Assistant Professor, Dept. of Information and Computer Science, University of Pennsylvania, Spring 1982: Lectured on the semantics of data types.

Visiting Lecturer, Dept. of Computer Science, UCLA, Fall 1980: Lectured on operational semantics of programming languages.

Department of Artificial Intelligence, Univ. of Edinburgh: Lectured on Scott's theory of domains, fixed point theory and induction, first order logic and resolution, programming languages, and abstract data types.

Dept. of Mathematics, Air Force Institute of Technology: Taught courses on advanced calculus, ordinary and partial differential equations, probability theory, linear algebra, applied algebra and automata theory, and functional analysis to graduate engineering students.

Short Courses

Marktoberdorf Summer School 2000, A NATO funded summer school organized by Tony Hoare, Manfred Broy, and Vlad Turski. Five hours of lectures on the topic "Structure and Abstraction in HOT Languages: A Comparison of Polymorphism, Modules, and Objects".

Internal Bell Laboratories courses on Standard ML, December, 1993

Standard ML, CSLI/ASL Summer School, Stanford, July, 1985

Internal Bell Laboratories course on the ML programming language, September, 1983

The Design of Distributed Processing Systems, Nice, June/July 1978

Honors

ACM Fellow, May 1999

Distinguished Member of Technical Staff, Bell Labs, 1989

National Science Foundation Graduate Fellow, 1968-1972

Phi Beta Kappa, 1967

Stanford Alumni Association Award for outstanding male freshman, 1965

Shell Merit Scholar, 1966-1968

National Merit Scholar, 1964-1966

Invited Addresses

American Mathematical Society Summer Meeting, Laramie, Aug. 1985

Assoc. for Symbolic Logic Summer Meeting, Stanford, July 1985

ACM Principles of Programming Language Conference, invited tutorial on Type Systems, 1988.

Other Professional Activities

Editorial Advisory Board for the journal Higher-Order and Symbolic Computation, January 2002.

Member of Program Committee for Second Symposium on Programs as Data Objects (PADO II), Aarhus, Denmark, 21-23 May 2001

Panel member for NSF Information Technology Research (ITR), February 2000

Panel member for NSF Grant Review, January 2000

General Chair for 1998 ACM Symposium on Principles of Programming Languages

Member of Program Committee for 1993 ACM Symposium on Principles of Programming Languages

Editorial Board of the Journal of the ACM, 1991-1994

Program Committee Chairman for 1989 4th International Conference on Functional Programming and Computer Architecture

Program Committee Chairman for 1989 ACM Symposium on Principles of Programming Languages

Member of Program Committee for 1986 ACM Symposium on Lisp and Functional Programming

Member of Program Committee for 1985 ACM Symposium on Principles of Programming Languages

Organizer and Program Co-chairman for International Symposium on Semantics of Data Types, Sophia-Antipolis, France, June 1984

Member of Program Committee for 1984 ACM Symposium on Principles of Programming Languages

Organizer (with Ravi Sethi, Albert Meyer, and Gordon Plotkin) of Workshops on Theory of Data Types, MIT, March, 1983 (12 participants) and CMU, June, 1983 (50 participants)

Co-editor (with Luca Cardelli) of Polymorphism newsletter

Member of Program Committee for 1981 ACM Conference on Functional Programming Languages and Computer Architecture

Charter Member of IFIP Working Group 2.8 (Functional Programming)

Invited Departmental Colloquia and Seminars

Stanford University
Cornell University
Carnegie Mellon University
MIT
Yale University
Univ. of California at Davis
Univ. of Chicago
Univ. of Indiana
Univ. of New Mexico
Univ. of Oregon
Univ. of Pennsylvania
Oregon Graduate Institute
Williams College
Univ. of Edinburgh
Univ. of Cambridge
Univ. of Oxford
Ecole Polytechnique
Univ. of Munich
Univ. of Oslo
Univ. of Trondheim
Chalmers Technical University, Univ. of Gothenberg
Univ. of Newcastle
INRIA Rocquencourt
INRIA Sophia Antipolis

Research Institutes

1995 Newton Institute Program on Semantics of Computation
(Cambridge University)

Research Interests

Theory of data types:

- semantic models for types
- type checking algorithms and type inference systems
- type abstraction
- polymorphism
- typed object oriented languages

Design and implementation of functional programming languages (ML)

Module systems and programming in the large

Programming environments and meta-linguistic tools

Theory of domains and denotational semantics, operational semantics.

Formal methods and tools for software specification and program development

Systems

- Standard ML '97, a revised definition of the Standard ML language, with Robin Milner, Mads Tofte, and Robert Harper, 1995-1997.
- Standard ML of New Jersey compiler, with Andrew Appel and others at Bell Laboratories and Princeton University, 1986 to present. Distributed and in wide-spread use since 1989. (http://cm.bell-labs.com/cm/cs/what/smlnj)
- Standard ML programming language design and definition, in collaboration with Robin Milner, Rod Burstall, and others from Edinburgh and Cambridge Universities, 1983-1988.
- The Hope functional programming language, designed with Rod Burstall and implementated with Donald Sannella, Edinburgh University, 1978-1980.

Publications

Post's Problem for Recursion in Higher Types, Ph.D. Dissertation, Massachusetts Institute of Technology, 1972.

A note on the envelope of a type n+2 object (abstract), Notices of the American Mathematical Society, Jan, 1974 (presented at the 1974 Annual AMS Meeting, San Francisco).

Selection in abstract recursion theory, with L. A. Harrington, Journal of Symbolic Logic, Vol. 41, No. 1 (March 1976), pp. 153–158.

Coroutines and networks of parallel processes, with Gilles Kahn, in B. Gilchrist (Ed.), Information Processing 77, North Holland, 1977, pp. 993–998.

Models for Distributed Computing, Proceedings of the Summer School on Design of Distributed Processing Systems, IRIA, 1979; also INRIA Rapport de Recherche No. 351, April, 1979.

Hope: An Experimental Applicative Language, with R. M. Burstall and D. Sannella, Proc. Lisp Conference, Stanford, August, 1980.

Structure and Parameterization in a Typed Functional Language, Proc. 1981 Symposium on Functional Language and Computer Architecture, Gothenburg, Sweden, June, 1981.

A Semantic Model of Types for Applicative Languages, with Ravi Sethi, Proc. of 1982 ACM Symposium on Lisp and Functional Programming, Pittsburgh, August, 1982, pp 243–252.

An Ideal Model for Recursive Polymorphic Types, with Ravi Sethi and Gordon Plotkin, Proc. of 1984 ACM Symposium on Principles of Programming Languages, Salt Lake City, January, 1984, pp. 165–174.

Semantics of Data Types, Proceedings of the International Symposium, Sophia–Antipolis, June 1984, co-editor with Gilles Kahn and Gordon Plotkin, Springer–Verlag Lecture Notes in Computer Science, Vol. 173, Springer–Verlag, Berlin, 1984.

Modules for Standard ML, Proc. of 1984 ACM Symposium on LISP and Functional Programming, Austin, August, 1984, pp. 198–207.

Completeness of proof systems for equational specifications, (with D. T. Sannella), IEEE Trans. on Software Engineering, SE–11, 5, May 1985, pp. 454–460.

Using Dependent Types to Express Modular Structure, Proc. of 1986 ACM Symposium on Principles of Programming Languages, St. Petersburg, January 1986.

An Ideal Model for Recursive Polymorphic Types, with Ravi Sethi and Gordon Plotkin, Information and Control, Vol 71, No 1/2, October/November 1986, pp. 95–130.

A Standard ML Compiler, with Andrew Appel, Proceedings of 3rd Intn'l Conf on Functional Programming and Computer Architecture, Portland, Sept 1987, Springer Verlag LNCS Vol 274, pp. 301–324.

Unifying Exceptions with Constructors in Standard ML, with Andrew Appel, Milner, R., and Tofte, M., Report ECS-LFCS-88-55, Laboratory for Foundations of Computer Science, Computer Science Dept., Edinburgh University, 1988.

Persistence and Type Abstraction, with Luca Cardelli, in Data Types and Persistence, M. P. Atkinson, P. Buneman, R. Morrison, eds., Springer–Verlag, 1988.

An Implementation of Standard ML Modules, Proc. of 1988 ACM Conf on Lisp and Functional Programming, Snowbird, July 1988, pp. 212–223.

Profiling in the Presence of Optimization and Garbage Collection, with Andrew W. Appel, Bruce F. Duba, and Andrew P. Tolmach, CS-TR-197-88, Princeton University November, 1988.

A Higher Order Type System for Functional Programming, in Research Topics in Functional Programming, David Turner, ed., Addison Wesley, 1990.

Standard ML of New Jersey, with Andrew Appel, in Programming Language Implementation and Logic Programming, Proceedings of the 3rd Intn'l Symposium, J. Maluszynski and M. Wirsing, eds., Springer Verlag, LNCS Vol 528, 1991, pp. 1–13.

Typing first–class continuations in ML, with Robert Harper and Bruce F. Duba, Journal of Functional Programming, Vol 3, No 4, October 1993, pp. 465–484.

Computing ML Equality Kinds Using Abstract Interpretation, with Carl A. Gunter and Elsa L. Gunter, Information and Computatin, Vo. 107, No 2, December 1993, pp. 303–323. (Earlier version appeared in TACS 9?)

Reflections on Standard ML, in Functional Programming, Concurrency, Simulation and Automated Reasoning, Peter E. Lauer, ed., Springer Verlag LNCS Vol 693, pp. 32–46.

Semantics for Higher Order Functors, with Mads Tofte, in European Symposium on Programming, Springer–Verlag LNCS Vol 788, April 1994, pp. 409–423.

Separate Compilation for Standard ML, with Andrew Appel, Proc. of the ACM SIGPLAN '94 Conf. on Programming Language Design and Implementation, Orlando, June, 1994, pp. 13–23.

An Implementation of Higher–order Functors, with Pierre Cregut, Proc. of 1994 ACM SIGPLAN Workshop on ML and its Applications, Orlando, June 1994, pp. 13–22.

How to add laziness to a strict language withouth even being odd, with Philip Wadler and Walid Taha, Proc. of the 1998 ACM Workshop on ML, Baltimore, MD, September 1998, pp. 24–30.

Adaptation in HOT Languages: Comparing Polymorphism, Modules, and Objects, in **Engineering Theories of Software Construction**, C. A. R. Hoare, M. Broy, and R. Steinbrüggen (editors), IOS Press, Amsterdam, 2001.

Should ML be Object-Oriented?, Rod Burstall Festscrift special issue of Formal Aspects of Computing, Volume 13, Numbers 3-5, Springer Verlag, pp 214 – 232, 2002.

Programming with Sequences, in **The Standard ML Basis Manual**, Emden R. Gansner and John H. Reppy (editors), Cambridge University Press, 2004.

Programming Languages, Berkshire Encyclopedia of Human-Computer Interaction, William S. Bainbridge, editor, Berkshire Publishing, 2004.

A Rewriting Semantics for Type Inference, with George Kuan and Robby Findler, Proc. of the European Symposium on Programming 2007 Braga, Portugal, March 2007.

Efficient Type Inference Using Ranked Type Variables, with George Kuan, ML '07: Proc. of the 2007 ACM Workshop on ML, Freiburg, Germany, October 2007.

Kahn Networks at the Dawn of Functional Programming, in From Semantics to Computer Science: Essays in Honor of Gilles Kahn, Cambridge University Press, 2008.

Proceedings edited

Semantics of Data Types, International Symposium, Sophia Antipolis, June 1984, Springer Verlag LNCS Vol 173, 1984.

Books

The Definition of Standard ML (Revised), with Robin Milner, Mads Tofte, and Robert Harper, MIT Press, 1997.