

## **RAY (a.k.a. TIM) TEITELBAUM**

### **EDUCATION**

1975 Carnegie-Mellon University, Ph.D., Computer Science  
1964 Massachusetts Institute of Technology, B.S., Mathematics

### **POSITIONS**

1988- Chairman and CEO, GrammaTech, Inc., Ithaca, NY  
2010- Professor Emeritus, Department of Computer Science, Cornell University  
1981-2010 Associate Professor, Department of Computer Science, Cornell University  
1982-83 Visiting Researcher, Institut National de Recherche en Informatique et en Automatique (INRIA), Rocquencourt, France  
1979-81 Senior Lecturer, Department of Computer Science, Cornell University  
1973-79 Assistant Professor, Department of Computer Science, Cornell University  
1968-72 Graduate Student, Department of Computer Science, Carnegie-Mellon University  
1965-68 Senior Research Programmer, Physics Department, Columbia University  
1964-65 Programmer, Western Electric Corporation

### **AWARDS AND HONORS**

2003 Recognized as a “Highly Cited Researcher” in the field of Computer Science by the Institute for Scientific Information.  
June 1996 Dean's Award for Outstanding Teaching  
1996 College of Engineering Teaching Award  
May 1986 Dean's Prize for Innovation in Undergraduate Teaching

### **PH.D. STUDENTS**

Aswin van den Berg (1998) [with D. Gries]  
Y. Annie Liu (1995)  
John Reppy (1992)  
John Field (1991)  
Allan Zaring (1990)  
Stephen Peckham (1990)  
William Pugh (1988) [PVI, Packard Fellow]  
Roger Hoover (1987)  
Susan Horwitz (1985) [PVI]  
Thomas Reps (1982) [ACM Doctoral Dissertation Award, NSF PVI, Packard Fellow, Guggenheim Fellow, ACM Fellow]

## **PUBLICATIONS**

### **Software**

GrammaTech, *CodeSonar*, performs a deep static analysis on C/C++ code and identifies many types of bugs. These include null-pointer dereferences, divide-by-zeros, buffer overruns, buffer underruns, double-frees, use-after-frees, and frees of non-heap memory. Various releases, February 2006 to present.

<http://www.grammatech.com/products/codesonar/>

GrammaTech, *CodeSurfer*, a software development, inspection, and maintenance tool that provides dependence-graph browsing and precise interprocedural program slicing for C programmers. Various releases, May 1999 to present.

<http://www.grammatech.com/products/codesurfer/>

GrammaTech, *Ada-ASSURED*, a multi-purpose tool that ensures consistent coding style, prevents syntax errors, and provides numerous productivity features for writing and reviewing code. It features WYSIWYG language-sensitive editing, automatic standards enforcement, high-quality pretty printing, and hypertext browsing in a package that can be integrated with any Ada compiler. Various releases, June 1996 to June 2004.

<http://www.grammatech.com/products/aa/>

Reps, T. and Teitelbaum, T., *The Synthesizer Generator*, Various releases, December 1985 to April 1991 (Cornell); September 1991 to present (GrammaTech). The Synthesizer Generator is a tool for creating language-based environments from formal specifications. To date, it has been licensed, in source code form, for research purposes, to approximately 350 sites worldwide. Roughly half of the sites are in the U.S. and half are overseas; roughly half the sites are academic and half are government or industrial research laboratories. The Synthesizer Generator has been commercialized by GrammaTech, Inc. of Ithaca, NY. Commercial products based on it include Penelope, a formal verification system for Ada, by ORA of Ithaca, NY; Raise, a rigorous approach to industrial software engineering, by CRI of Copenhagen, DK; CRIE, a LOTOS editing tool, U. Twente, Netherlands; and Ada-ASSURED, an Ada language-sensitive editor and program analysis tool, by GrammaTech.

Reps, T., Teitelbaum, T., et al., *The Cornell Program Synthesizer*, Version 1, June 1979; Version 1.02, September 1980; Version 1.03, September 1981 (with T. Reps). The Cornell Program Synthesizer was a programming environment for a small dialect of PL/I that demonstrated the feasibility of Integrated Development Environment (IDES). During its lifetime, it was licensed to 110 sites worldwide and was used by over 20,000 introductory programming students.

### **Books**

Reps, T. and Teitelbaum, T., *The Synthesizer Generator: A System for Constructing Language-Based Editors*, Springer-Verlag, New York, 1988.

Reps, T. and Teitelbaum, T., *The Synthesizer Generator Reference Manual: Fourth Edition*. Springer-Verlag, New York, NY, 1992.

Chinese reprint published by the World Publishing Corporation, Beijing, China, 1991.

### **Book Chapters**

Kozen, D., Teitelbaum, T., Chen, W., Field, J., Pugh, W., and Vander Zanden, B., Alex - An Alexical Programming Language. In *Visual Languages and Applications*, T. Ichikawa, E. Jungert and R. Korfhage (eds.), Plenum Press, NY, 1990.

### **Reprinted in Collections**

Reps, T., Balakrishnan, G., Lim, J., and Teitelbaum, T., A next-generation platform for analyzing executables. In *Malware Detection*, Advances in Information Security Series, Vol. 27, M. Christodorescu, S. Jha, D. Maughan, D. Song, and C. Wang (eds.), Springer-Verlag, 2006, pp. 43-61  
Reprinted from *Proc. 3rd Asian Symposium on Programming Languages and Systems* (Tsukuba, Japan, November 3-5, 2005).

Reps, T. and Teitelbaum, T., Language processing in program editors. In *Language Architectures and Programming Environments*, T. Ichikawa and H. Tsubotani (eds.), The World Scientific Publishing Company, Singapore, 1992, pp. 146-169.

Reprinted from *IEEE Computer* 20, 11 (November 1987), 29-40.

Reps, T. and Teitelbaum, T., The Cornell Program Synthesizer: A Syntax-directed Programming Environment. In *Interactive Programming Environments*, D. R. Barsow, E. Sanderwall, and H. Shrobe (eds.), McGraw-Hill, NY, 1984, pages 97-116.  
Reprinted from *Communications of the ACM* 24, 9 (September 1981), pp 563-573.

Reps, T., Horowitz, S. and Teitelbaum, T., The Why and Wherefore of the Cornell Program Synthesizer. In *Software Development Environments*, A.I. Wasserman (ed.), IEEE Computer Society Press, November 1981, pages 64-72.  
Reprinted from *Proceedings of ACM/SIGPLAN-SIGOA Symposium on Text Manipulation* (Portland, OR, June 8-10, 1981), *SIGPLAN NOTICES* 16, 6 (June 1981), pp 8-16.

### Journal Publications

Anderson, P., Reps, T., and Teitelbaum, T., Design and implementation of a fine-grained software inspection tool. In *IEEE Trans. on Software Engineering* 29, 8 (Aug. 2003), 721-733.

Anderson, P., Binkley, D., Rosay, G., and Teitelbaum, T., Flow Insensitive Points-to Sets. In *Information and Software Technology (I&ST)* 44, 13 (October 2002), 743-754.

Clarke, E. M., Fujita, M., Rajan, P. S., Reps, T., Shankar, S. and Teitelbaum, T., Program Slicing for VHDL. In *Software Tools for Technology Transfer* 4, 1 (October 2002), 125-137.

Liu, Y. A., Stoller, S. D. and Teitelbaum, T., Strengthening Invariants for Efficient Computation. In *Science of Computer Programming (SCP)* 41, 2 (October 2001), 139-172.

Millett, L. and Teitelbaum, T., Issues in Slicing Promela and its Applications to Model Checking, Protocol Understanding, and Simulation. In *International Journal on Software Tools for Technology Transfer* 2, 4 (2000), 343-349.

Liu, Y. A., Stoller, S. D. and Teitelbaum, T., Static Caching for Incremental Computation. In *ACM Transactions on Programming Languages and Systems (TOPLAS)* 20, 3 (May 1998), 546-585.

Liu, Y. A. and Teitelbaum, T., Systematic Derivation of Incremental Programs. In *Science of Computer Programming* 24, 1 (1995), 1-39.

Demers, A. J., Horwitz, S. and Teitelbaum, T., An Efficient General Iterative Algorithm for Dataflow Analysis. In *Acta Informatica* 24, 6 (1987), 679-694.

Horwitz, S. and Teitelbaum, T., Generating Editing Environments Based on Relations and Attributes. In *TOPLAS* 9, 3 (October 1986), 577-608.

Reps, T., Teitelbaum, T. and Demers, A. J., Incremental Context-dependent Analysis for Language-based Editors. In *TOPLAS* 5, 3 (July 1983), 449-477.

Teitelbaum, T. and Reps, T., The Cornell Program Synthesizer: A Syntax-directed Programming Environment. In *CACM* 24, 9 (September 1981), 563-573.

### Refereed Conference Proceedings

Reps, T., Balakrishnan, G., Lim, J., and Teitelbaum, T., A next-generation platform for analyzing executables. In *Proc. 3rd Asian Symposium on Programming Languages and Systems*, Tsukuba, Japan, Nov. 3-5, 2005.

Balakrishnan, G., Reps, T., Melski, D., and Teitelbaum, T., WYSINWYX: What You See Is Not What You eXecute. In *Proc. IFIP Working Conference on Verified Software: Theories, Tools, Experiments*, Zurich, Switzerland, Oct. 10-13, 2005.

Balakrishnan, G., Reps, T., Kidd, N., Lal, A., Lim, J., Melski, D., Gruian, R., Yong, S., Chen, C.-H., and Teitelbaum, T., Model checking x86 executables with CodeSurfer/x86 and WPDS++. In *Proc. Workshop on the Evaluation of Software Defect Detection Tools*, June 2005.

- Balakrishnan, G., Reps, T., Kidd, N., Lal, A., Lim, J., Melski, D., Gruian, R., Yong, S., Chen, C.-H., and Teitelbaum, T., Model checking x86 executables with CodeSurfer/x86 and WPDS++, (tool-demonstration paper). In *Proc. Computer-Aided Verification*, 2005.
- Balakrishnan, G., Gruian, R., Reps, T., and Teitelbaum, T., CodeSurfer/x86 -- A platform for analyzing x86 executables, (tool demonstration paper). In *Proc. Int. Conf. on Compiler Construction*, April 2005.
- Anderson, P., Binkley, D., Rosay, G., and Teitelbaum, T., Flow Insensitive Points-to Sets. In *Proceedings of the first IEEE Workshop on Source Code Analysis and Manipulation*, Florence, Italy, November 2001, pp. 79-89.
- Clarke, E. M., Fujita, M., Rajan, S. P., Reps, T., Shankar, S. and Teitelbaum, T., Program Slicing of Hardware Description Languages. In *Proc. of Charme '99*, Bad Herrenalb, Germany, September 1999.
- Millett, L. and Teitelbaum, T., Channel Dependence Analysis for Slicing Promela. In *Proceedings of the International Symposium on Software Engineering for Parallel and Distributed Systems (PDSE'99)*, Los Angeles, CA, pp. 52-61, May 1999.
- Anderson, P., Goldsmith, M. and Scattergood, B. and Teitelbaum, T., An Environment for Integrating Formal Methods Tools. In *Proceeding of User-Interfaces for Theorem Provers 97 (UITP97)*, INRIA, Sophia-Antipolis, September 1997.
- Liu, Y. A., Stoller, S. D. and Teitelbaum, T., Discovering Auxiliary Information for Incremental Computation. In *Proceedings of 23rd ACM Symposium on Principles of Programming Languages*, St. Petersburg Beach, FL, pp. 157-170, January 21-24, 1996.
- Lui, Y. A. and Teitelbaum, T., Caching Intermediate Results for Program Improvement. In *Proceedings of ACM SIGPLAN Symposium on PEPM*, La Jolla, CA, pp. 190-201, June 1995.
- Field, J. and Teitelbaum, T., Incremental Reduction in the Lambda Calculus. Presented at *1990 Lisp and Functional Programming Conference*, Nice, France, pp. 307-322, June 1990.
- Teitelbaum, T. and Chapman, R., Higher-order Attribute Grammars and Editing Environments. In *Proceedings of ACM SIGPLAN '90 Conference on Programming Language Design and Implementation*, White Plains, NY, pp. 197-208, June 1990.
- Pugh, W. and Teitelbaum, T., Incremental Computation by Function Caching. In *Proceedings of 16th ACM Symposium on Principles of Programming Languages*, Austin, TX, January 11-13, 1989, pp. 269-276.
- Kozen, D., Teitelbaum, T., Chen, W., Field, J., Pugh, W., and Zanden, B. V., Alex - An Alexical Programming Language. *Workshop on Visual Languages*, Linkoping, Sweden, August 19-21, 1987.
- Hoover, R. and Teitelbaum, T., Efficient Incremental Evaluation of Aggregate Values in Attribute Grammars. In *Proceedings of ACM SIGPLAN '86 Symposium on Compiler Construction*, Palo Alto, CA, June 1986, pp. 39-50.
- Reps, T., Marceau, C. and Teitelbaum, T., Remote Attribute Updating for Language-based Editors. In *Proceedings of 13th ACM Symposium on Principles of Programming Languages*, St. Petersburg, FL, January 1986, pp. 1-13.
- Horwitz, S. and Teitelbaum, T., Relations and Attributes: A Symbiotic Basis for Editing Environments. In *Proceedings of ACM SIGPLAN '85 Symposium on Language Issues in Programming Environments*, Seattle, WA, June 1985, pp. 93-106.
- Reps, T. and Teitelbaum, T., The Synthesizer Generator. In *Proceedings of ACM SIGSOFT/SIGPLAN Software Engineering Symposium on Practical Software Development Environments*, Pittsburgh, PA, April 1984, pp. 42-48.

Teitelbaum, T., Reps, T. and Horowitz, S., The Why and Wherefore of the Cornell Program Synthesizer. In *Proceedings of ACM/SIGPLAN-SIGOA Symposium on Text Manipulation*, Portland, OR, June 8-10, 1981, pp. 8-16.

Demers, A. J., Reps, T. and Teitelbaum, T., Incremental Evaluation for Attribute Grammars with Application to Syntax-directed Editors. In *Proceedings of 8th ACM Symposium Principles of Programming Languages*, Williamsburg, VA, January 26-28, 1981, pp. 105-116.

Demers, A. J., Donahue, J., Teitelbaum, T., and Williams, J., Encapsulated Data Types and Generic Procedures. In *Proceedings of DOD Workshop on a Common Programming Language for Embedded Systems*, Ithaca, NY, 1976, Springer-Verlag, pp. 171-214.

Teitelbaum, T., Context-free Error Correction by Evaluation of Algebraic Power Series. In *Proceedings of 5th ACM Symposium on Theory of Computing*, Austin, TX, April 30-May 2, 1973, pp. 196-199.

Teitelbaum, T., Newman, et al., A Study of Sigma Leptonic Decay Using an HPD in Pattern Recognition Mode. In *Proceedings International Conference on Advanced Data Processing for Bubble Chambers and Spark Chambers*, New York, NY, October 1968, pp. 256-265.

Teitelbaum, T. and Burd, D., Current Status of Automatic Scanning at Columbia University. In *Proceedings of the 1967 International Conference on Programming for Flying Spot Devices*, Munich, Germany, January 1967.

#### **Other Conference Publications**

Melski, D., Teitelbaum, T., and Reps, T., Static Analysis of Software Executables. In *CATCH '09: Proceedings of the 2009 Cybersecurity Applications & Technology Conference for Homeland Security*, 2009.

Anderson, P. and Teitelbaum, T., Software Inspection Using CodeSurfer. In *WISE'01: Proceedings of the 1st Workshop on Inspection in Software Engineering*, Paris, France, July 23, 2001.

Millett, L. and Teitelbaum, T., Slicing Promela and its Applications to Protocol Understanding and Analysis. In *Proceedings of the 4th Workshop on Automata Theoretic Verification with the SPIN Model Checker*, Paris, France, pp. 75-83, November 1998.

#### **Tutorials**

Semantic Analysis. SIGPLAN '93 Conference on Programming Language Design and Implementation, Albuquerque, NM, June, 1993.

Generating Language-Sensitive Environments. *SIGPLAN '92 Conference on Programming Language Design and Implementation*, San Francisco, CA, June 15-19, 1992.

Semantic Analysis. SIGPLAN '88 Conference on Programming Language Design and Implementation, Atlanta, GA, June 22-24, 1988.

Semantic Analysis. *SIGPLAN '86 Symposium on Compiler Construction*, Palo Alto, CA, June 25-27, 1986.

#### **Magazine Articles**

Anderson, P., Reps, T., Teitelbaum, T., and Zarins, M., Tool support for fine-grained software inspection. *IEEE Software* 20, 4 (2003), 42-50.

Reps, T. and Teitelbaum, T., Language processing in program editors. *IEEE Computer* 20, 11 (November 1987), 29-40.

#### **Other Publications and Reports**

Reps, T.W., Teitelbaum, T., Anderson, P., and Melski, D., Static analysis of binary executable code. Proceedings of Defining the State of the Art in Software Security Tools Workshop, NIST Special Publication 500-264, Sept. 2005.

- Teitelbaum, T., Structure of C Programs and Their Interpretation, Third Edition August 20, 1996, 58 pp.  
Approximately 1000 copies printed.
- Liu Y.A., Teitelbaum, T., Incremental Computation for Transformational Software Development. Tech. Rep. 95-1499, Department of Computer Science, Cornell University, Ithaca, NY, March 1995.
- Liu Y.A., Teitelbaum, T., Caching Intermediate Results for Program Improvement. Tech. Rep. 95-1498, Department of Computer Science, Cornell University, Ithaca, NY, March 1995.
- Liu Y.A., Teitelbaum, T., Systematic Derivation of Incremental Programs. Tech. Rep. 94-1444, Department of Computer Science, Cornell University, Ithaca, NY, August 1994.
- Liu Y.A., Teitelbaum, T., Deriving Incremental Programs. Tech. Rep. 93-1384, Department of Computer Science, Cornell University, Ithaca, NY, September (revised October) 1993.
- Kozen, D., Teitelbaum, T., Chen, W.Z., Field, J.H., Pugh, W.W.; Vander Zanden, B.T., Alex -- An Alexical Programming Language. Tech. Rep. 87-835, Department of Computer Science, Cornell University, Ithaca, NY, May 1987.
- Teitelbaum, T. and Reps, T., Release of the Synthesizer Generator. In ACM Software Engineering Notes 11, 1 (January 1986), 109-110.
- Teitelbaum, T., The Cornell Program Synthesizer: A Tutorial Introduction. Department of Computer Science, Cornell University, First Edition, July 1979, Fifth Edition, May 1983, 49 pp. Approximately 20,000 copies printed.
- Teitelbaum, T. and Reps, T., On the Value of Syntax-directed Editors. CACM 25 (5), May 1982, pp. 351-352.
- Teitelbaum, T., The Cornell Program Synthesizer: Announcement. SIGPLAN NOTICES, October 1979, page 75.
- Teitelbaum, T., The Cornell Program Synthesizer: A Microcomputer Implementation of PL/CS. Tech. Rep. 79-370, Department of Computer Science, Cornell University, Ithaca, NY, March 1979.
- Teitelbaum, T., A Formal Syntax for PL/CS. Tech. Rep. 76-281, Department of Computer Science, Cornell University, Ithaca, NY, January 1976.
- Teitelbaum, T., A Compiler Project. Department of Computer Science, Cornell University, Ithaca, NY, January 1976.
- Teitelbaum, T., Minimal Distance Analysis of Syntax Errors in Computer Programs. Ph D. Thesis, Department of Computer Science, Carnegie-Mellon University, Pittsburgh, PA, September 1975

## **LECTURES**

### **Static-semantic Analysis Based on Dependence Graphs.**

- Sandia National Laboratory, Albuquerque, NM, April 1999.
- Northrop-Grumman, Pico Rivera, CA, April 1999.
- National Security Agency, Linthicum Heights, MD, January 1999.
- Martin-Marietta, Owego, NY, October 1997.

### **Assuring Software Quality Using an Ada Language-sensitive Programming Environment.**

- Martin-Marietta Corporation, Syracuse, NY, April 1994.
- Loral Aerospace Corporation, Owego, NY, June 1994.
- IBM Federal Systems Division, Owego, NY, April 1993.
- Software Productivity Laboratory, Herndon, VA, March 1993.
- SAIC, Orlando, FL, March 1993.
- Martin-Marietta Corp., Orlando, FL, March 1993.
- ECC, Orlando, FL, March 1993.
- GE Aerospace Corp., Syracuse, NY, July 1992.

IBM Federal Systems Division, Owego, NY, July 1992.

**Higher-order Attribute Grammars and Editing Environments.**

Rice University, Houston, TX, April 1990.

ACM SIGPLAN '90 Conference on Programming Language and Design and Implementation, White Plains, NY, June 1990.

**Static Semantic Analysis.**

ACM SIGPLAN Conference-93, Albuquerque, NM, June 1993.

**Automatically Enforcing Quality in ADA Software: Implications for Interactive Tools.**

10th Annual Washington ADA Symposium, McLean, VA, June 1993.

**The Synthesizer Generator: A System for Constructing Language-based Editors.**

AT&T Bell Laboratories, Murray Hill, NJ, May 1993.

HP Laboratories, Palo Alto, CA, March 1993.

Lockheed Missiles and Space Co., Palo Alto, CA, March 1993.

HP Corp., Ft. Collins, CO, March 1993.

Software Productivity Consortium, Herndon, VA, March 1993.

Digital Equipment Corporation, Nashua, NH, February 1993.

Raytheon Corporation, Portsmouth, RI, November 1992.

GE Aerospace Corp., Syracuse, NY, July 1992.

RADC, Rome, NY, July 1992.

CASE-92, Montreal, Canada, July 1992.

GTE, Research Triangle Park, NC, May 1992.

Verdix Corporation, Herndon, VA, April 1992.

Loral Space and Range Systems, San Jose, CA, March 1992.

Sun Microsystems Laboratories, Inc., Mountain View, CA, March 1992.

SunPro, Mountain View, CA, March 1992.

Lockheed Missiles and Space Co., Palo Alto, CA, March 1992.

Workshop on Programming Environments, Dagstuhl, Germany, March 1992.

Unisys/Paramax, Arlington, VA, March, 1992.

Software Productivity Consortium, Herndon, VA, February 1992.

Seer Technologies, New York, NY, October 1991.

Tandem Computers, Cupertino, CA, September 1991.

Software Productivity Laboratory, Loral Aerospace Corp., San Jose, CA, September 1991.

IDE, San Francisco, CA, September 1991.

Telesoft Corp., San Diego, CA, September 1991.

Naval Oceans Systems Center (NOSC), San Diego, CA, September 1991.

NASA, Langley Air Force Base, FL., May 1991.

Ford Aerospace Corp., San Jose, CA., January 1990.

Annual Meeting, Syracuse University CASE Center, Blue Mountain Lake, NY, July 1989.

**Incremental Computation.**

Office of Naval Research, April 1988.

**Generation of Language-based Programming Environments.**

Boston SIGPLAN, Intermetrics, Cambridge, MA, November 1988.

General Motors, Warren, MI, March 1988.

Department of Computer Science, Bucknell University, Lewisburg, PA, November 1987.

Department of Mathematics and Computer Science, Dartmouth College, Hanover, NH, October 1987.

General Electric, Schenectady, NY, July 1987.

Institute for the Retraining in Computer Science. Clarkson University, Potsdam, NY, July 1986.

Office of Naval Research, Washington, DC, February 1986.

Wang Institute, January, 1985.

Department of Computer Science, University of Maryland, October, 1984.

**Syntax-directed Programming Environments.**

Department of Computer Science, ETH, Lausanne, Switzerland, July 1984 (2 lectures).  
Department of Computer Science, University of Oslo, Oslo, Norway, February 1983.  
Department of Computer Science, University of Linköping, Linköping, Sweden, February 1983.

**Incremental Evaluation for Attribute Grammars with Application to Syntax-directed Editors.**

Sino-American Symposium of Computer Software Engineering, Changsha, People's Republic of China, April 1982.  
Central Research Laboratory, Nippon Electric Company, Kawasaki-City, Japan, April 1982.  
Department of Computer Science, New York University, New York, NY, March 1981.  
Department of Computer Science, Purdue University, Lafayette, IN, February 1981.  
Eighth Annual ACM Symposium on Principles of Programming Languages (POPL), Williamsburg, VA, January 1981.  
Department of Computer Science, Carnegie-Mellon University, Pittsburgh, PA, November 1980.

**Design and Implementation of the Cornell Program Synthesizer, A Syntax-directed Programming Environment (usually with demonstrations on a Terak (LSI-11) microcomputer).**

Department of Computer Science, Tsinghua University, Peking, Peoples Republic of China, April 1982.  
Sino-American Symposium of Computer Software Engineering, Changsha, Peoples Republic of China, April 1982.  
Central Research Laboratory, Nippon Electric Company, Kawasaki-City, Japan, April 1982.  
Language Issues for Large-Scale Computing, Department of Energy, Gleneden Beach, OR, March 1982.  
Department of Computer Science, Pennsylvania State University, State College, PA, December 1981.  
Department of Mathematical Sciences, Rensselaer Polytechnic Institute, Troy, NY, December 1981.  
Department of Computer Science, Brown University, Providence, RI, September 1981.  
Department of Computer Science, SUNY Stony Brook, Stony Brook, NY, March 1981.  
National Bureau of Standards, Gaithersburg, MD, March 1981.  
Department of Computer Science, City University of New York, New York, NY, March 1981.  
Department of Computer Science, University of Indiana, Bloomington, IN, February 1981.  
Department of Computer Science, Purdue University, Lafayette, IN, February 1981.  
Department of Computer Science, University of Rochester, Rochester, NY, January 1981.  
Schlumberger-Doll Research, Ridgefield, CT, January 1981.  
IBM, T. J. Watson Research Center, Yorktown Heights, NY, January 1981.  
Department of Mathematics, Dartmouth, Hanover, NH, December 1980.  
Department of Computer Science, University of Waterloo, Ontario, Canada, December 1980.  
Bell Telephone Laboratories, Murray Hill, NJ, November 1980.  
IBM Endicott Development Laboratory, Endicott, NY, November 1980.  
Department of Electrical and Computer Engineering, and the Department of Computer and Information Sciences (COINS), University of Massachusetts, Amherst, MA, November 1980.  
Department of Computer Science, New York University, New York, NY, October 1980.  
Department of Computer Science, University of Texas, Austin, TX, October 1980.  
Department of Mathematical Sciences, Rice University, Houston, TX, October 1980.  
General Motors Research Laboratories, Warren, MI, May 1980.  
Department of Computer and Information Sciences, University of Michigan, Ann Arbor, MI, May 1980.  
Bell Telephone Laboratories, Naperville, IL, May 1980.  
Department of Mathematics, Ithaca College, Ithaca, NY, April 1980.  
Department of Electrical Engineering and Computer Science, University of Connecticut, Storrs, CT, April 1980.  
Department of Mathematics, Wesleyan University, Middletown, CT, April 1980.  
Bell Telephone Laboratories, Holmdel, NJ, March 1980.  
Department of Computer Science, Queens University, Kingston, Canada, February 1980.  
Digital Equipment Corporation, Maynard, MA, July 1979.  
Department of Computer Science, University of Guelph, Guelph, Canada, June 1979.  
Department of Mathematics, Hamilton College, Clinton, NY, April 1979.  
IEEE Delaware Bay Chapter, Newark, DE, April 1979.  
Department of Electrical Engineering, University of Delaware, Newark, DE, April 1979.  
Department of Computer Science, Carnegie-Mellon University, Pittsburgh, PA, March 1979.  
Department of Computer Science, North Carolina State University, Raleigh, NC, March 1979.  
Department of Computer Science, Duke University, Durham, NC, March 1979.  
IBM Scientific Center, Cambridge, MA, March 1979.

Zilog Inc., Cupertino, CA, February 1979.

Department of Electrical Engineering and Computer Science, University of Santa Clara, Santa Clara, CA, February 1979.

Intel Corporation, Santa Clara, CA, February 1979.

IBM Research Laboratory, San Jose, CA, February 1979.

Department of Electrical Engineering and Computer Science, Columbia University, New York, NY, January 1979.

Department of Electrical Engineering and Computer Science, Princeton University, Princeton, NJ, January 1979.

IBM, T. J. Watson Research Center, Yorktown Heights, NY, January 1979.

### **Computer science and software engineering education at Cornell.**

Changsha Institute of Technology, Changsha, Peoples Republic of China, April 1982.

### **On encapsulated data types and generic procedures.**

Department of Computer Science, SUNY Stony Brook, Stony Brook, NY, December 1976.

### **On structured assembly languages.**

U.S. Army Electronics Command, Fort Monmouth, NJ, December 1975.

### **On the diagnosis and correction of syntax errors in programs by evaluation of algebraic power series in non-commuting variables.**

Fifth Annual ACM Symposium on Theory of Computing (SIGACT), Austin, TX, May 1973.

Department of Computer Science, Cornell University, Ithaca, NY, March 1973.

Department of Electrical Engineering, Massachusetts Institute of Technology, Cambridge, MA, March 1973.

Department of Computer Science, Duke University, Durham, NC, March 1973.

School of Electrical Engineering, University of Pennsylvania, Philadelphia, PA, February 1973.

Department of Electrical Engineering, Princeton University, Princeton, NJ, February 1973.

Department of Computer Science, SUNY Stony Brook, Stony Brook, NY, December 1973.

### **On automatic scanning of bubble chamber photographs**

Brookhaven Laboratory, Upton, NY, October 1967

## **PROFESSIONAL ACTIVITIES**

### **Chairman**

Doctoral Dissertation Award Committee, ACM, 1992-93.

### **Member**

Doctoral Dissertation Award Committee, ACM, July 1988-94.

Academic Advisory Committee, ADAPSO, October 16-19, 1988, Dallas, TX.

Program Committee, ACM SIGPLAN '88 Compiler Construction Conference, June 20-24, 1988, Atlanta, GA.

Panel, Software Engineering Program, NSF, April 4, 1988, Washington, DC.

NSF Software Engineering Workshop, February 24-26, 1988, Atlanta, GA.

Program Committee, Fifteenth Annual ACM SIGACT/SIGPLAN Symposium on Principles of Programming Languages, January 1987.

Program Committee, ACM SIGPLAN '84 Symposium on Compiler Construction, Montreal, Canada, June, 1984.

Program Committee, International Course on Syntax-Directed Editors, Aussois, France, April 18-22, 1983 (Co-director).

Program Committee, Tenth Annual ACM SIGACT/ SIGPLAN Symposium on Principles of Programming Languages, January 24-26, 1983 (Co-chairman).

Program Committee, ACM SIGPLAN '82 Symposium on Compiler Construction, Boston, MA, June 23-25, 1982.

Delegate, Sino-American Symposium on Computer Software Engineering, Changsha, Peoples Republic of China, April 8-10, 1982.

Program Committee, ACM SIGSOFT/SIGPLAN Software Engineering Symposium on High-Level Debugging, 1981-82.

Panel, Productivity in Education, IEEE COMPCON, Washington, DC, September 15, 1981.  
Association for Computing Machinery

**Consultant**

IBM (1985), AMS/ACM Summer Computer Science Institute Planning Committee (1982), Terak Corp. (1979), U.S. Army Electronics Command (1975), Digital Equipment Corp. (1970).

**Reviewer**

ACM Computing Surveys, ACM TOPLAS, IEEE Computer, IEEE Software, IEEE Transactions on Software Engineering, MIT Press.  
Review of DoD Programming Language Policy, Computer Science and Telecommunications Board, National Research Council (1996).

**Referee**

NSF, NSERC

**CORNELL ACTIVITIES**

Member, Computing Policy Committee (1994-1996)  
Chairman, Departmental Computer Facilities Committee (1990-91)  
Member, 2001 Committee (1990-91)  
Member, Committee on Instructional Computer Technologies (1990-91)  
Member, Search Committee for Associate Dean for Undergraduate Affairs (1986)  
Member, CER Management Committee (1986-89); Chairman (1987-88)  
Chairman, Department Chairman Search Committee (1986-87)  
Member, Senior Faculty Recruiting Committee (1985-1992); Chairman (1985-87)  
Member, Engineering College Resource Allocation Advisory Committee (1985-86)  
Member, Engineering College Computing Board (1984-88); Chairman (1987-88)  
Member, Computer Science Undergraduate Academic Affairs Committee (1984-85)  
Member, University Appeals Panel (1984-89)  
Director, Undergraduate Programs in Computer Science (1983-85)  
Member, Engineering College Computer Advisory Committee (1983-84)  
Member, Committee to Study Computers in Engineering Mathematics (1983-84)  
Co-director, Computer Science Summer School Program (1981-82)  
Member, University Computing Board subcommittee (1981-82)  
Member, Faculty Appeals Board (1981-82)  
Director, Computer Science Summer School Program (1979-80)  
Member, Engineering College Core Curriculum Committee (1977-82)  
Undergraduate program advisor (1977-1995)

**CORNELL COURSES TAUGHT****CS100—Introduction to Computer Programming**

Spring 2002, 147 students  
Fall 2000, 298 students  
Fall 1999, 205 students  
Fall 1996, 181 students  
Fall 1995, 189 students  
Fall 1994, 270 students  
Fall 1993, 317 students  
Fall 1992 and Spring 1993, 478 students  
Fall 1985, 645 students  
Fall 1984, 758 students  
Fall 1983, 749 students  
Fall 1981, 725 students  
Fall 1980 and Spring 1981, 1176 students  
Fall 1979 and Spring 1980, 1020 students  
Fall 1978 and Spring 1979, 952 students  
Fall 1977, 475 students  
Fall 1976, 544 students  
Fall 1975, 460 students

**CS100S—Introduction to Computer Programming (Honors)**

Fall 1987, 45 students  
Spring 1987, 10 students

**CS211—Computers and Programming**

Fall 1990, 85 students

**CS212—Modes of Algorithmic Expression**

Fall 1988, 42 students

**CS314—Introduction to Computer Systems and Organization**

Fall 1974, 35 students

Fall 1973, 48 students

**CS411—Introduction to Programming Languages**

Spring 1988, 23 students

**CS412—Translator Writing**

Spring 2008, ~30 students

Spring 2007, ~25 students

Spring 2005, 30 students

Spring 1997, 30 students

Spring 1996, 47 students

Spring 1994, 37 students

Spring 1993, 24 students

Spring 1974, 42 students

Spring 1973, 25 students

**CS501—Software Engineering**

Fall 1998, 36 students

**CS612—Advanced Programming Languages and Translator Writing**

Spring 1995, 10 students

Spring 1986, 28 students

Spring 1984, 32 students

Spring 1982, 24 students

Spring 1977, 33 students

Spring 1976, 29 students

Spring 1975, 36 students

**CS712—Topics in Programming Languages and Systems**

Spring 1989, 10 students

Fall 1986, 7 students

Spring 1985, 11 students

**CORNELL LECTURES**

Computer programming as engineering design. *Cornell College of Engineering Alumni Council*, May 1984.

\_\_\_\_\_. *Engineering Career Orientation Forum*, February 1984.

The Cornell Program Synthesizer. *Conversations at Cornell*, May 1982.

\_\_\_\_\_. *Computing in Agriculture, ATC/CALS Faculty Series*, January 6, 1981.

The computer: idiot savant or wunderkind? *Freshman Orientation Program*, August 28, 1980.

From slide rule to microcomputer: how freshmen learn to compute. *Cornell Trustee's Weekend*, October 12, 1979.

Design and implementation of the Cornell Program Synthesizer, a syntax-directed programming environment, with demonstration. *OCS Seminar*, March 28, 1979.

\_\_\_\_\_. *Department of Computer Science*, December 7, 1978.

Computer programming as engineering communication. *Parents' Weekend*, October 22, 1977.