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## 1 Personal Information

### 1.1 Education

- B.S. (Mathematics), Rensselaer Polytechnic Institute, 1967.
- M.S. (Computer Science), Cornell University, 1969.
- Ph.D. (Computer Science), Cornell University, 1971.

### 1.2 Experience in Higher Education

- *University of Maryland*, Department of Computer Science, 1971-present  
2007-present, Professor Emeritus  
1971-2007, Assistant, Associate Professor, and Professor  
1987-88, Associate Chairman for Facilities  
1985, Acting Chairman  
1982-85, Associate Chairman for Education
- *Ithaca College*, 1970, Visiting Lecturer of Mathematics

### 1.3 Experience Other than in Higher Education

- *Senior Research Scientist*, Fraunhofer Center for Experimental Software Engineering, Maryland  
2007-present,  
*Chief Scientist*, 2003-2007.  
*Co-Director*, 1998-2003.
- *Computer Scientist/Faculty Appointment*, Information Technology Laboratory, National Institute of Standards and Technology, Gaithersburg, MD, 1976-97.
- *Consultant*, various companies and agencies in Washington DC area.
- *Systems Programmer*, RCA Computer Systems Division, June 1969-September 1969.
- *Systems Programmer*, Office of Computer Services, Cornell University, 1968-69.

## 2 Research Activities

### 2.1 Books and Book Chapters

1. Zelkowitz M. V. *PL/I Programming with PLUM*, Paladin House Publishers, Geneva, Ill. (June 1976) 140 pp.
2. Zelkowitz M. V. Interrelationships between optimization and structured programming, in *Program Optimization*, Infotech State of the Art Reports 30 (1976) 369-381.
3. Zelkowitz M. V., Shaw A. C. and Gannon J. D., *Principles of Software Engineering and Design*, Prentice Hall Inc., Englewood Cliffs, NJ (1979).

4. Zelkowitz M. V. Advances in software engineering: Resource estimation, in *Advances in Computer Program Management*, Heyden and Son (1980) 206-225.
5. Zelkowitz M. V. (ed.) *Selected Reprints in Software*, IEEE Computer Society Press (1980) pp282. Second edition -- (1982) pp 337; Third edition -- (1987) pp 400.
6. Zelkowitz M. V., *Software Engineering*, Auerbach Publishers (1983).
7. Kowalchack B. and M. V. Zelkowitz, Drs. A language-oriented diagnostic run-time system, in *Role of Language in Problem Solving 2*, Elsevier Science Publishers (1987) 377-389.
8. Zelkowitz, M.V., B. Kowalchack, D. Itkin, L. Herman, A SUPPORT tool for Teaching Computer Programming, in *Issues in Software Engineering Education*, R. Fairley and P. Freeman (ed.) Springer Verlag (1989) 139-167.
9. Zelkowitz M. V. (ed.) *Requirements for a software engineering environment*, Ablex Publishing Co. (1989) 175 pp.
10. Zelkowitz M. V., The role of verification in the software specification process, *Advances in Computers* 36, Academic Press (1993) 43-109.
11. Gannon J. D., J. M. Purtilo and M. V. Zelkowitz, *Software specifications: A comparison of formal methods*, Ablex Publishing Co., Norwood, NJ (1994) 249 pp.
12. Yovits M. and M. Zelkowitz (Ed.) *Advances in Computers* 40, Academic Press, San Diego, CA, (1995).
13. Zelkowitz M. V. (Ed.) *Advances in Computers* 41—56 (1995-2002) Academic Press; 57-62, 64-67, 69-74 (2003-8) Elsevier, Amsterdam.
14. Pratt T. and M. Zelkowitz, *Programming Languages: Design and Implementation (Third Edition)*, Prentice Hall, Upper Saddle River, NJ, (1996), *Fourth edition*, (2001).
15. Zelkowitz M. V., *Instructor's Guide to Programming Languages: Design and Implementation (Third Edition)*, Prentice Hall, Upper Saddle River, NJ, (1996).
16. Zelkowitz, M. V., *Programming Languages*, McGraw Hill Encyclopedia of Science and Technology, 9th Edition, (2002).
17. Zelkowitz, M. V., D. R. Wallace, D. Binkley, Evaluation of new software engineering technologies In *Lecture Notes on Empirical Software Engineering* (N. Juristo and A. Moreno, Ed.), World Scientific Publishing, (2003) 229-263.
18. Boehm B., H. D. Rombach, and M. V. Zelkowitz (Eds), *Foundations of Empirical Software Engineering*, Springer, (2005).
19. Zelkowitz, M. V., Techniques for empirical validation, *Empirical Software Engineering Issues: Critical Assessment and Future Directions*, LNCS-4336, Springer, (2007), 4-9.
20. Zelkowitz, M. V., Data sharing enabling technologies, *Empirical Software Engineering Issues: Critical Assessment and Future Directions*, LNCS-4336, Springer, (2007), 108-110.
21. Hochstein L., T. Nakamura, F. Shull, N. Zazaworka, V. R. Basili and M. V. Zelkowitz, An environment for conducting families of software engineering experiments, *Advances in Computers* 74, Elsevier, Boston, MA, (2008) 175-200.
22. Zelkowitz M. V., Education of Software Engineers, *Perspectives on the future of software engineering*, J. Munch and K Schmid (Ed.), Springer, Heidelberg, Germany (2013)349-358.

## 2.2 Journals

23. Zelkowitz M. V. Interrupt Driven Programming, *Comm. of the ACM* 14(6), (1971) 417-418.
24. Zelkowitz M. V. PIT: A macro implemented implementation language, *Software Practice and Experience* 2(4) (1972) 337-346.
25. Zelkowitz M. V., Agrawala A. K. KWIC index for computer networks, *Networks* 3(2), (1973) 135-171.
26. Zelkowitz M. V. Reversible Execution, *Comm. of the ACM* 16(9), (1973) 566.
27. Zelkowitz M. V. and W. G. Bail Optimization of Structured Programs, *Software Practice and Experience* 4(1), (1974) 51-57.
28. Zelkowitz M. V. Structured Operating System Organization, *Information Processing Letters* 2(2), (1974) 29-32.
29. Harada K., Zelkowitz M. V. Design and implementation of an interactive PL/I system, *J. of Information Processing (Japan)* 16(2), (1975) 85-92.
30. Zelkowitz M. V., Effects of structured programming on PL/1 programmers, *Software Practice and Experience* 7(6), (1977) 793-795.

31. Zelkowitz M. V. and H. J. Larsen, Implementation of a capability based data abstraction, *IEEE Trans. on Software Engineering* 4(1), (1978) 56-64.
32. Zelkowitz, M. V., Perspectives on software engineering, *ACM Computing Surveys* 10(2), (1978) 197-216.
33. Basili V. R. and Zelkowitz M. V., Measuring software development characteristics in the local environment, *Computers and Structures* 10 (1979) 39-43.
34. Zelkowitz M. V. A case study in rapid prototyping, *Software Practice and Experience* 10(12), (1980) 1037-1042.
35. Zelkowitz M. V. and J. Lyle, Implementation of language enhancements, *J. of Computer Languages* 6(5), (1981) 139-153.
36. Zelkowitz M. V., Data collection and evaluation for experimental computer science research, *Information Processing and Management* 12(1), (1984) 269-276.
37. Zelkowitz M. V., Yeh R. T., Hamlet R. G., Gannon J. D., Basili V. R., Software engineering practices in the United States and Japan, *IEEE Computer* 17(6), (1984) 57-66.
38. Gannon J. D. and M. V. Zelkowitz, Two implementation models of abstract data types, *J. of Computer Languages* 12(1), (1987) 21-25.
39. Zelkowitz M. V., Resource utilization and software development, *J. of Systems and Software* 8, (1988) 331-336.
40. Bail W. and M. V. Zelkowitz, Program complexity using hierarchical abstract computers, *J. of Computer Languages* 13(3), (1988) 109-123.
41. Zelkowitz M. V., L. Herman, D. Itkin, B. Kowalchack, A tool for understanding program execution, *J. of Pascal, Ada and Modula-2* 8(3), (1989) 10-20.
42. Zelkowitz M., L. Herman, D. Itkin, and B. Kowalchack, Experiences building a syntax-directed editor *Software Engineering J.* 4(6), (November, 1989) 294-300.
43. Zelkowitz M. V. Evolution towards a specifications environment: Experiences with syntax editors, *Information and Software Technology* 32(3), (April, 1990) 191-198.
44. Zelkowitz M. V., A functional correctness model of program verification, *IEEE Computer* 23(11), (November, 1990) 30-39.
45. Zelkowitz M. V. and S. Cárdenas-García, The role for executable specifications in system maintenance, *Information Sciences Journal* 57 (1991) 347-359.
46. Cárdenas-García S., and M. V. Zelkowitz, A management tool for evaluation of software designs *IEEE Trans. on Software Engineering* 17(9), (1991) 961-971.
47. Tian J., and M. V. Zelkowitz, A formal model of program complexity and its application, *J. of Systems and Software* 17(3), (1992) 253-266.
48. Cárdenas-García S., J. Tian and M. V. Zelkowitz, An application of decision theory for the evaluation of software prototypes, *J. of Systems and Software*, 19(1), (1992) 27-39.
49. Brown A. W., D. J. Carney, P. H. Feiler, P. Oberndorf, and M. V. Zelkowitz, Issues in the Definition of a Project Support Environment Reference Model, *Computer Standards and Interfaces* 15 (1993) 431--443.
50. Zelkowitz M. V. and J. Tian, Measuring prime program complexity, *Information Sciences* 77, (1994) 325-350.
51. Tian J. and M. V. Zelkowitz, Complexity measure evaluation and selection, *IEEE Trans. on Software Engineering*, 21(8), (1995) 641-650.
52. Basili V., M. Zelkowitz, F. McGarry, J. Page, S. Waligora, and R. Pajerski, SEL's software process-improvement program, *IEEE Software* 12(6), (1995) 83-87.
53. Abrams M. D. and M. V. Zelkowitz, Striving for correctness, *Computer and Security* 14 (1995) 719-738.
54. Zelkowitz M., Modeling software engineering environment capabilities, *J. of Systems and Software* 35(1), (1996) 3-14.
55. Zelkowitz M. V., Software Engineering technology infusion within NASA, *IEEE Trans. on Eng. Mgmt.* 43(3), (August, 1996) 250-261.
56. Basili V., S. Green, O. Laitenberger, F. Lanubile, F. Shull, S. Sorumgaard, and M. Zelkowitz, The empirical investigation of perspective-based reading *J. of Empirical Software Engineering* 1(2), (1996) 133-164.
57. Zelkowitz M. V. and B. Cuthill, Application of an information technology model to software engineering environments, *Journal of Sys and Software* 37(1), (1997) 27-40.

58. Morasca S., L. C. Briand, V. R. Basili, E. J. Weyuker, and M. V. Zelkowitz, Comments on "Toward a framework for software measurement validation" (Correspondence), *IEEE Transactions on Software Engineering* 23(3), (March, 1997) 187-188.
59. Zelkowitz M. V. and D. Wallace, Experimental validation in software technology, *Information and Software Technology*, 39(11), (November, 1997) 735-744.
60. Zelkowitz M. V. and D. Wallace, Experimental models for validating computer technology, *IEEE Computer* 31(5), (May, 1998) 23-31.
61. Zelkowitz M. V. and D. R. Wallace, Validating the benefit of new software technology, *Software Quality Practitioner* 1(1), (November, 1998).
62. Tesoriero R. and M. Zelkowitz, WebME: A web-based tool for data analysis and presentation *IEEE Internet Computing*, 2(5), (September, 1998) 63-69.
63. Zelkowitz, M. V. and I. Rus, Defect evolution in a product line environment, *Journal of Systems and Software*, vol. 70(1-2), (2004) 143-154
64. Jiwnani K. and M. Zelkowitz, Susceptibility matrix: A new aid to software auditing, *IEEE Security and Privacy*, 2(2) (March, 2004) 16-21.
65. Lindvall M., Rus I., Shull F., Zelkowitz M. V., Donzelli P., Memon A., Basili V. R., Costa P., Tvedt R. T., Hochstein L., Asgari S., Ackermann C., and Pech D., An Evolutionary Testbed for Software Technology Evaluation, *NASA Journal of Innovations in Systems and Software Engineering* (1)1 (2005) 3-11.
66. Donzelli P., M. Zelkowitz, V. Basili, D. Allard, K. N. Meyer, Evaluating COTS Components Dependability: The case of Real-Time Java Virtual Machines for Spacecraft Software, *IEEE Software*, (July 2005), 46-53.
67. Dangle K. C., P. Larsen, M. Shaw, and M. V. Zelkowitz, Software process improvement in small organizations: A case study, *IEEE Software*, (November, 2005) 68-75.
68. Shull F., C. Seaman and M. Zelkowitz, Quality time: Victor R. Basili's Contributions to Software Quality, *IEEE Software*, (January 2006) 16-18.
69. Lindvall M., I. Rus, P. Donzelli, A. Memon, M. Zelkowitz, C. Ackermann, B. Anders, S. Asgari, V. Basili, P. Costa, J. Fellmann, D. Hirschbach, L. Hochstein, F. Shull, R. Tvedt, D. Pech, An environment to aid in the replication of software engineering experiments, *Empirical Software Engineering*, 12(4) 2007, 417-444.
70. Basili V. R., M. V. Zelkowitz, D. I. K. Sjøberg, P. Johnson, and A. J. Cowling, Protocols in the use of Empirical Software Engineering Artifacts, *Empirical Software Engineering*, 12(1), 2007, 107-119.
71. Carver J. C., L. Hochstein, R. P. Kendall, T. Nakamura, M. V. Zelkowitz, V. R. Basili and D. E. Post, Observations about Software Development for High End Computing, *CTWatch* 2(4A), (November, 2006) 33-38.
72. Hochstein L., T. Nakamura, V. R. Basili, S. Asgari, M. V. Zelkowitz, J. K. Hollingsworth, F. Shull, J. Carver, M. Voelp, N. Zazworka, Philip Johnson, Experiments to Understand HPC Time to Development, *CTWatch* 2(4A), (November 2006) 24-32.
73. Basili, Victor R. and M. V. Zelkowitz, Empirical Studies to Build a Science of Computer Science, *Comm. of the ACM* 50(11), 2007, 33-37.
74. V. R. Basili, D. Cruzes, J. C. Carver, L. M. Hochstein, J. K. Hollingsworth and M. V. Zelkowitz, Understanding the high-performance computing community: A software engineer's perspective, *IEEE Software*, (July 2008) 29-36.
75. Zelkowitz M. V., An Update to Experimental Models for Validating Computer Technology, *J. of Systems and Software* 82, (2009), 373-376.

### 2.3 Major Conference Papers

76. Lay W. M., Mills D. L., Zelkowitz M. V., Design of a distributed computer network for resource sharing. AIAA Computer Network Systems Conf., Huntsville, Alabama (April, 1973) 73.426.1 - 73.426.7.
77. Zelkowitz M. V., PLUM: An interactive PL/1 system, USE Technical papers, Spring 1974 Meeting, New Orleans, March, 1974 (invited paper).
78. Hamlet R. G., Zelkowitz M. V., SIMPL systems programming on a minicomputer, IEEE Comcon, Washington, D. C. (September, 1974) 203-206.

79. Basili V. R., Noonan R., Zelkowitz M. V., A Computer Science Curriculum in Programming Languages, IFIP Second World Conf. in Computers in Education, Marseilles, France (September, 1975) 1003-1012.
80. Zelkowitz M. V., Third Generation Compiler Design, ACM 28 National Conf., Minneapolis, Minn. (October, 1975) 253-258.
81. Zelkowitz M. V., Automatic program analysis and evaluation, Second International Conf. on Software Engineering, San Francisco, CA (October, 1976) 158-163.
82. Zelkowitz M. V., McMullin P., Merkel K., Larsen H., Error checking with pointer variables, ACM 29 National Conf., Houston, TX (October, 1976) 391-395.
83. Basili V. R. and M. V. Zelkowitz, Analyzing medium scale software development, Third International Conf. On Software Engineering, Atlanta, Ga. (May, 1978) 116-123.
84. Bail W. G. and M. V. Zelkowitz, Program Complexity using hierarchical abstract computers, National Computer Conf. 47, Anaheim, CA (June, 1978) 605-608.
85. Zelkowitz M. V., Resource estimation for medium scale software projects, 12th Symp. on the Interface of Statistics and Computer Science, Waterloo, Canada (May, 1979) 267-272 (invited paper).
86. Zelkowitz M. V. and J. Lyle, Implementation of program specifications, IEEE Computer Society COMPSAC, Chicago, Ill., (October, 1980) 194-200.
87. Chen E. and M. V. Zelkowitz, Use of cluster analysis in evaluating software engineering methodologies, ACM/IEEE 5<sup>th</sup> International Conf. on Software Engineering, San Diego CA (March, 1981) 117-123.
88. Zelkowitz M. V., What has happened to data abstractions? - Experience with one implementation, Sixth International Conf. on Software Engineering (Poster session), Tokyo, Japan (September, 1982) 9-10.
89. Zelkowitz M. V., Data collection and evaluation for experimental computer science research, Symp. on Empirical Foundations of Information and System Science, Atlanta, GA (1982) 269-276.
90. Zelkowitz M. V., A small contribution to editing with a syntax directed editor, ACM SIGSOFT SIGPLAN Symp. on Practical Software Development Environments, Pittsburgh, PA (April, 1984) (in *ACM SIGSOFT Software Engineering Notes* 9, 3 (1984) 1-6).
91. Lyon G., M. V. Zelkowitz, et al., Dialogue mechanisms in a tabletop programming environment, IEEE COMPCON, Arlington VA (September, 1984) 33-39.
92. Zelkowitz M. V. et al., Engineering an environment for small machines, IEEE International Conf. on Computer Workstations, San Jose, CA (November, 1985) 61-69.
93. Zelkowitz M. V., An editor for program designs IEEE Compcon, San Francisco, CA (February, 1987) 242-246.
94. Antoy S., P. Forcheri, B. Kowalchack, M. Molfino, S. Pearlman, M. Zelkowitz, Using abstractions in a Pascal environment, AICA Conf., Trento, Italy (September, 1987) 155-162.
95. Cárdenas-García S. and M. V. Zelkowitz, Evaluation criteria for functional specifications, ACM/IEEE 12th Int. Conf. on Soft. Eng., Nice Fr (March, 1990), 26-33.
96. Antoy S., P. Forcheri, M. T. Molfino, and M. Zelkowitz, Rapid prototyping of system enhancements, First IEEE Int. Conf. on System Integration, Morristown, NJ (April, 1990), 330-336.
97. Straub P. and M. V. Zelkowitz, PUC: A functional specification language for Ada, 10th Int. Software Engineering Conference, Santiago, Chile (July, 1990) 111-122.
98. Straub P. and M. V. Zelkowitz, On the nature of bias and defects in the software specification process, IEEE COMPSAC 92, Chicago, IL (September, 1992) 17-24.
99. Tian J., A. Porter and M. V. Zelkowitz, An improved classification tree analysis of high cost modules based upon an axiomatic definition of complexity, IEEE  $\text{\$}^{\text{\$}}{\text{\$}}$  International Symp. on Software Reliability Engineering, Research Triangle Park, NC (October, 1992) 164-172.
100. Zelkowitz M. V., Use of an environment classification model, ACM/IEEE 15<sup>th</sup> International Conf. on Soft. Eng., Baltimore, MD (May, 1993), 348-357.
101. Brown A. W., D.J. Carney, P.A. Oberndorf, and M.V. Zelkowitz, A Project Support Environment Reference Model, Tri-Ada Conference, Seattle, WA, September, 1993.
102. Li N. R. and M. V. Zelkowitz, An Information Model for Use in Software Management Estimation and Prediction, Second International Conference on Information and Knowledge Management, Washington, DC, November, 1993, 481-489.

103. Abrams M. D. and M. V. Zelkowitz, Belief in correctness, National Computer Security Conference, Baltimore, October, 1994, 132-141.
104. Cuthill B. and M. Zelkowitz, The Integrated Technology and Measurement Model, Software Technology Conference, Salt Lake City, UT, April, 1995.
105. Tesoriero R. and M. V. Zelkowitz, Measurement of process complexity, European Software Control and Metrics Conference, Wilmslow, UK, May, 1996, 304-315.
106. Zelkowitz M. V., The twelve step method for experimental computer science, 16<sup>th</sup> International Conference of the Chilean Computer Science Society, Valdivia, Chile, November, 1996 (Invited talk).
107. Zelkowitz M. V. and D. Wallace, Experimental validation in software engineering, International Conference on Empirical Assessment and Evaluation in Software Engineering, March, 1997, Keele University, UK. (A revision of this paper appears in the November, 1997 issue of *Information and Software Technology*).
108. Tesoriero R. and M. V. Zelkowitz, A Model of Noisy Software Engineering Data (Status Report), International Conf. on Soft. Eng., Kyoto Japan, April 1998, 461-464.
109. Zelkowitz M. V. and I. Rus, Understanding IV&V in a Safety Critical and Complex Evolutionary Environment: The NASA Space Shuttle Program, IEEE Computer Society and ACM International Conf. on Soft. Eng., Toronto, CA, May 2001, 349-357.
110. Basili, V. R., Tesoriero, R., Costa, P., Lindvall, M., Rus I., Shull, F., and Zelkowitz, M. V. "Building an Experience Base for Software Engineering: A report on the first CeBASE eWorkshop", Bomarius, Frank and Komi-Sirviö, Seija, Springer, PROFES (Product Focused Software Process Improvement), pp. 110-125, 2001.
111. Zelkowitz M. V. and I. Rus, The Role of Independent Verification and Validation in Maintaining a Safety Critical Evolutionary Software in a Complex Environment: The NASA Space Shuttle Program, International Conference on Software Maintenance, Florence Italy, November 2001, 118-126.
112. Basili V., F. McGarry, R. Pajerski, M. Zelkowitz, Lessons learned from 25 years of process improvement: The rise and fall of the NASA Software Engineering Laboratory, IEEE Computer Society and ACM International Conf. on Soft. Eng., Orlando FL, May 2002, 69-79.
113. Shull F., V. Basili, B. Boehm, A. W. Brown, P. Costa, M. Lindvall, D. Port, I. Rus, R. Tesoriero, and M. Zelkowitz, What we have learned about fighting defects, IEEE Computer Society International Symposium on Software Metrics, Ottawa Canada, June, 2002, 249-258.
114. Jiwnani K. and M. Zelkowitz, Software testing from a security perspective, International Conference on Software Maintenance, Montreal, Canada, October 2002, 194-203.
115. Jiwnani K. and M. Zelkowitz, Security testing using a susceptibility matrix, International Symposium on Software Reliability Engineering (Fast Abstracts), Annapolis, MD, November, 2002.
116. Huynh D., M. V. Zelkowitz, V. R. Basili, I. Rus, Modeling dependability for a diverse set of stakeholders (Fast Abstracts), Distributed Systems and Networks, San Francisco, CA, June, 2003, B6-B7.
117. Hochstein L., V. Basili, M. Zelkowitz, J. Hollingsworth and J. Carver, Combining self-reported and automatic data to improve effort measurement, Joint 10th European Software Engineering Conference and 13th ACM SIGSOFT Symposium on the Foundations of Software Engineering (ESEC/FSE 2005), Lisbon, Portugal, September 2005, 356-365.
118. Zelkowitz M., V. Basili, S. Asgari, L. Hochstein, J. Hollingsworth, and T. Nakamura, Productivity measures for high performance computers, International Symposium on Software Metrics, Como, Italy, September, 2005.
119. Hochstein L., J. Carver, F. Shull, S. Asgari, V. Basili, J. K. Hollingsworth, M. Zelkowitz, HPC Programmer Productivity: A Case Study of Novice HPC Programmers, Supercomputing 2005, Seattle, WA, November 2005.
120. Basili V. R., Zelkowitz M. V., Layman L., and Dangle K., Obtaining valid safety data for software safety measurement and process improvement, Empirical Software Engineering and Measurement, Bolzano Italy, September 2010, 4pp.
121. Layman L., Basili V. R., Zelkowitz M. V., and Fisher K. L., A case study of measuring process risk for early insights into software safety, ACM and IEEE Int. Conf. on Software Engineering, May 2011, Honolulu HI, 10pp.

## 2.4 Other Conferences and Workshops

122. Noonan R., Basili V., Hamlet R., Lay M., Mills D., Turner J., Zelkowitz M., A SIMPL distributed operating system and its formal definition, Proc. of an ACM SIGPLAN - SIGOPS Interface meeting, Savannah, GA (April, 1973) (in *SIGPLAN NOTICES* 8,9 (1973) 127-128).
123. Lay W. M., Mills D. L., Zelkowitz M. V., Operating systems architecture for a distributed computer network, Trends and Applications 1974: Computer Networks, IEEE Computer Society Washington Chapter and National Bureau of Standards, Gaithersburg, MD (May, 1974) 39-44.
124. Zelkowitz M. V., Simulation and Implementation of a Computer Network, Thirteenth Annual Technical Symp., ACM Washington Chapter, Gaithersburg, MD (June, 1974) (Best Paper award - 5 awards out of 24 papers presented) B.3.1-B.3.7.
125. Zelkowitz M. V., A Proposal on process hierarchy and network communications, ACM Interprocess communications Workshop, Santa Monica, CA (March, 1975) 154-158.
126. Zelkowitz M. V., A compiler designed to aid in reliable program development, USE Proceedings, Orlando, FL (October, 1976).
127. Basili V. R. and M. V. Zelkowitz, The Software Engineering Laboratory: Objectives, ACM SIGCPR Symposium, Washington D. C. (August, 1977).
128. Zelkowitz M. V., PLACES: Programming language and construct evaluation system, Seventeenth Annual Technical Symp., ACM Washington, D. C. chapter, Gaithersburg, MD (June, 1978) 79-85.
129. Lyle J. and M. V. Zelkowitz, Some practical experience with a data abstraction, IEEE Computer Society Trends and Applications: 1981, Gaithersburg, MD (May, 1981) 2-6.
130. Zelkowitz M. V., Developing a programming environment, NBS ACM 20th Annual Technical Symposium, Gaithersburg, MD (June, 1981) 23-28.
131. Zelkowitz M. V., M. Branstad, P. Henderson, G. Lyon, An editor for rapid prototypes, ACM SIGSOFT Software Engineering Symp.: Rapid prototypes, Columbia MD (April, 1982) 46.1-46.3.
132. Zelkowitz M.V. et al., The Still Unnamed Production Programming Oriented Research Tool (SUPPORT) Environment, IBM AEP Conference, Alexandria, VA (June, 1985) 97-112.
133. Zelkowitz M. V. et al., The SUPPORT Pascal Programming Environment, 8th Minnowbrook Workshop, Blue Mt. Lake, NY (July, 1985).
134. Zelkowitz M. V. and B. Kowalchack, A Knowledge base design facility for a syntax-sensitive editor, 9th Minnowbrook Workshop, Blue Mt. Lake, NY (August, 1986).
135. Zelkowitz M. V., Automating the design process with syntactic-based tools, 11th NASA/GSFC Software Engineering Workshop, Greenbelt MD (December, 1986).
136. Zelkowitz, M. V., The effectiveness of software prototyping: a case study, ACM Washington Chapter 26th Technical Symp., Gaithersburg, MD (June, 1987) 7-15.
137. Zelkowitz M. V., et al., Algebraic specifications as a basis for reuse, 10th Minnowbrook Workshop on Software, Blue Mt. Lake, NY (July, 1987).
138. Zelkowitz M. V., A functional correctness approach towards program development, 1st International Workshop on Software Quality Improvement, Tokyo, Japan (February, 1989) 100-101.
139. Zelkowitz M. V., Ada environments, Software Breakthrough Initiative Conference, Atlanta, GA (March, 1989).
140. Zelkowitz M. V., Impediments to a software engineering curriculum, W2.3 Workshop on Informatics curricula for the 1990s, Providence, RI (April, 1990).
141. Zelkowitz M. and P. Straub, Research in bias in specifications, 13th Minnowbrook Workshop on Software, Blue Mt. Lake, NY (July, 1990).
142. Zelkowitz M. V., S. Cárdenas-García and P. Straub, Evaluation of software design quality, 3rd International Workshop on Software Quality Improvement, Tokyo, Japan (January, 1991).
143. Zelkowitz M. V., An axiomatic model for program complexity, International Workshop on Experimental Software Engineering Issues, Dagstuhl Castle, Germany, {Lecture Notes in Computer Science} 706, Springer-Verlag, (September 1992) 133-136.
144. Zelkowitz M. V., Point/Counterpoint: Are software engineering process standards really necessary? *Computer* 25, 11, (November, 1992) 82-84.
145. Zelkowitz M. V., Milestones: Measuring Software Productivity, *J. of Irreproducible Results* 38, 1, (January, 1993) 19-20.
146. Tian J. and M. V. Zelkowitz, Analyzing multidimensional complexity measures, IBM Software Engineering ITL Conf., Toronto, CA (June, 1993) 539-548.

147. Zelkowitz M. V., Software engineering technology transfer: Understanding the process, 18<sup>th</sup> NASA Software Engineering Workshop, Greenbelt, MD (December, 1993) pp 450-458.
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149. Tesoriero R. and M. Zelkowitz, Process enactment within an environment, NASA/GSFC Software Engineering Workshop, Greenbelt, MD, (November, 1995) 215-232.
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152. Zelkowitz M. V. and D. Wallace, Models of software experimentation, ISERN Annual Meeting, Sydney, Australia (August, 1996).
153. Zelkowitz M. V. and D. R. Wallace, Collecting industrial experimental data, 2<sup>nd</sup> Int. Workshop on Empirical Studies of Software Maintenance (WESS), ISBN 3-00-002030-6, Bari, Italy, (October, 1997) 199-202.
154. Tesoriero R. and M. Zelkowitz, The Web Measurement Environment (WebME): A Tool for Combining and Modeling Distributed Data: 22<sup>nd</sup> NASA/GSFC Software Engineering Workshop, Greenbelt, MD, (December, 1997).
155. Tesoriero R. and M. Zelkowitz, Using the internet to combine and analyze distributed software engineering data, Software Engineering Over the Internet Workshop, Kyoto, Japan (April, 1998).
156. Tesoriero R. and M. V. Zelkowitz, The WebME data visualization tool, Software Tech News 3, 1 (1999).
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159. Eickelmann N., I. Rus and M. Zelkowitz, Preliminary case study findings of the space shuttle software evolution as a product line process, 4<sup>th</sup> International Software Architecture Workshop, Limerick, Ireland, (June, 2000).
160. Basili, V. R., Costa, P., Lindvall, M., Mendonca M., Seaman, C., Tesoriero, R., and Zelkowitz, M. V. "An Experience Management System for a Software Engineering Research Organization", 26<sup>th</sup> Annual NASA Goddard Software Engineering Workshop, (December 2001).
161. Rus I., V. Basili, M. Zelkowitz, and B. Boehm, Empirical evaluation techniques and methods used for achieving and assessing high dependability, Workshop on dependability benchmarking, Int. Conf. on Dependable Systems, Washington, DC (June, 2002).
162. Lindvall M., V. Basili, B. Boehm, P. Costa, K. Dangle, F. Shull, R. Tesoriero, L. Williams, and M. Zelkowitz, Empirical findings in agile methods, XP/Agile Universe, Chicago, IL, (August, 2002).
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## 2.5 Reports and Other Technical Contributions

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175. Zelkowitz M. V., It is not time to define structured programming, SIGOPS Operating System Review 8, 2, (April, 1974) 7-8.
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178. Zelkowitz M. V., PLUM: The University of Maryland PL/1 System, Technical Report TR-318, Computer Science, University of MD (July, 1974).
179. Zelkowitz M. V., Pointer variables in a diagnostic Compiler, Technical Report TR-343, Computer Science, University of MD (December, 1974).
180. Basili V. R., Zelkowitz M. V., Compiler generated programming tools, ACM, IEEE TC/SE and NBS Workshop on Currently Available Testing Tools, Los Angeles, CA (April, 1975) 45-46.
181. Zelkowitz M. V., An integrated software development and evaluation tool, Technical Report TR-395, Computer Science, University of MD (July, 1975).
182. Zelkowitz M. V., Use of uninitialized variables, IEEE Computer Society Technical Committee on Software Engineering Newsletter 2, 2 (June, 1976) 10-11.
183. Zelkowitz M. V., Automatic evaluation of PL/1 programs, Technical Report TR-524, Computer Science, University of MD (April, 1977).
184. Basili V. R., Zelkowitz M. V., et al., The Software Engineering Laboratory, Technical Report TR-535, Computer Science, University of MD (May, 1977).
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194. Tian J. and M. V. Zelkowitz, Notes on data complexity and comprehension, UMIACS Technical Report 91-165, Computer Science TR 2810, University of Maryland (December, 1991).
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200. Zelkowitz M. V., Assessing Software Engineering Technology Transfer Within NASA, Technical Report NASA-RPT-003-95, NASA/GSFC, January, 1995.
201. Cuthill B. and M. V. Zelkowitz, Defining environment integration requirements, NIST, NISTIR 5654, May, 1995.
202. Wallace D. and M. Zelkowitz, Center for high integrity software system assurance: Initial goals and activities, NIST, NISTIR 5677, June, 1995.
203. Zelkowitz M. V. and D. Wallace, Experimental models for software diagnosis, Natl. Inst. of Stnds. and Tech., NIST 5889, September, 1996.
204. Rus I. and M. Zelkowitz, Experimental studies on the benefits of independent verification and validation, Technical Report 99-101, Fraunhofer Center - Maryland, October, 1999.
205. Zelkowitz M. V. and I. Rus, Necessary shuttle data to evaluate IV&V effectiveness, Technical Report 99-102, Fraunhofer Center - Maryland, October 1999.
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#### **a. Invited Talks**

1. Summer Institute of Computer Science, University of MD, 1972 (Compiler construction).
2. Sperry Univac, St. Paul, Minn., December, 1973 (PL/1 Compiler Design).
3. National Computer Conference, New York, New York, June, 1976, (Software physics).
4. NASA Goddard Workshop on Software Engineering, August 5, 1976 (Automated tools).
5. (Federal) Interagency Advisory Committee on ADP, Special Interest Group on Project Management, February, 1977, (Research in software engineering).
6. IEEE Computer Society Washington Chapter, February, 1977, (Current ideas in software development).
7. North Carolina State University Workshop in Control Structures in Programming Languages, March, 1977 (Data Abstractions to aid in control structures).
8. USACSC (U.S. Army Computer Systems Command) workshop on Software Life Cycle Management, August 1977, (Phenomenology of software development).
9. NASA/Goddard Workshop on Software Engineering, Greenbelt, MD, September 19, 1977, (The Software Engineering Laboratory).
10. North Carolina State University, February 2, 1978, (Early results of the Software Engineering Laboratory).
11. Instituto Venezolano de Investigones Cientificas, Caracas, Venezuela, February 27-March 3, 1978 (Ingenieria de Programacion: Desarrollo de Programacion a gran escala).
12. Central University of Venezuela, Caracas, Venezuela, March 9, 1978 (Ingenieria de Software).

13. Universidad Simon Bolivar, Caracas, Venezuela, March 13, 1978, (Structured programming and software engineering).
14. Instituto Universidad de Venezuela, Caracas, Venezuela, March 14, 1978 (Survey of software engineering).
15. Second Software Engineering Life Cycle Management Workshop, Atlanta, GA, August, 1978 (The Software Engineering Laboratory).
16. Naval Research Laboratory, Washington, D. C., May, 1979, (Resource estimation for medium scale software developments).
17. NASA/GSFC Workshop on Software Engineering, November, 1979 (Data validation).
18. IBM T J Watson Research Center, Yorktown Heights NY, January, 1980 (Data abstractions in PLACES).
19. Washington University, St. Louis, February, 1980 (Resource Estimation and the Software Engineering Laboratory).
20. Third Minnowbrook Workshop on performance evaluation, August, 1980 (Cluster analysis on collected data).
21. University of Washington, Seattle Washington, October, 1980 (Implementation of program specifications).
22. Compsac panel, Chicago Ill, October, 1980 (Data abstraction).
23. Compsac panel, Chicago Ill, October, 1980 (Programming environments).
24. University of Bridgeport, Bridgeport CT, March, 1981, (Evolution of a programming environment).
25. Fourth Minnowbrook Workshop on Software Performance Evaluation, August, 1981, Experiences with a data abstraction).
26. Keynote technical Talk - Program Productivity Development System Conference, Tokyo, Japan, December, 1981 (Current trends in Software Engineering in the U.S.).
27. Prince Visiting Lecturer, Arizona State University, April, 1982, (Program Measurement, Data abstractions).
28. Talk on Software Engineering Practices in the U. S. and Japan
  - Xerox Corporation, Rochester, NY, April 1982
  - Bell Telephone Labs, Piscataway, NJ, September 1983
  - Bell Telephone Labs, Holmdel, NJ, September 1983
  - United Technologies Corp, E. Hartford, CT, February 1984
  - National Security Agency, Ft. Meade, MD, April 1984
29. Panel chair, Fifth Minnowbrook Software Performance Workshop, July, 1982.
30. Panel chairman, Rapid prototyping, IEEE Computer Society COMPSAC, November, 1982, Chicago, Ill.
31. State University of New York at Stony Brook, March, 1983 (The Software Engineering Laboratory).
32. Sixth Minnowbrook Software Performance Workshop, July, 1983 (Experiment in Prototyping).
33. Panel chairman, IEEE Softfair, Arlington VA, July, 1983.
34. AIAA National Capital Section, Lunch and Learn speaker, December, 1983 (Software Engineering Measurement).
35. Seventh Minnowbrook Software Performance Workshop, July, 1984 (Subjective evaluation of prototype designs).
36. Boeing Aerospace, Seattle WA, September, 1984 (Software engineering practices in industry).
37. Panel Member, Software Maintenance Conference, November 1985 (prototyping).
38. Martin Marietta Corp., August, 1986 (Program environments).
39. Mori Initiative Workshop on Computer Software Engineering, Hawaii, January, 1987 (Using syntactic-based tools).
40. Maryland State Bar Association, January, 1989 (Risks in an information society).
41. A functional correctness approach towards program development:
  - Fudan University, Shanghai, China, February 1989
  - Sharp Corp., Nara, Japan, February 1989
42. I.M.A., Genoa Italy, September, 1989 (Evaluation criteria for functional specifications).
43. Panelist, Software Engineering Standards Application Workshop, San Diego, CA, May, 1991 (Are standards necessary?)

44. Northrop Research and Technology Center, Palos Verdes CA, May, 1991 (Evaluation of Software Design Quality).
45. Computer Based Systems Engineering Workshop, College Park MD, March, 1992 (Software engineering environment reference models).
46. Integrated Software Engineering Environments User Forum, NIST, Gaithersburg, MD, November, 1992 (Framework reference model).
47. Panelist, 18<sup>th</sup> International Conference on Software Engineering, Berlin, March, 1996 (Why do we care about software complexity?)
48. George Washington University (April, 1996) and I.M.A., Genoa Italy (May, 1996) (The Process of Software Engineering Technology Transfer).
49. Panelist, 19<sup>th</sup> National Information Systems Security Conference, Baltimore, MD, October, 1996 (Measurement of reliability).
50. 16<sup>th</sup> International Conference of the Chilean Computer Science Society, Valdivia, Chile, November, 1996 (The twelve step method for experimental computer science).
51. Florida Atlantic University (March, 1998) (The twelve step method for experimental computer science).
52. Keynote presentation, MITRE Software Engineering Symposium (April, 1998) (The Software Experience Center: Understanding multicorporate multinational software development practices).
53. Panel Member, 10<sup>th</sup> Software and Knowledge Engineering Conference, San Francisco, CA, June 1998 (Empirical studies).
54. The Y2K bug: What is it and do you care?
  - N.C.A.S. Millennium Madness Workshop, Fredericksburg, VA, May 1999
  - Mitretek, McLean, VA, June 1999
  - N.C.A.S. Meeting, Bethesda, MD, December 1999
55. How you know what is so: How science learns about the world around us
  - N.C.A.S. Workshop on Understanding Belief, Winchester VA, May 2001
  - University of Maryland Senior University, October 2001
56. Panelist, What are the missing elements from software engineering research? COMPSAC, Chicago, October 2001
57. 25 years of software process improvement: The NASA SEL, Portland State University, Portland OR, February, 2002
58. Skepticism: The prequel, N.C.A.S. 2002 Workshop: Beyond the basics, Harpers Ferry WV, April 2002
59. Non-technical issues in software process improvement
  - Inter-Profit Seminar on Empirical Software Engineering, Oslo Norway, August 2002
  - Rose City SPIN meeting, Portland Oregon, May, 2003
60. Understanding biblical (In)Accuracy, N.C.A.S. meeting, Bethesda, MD, November, 2003
61. Experimentation in software engineering, Loyola University, Baltimore, MD, October, 2004.
62. Science talks at the Balticon Science Fiction Convention, Baltimore, MD
  - a. Critical Thinking, May, 2007
  - b. Artificial Intelligence, May, 2008
  - c. High performance processors, May, 2009
  - d. Linguistic uses of computers, May, 2010
  - e. Cloud computing, May, 2011
  - f. Controversy of autism and vaccines, May, 2011
  - g. Internet Search, May 2012
  - h. Top (internet) scams, May 2012
  - i. Software patents, May 2013
  - j. A Skeptics Tour of Washington DC, May 2013
63. Keynote Speaker, "The Science of Software Engineering," International Symposium on Empirical Software Engineering and Measurement, Orlando, Florida, October 2009
64. Capital Science 2012, Washington Academy of Sciences, March 31-April 1, 2012
  - a. Controversy of autism and vaccines
  - b. Top scams of the year

## **b. Contracts and Grants**

1. Appraisal of a distributed operating system for network control, Office of Naval Research grant N00014-67-A-0239-0032, June, 1973-May, 1974 (\$20,000) (with D. Mills and M. Lay)
2. Research in Automation technology, Compiler Validation and Performance Evaluation, National Bureau of Standards contract 5-9017, August, 1975-December, 1976 (\$29,936) (with J. Minker)
3. Evaluation of software engineering methodologies, NASA Grant NSG-5123, August, 1976-December, 1981 (\$328,000) (with V. Basili).
4. Programming languages construct evaluation, Air Force Office of Scientific Research grant 77-3181, January 1, 1977- December 31, 1978, (\$110,732) (with V. Basili)
5. Research in programming languages and software engineering, Air Force Office of Scientific Research grant 3181B, January 1, 1979-December 31, 1979, (\$107,500) (with V. Basili, R. Hamlet and J. Gannon)
6. Research in Software Engineering, Air Force Office of Scientific Research, Grant F49620-80-C-001, (Also F49620-83-K-0018) January, 1980 - December, 1984, (\$1,270,000) (with V. Basili, R. Hamlet, J. Gannon and R. Yeh)
7. Equipment Grant, Hewlett Packard, (\$24,000), May, 1984
8. Research in Software Engineering, Air Force Office of Scientific Research, Grant F49620-85-K-008, Jan. 1985 - Feb. 1987 (\$566,236) AFOSR-87-0130 (\$494,900), March 1987 - October 1989, AFOSR-90-0031 (\$376,000) November, 1989-June, 1992 (with V. Basili and J. Gannon)
9. University Sponsored Research Program, Burroughs Corp., (\$256,000) February 1985 - April 1986 (with V. Basili)
10. Evaluation of software engineering methodologies, NASA Grant NSG-5123, May, 1987- November, 1996 (\$2,600,000) (with V. Basili).
11. Research in Requirements and Software Design, NASA Goddard Space Flight Center, Grant NAG5-368, (\$370,000) September, 1983-1987 (with V. Basili)
12. Program complexity measures based on information theory complexity measures, NSF Grant: CCR-8819793 (\$125,663), February, 1989-April, 1992 (REU Supplement: \$4,400 June, 1989-April, 1992).
13. Evaluation of software engineering methodologies, NASA Grant NCC 5-170, (\$1,121,000) November, 1996-March, 2000 (with V. Basili).
14. Experimental Validation and Packaging of Software Technology, NSF grant: CCR-9706151 (\$902,256) August, 1997-July, 2002 (with V. Basili)
15. Data Analysis Center for Software, ITT Software, 970604-7878, December, 1997-November 2002, \$175,000 (With V. Basili).
16. Evaluation of software engineering methodologies, NASA Grant NCC 5-464, (\$488,000) February, 2000-February, 2003 (with V. Basili).
17. ITR/SW Collaborative Research for a national center for software engineering, NSF grant CCR0086078 (\$2,108,454) September, 2000-August, 2003 (with V. Basili, F. Shull, B. Boehm)
18. Empirical research in high dependability computing, NASA/Ames (CMU subcontract 1249311110048), December, 2001-May, 2005, \$1,426,000 (with V. Basili)
19. Implementation of software engineering best practices, MIPS program 4-32398, August 1, 2003-December 31, 2005, \$189,000.
20. High productivity computing project, Air Force Rome Labs, March 1, 2005-February 29, 2008, \$900,000 (with V. Basili, J. Hollingsworth)
21. Petascale Application Development Analysis, Department of Energy, September 14, 2004-September 13, 2007, \$600,000 (with V. Basili)

## **c. Awards and professional memberships**

*Member*, Association for Computing Machinery, SIGSOFT  
*Member*, IEEE Computer Society, Technical Council on Software Engineering.  
*Fellow*, IEEE, 1997  
Golden Core Member, Computer Society, 1996  
University of MD Faculty Research Award, Summer, 1972 (\$2800)  
Who's who in Science and Technology  
American Men and Women of Science  
Who's Who in America

Who's Who in the East  
 Elected to Pi Mu Epsilon Honorary  
 Elected to Phi Kappa Phi Honorary  
 Best paper award, Thirteenth Technical Symposium, ACM Washington Chapter, June, 1974  
 University of MD Faculty Research Award, Summer, 1974 (\$2500)  
 Certificate of Appreciation, IEEE Washington Section, 1980  
 Certificate of Appreciation, IEEE Computer Society, 1980  
 Certificate of Recognition, National Bureau of Standards, 1981  
 Meritorious Service Certificate, IEEE Computer Society, 1992  
 Certificate of Appreciation, NGCR PSESWG program, 1993  
 Certificate of Appreciation, U.S. Department of Commerce, 1995  
 Service Award, ACM, 1997  
 Certificate of Appreciation, IEEE Computer Society, 1999  
 Distinguished Service Award, ACM SIGSOFT, 2000  
 Service Award, ACM, 2004

#### d. Editorial Boards

*Series Editor*, Advances in Computers, Elsevier (Academic Press), 1994-2011  
*Associate editor*, J. of Computer Languages, Systems and Structures, 1980-2007  
*Editorial Board*, J. of Empirical Software Engineering, 1995-2010  
*Series Editor*, ABLEX Series in Software Engineering, 1985-97  
*Editorial Board*, IEEE Trans. on Software Engineering, 1988-92

### 209. Educational Activities

#### e. Courses Taught

CMSC 112	Computer Science I	140/semester
CMSC 113	Computer Science II	140/semester
CMSC 330	Organization of Programming Languages	120/semester
CMSC 400	Intro. to Systems and Software	30/semester
CMSC 430	Theory of Language Translation	35/semester
CMSC 435	Software Engineering	30/semester
MSWE 607	Software Engineering	45/semester
MSWE 609	A Quantitative Approach to Engineering Software	35/semester
CMSC 630	Theory of Programming Languages	30/semester
CMSC 798	Software Engineering Seminar	15/semester
CMSC 838Z	Language Translation	5/semester
CMSC 838Z	Open Systems	10/semester

### 210. Advising

John P. Cleveland	MS	1972	Lawrence K. Johnson	MS	1972
David C. French	MS	1972	William G. Bail	MS	1973
Walter Christensen	MS	1973	Wayne S. Rasband	MS	1973
Terry L. Dollhoff	MS	1973	Christine H. Turner	MS	1973
Jane M. Small	MS	1973	Herbert Novitski	MS	1973
Steve Nabers	MS	1973	Randolph Reece	MS	1974
Douglas T. Denault	MS	1974	Joseph Ferraro	MS	1974
Howard T. Kaplan	MS	1974	Robert Niemeyer	MS	1974
Jeffery Yeh	PhD	1975	Theodore Hopp	MS	1977
Sharon Durkee	MS	1977	Tzer-Tai Tzeng	MS	1980
Eric Chen	MS	1980	William G. Bail	PhD	1985
Bonnie (Kowalchak) Jarvis	MS	1985	Jennifer Elgot	MS	1985

Koichi Sada	MS	1985	Michael Maggio	MS	1985
Brook Susman	MS	1986	Lifu Wu	MS	1988
Pablo Straub	MS	1990	Sergio Cárdenas-García	PhD	1991
Pablo Straub	PhD	1992	Jianhui Jeff Tian	PhD	1992
Hsiantgi Chang	MS	1992	Roseanne (Tesoriero) Tvedt	PhD	1999

## 211. Service

### f. Professional

1. *Program Comm.*, Trends and Applications 1973: Minicomputers, IEEE Computer Society Washington Chapter and NBS, Gaithersburg, MD, April, 1973.
2. *Program Comm.*, Trends and Applications 1974: Computer Networks, IEEE Computer Society Washington Chapter and NBS, Gaithersburg, MD, May, 1974.
3. *Program Chairman*, Trends and Applications 1975: Computer Networks, IEEE Computer Society Washington Chapter and NBS, Gaithersburg, MD, June, 1975.
4. *Proc. Editor*, 14th Technical Symp., ACM Washington Chapter and NBS, Gaithersburg, MD, June, 1975.
5. *Conf. Chairman*, Trends and Applications 1976: Micro and Mini Systems IEEE Computer Society Washington Chapter and NBS, Gaithersburg, MD, May, 1976.
6. *Proc. Editor*, ACM 15th Technical Symp., ACM Washington Chapter and NBS, Gaithersburg, MD, June, 1976.
7. *Newsletter Editor*, Computer Society Tech. Comm. on Software Engineering, 1976-79.
8. *Treasurer*, Trends and Applications 1978: Distributed Processing, IEEE Computer Society and NBS, Gaithersburg, MD, May, 1978.
9. IEEE Computer Society, Washington, D. C. Chapter
  - a. Secretary/Treasurer, July, 1976-July, 1977
  - b. Vice Chairman, July, 1977-July, 1978
  - c. Chairman, July, 1978-July, 1979
10. IEEE Computer Society Technical Committee on Software Engineering
  - a. Chairman, 1984 - 1986
  - b. Executive Committee, 1976 - 93
11. *Program Comm.*, IEEE Computer Society COMPCON Conf., Washington, DC, September, 1978.
12. *Program Chairman*, Specifications of Reliable Software, IEEE Computer Society, Technical Committee on Software Engineering, Cambridge, MA, April, 1979.
13. ACM Special Interest Group on Software Engineering (SIGSOFT)
  - a. Chairman, July, 1979 - June, 1981
  - b. Executive Committee, July, 1981 - June, 1987
14. *Program Comm.* 5th International Conference on Software Engineering, San Diego CA, March, 1981
15. *Chairman*, 2nd ACM SIGSOFT Software Engineering Symp.: Workshop on rapid prototyping, Columbia, MD, April, 1982
16. *Program Comm.*, 6th International Conf. on Software Engineering, Tokyo, Japan, September, 1982
17. *Program Comm.*, IEEE Computer Society SoftFair, July, 1983, Arlington, VA.
18. *Program Comm.*, Symp. on Application and Assessment of Automated Tools, San Francisco, CA, November, 1983.
19. *Program Comm.*, ACM SIGSOFT Symp. on Practical Software Development Environments, Pittsburgh, PA, April, 1984.
20. *Program Comm.*, 8th Minnowbrook Workshop on Software Performance Evaluation, Blue Mt. Lake, NY, July, 1985.
21. *Chairman*, IEEE SoftFair II Conference, December, 1985, San Francisco, CA.
22. *Program Comm.*, 10th Minnowbrook Workshop on Software, July, 1987

23. *Program Comm.*, 2nd Empirical Studies of Programmer Workshop, December 1987, Washington, DC.
24. *Advisory Panel*, CASE 88 Workshop, July, 1988, Boston MA.
25. *Program Comm.*, 11th International Conference on Software Engineering, May, 1989, Pittsburgh, PA.
26. *Program Chairman*, Workshop on Formal Methods, UMIACS, February, 1989, Baltimore, MD.
27. *Program Comm.*, 12th International Conference on Software Engineering, March, 1990, Nice, France.
28. *Workshop Comm.*, SETA2, January 1992, Washington, DC.
29. *Local Arrangements Chair*, 15<sup>th</sup> International Conference on Software Engineering, May, 1993, Baltimore, MD.
30. *Tools Fair Chair*, ACM SIGSOFT 5<sup>th</sup> Software Development Environment Symposium, December, 1992, Washington, DC.
31. *Program Comm.*, Software Metrics Symposium, May, 1993, Baltimore, MD.
32. *Program Comm.*, 17<sup>th</sup> IEEE/ACM International Conference on Software Engineering, April, 1995, Seattle, WA.
33. *Program Comm.*, Workshop on Information Technology Assurance and Trustworthiness, Virginia Beach VA, March, 1995.
34. *Program Co-chairman*, 18<sup>th</sup> IEEE/ACM International Conference on Software Engineering, March, 1996, Berlin, Germany.
35. *Program Chairman*, International Conference of the Chilean Computer Science Society (SCCC Conference), Valdivia, Chile, November, 1996.
36. *Member*, NIST Integrated Software Engineering Environment Working Group, 1989-1994.
37. *Member*, Navy Next Generation Computer Resources Project Support Environment Standards Working Group, 1991-1993.
38. *Member*, ECMA/TC33 Task Group on the Reference Model, 1992-1993.
39. *Prog. Comm.*, Metrics 97 Conference, Albuquerque, NM, November, 1997.
40. *Prog. Comm.*, 10<sup>th</sup> International Conference on Software Engineering and Knowledge Engineering, San Francisco, CA, June, 1998.
41. *Prog. Chair*, Metrics 98 Symposium, Bethesda, MD, November, 1998.
42. *Prog. Comm.*, 11<sup>th</sup> International Conference on Software Engineering and Knowledge Engineering, Kaiserslautern, Germany, June, 1999.
43. *Prog. Comm.*, International Workshop on Web-Based Information Visualization, Florence, Italy, September, 1999.
44. *Prog. Comm.*, Metrics 99 Symposium, Boca Raton, FL, November, 1999.
45. *Prog. Comm.*, Seventh European Workshop on Software Process Technology, Salzburg, Austria, February, 2000.
46. *Prog. Comm.*, Metrics 2001 Symposium, London, UK, April 2001.
47. *Prog. Comm.*, Software Engineering Workshop, NASA/GSFC, November 2001.
48. *Prog. Comm.*, Metrics 2002 Symposium, Ottawa Canada, June, 2002
49. *Prog. Comm.*, Learning Software Organizations Workshop, Chicago, IL, August, 2002
50. *Prog. Comm.*, Software Engineering and Knowledge Engineering (SEKE 2002), July 15-18, 2002, Ischia, Italy
51. *Prog. Comm.*, Int. Symp. on Empirical Soft. Eng., Nara, Japan, October, 2002
52. *Prog. Comm.*, Int. Symp. on Empirical Soft. Eng., Rome, Italy, September, 2003
53. *Prog. Comm.*, Metrics 2003 Symposium, Sydney, Australia, October, 2003
54. *General Chair*, Int. Symp. on Empirical Soft. Eng., Redondo Beach, CA, August, 2004
55. *Prog. Comm.*, Metrics 2004 Symposium, Chicago, Ill, September, 2004
56. *Prog. Comm.*, Metrics 2005 Symposium, Como, Italy, September, 2005
57. *Prog. Comm.*, Int. Symp. on Empirical Soft. Eng., Noosa Heads, Australia, November 2005
58. *Prog. Comm.*, Int. Symp. on Empirical Soft. Eng., Rio de Janeiro, Brazil, September 2006
59. *Prog. Comm.*, Int. Symp. on Empirical Soft. Eng. and Measurement, Madrid, Spain, September 2007
60. *Prog. Comm.*, Promise 3, Minneapolis, MN, May 2007
61. *Local Arrangements*, Int. Symp. On Empirical Soft. Eng. And Measurement, Baltimore, MD, October 2013.



## **g. Educational Service**

### **University**

Campus Senate Committee on Academic Procedures and Standards 2003-5, (Chair) 2004-5.  
Provost Advisory Comm. on Advising and Admissions 1996-2004  
Campus Senate, 1991-4. 2003-5.  
CUSP (UNIX Users Group) Comm. 1994-5.  
CMPS College Computing Committee, 1991-2.  
CMPS PCC Comm. 1990-2.  
CMPS Space Committee. 1989, 1991-2.  
Department chairman Search Committee (Computer Science). 1981, 1987.  
CMPS-Engineering Colleges Computer Committee, 1988.  
Impediments to Research Committee 1987-9.  
Campus Computer Coordinating Committee 1987-9.  
Institute for Advanced Computer Studies Organization Comm. 1985.  
Physical Science Committee. 1982-4, 1990.  
MPSE Division Promotion (APT) Committee. 1980-1.  
Computer User's Organization (Exec. Comm). 1972-4.

### **Departmental**

Computer Science Instructional Center (CSIC) new building committee 2000-2  
Faculty Recruiting Comm. 1994-7 (chair, 1995), 1999, 2000.  
New Building Comm. 1989-91.  
CMSC 112-113 Evaluation Comm. 1988.  
Associate Chairman for Facilities. 1987-8.  
Acting Chairman, 1985.  
Associate Chairman for Education. 1982-5.  
Education Committee. 1971-present.  
Programming Languages Field Committee. 1973-present.  
Professional Software Engineering Program Comm. 1987-2000.  
Budget Enhancement Committee. 1982.  
Graduate Assistantship. 1973, 1982.  
Laboratory Comm. 1972-4, 1977 (chairman), 1980-1, 1986-7 (chairman), 1989-92, 2000-02  
Colloquium Comm. 1976-7, 1979-1980 (chairman).  
Departmental Council. 1975-6, 1984-5, 1986-9.  
Departmental Affairs Comm. 1975-6.  
CMSC 110-120 Study Comm. 1976.  
EE-CMSC Course overlap Comm. 1976.  
Graduate Exam Restructuring Comm. 1972.