

Christopher David Hundhausen

Visualization and End User Programming Lab
School of Electrical Engineering and Computer Science
Washington State University
Pullman, WA 99164-2752

Voice: (509) 335-4590
Fax: (509) 335-3818
hundhaus@eecs.wsu.edu
<http://eecs.wsu.edu/~hundhaus>

Summary

Recipient of both a Fulbright Grant and a National Science Foundation CAREER Award, Christopher Hundhausen is founder and director of the Visualization and User Programming Lab at Washington State University (<http://eecs.wsu.edu/~veupl>). His research focuses on the general area of human-computer interaction—the "human side" of computer science concerned with better understanding how humans interact with technology, and ultimately with designing effective interactive artifacts for humans. Within this general area, Dr. Hundhausen has established himself as an international leader in the field of algorithm visualization, which explores technology and pedagogical approaches that enhance human understanding of computer algorithms. Over the past six years, Dr. Hundhausen's research has produced the following outcomes:

- \$725,000 in grant funding from the National Science Foundation, Hewlett-Packard, Washington State University, and the University of Hawai'i;
- thirteen semesters of graduate research assistantships, which have supported two graduated M.S. students and two continuing M.S. students;
- two book chapters, 10 refereed journal publications and 22 refereed conference publications, including (a) an article in the *Journal of the Learning Sciences*, whose Thomson impact factor ranks first among 98 journals in the area of Education and Educational Research, (b) a seminal integrative review of the field of algorithm visualization that one peer reviewer called "a real contribution to the software visualization field...[that]...will become widely cited by the software visualization community," and (c) a research paper that won a best paper award at a 2006 IEEE conference.

Dr. Hundhausen's research has led him to explore a novel, "studio based" approach to teaching courses in computer programming and human-computer interaction. In this approach, student teams use specialized software environments to construct their own visual representations of the objects under study (computer algorithms or user interfaces). They then present those visual representations to their peers and instructor for feedback and discussion. Dr. Hundhausen has honed the approach and documented positive learning processes and outcomes through extensive laboratory and field studies.

Finally, Dr. Hundhausen has been elected to key leadership and service roles in his professional community. In addition to serving on the program committees of the IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC), the IEEE Symposium on Information Visualization, and the ACM Symposium on Software Visualization for the past several years, Dr. Hundhausen was technical program co-chair for the 2004 IEEE VL/HCC Symposium. More recently, Dr. Hundhausen was elected to serve in the highest leadership position (general chair) of the 2007 IEEE VL/HCC Symposium.

Research Interests

- Human-computer interaction
- Scientific visualization, especially software and algorithm visualization
- End-user and domain-specific programming languages and environments
- Computer-supported collaborative learning
- Engineering education

Education

Postdoctoral Researcher, Laboratory for Interactive Learning Technologies, Information and Computer Sciences Department, University of Hawai'i, Honolulu, July, 1999 – August, 2000

- Assisted in design, analysis, and execution of NSF-funded research study “The Effects of Representational Bias on Collaborative Learning Interactions” (see <http://lilt.ics.hawaii.edu/lilt/research/repbias.html>)

Ph.D., Computer and Information Science, University of Oregon, Eugene, 1999

- Dissertation title: “Toward Effective Algorithm Visualization Artifacts: Designing for Participation and Communication in an Undergraduate Algorithms Course” (Available at <http://www.eecs.wsu.edu/~hundhaus/veupl/proj/dis/>)

Fulbright Scholar, Institute for Program Structures and Data Organization, University of Karlsruhe, Germany, 1993–1994

- Organized and led research group that designed and conducted empirical studies of algorithm visualization specification techniques
- Taught (in German) graduate seminar on user-centered software development

M.S., Computer and Information Science, University of Oregon, Eugene, 1993

B.A., Math/Computer Science, Lawrence University, Appleton, WI, 1991

Experience

Assistant Professor, School of Electrical Engineering and Computer Science, Washington State University, Pullman, August, 2003–present

- Director and founder, Visualization and End-User Programming Laboratory (see <http://eecs.wsu.edu/~veupl/>), August 2003–present
- Faculty member, Engineering Education Research Center (see <http://eerc.wsu.edu>)
- Member, computer science curriculum committee
- Taught introductory computer science course, along with undergraduate and graduate courses on human-computer interaction and scientific visualization (see <http://eecs.wsu.edu/~hundhaus/teaching>)

Assistant Professor, Information and Computer Sciences Department, University of Hawai'i, Honolulu, August, 2000–August, 2003

- Recipient, National Science Foundation CAREER Award, January 2002
- Assistant Director, Laboratory for Interactive Learning Technologies (see <http://lilt.ics.hawaii.edu/lilt>), August 2000 – July 2003
- Faculty member, Interdisciplinary Doctoral Program in Communication & Information Science, University of Hawai'i, September 2000–July 2003
- Taught CS 1, CS 2, and undergraduate and graduate courses on human-computer interaction, end-user programming, and scientific visualization

Human-Computer Interaction Consultant, Spirent Communications, Inc., Honolulu, HI, June 2002 – 2003

- Advised team of software engineers on how to perform user-centered, empirically-driven design
- Designed, conducted, analyzed usability studies of network diagnostic software tools

Graduate Teaching Assistant, Department of Computer and Information Science, University of Oregon, Eugene, 1995 – 1999

- Taught laboratory sections of introductory computer science courses and introductory database course

- Assisted in teaching of undergraduate and graduate courses on human-computer interaction

Instructor, Department of Computer and Information Science, University of Oregon, Eugene, Summer 1995, Fall 1997, and Summer 1998

- Taught courses on UNIX, information technology and the Internet, and multimedia on the web

Usability Engineer, Microsoft Corporation, Redmond, WA, Summer 1996 and Summer 1997

- Designed, conducted, analyzed, and wrote up laboratory usability studies of Microsoft programming tools (e.g., Visual Basic, Visual J++, Visual InterDev, Visual C++)

Graduate Research Assistant, Department of Computer and Information Science, University of Oregon, 1994–1995

- Assisted in the design, implementation, and documentation of Viz, an experimental language (based on Scheme, Tk, and Open Inventor) for rapidly prototyping visualizations

Technical Editor and Translator, Forschungszentrum Informatik, Karlsruhe, Germany, 1993 – 1994

- Edited and translated (from German to English) technical computer science documents

Administrative Programmer, Graduate School, University of Oregon, Eugene, 1991 – 1993

- Designed, implemented, and maintained Oracle administrative databases and their Hypercard interfaces

Technical Writer, West Publishing, St. Paul, MN, 1991

- Prepared solutions to end-of-section exercises for introductory computer science textbook, and edited selected chapters

Algorithm Visualization System Developer, Lawrence University/Cray Research, Inc., Appleton, WI, 1988 – 1991

- Assisted in design and implementation of the GAIGS (Generalized Algorithm Illustration through Graphical Software) algorithm visualization system (10,000+ lines of Pascal and GKS code); see (Naps & Hundhausen, 1991)

Honors and Awards

Recipient, Best Paper Award, IEEE Symposium on Visual Languages and Human Centric Computing, 2006

Recipient, National Science Foundation CAREER Award, January 2002

Faculty Performance Award, College of Natural Sciences, University of Hawai'i, Honolulu, 2000

Member, *Doctoral Consortium*, ACM SIGCHI Conference, Los Angeles, CA, 1998

Andrew C. Berry-James Stewart Prize in Mathematics (awarded to outstanding graduating senior in mathematics department), Lawrence University, Appleton, WI, 1991

Phi Beta Kappa, Lawrence University, Appleton, WI, 1990

Mortar Board, Lawrence University, Appleton, WI, 1990

Professional Service Activities

General Chair, 2007 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC '07), Coeur d'Alene, Idaho, September 2007 (see <http://vlhcc07.eecs.wsu.edu>)

Program Committee Member, 2006 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC '06), Brighton, UK, September 2006 (see <http://www.cmis.brighton.ac.uk/vlhcc/>)

Program Committee Member, 2006 ACM Symposium on Software Visualization, Brighton, UK, September, 2005 (see <http://www.softvis.org/softvis06>)

Publicity Chair and Program Committee member, 2005 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC '05), Dallas, Texas, September 2005 (see <http://viscomp.utdallas.edu/vlhcc05/>)

Program Committee Member, 2005 ACM Symposium on Software Visualization, St. Louis, MO, May 2005 (see <http://www.softvis.org/softvis05>)

Technical Program Chair, 2004 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC '04), Rome, Italy, September 2004 (see <http://vlhcc04.dsi.uniroma1.it/index.php>)

Publicity Chair and Program Committee Member, 2003 IEEE Symposia on Human-Centric Computing Languages and Environments (HCC '03), Auckland, New Zealand, October 28–31, 2003 (see <http://www.cs.dal.ca/HCC03>)

Program Committee Member, 2003 IEEE Symposium on Information Visualization (InfoVis '03), Seattle, WA, October 19-21, 2003 (see <http://www.infovis.org/infovis04/>)

Treasurer and Program Committee Member, 2003 ACM Symposium on Software Visualization (SOFTVIS '03), San Diego, CA, June 11–13, 2003 (see <http://www.softvis.org/softvis03>)

Reviewer for the following journals:

- *Journal of Visual Languages and Computing*
- *Human-Computer Interaction*
- *International Journal of Human-Computer Studies*
- *Information Visualization*
- *Communications of the ACM*
- *World Wide Web*

Member, advisory board for international web repository for algorithm animation systems, supporting materials, reviews, and evaluations, May, 2001–present

Panelist, National Science Foundation, Arlington, VA, 2001 and 2005

Program Committee, IEEE Information Visualization Conference, 2001–2005

Reviewer, Special Volume on Software Visualization to be published by Springer Verlag, 2000

Alumni Admissions Volunteer, Lawrence University, Appleton, WI, 1996 – present

Graduate Teaching Fellows Federation Steward, Computer and Information Science Department, University of Oregon, Eugene, 1997 – 1998

Awarded Grant Support

Using HP Mobile Technology to Support a Human-Computer Interaction Design Studio. C.D. Hundhausen, Principal Investigator. Hewlett Packard Technology for Teaching Grant. Award no. U06TFH0033E. Amount: \$73,314. Funding period: June 2006 – June 2007

Design and Implementation of a Placement Exam and New Introductory Course to Increase Retention of Computer Science Students. C.D. Hundhausen, Principal Investigator. Washington State University Office of Undergraduate Education. Amount: \$22,573. Funding period: February, 2006 – March, 2007.

Using a Collaborative Learner-Constructed Engineering-Concept Representation Model in Engineering Education. C.D. Hundhausen, Co-Principal Investigator (with Denny Davis, Todd Johnson, Gerald Maring, and Reid Miller). National Science Foundation Department-Level Reform Award. Award no. 0530708. Amount: \$100,001. Funding period: September, 2005 – August, 2007 (see <http://eerc.wsu.edu>)

Exploring Cognitive, Social, and Cultural Dimensions of Visualization in Computer Science Education. C.D. Hundhausen, Principal Investigator. National Science Foundation CAREER Award. Award no 0406485. Amount: \$529,386. Funding period: February 2002 – January 2007 (see <http://eecs.wsu.edu/~veupl/proj/algstudio/>)

Development of "Low Fidelity" Algorithm Visualization Software for a Studio-Based Algorithms Course (continued). C.D. Hundhausen, Principal Investigator. University of Hawai'i Educational Improvement Fund Award. Amount: \$5,000. Funding period: May – August, 2002

Development of "Low Fidelity" Algorithm Visualization Software for a Studio-Based Algorithms Course. C.D. Hundhausen, Principal Investigator. University of Hawai'i Educational Improvement Fund Award. Amount: \$5,000. Funding period: May – August, 2001

Graduate Students

Graduated

Sean Farley, M.S. Computer Science, May, 2006

Jonathan Brown, M.S., Computer Science, March, 2006

In progress

Steven Trent (WSU Tri-Cities), M.S., Computer Science, May, 2007 (expected)

Cole Nevins, M.S., Computer Science, May, 2008 (expected)

Graduate Student Committees

Jon Baekken, M.S., Computer Science, July, 2006

Andreas Stefik, M.S., Computer Science, December, 2005

Yan Chen, M.S., Computer Science, August, 2005

Ed Mancebo, M.S., Computer Science, December, 2004

Graduate Courses Taught

CptS 538 ("Scientific Visualization"), Spring 2005 (via WHETS)

CptS 538 ("Scientific Visualization"), Spring 2004

Edited Books (Proceedings)

Bottoni, P., Hundhausen, C.D., Levialdi, S., and Tortora, G. (2004). *Proceedings of the 2004 IEEE Symposium on Visual Languages and Human Centric Computing*. Piscataway, NJ: IEEE.

Refereed Journal Articles

(Note: These articles are available on-line at <http://eeecs.wsu.edu/~veupl/pub>)

Hundhausen, C.D., & Brown, J.L. (In press). An experimental study of the impact of visual semantic feedback on novice programming. *Journal of Visual Languages and Computing*.

Hundhausen, C.D., & Brown, J.L. (In press). Designing, visualizing, and discussing algorithms within a CS 1 studio experience: an empirical study. *Computers & Education*.

Hundhausen, C.D., & Brown, J.L. (In press). What you see is what you code: a 'live' algorithm development and visualization environment for novice learners. *Journal of Visual Languages and Computing*.

Hundhausen, C.D. (2005). Using end user visualization environments to mediate conversations: A 'communicative dimensions' framework. *Journal of Visual Languages and Computing* 16(3), 153-185.

Suthers, D., Hundhausen, C., & Girardeau, L. (2003). Comparing the roles of representations in face-to-face and online computer supported collaborative learning. *Computers & Education* 41(4), 335-351.

Hundhausen, C. (2002). Ethnographic studies of a social constructivist approach to integrating algorithm visualization technology into an undergraduate algorithms course. *Computers & Education* 39(3), 237-260.

Naps, T., Rodger, S., Valazquez-Iturbide, J.A, Roessling, G., Almstrum, V., Dann, W., Fleischer, R., Hundhausen, C., Korhonen, A., Malmi, L., & McNally, M. (2003). Exploring the role of visualization and engagement in computer science education. *ACM SIGCSE Bulletin* 35(2), 131-152.

Suthers, D., & Hundhausen, C. (2003). An experimental study of the effects of representational guidance on collaborative learning processes. *Journal of the Learning Sciences* 12(2), 183-219.

Hundhausen, C., & Douglas, S. (2002) Low fidelity algorithm visualization. *Journal of Visual Languages and Computing* 13(5), 449-470.

Hundhausen, C., Douglas, S., & Stasko, J. (2002). A meta-study of algorithm visualization effectiveness. *Journal of Visual Languages and Computing* 13(3), 259-290.

Book Chapters

Stasko, J.T. & Hundhausen, C.D. (2004). Algorithm visualization. In S. Fincher & M. Petre (eds.), *Computer Science Education Research* (pp. 199-228). Lisse, The Netherlands: Taylor & Francis.

Hundhausen, C.D., & Douglas, S.A. (2002). A language and system for constructing and presenting "low fidelity" algorithm visualizations. In S. Diehl (ed.), *Software Visualization State-of-the-Art Survey, LNCS 2269* (pp. 227-240). New York: Springer Verlag.

Edited Books (Proceedings)

Bottoni, P., Hundhausen, C.D., Levialdi, S., and Tortora, G. (2004). *Proceedings of the 2004 IEEE Symposium on Visual Languages and Human Centric Computing*. Piscataway, NJ: IEEE.

Refereed Conference Papers

(Note: These papers are available on-line at <http://eecs.wsu.edu/~veupl/pub>)

Hundhausen, C.D., Brown, J.L., Farley, S., & Skarpas, D. (2006). A methodology for analyzing the temporal evolution of novice programs based on semantic components. *Proceedings 2006 ACM International Computing Education Research Workshop* (pp. 59-71). New York: ACM Press.

Hundhausen, C.D., Brown, J.L., & Farley, S. (2006). Adding procedures and pointers to the ALVIS algorithm visualization software: a preliminary design. *Proceedings 2006 ACM Symposium on Software Visualization* (pp. 155-156). New York: ACM Press.

Hundhausen, C.D., Farley, S., & Brown, J.L. (2006). Can direct manipulation lower the barriers to programming and promote positive transfer to textual programming? An experimental study. *Proceedings IEEE 2006 Symposium on Visual Languages and Human-Centric Computing* (pp. 157-164). Piscataway, NJ: IEEE.

Hundhausen, C.D., & Brown, J.L. (2005). Personalizing and discussing algorithms within CS 1 studio experiences: An observational study. In *Proceedings ACM International Computing Education Research Workshop* (pp. 45-56). New York: ACM Press.

Hundhausen, C., & Brown, J. (2005). What you see is what you code: A radically dynamic algorithm visualization development model for novice learners. In *Proceedings IEEE 2005 Symposium on Visual Languages and Human Centric Computing* (pp. 163-170). Los Alamitos: IEEE Press.

Hundhausen, C., Patterson, R. Brown, J., & Farley, S. (2004). The effects of algorithm visualizations with storylines on retention: An experimental study. In *Proceedings IEEE 2004 Symposium on Visual Languages and Human-Centric Computing* (pp. 226 - 228). Piscataway, NJ: IEEE.

Hundhausen, C., Vatrappu, R., & Wingstrom, J. (2004). The evolving user-centered design of the algorithm visualization storyboarder. In *Proceedings IEEE 2004 Symposium on Visual Languages and Human-Centric Computing* (pp. 62- 64). Piscataway, NJ: IEEE.

Hundhausen, C., Vatrappu, R., & Wingstrom, J. (2003). End-user programming as translation: An experimental framework and study. In *Proceedings IEEE 2003 Symposium on Human-Centric Computing* (pp. 47-49). Piscataway, NJ: IEEE.

Suthers, D., Hundhausen, C., & Girardeau, L. (2003). Comparing the roles of representations in face-to-face and online collaborations. *Proceedings 2003 International Conference on Computers and Education*.

Suthers, D., Hundhausen, C., & Girardeau, L. (2003). An exploratory comparison of the roles of representations in face-to-face and online collaborative learning. *Proceedings of the 36th Hawai'i International Conference on the System Sciences*. Los Alamitos, CA: IEEE Press.

Hundhausen, C. (2002). The "Algorithms Studio" Project: Using sketch-based visualization technology to construct and discuss visual representations of algorithms. In *Proceedings IEEE 2002 Symposia on Human Centric Computing Languages and Environments* (pp. 99-100). Los Alamitos, CA: IEEE Computer Society Press.

- Suthers, D., Girardeau, L., & Hundhausen, C. (2002). The Roles of Representations in Online Collaborations. Paper presented at the Annual Meeting of the American Educational Research Association (AERA), New Orleans, April 1-5.
- Suthers, D. D., & Hundhausen, C. D. (2002). The effects of representation on students' elaborations in collaborative inquiry. In *Computer Supported Collaborative Learning: Foundations for a CSCL Community (Proceedings of CSCL 2002)* (pp. 472–480). Hillsdale, NJ: Lawrence Erlbaum.
- Puntambekar, S., Stylianou, A., Suthers, D., Hundhausen, C., & Hubscher-Younger, T. (2002). External representations for collaborative learning and assessment. In *Computer Supported Collaborative Learning: Foundations for a CSCL Community (Proceedings of CSCL 2002)* (pp. 714–715). Hillsdale, NJ: Lawrence Erlbaum.
- Hundhausen, C. D., & Douglas, S. A. (2001). Communicative dimensions of end-user environments. In *Proceedings of 2001 IEEE Symposium on Human-Centric Computing Languages and Environments* (pp. 127-134). Los Alamitos, CA: IEEE Computer Society Press.
- Suthers, D.D. & Hundhausen, C.D. (2001). Learning by constructing collaborative representations: An empirical comparison of three alternatives. In *Proceedings of European Conference on Computer-Supported Collaborative Learning*, Maastricht, the Netherlands, March, 2001.
- Hundhausen, C.D. & Douglas, S.A. (2000a). Using visualizations to learn algorithms: Should students construct their own, or view an expert's? In *Proceedings of 2000 IEEE Symposium on Visual Languages* (pp. 21-28). Los Alamitos, CA: IEEE Computer Society Press.
- Hundhausen, C.D. & Douglas, S.A. (2000b). SALSA and ALVIS: A language and system for constructing and presenting low fidelity algorithm visualizations. In *Proceedings of 2000 IEEE Symposium on Visual Languages* (pp. 67-68). Los Alamitos, CA: IEEE Computer Society Press.
- Hundhausen, C.D. & Douglas, S.A. (2000c). Shifting from "high fidelity" to "low fidelity" algorithm visualization technology. In *Human Factors in Computing Systems: SIGCHI 2000 Summary* (pp. 179-180).
- Hundhausen, C.D. (1998). Toward effective algorithm visualization artifacts: Designing for participation and negotiation in an undergraduate algorithms course. In *Human Factors in Computing Systems: CHI 98 Summary* (pp. 54-55). New York: ACM Press.
- Douglas, S.A., McKeown, D., & Hundhausen, C.D. (1996). Exploring human visualization of computer algorithms. In *Proceedings of Graphics Interface '96*. Toronto, Canada: Canadian Information Processing Society.
- Douglas, S.A., Hundhausen, C.D., & McKeown, D. (1995). Toward empirically-based software visualization languages. In *Proceedings of 1995 IEEE Symposium on Visual Languages* (pp. 342-349). Los Alamitos, CA: IEEE Computer Society Press.
- Naps, T.L., & Hundhausen, C.D. (1991). The evolution of an algorithm visualization system. In *Proceedings of the 24th Annual Small College Computing Symposium* (pp. 259-266), Morris, MN.

Workshop Papers

- Crescenzi, P., Hundhausen, C., Stasko, J., Faltin, N., Naeher, S., Fleischer, R., Roessling, G., & Sutinen, E. (2002). The Algorithm Animation Repository. Paper presented at the Second Program Visualization Workshop, Hornstrup Centret, Denmark, June 27–28.
- Hundhausen, C.D. (2002). The Algorithms Studio Project. Paper presented at the Second Program Visualization Workshop, Hornstrup Centret, Denmark, June 27–28.

Hundhausen, C., & Douglas, S. (2000). Low fidelity algorithm visualization. Paper presented at The Visual End User Workshop, 2000 IEEE Symposium on Visual Languages, Seattle, WA, September 10.

Hundhausen, C.D. (1999). Using representations to assess level of membership in a community of practice. Presented at the Collaborative Use of Representations: Analyzing Learning Interactions Workshop, CSCLE '99, Palo Alto, CA, December 11.

Hundhausen, C.D. (1994). Toward the development of highly interactive software visualization systems: A user-centered approach. Paper presented at the International Workshop on Software Visualization, CHI '94 Conference on Human Factors in Computing Systems, Boston, MA, April 24.

Technical Reports

Hundhausen, C.D. (1997). A meta-study of software visualization effectiveness. Unpublished manuscript available at <http://eecs.wsu.edu/~veupl/pub/MetaStudy.pdf>.

Douglas, S.A., Hundhausen, C.D., & McKeown, D. Toward empirically-based software visualization languages.. Technical Report CIS-TR-95-12, Department of Computer and Information Science, University of Oregon, Eugene. Available at <http://eecs.wsu.edu/~veupl/pub/tr-95-12.pdf>

Douglas, S.A., McKeown, D., & Hundhausen, C.D. Exploring human visualization of algorithms. Technical Report CIS-TR-94-27, Department of Computer and Information Science, University of Oregon, Eugene. Available at <http://eecs.wsu.edu/~veupl/pub/tr-94-27.pdf>

Hundhausen, C.D. (1993a). Subverting the comparative research paradigm: The potential for ethnomethodology in evaluating the effects of algorithm visualization on learning. Unpublished manuscript available at <http://eecs.wsu.edu/~veupl/pub/sblpaper.pdf>.

Hundhausen, C.D. (1993b). The search for an empirical and theoretical basis for algorithm visualization. Unpublished manuscript available at <http://eecs.wsu.edu/~veupl/pub/avcogsci.pdf>.

Hundhausen, C.D. (1993c). Exploring the potential for conversational analysis in the evaluation of interactive algorithm visualization systems. Unpublished manuscript available at <http://eecs.wsu.edu/~veupl/pub/lensusab.pdf>

Hundhausen, C.D., & Malony, A.D. (1993). ObjectView: A software design architecture for breakpoint-based program visualization. Technical Report CIS-TR-93-22, Department of Computer and Information Science, University of Oregon, Eugene. Available at <http://lilt.ics.hawaii.edu/~veupl/pub/objview.pdf>.

Invited Talks and Tutorials

“Communicative Dimensions of Programming Environments.” Keynote address presented at the 15th Annual Workshop of the Psychology of Programming Interest Group, Keele, England, April 8, 2003.

“Empirically Evaluating Software Visualization Technology” Tutorial presented with Eileen Kraemer at the 2003 ACM Symposium on Software Visualization.

University Service Activities

Member, Curriculum Committee, School of Electrical Engineering and Computer Science, Washington State University, September, 2003–present

Faculty Advisor, Team "Hickory," EE415 Senior Design Project., 2004 – 2005

Chair, Curriculum Committee, Department of Information and Computer Sciences, University of Hawai'i, 2001 – 2003

Chair, Human-Computer Interaction Area Exam Committee, Interdisciplinary Doctoral Program in Communication and Information Science, University of Hawai'i, 2001 – 2003

Information and Computer Sciences Faculty Representative, University of Hawaii Professional Assembly (Faculty Union), 2001 – 2003

Member, College of Natural Sciences Curriculum Committee, University of Hawai'i, September, 2001 – 2003

Member, Manoa Educational Improvement Fund Steering Committee, University of Hawai'i, 2001

Curriculum Developer, Information and Computer Sciences Department On-line Degree Program, University of Hawai'i, Honolulu, 2000-present

- Developed completely on-line versions of "CS 1" and "CS 2" courses using WebCT