

VITA

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UNDERGRADUATE EDUCATION

Schools Attended

- 1). University of Wisconsin–Milwaukee, 1966–67
 - 2). Marquette University, 1967–70
- Degree: B.S., Marquette, *summa cum laude*, 1970
Major: Mathematics
Minors: Philosophy, German
GPA: 3.9

GRADUATE EDUCATION

School Attended: University of Notre Dame, 1970–71, 1972–75
Degrees M.S., 1973, Ph.D., 1975
Area of Specialization: Mathematical Logic, Ph.D. dissertation “Set Theory in Infinitary Languages”
GPA: 3.875

HONORS, AWARDS, FELLOWSHIPS

- 1). National Science Foundation Fellowship
- 2). Woodrow Wilson Fellowship
- 3). Honorable Mention in Danforth Fellowship Competition

PROFESSIONAL EXPERIENCE SINCE JUNE 1975

- Assistant Professor of Math/Computer Science, UWCenter–Fox Valley, 1975–81
- Assistant Professor of Math/Computer Science, Lawrence University, 1981–88
- Associate Director of Computer Services, Lawrence University, 1981–88
- Associate Professor of Math/Computer Science, Lawrence University, 1988–2001
- Professor of Computer Science, University of Wisconsin Oshkosh, 2001–present

RESPONSIBILITIES

- Have taught full range of math courses: Calculus Sequence, Statistics, Logic, Linear Algebra, Differential Equations, Discrete Math, Combinatorics, Numerical Analysis

- Have taught full range of Computer Science courses: BASIC, FORTRAN, COBOL, Pascal, C, C++, Java, Assemblers, Data Structures and Algorithm Analysis, Systems Analysis, Compilers, Artificial Intelligence, Graphics, Programming Languages, Computability Theory, Operating Systems, Software Engineering, Ethical Issues in Computing
- System management of DEC PDP11/70 (RSTS/E), VAX 6210 (VMS), VAXStation 3100 (UNIX), network of Intel-based PC's
- Planning of Computer Science curriculum

MEMBERSHIPS AND SERVICE – PROFESSIONAL ORGANIZATIONS AND COMMITTEES

- Association for Computing Machinery
- Special Interest Group Computer Science Education (SIGCSE), Association for Computing Machinery
- Chair, Focus Group on Algorithms and Data Structures for the Joint Task Force on “Year 2001 Model Curricula for Computing: CC-2001” organized by IEEE Computer Society and ACM.
- USA representative on the Program Committee for the Second Program Visualization Workshop, June 27-28, 2002, HornstrupCentret, Denmark
- Student Activities Coordinator for the 2003 ACM SIGCSE Technical Symposium on Computer Science Education, Reno, Nevada, February 19-23, 2003
- Program Committee member for the *ACM Symposium on Software Visualization (SoftVis 03)*, June 11-13, San Diego, CA.
- ABET program evaluator for CSAB (Computer Science Accreditation Board)
- Program co-chair (with Wanda Dann of Ithaca College) for the 2004 ACM SIGCSE Technical Symposium on Computer Science Education, Norfolk, Virginia, February, 2004
- Symposium co-chair (with Wanda Dann of Ithaca College) for the 2005 ACM SIGCSE Technical Symposium on Computer Science Education, St. Louis, Missouri, February, 2005
- Program co-chair (along with Wim De Pauw of the IBM TJ Watson Research Center) for the *ACM Symposium on Software Visualization (SoftVis '05)*.
- One of two USA representatives on the Program Committee for the Fourth Program Visualization Workshop that will be held June 29-30, 2006, University of Florence, Italy.

PUBLISHED TEXTBOOKS AND LABORATORY MANUALS

- *COBOL: A Comprehensive Treatment*, co-authored with Dr. Bhagat Singh, Reston Publishing Co. (1982)
- *Introduction to Data Structures*, co-authored with Dr. Bhagat Singh, West Publishing Co. (January 1985)
- *Introduction to Data Structures with Pascal*, co-authored with Dr. Bhagat Singh, West Publishing Co. (January 1986)

- *Program Design with Pascal – Principles, Algorithms, and Data Structures*, co-authored with Dr. Bhagat Singh, West Publishing Co. (January 1988)
- *Introduction to Computer Science: Programming, Problem-Solving, and Data Structures*, co-authored with Dr. Douglas Nance, West Publishing Co. (January 1989)
- *Introduction to Computer Science: Programming, Problem-Solving, and Data Structures* (alternate edition), co-authored with Dr. Douglas Nance & Dr. Bhagat Singh, West Publishing Co. (January 1989)
- *Introduction to Data Structures and Algorithm Analysis* (second edition), West Publishing Co. (January 1992)
- *Introduction to Data Structures and Algorithm Analysis with Pascal* (second edition), co-authored with Dr. George J. Pothering of the College of Charleston, West Publishing Co. (January 1992)
- *Introduction to Computer Science: Programming, Problem-Solving, and Data Structures* (second edition), co-authored with Dr. Douglas Nance of Central Michigan, West Publishing Co. (April 1992)
- *Introduction to Computer Science: Programming, Problem-Solving, and Data Structures* (second alternate edition), co-authored with Dr. Douglas Nance of Central Michigan, West Publishing Co. (April 1992)
- *Introduction to Program Design and Data Structures*, West Publishing Co. (August 1992)
- *Laboratory Manual for Program Design and Introductory Data Structures (CS 2)*, Thomas L. Naps and Carol Wilson, West Publishing Co. (August 1992)
- *Laboratory Manual for Program Design and Introductory Data Structures (CS 2): Turbo Pascal version*, Carol Wilson and Thomas L. Naps, West Publishing Co. (August 1992)
- *Introduction to Data Structures and Algorithm Analysis with C++*, co-authored with Dr. George J. Pothering of the College of Charleston, West Publishing Co. (January 1995)
- *Introduction to Computer Science: Programming, Problem-Solving, and Data Structures* (third edition), co-authored with Dr. Douglas Nance of Central Michigan, West Publishing Co. (February 1995)
- *Introduction to Computer Science: Programming, Problem-Solving, and Data Structures* (third alternate edition), co-authored with Dr. Douglas Nance of Central Michigan, West Publishing Co. (April 1995)
- *Laboratory Manual for Program Design and Introductory Data Structures: Standard Pascal version* (second edition), co-authored with Carol Wilson (Western Kentucky University), West Publishing Co. (January 1995)
- *Laboratory Manual for Program Design and Introductory Data Structures: Turbo Pascal version* (second edition), co-authored with Carol Wilson (Western Kentucky University), West Publishing Co. (February 1995)
- *Laboratory Manual for Data Structures and Algorithm Analysis: Pascal version*, West Publishing Co. (February 1995)
- *Laboratory Manual for Data Structures and Algorithm Analysis: C++ version*, West Publishing Co. (June 1995)

- *Introduction to Computer Science with C++*, co-authored with Kenneth Lambert (Washington & Lee University) and Douglas Nance (Central Michigan University), West Publishing Co. (February 1996)
- *Understanding Program Design and Data Structures in C++*, co-authored with Kenneth Lambert (Washington & Lee University), West Publishing Co. (February 1996)
- *Introduction to Computer Science with C++ (2nd edition)*, co-authored with Kenneth Lambert (Washington & Lee University) and Douglas Nance (Central Michigan University), Brooks-Cole Publishing Co. (February 2000)
- *Fundamentals of C++ and Data Structures, Advanced Course (2nd edition)*, co-authored with Kenneth Lambert (Washington & Lee University), Course Technology Publishing Co. (February 2001)

RESEARCH-ORIENTED PAPERS

- “Adaptation of UNIX Compiler Development Tools to Pascal,” *Proceedings of Small College Computing Symposium* (Macalester College, St. Paul, MN, 1987)
- “Design of a Completely General Algorithm Visualization System,” *Proceedings of Small College Computing Symposium* (University of Wisconsin – EauClaire, April 1989)
- “Algorithm Visualization in Computer Science Laboratories,” *Proceedings of the SIGCSE Session, ACM Meetings* (Washington, D.C., February 1990)
- “The Evolution of an Algorithm Visualization System,” co-authored with Christopher D. Hundhausen (Lawrence student), *Proceedings of the Small College Computing Symposium* (University of Minnesota - Morris, April 1991)
- “An Object-oriented Approach to Algorithm Visualization,” co-authored with Brian Swander (Lawrence student), *Proceedings of the SIGCSE Session, ACM Meetings* (Phoenix, Arizona, March 1994)
- “Tools for Visual Exploration of Scope and Parameter Passing in a Programming Languages Course,” *Proceedings of the ACM SIGCSE Technical Symposium*, co-authored with Jeremy Stenglein, Philadelphia, Pennsylvania, February 1996
- “Algorithm Visualization Delivered Off the World Wide Web – Why and How” in *Proceedings of the Association for Computing Machinery’s SIGCSE/SIGCUE Conference on Integrating Technology into Computer Science Education*, Barcelona, Spain, June, 1996
- “A Tested Tool for Teaching Graphics” in *Journal of Computing in Small Colleges (Proceedings of the Third Annual CCSC Midwestern Conference)*, co-authored with Rosalee Wolfe (DePaul University), Scott Grissom (University of Illinois-Springfield), and Andrew Sears (DePaul University), Greencastle, IN, vol. 12, no. 2, November 1996.
- “Algorithm Visualization on the World Wide Web the Difference Java Makes” in *Proceedings of the Association for Computing Machinery’s SIGCSE/SIGCUE Conference on Integrating Technology into Computer Science Education*, Uppsala, Sweden, June, 1997
- “A multi-windowed environment for simultaneous visualization of related algorithms on the World Wide Web,” co-authored with Eric Bressler (Lawrence student), in *Proceedings of the SIGCSE Session, ACM Meetings* (Atlanta, Georgia, February, 1998).

- A Java Visualizer Class: Incorporating Algorithm Visualizations into Students Programs, in *Proceedings of the Association for Computing Machinery's SIGCSE/SIGCUE Conference on Integrating Technology into Computer Science Education*, Dublin, Ireland, August, 1998
- Using Visualization to Teach Parallel Algorithms,“ co-authored with Eric Chan (Lawrence student) in *Proceedings of the ACM SIGCSE Technical Session*, ACM Meetings (New Orleans, Louisiana, March, 1999).
- ”JHAVÉ – An Environment to Actively Engage Students in Web-based Algorithm Visualizations,“ co-authored with James R. Eagan and Laura L. Norton (Lawrence students) in *Proceedings of the ACM SIGCSE Technical Session*, Austin, Texas, March, 2000
- ”A Context For The Assessment Of Algorithm Visualization Systems As Pedagogical Tools“, co-authored with Jay Martin Anderson (Franklin and Marshall College), in *Proceedings of the First Program Visualization Workshop*, Helsinki, Finland, July, 2000
- ”Incorporating Algorithm Visualization into Educational Theory“, in *Informatik: Journal of the Swiss Informaticians Society*, no. 2, April 2001. Available in print and online at <http://www.svifsi.ch/revue/>.
- Making Interactive Prediction Count In Algorithm Visualization Yes, It Will Be On The Test!, co-authored with Stanley Makalew (undergraduate student, UW Oshkosh), in *Proceedings of the 35th Annual Midwest Instruction and Computing Symposium*, April 5-6, 2002, University of Northern Iowa, Cedar Falls, Iowa.
- Addressing Pedagogical Requirements in Algorithm Visualizations, co-authored with Guido Röbling (Darmstadt University of Technology), in *Proceedings of the 7th Annual SIGCSE/SIGCUE Conference on Innovation and Technology in Computer Science Education*, ITiCSE 2002, June 2002, Aarhus, Denmark.
- Towards Improved Individual Support in Algorithm Visualization, co-authored with Guido Röbling (Darmstadt University of Technology) in *Proceedings of the Second Program Visualization Workshop*, June 2002, HornstrupCentret, Denmark.
- The Effective Use of Quicksort Visualizations in the Classroom, co-authored with Scott Grissom (Grand Valley State), in *Proceedings of the 9th Annual Consortium for Computing Sciences in Colleges (CCSC) Midwest Conference*, September, 2002, Indiana Wesleyan University, Marion, Indiana.
- VisualGraph: A Graph Class Designed for Both Undergraduate Students and Educators, co-authored with Jeff Lucas (UW Oshkosh) and Guido Röbling (Darmstadt University of Technology), in *Proceedings of the ACM SIGCSE Technical Symposium on Computer Science Education*, Reno, Nevada, February 19-23, 2003.
- Algorithm Visualization in CS Education: Comparing Levels of Student Engagement, co-authored with Scott Grissom (Grand Valley State) and Myles F. McNally (Alma College), in *Proceedings of the ACM Symposium on Software Visualization*, San Diego, California, June 11-13, 2003. Won Distinguished Paper award.
- “JHAVÉ – Supporting Algorithm Visualization Engagement”, in the journal *IEEE Computer Graphics and Applications*, September/October, 2005, vol. 25, no. 5.
- “JHAVÉ – More Visualizers (and Visualizations) Needed”, co-authored with Guido Roessling, in the *Proceedings of the Fourth Program Visualization Workshop*, June, 2006, Florence, Italy
- “Realizing XML-Driven Algorithm Visualization”, co-authored with Myles McNally, in the *Proceedings of the Fourth Program Visualization Workshop*, June, 2006, Florence, Italy

- “BlockTree – Pedagogical Information Visualization for Heuristic Search”, co-authored with David Furcy and Andrew Jungwirth, in the *Proceedings of the 20th International FLAIRS Conference on Artificial Intelligence*, May, 2007, Key West, Florida
- “Supporting the Rapid Development of Pedagogically Effective Algorithm Visualizations”, co-authored with Myles McNally, Scott Grissom, David Furcy, Christian Trefftz, in *Proceedings of the 14th Annual Consortium for Computing Sciences in Colleges (CCSC) Midwest Conference*, September, 2007, Miami University, Hamilton, Ohio
- “SOS – The Sequel”, co-authored with David Furcy and Jason Wentworth, in the *Proceedings of the 13th Conference on Innovation and Technology in Computer Science Education*, June, 2008, Madrid, Spain

WORKING GROUP REPORTS

- ”An Overview of Visualization: Its Use And Design“ in *Proceedings of the Association for Computing Machinery’s SIGCSE/SIGCUE Conference on Integrating Technology into Computer Science Education*, Barcelona, Spain, June, 1996, chaired and co-authored with Joe Bergin, Ken Brodlie, Michael Goldweber, Ricardo Jimenez–Peris, Sami Khuri, Marta Patino-Martinez, Myles McNally, Susan Rodger, Judith Wilson.
- ”Report of the Working Group on Using the World Wide Web as the Delivery Mechanism for Interactive, Visualization-based Instructional Modules“ in *Proceedings of the Association for Computing Machinery’s SIGCSE/SIGCUE Conference on Integrating Technology into Computer Science Education*, Uppsala, Sweden, June, 1997, co-chaired and co-authored with Joe Bergin (co-chair), Ricardo Jimenez–Peris, Marta Patino-Martinez, Myles McNally, Viera Proulx, Jorma Tarhio.
- ”Java Resources for Computer Science Instruction: Report of the ITiCSE98/ACTC98 Working Group on Curricular Opportunities of Java Based Software Development in *Proceedings of the Association for Computing Machinery’s SIGCSE/SIGCUE Conference on Integrating Technology into Computer Science Education*, Dublin, Ireland, August, 1998, co-chaired and co-authored with Joseph Bergin (co-chair), Constance G. Bland, Stephen J. Hartley, Mark A. Holliday, Pamela B. Lawhead, John Lewis, Myles F. McNally, Christopher H. Nevison, Cheng Ng, George J. Pothering, Tommi Teräsvirta
- “A Collection of Resources for the First Courses in Computer Science: Report of the Working Group on Non-Programming Resources for an Introduction to CS in *Proceedings of the Association for Computing Machinery’s 5th SIGCSE/SIGCUE Conference on Integrating Technology into Computer Science Education*, Helsinki, Finland, July 2000, co-authored with Joseph Bergin (co-chair), Myles McNally (co-chair), Mike Goldweber, Stephen Hartley, Charles Kelemen, Chris Power
- Exploring the Role of Visualization and Engagement in Computer Science Education, Report of the Working Group on Improving the Educational Impact of Algorithm Visualization at the *7th Annual SIGCSE/SIGCUE Conference on Innovation and Technology in Computer Science Education*, ITiCSE 2002, June 2002, Aarhus, Denmark, Thomas L. Naps (co-chair, U Wisconsin Oshkosh, USA), Guido Rößling (co-chair, Darmstadt U Techn., Germany), Vicki Almstrum (U Texas Austin, USA), Wanda Dann (Ithaca College, USA), Rudolf Fleischer (Hong Kong U Sc. & Techn.), Chris Hundhausen (U of Hawaii, USA), Ari Korhonen (Helsinki U Techn., Finland), Lauri Malmi (Helsinki U Techn., Finland), Myles McNally (Alma College, USA), Susan Rodger (Duke University, USA), J. Ángel Velázquez-Iturbide (U Rey Juan Carlos, Spain). This report will appear in print in the June 2003 issue of the ACM SIGCSE Bulletin *Inroads*.

- “Evaluating the Educational Impact of Algorithm Visualization”, Anderson J., Cooper S., Dann W., Fleischer R., Koldehofe B., Korhonen A., Kuittinen M. Leska C., Malmi L., McNally M., Naps, T. (co-chair) Rantakokko J., Rößling, G (co-chair), Ross R. Evaluating the Educational Impact of Visualization – Report of the Working Group on Evaluating the Educational Impact of Visualization. Eighth Annual SIGCSE/SIGCUE Conference on Innovation and Technology in Computer Science Education, June 2003, Thessaloniki, Greece. In the ACM SIGCSE Bulletin *Inroads*, March 2004.
- “Development of XML-based Tools to Support User Interaction with Algorithm Visualization”. co-authored by Peter Brusilovsky – University of Pittsburgh, John English – University of Brighton UK, Duane Jarc – University of Maryland University College, Ville Karavirta – Helsinki University of Technology Finland, Charles Leska – Randolph-Macon College, Myles McNally – Alma College, Andrés Moreno – University of Joensuu Finland, Thomas Naps (co-chair) – U Wisconsin Oshkosh, Guido Rößling (co-chair) – TU Darmstadt Germany, Rockford J. Ross – Montana State University, Jaime Urquiza-Fuentes – Universidad Rey Juan Carlos Spain. In the ACM SIGCSE Bulletin *Inroads*, December 2005.
- “Merging Interactive Visualizations with Hypertextbooks and Course Management”. co-authored by Guido Rößling, Thomas Naps, Mark S. Hall, Ville Karavirta, Andreas Kerren, Charles Leska, Andrés Moreno, Rainer Oechsle, Susan H. Rodger, Jaime Urquiza-Fuentes, . Ángel Velázquez-Iturbide. In the ACM SIGCSE Bulletin *Inroads*, December 2006.

RECENT PROFESSIONAL TALKS AND PRESENTATIONS

- March 2000, ”Algorithm Visualization: Why Teachers ’Get It’ and Students (Often) Don’t“, invited colloquium presented at the University of Mississippi
- July 2002, Algorithm Visualization: Why doesn’t it work? What can we do about it?, invited colloquium presented at Technical University, Darmstadt, Germany

WORKSHOPS/TUTORIALS TAUGHT AT PROFESSIONAL CONFERENCES

- August 1991, two one-week workshops on ”Algorithm Visualization in Computer Science Laboratories“, conducted by myself and Marc Brown of DEC Systems Research (Palo Alto), attracted to Lawrence 39 faculty from undergraduate institutions nation-wide.
- March, 1992, one-day workshop on ”Algorithm Visualization“ at the SIGCSE Symposium of the Association of Computing Machinery, Kansas City, Missouri
- July 2000, ”Interacting with Java-Based Algorithm Visualizations“, a tutorial co-taught with Professor Sami Khuri (San Jose State University) at the Fifth Annual Conference on Integrating Technology into Computer Science Education, Helsinki, Finland
- October 2000, ”Instructional Interaction with Algorithm Visualizations“, a tutorial taught at the Consortium for Computing in Small Colleges Midwest Conference, Valparaiso, Indiana
- August 2005 and June 2006, “Integrating Algorithm Visualization into Computer Science courses”, a four-day workshop co-taught at Grand Valley State University with Scott Grissom (GVSU), Myles McNally (Alma), Susan Rodger (Duke), Rockford Ross (Montana State), and John Stasko (Georgia Tech).
- March 2006, “Integrating Algorithm Visualization into Computer Science Courses” co-taught Scott Grissom (Grand Valley State), Myles McNally (Alma) at the 2006 SIGCSE Technical Symposium on Computer Science Education, Houston, TX

- March 2007, “Developing Algorithm Visualizations for Computer Science Instruction” co-taught Scott Grissom (Grand Valley State), Myles McNally (Alma) at the 2007 SIGCSE Technical Symposium on Computer Science Education, Cincinnati, OH

PANEL PARTICIPATION AT PROFESSIONAL CONFERENCES

- February 1993, panel co-presented with Hunkins, Dalton R. (moderator) and Andrianoff, Steven K. and Nerheim-Wolfe, Rosalee, ”Computer Graphics Across the Computer Science Curriculum,“ cited in *Papers of the 24th SIGCSE Technical Symposium on Computer Science Education*, February 1993, Vol. 25, No. 1, Indianapolis, IN, p.295.
- February 1995, panel co-presented with Scott Grissom (moderator), Susan Rodger, Rockford Ross, Dino Schweitzer, and Dalton Hunkins , ”Using Visual Demonstrations,“ cited in *Papers of the 26th SIGCSE Technical Symposium on Computer Science Education*, February 1995, Vol. 27, No. 1, Nashville, TN, p.370.
- July 2000, a panel ”Future Challenges in Program Visualization“ co-presented with Mordechai Ben-Ari (Weizmann Institute, Israel), Rockford Ross (Montana State University), Erkki Sutinen (University of Joensuu, Finland), and Andreas Zeller (Passau University, Germany) at the Fifth Annual Conference on Integrating Technology into Computer Science Education, Helsinki, Finland
- February 2001, a panel ”Practical Teaching Tips from Around the World“ co-presented with Scott Grissom (Grand Valley State), Pamela Lawhead (Mississippi), and Nick Parlante (Stanford)
- March 2006, a panel “Animation and Visualization in the Curriculum: Opportunities, Challenges, and Successes” co-presented with Susan Rodger (Duke), Guido Rößling (Darmstadt Technical University), and Rockford Ross (Montana State) at the 2006 SIGCSE Technical Symposium on Computer Science Education, Houston, TX

DIRECTION OF PROJECTS LEADING TO UNDERGRADUATE

PUBLICATIONS AND PRESENTATIONS

- *Visualization in the Teaching of Computer Science*, paper presented by Phoutha (Allan) Keopanya at the Associated Colleges of the Midwest Minority Scholar Research Report Meeting, Grinnell, Iowa, October, 1990.
- *An Object-oriented Implementation of the Union-find Data Structure and its Application in the Equivalence of Finite State Automata*, paper presented by Lambros Piskopos at the Argonne Undergraduate Research Symposium, Argonne National Labs, Argonne, Illinois, November, 1990.
- *Algorithm Visualization in a Windowing Environment*, a paper presented by Christopher Hundhausen at the Argonne Undergraduate Research Symposium, Argonne National Labs, Argonne, Illinois, November, 1990.
- *Visualization of Sorting Algorithms in Java*, a paper presented by Yin-so Chen at the Associated Colleges of the Midwest Minority Scholar Research Report Meeting, Carleton College, Minnesota, October, 1996.
- *A Java Implementation of an Online Quiz Administration System*, a paper presented by Pamela Kunes and Laura Norton at the Seventh Annual Consortium for Computing at Small Colleges Midwest Conference, Valparaiso, Indiana, October, 2000.

- *Three-dimensional Animation of Sorting Algorithms Using VRML and Java Servlets*, a paper presented by Lerie Herrera at the Associated Colleges of the Midwest Minority Scholar Research Report Meeting, Carleton College, Minnesota, October, 2000.
- *One Step Toward The Paperless Classroom*, a presentation by UW Oshkosh student Jesse Schingen at the Argonne Undergraduate Research Symposium, October 25, 2002)
- Spring 2003, Honors Project of UW-Oshkosh student Jeff Lucas, “Visualizing Graphical Algorithms for a Educational Environment And Defining an XML Graph Specification”, won UW-Oshkosh *Outstanding Student Research Award*
- Spring 2003, Honors Project of UW-Oshkosh student Justin Miller, “Developing Pedagogical Visualizations of Dense Matrix Operations on Interconnection-Network SIMD Computers”, presented at Midwest Instructional Computing Symposium 2003 Conference in Duluth, Minnesota
- Spring 2004, faculty adviser on a project done by Jessica Gowe and Orjola Kajo – “Improving Students’ Understanding of Parameter Passing Methods in a Programming Languages Course” – culminated in the Spring semester of 2004 with a paper presentation *Using Algorithm Visualization to Improve Students’ Understanding of Parameter Passing Methods at the 37th Annual Midwest Instruction and Computing Symposium April 16-17th, 2004, University of Minnesota, Morris*
- Spring 2005, faculty adviser on research project done by Andrew Jungwirth, “Developing Instructional Animations for Three Artificial Intelligence Algorithms”, presented at *UW System Symposium for Undergraduate Research and Creative Activity, UW Stout, May 5*

MAJOR EXTERNAL GRANTS

- Summer 1985 through Summer 1987 – Principal investigator for NSF College Science Instrumentation Program grant, “Microcomputer Lab for Advanced Computing Students.”
- Summer 1988 through Summer 1990 – Principal Investigator for NSF Instrumentation and Laboratory Improvement grant, “Algorithm Visualization Laboratory,” matching funds provided by Cray Research Foundation grant.
- January 1991 through April 1992, principal investigator for \$24,000 grant from NSF’s Undergraduate Faculty Enhancement Program - “Workshops on Algorithm Visualization in Computer Science Laboratories“
- June 1992 through September 1994, co-investigator with Joe Gregg for \$31,500 grant from NSF’s Instrumentation and Laboratory Improvement Program - “Incorporation of Object-oriented Paradigm into Introductory and Intermediate Computer Science“
- January 1993 through October 1993, coordinator for \$30,000 supplemental grant from NSF’s Undergraduate Faculty Enhancement Program - “Projects in Algorithm Visualization“
- Summer 1996 through Summer 1998, Principal Investigator, NSF Instructional Laboratory Improvement Grant, “Incorporation of Algorithm Visualization into Instructional Materials Served off the World Wide Web“.
- Summer 1999 through Summer 2000 - Received Ameritech Corporation WFIC (Wisconsin Foundation of Independent Colleges) Grant to explore pedagogical user interface issues in the design of an algorithm visualization system.

- June 2002 through May 2003, co-investigator, along with Scott Grissom (Grand Valley State) and Myles McNally (Alma College), for NSF Course, Curriculum, and Laboratory Improvement (CCLI) grant (\$72,000) - "Integrating Algorithm Visualization into Computer Science Education." We are working to develop and evaluate algorithm visualization resources to support CS education.
- January 2004 – December 2007, co-investigator, along with Scott Grissom (Grand Valley State) and Myles McNally (Alma College), NSF CCLI EMD (Educational Materials Development) grant – "Integrating Algorithm Visualization into Computer Science Education." (\$197,118) A follow-up to our prior proof-of-concept grant in 2002 to continue work on the development and evaluation of algorithm visualization resources to support CS education

OTHER PROJECTS SUPPORTED BY LOCAL GRANTS

- Summer 1978 – Received UW System grant to develop a computer-assisted instruction package for an elementary statistics course. My work under this grant resulted in the development of STATS (Statistics Teaching and Tutorial System) which was classroom tested for the first time in the fall semester of 1978.
- Summer 1979 – Received UW System grant to continue development of STATS (see above). Results of this grant included my authoring the text *STATS: A Computer-Assisted Approach to Elementary Statistics* and implementation of the STATS package at UW-Superior and UW-Marinette, as well as at the Fox Valley Center.
- Fall 1979 & Spring 1980 – Selected to participate in NSF Chautauqua short course on "The Social Impact of Computers" at the University of Missouri – Kansas City.
- Summer 1980 – One of 48 participants chosen from nation-wide competition for NSF College Faculty Conference on CAI at Western Washington University. My attendance at this conference was supported by NSF funding and a Center System grant.
- Summer 1981 – Received grant from Lawrence to attend four-credit graduate course in Database Processing at the National Computer Educators Institute.
- Summer 1982 – Taught Elderhostel course, "Taming the Dragon – Computers and Society," at Lawrence.
- Summer 1982 – Implemented on DEC 11/70 a computer model for economic simulation in "Business Week" activities at Lawrence.
- Summer 1982 – Received grant from Lawrence to attend four-credit graduate course in Systems Analysis & Design at the National Computer Educators Institute.
- Summer 1983 – Participated on project team developing COSAP, Conversationally-Oriented Statistical Analysis Package, at Lawrence University.
- Summer 1983 – Received joint grant from Lawrence and GTE Corp. to attend course in Compiler Design & Construction at University of California.
- Summer 1984 – Received joint grant from Lawrence and Ohio section of MAA to attend course in Systems Programming at Dennison University.
- Summer 1985 – Received educational development grant from Lawrence to attend course on Operating Systems at Bowling Green State University.

- Summer 1986 – Taught Elderhostel course, "Taming the Dragon – Computers and Society," at Lawrence.
- Summer 1987 – Taught College Board Advanced Placement course, "Algorithms and Data Structures," for high school teachers.
- Summer 1988 – Taught College Board Advanced Placement course, "Programming in Pascal," for high school teachers.
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- Summer 1989 – Taught College Board Advanced Placement course, "Algorithms and Data Structures," for high school teachers.
- Summer 1990 - Taught College Board Advanced Placement course, "Algorithms and Data Structures," for high school teachers.
- Summer 1994 - Received Lawrence Faculty Research Grant to work with students Brian Swander and Jeremy Stenglein in converting GAIGS algorithm visualization software to Microsoft Windows platform
- Summer 1995 - Received Lawrence Faculty Research Grant to work with students Jeremy Stenglein and Noel Ramathal in developing instructional visualizations for a programming languages course to be served off the World Wide Web.
- Summer 1996 - Received Lawrence Faculty Research Grant to work with students Eric Bressler, Yinso Chen, and Haiyan Zhao in developing Java-based techniques for delivering instructional visualizations via the World Wide Web.
- Summer 1997 - Received Lawrence Faculty Research Grant to work with student Eric Bressler in continuing development of Java-based techniques for delivering instructional visualizations via the World Wide Web.
- Summer 1997 - Taught course, "Programming in Java," for gifted high school students through WCATY (Wisconsin Center for Academically Talented Youth).
- Summer 1998 - Received Lawrence Faculty Research Grant to work with student Eric Chan in development of visualization techniques for parallel algorithms.
- Summer 1998 - Taught course, "Programming in C++," for gifted high school students through WCATY (Wisconsin Center for Academically Talented Youth).
- Summer 1998 – Taught College Board Advanced Placement course, "AP Computer Science and the Change to C++," for high school teachers.
- Summer 1999 – Taught College Board Advanced Placement course, "AP Computer Science and the Change to C++," for high school teachers.
- Summer 2000 - Received funding from Culpeper Grant to supervise the work of Lawrence student Pamela Kunes in finishing implementation of Web-based system to allow Lawrence faculty to administer on-line quizzes to their students.

- Summer 2000 - Received funding from Associated Colleges of the Midwest Minority Scholars Program to supervise a research project with Lawrence student Lerie Herrera on using VRML to develop three-dimensional animations of sorting algorithms
- Summer 2000 – Taught College Board Advanced Placement course, "AP Computer Science and the Change to C++," for high school teachers.
- Summer 2002 – With UW-Oshkosh student Jeff Lucas, received funding from Undergraduate Student and Faculty Collaborative Research Program to develop Java tools to animate graph algorithms
- Summer 2007 – With UW-Oshkosh student Jason Wentworth and faculty member David Furcy, received funding from Undergraduate Student and Faculty Collaborative Research Program to develop a highly interactive Flash-based implementation of the classic instructional video "Sorting Out Sorting" by Ronald Baecker.
- Fall 2007 – Received sabbatical support from UW-Oshkosh and the Helsinki University of Technology to engage in a collaborative research endeavor with Dr. Ari Korhonen and Dr. Lauri Malmi of HUT that will involve integration of the algorithm visualization systems we have each developed.