VITA

Thomas L. Naps
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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
4). ACM Distinguished Educator (2013)

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, 2001-2018
- Professor Emeritus of Computer Science, University of Wisconsin Oshkosh, 2018-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, Theory of Computation, Operating Systems, Software Engineering, Ethical Issues in Computing, Database, Web Software Design
- 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 CAC (Computing Accreditation Commission), 2002 - present
- 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, June 29-30, 2006, University of Florence, Italy.
- Program co-chair (with Christian Spannagel of Pädagogische Hochschule Heidelberg) for the 2011 ACM ITiCSE Conference, Darmstadt, Germany, June 2011
- ACM Senior Members Committee (2014 . . .)
- ACM 2013 Distinguished Educator Award (see *http://www.acm.org/press-room/news-releases/2013/distinguished-2013*)

- Member of the Editorial Advisory Board, ACM's Inroads Magazine (2016 . . .)

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 Roessling (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 Roessling (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 Roessling (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
- "A Comprehensive Taxonomy of Algorithm Animation Languages", co-authored with Ville Karavirta, Ari Korhonen, Lauri Malmi (all from Aalto University, formerly the Helsinki University of Technology), in *Journal of Visual Languages and Computing*, Elsevier Publishing, Volume 21, Issue 1, February 2010, Pages 1-22.
- " OpenDSA: Beginning a Community Hypertextbook Project", co-authored with C.A. Shaffer (Virginia Tech), V. Karavirta (Aalto University, Helsinki, Finland), and A. Korhonen (Aalto University, Helsinki, Finland), in Proceedings of 11th Koli Calling International Conference on Computing Education Research, November 17-20, 2011, Koli National Park, Finland, 112–117.
- "Interactive Textbooks for Computer Science Education", co-authored with C.A. Shaffer (Virginia Tech) and E. Fouh (Virginia Tech), in Proceedings of the Sixth Program Visualization Workshop, June 30, 2011, Darmstadt, Germany, 97-103.
- "Design and Architecture of an Interactive eTextbook –the OpenDSA System", co-authored with Eric Fouh (Virginia Tech), Ville Karavirta (Aalto University, Helsinki, Finland), Daniel A. Breakiron (Virginia Tech), Sally Hamouda (Virginia Tech), Simin Hall (Virginia Tech), Clifford A. Shaffer (Virginia Tech), in Science of Computer Programming (Elsevier), Volume 88, 2014, pages 22-40.

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 Terasvirta

- "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 Roessling (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. Angel VelÃ¡zquez-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", Guido Rößling (co-chair), Thomas Naps (co-chair), 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.

- "Enhancing Learning Management Systems to Better Support Computer Science Education", Guido Rößling (co-chair), Mike Joy, Andrés Moreno, Atanas Radenski, Lauri Malmi (co-chair, Andreas Kerren, Thomas Naps, Rockford J. Ross, Michael Clancy, Ari Korhonen, Rainer Oechsle, J. Ángel Velázquez Iturbide. In the ACM SIGCSE Bulletin *Inroads*, December 2008.

- "Requirements and Design Strategies for Open Source Interactive Computer Science eBooks", Ari Korhonen (co-chair), Thomas Naps (co-chair), Charles Boisvert, Pilu Crescenzi, Ville Karavirta, Linda Mannila, Bradley Miller, Briana Morrison, Susan H. Rodger, Rocky Ross, Clifford A. Shaffer, in Proceedings of the ITiCSE Working Group Reports Conference on Innovation and Technology in Computer Science Education-working Group Reports, 2013, ACM, New York, NY

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

- March 2010 "Building an online educational community for algorithm visualization", co-taught with Clifford A. Shaffer, Susan H. Rodger, Stephen H. Edwards at the 2010 SIGCSE Technical Symposium on Computer Science Education

- March 2016, "Using OpenDSA eTextbooks in Your Class" workshop presented with Clifford Shaffer, Virginia Tech and Susan Rodger, Duke University at tthe ACM SIGCSE Symposium, Memphis, TN

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
- March 2010, a panel co-presented with Reynold Bailey, Guy-Alain Amoussou, Tiffany Barnes, and Hans-Peter Bischof. "Relevant real-world undergraduate research problems: lessons from the NSF-REU trenches". In *Proceedings of the 41st ACM technical symposium on Computer science education* (SIGCSE '10). ACM, New York, NY, USA.

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 Gowey 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*
- Summer 2010, co-adviser (along with David Furcy) on REU project done by Cory Sheeley, William Penn University; Caitlyn Pickens, Lake Forest College; William Clements, University of Wisconsin-Oshkosh, "VIBES: Visual Interpreter of Bytecodes for Educating Students", undergraduate research poster presented at SIGCSE 2011
- Summer 2010, adviser on REU project done by Alejandro Carrasquilla and Shawn Recker – their visualization of the Sutherland-Hodgman Clipping Algorithm won an "AV of the year" award in the annual competition at *algoviz.org*, thereby gaining entry in the AlgoViz.org Hall of Fame
- Summer 2011, co-adviser (along with George Thomas) on REU project done by Kimberly Barth and Shauna Hetrick, "Creating a Visualization Tool for Object Composition", won first place in the student poster competition at CCSC Midwest, 2011.

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

- June 2009 – September 2012, co-principal investigator with David Furcy (UWOshkosh) on NSF REU Site grant – "Exploring Open Source Software: Development and Efficacy of Online Learning Environments in Computer Science." ($261,167, NSF Award #0851569). Design and supervise research projects each summer for eight students (two from UWOshkosh, six recruited nationally).

- June 1 , 2012 – May 31, 2014, principal investigator on NSF DUE research project "Collaborative Research: Integrating the eTextbook: Truly Interactive Textbooks for Computer Science Education", ($49,934, NSF Award number 1139825). Working collaboratively with PI's at two other universities who hold similar awards – Virginia Tech (Dr. Cliff Shaffer, award #1139861) and William Marsh Rice University, (Dr. Richard G. Baraniuk, award #1139873). Project involves development of open-source on-line interactive textbook for a Data Structures and Algorithms course. As instructional modules are developed for the project, they are made available at *http://algoviz.org/OpenDSA/*.

- January 1, 2015 – December 31, 2017, co-principal investigator with David Furcy on NSF IUSE research project "Collaborative Research: Assessing and Expanding the Impact of OpenDSA, an Open-Source, Interactive eTextbook for Data Structures and Algorithms" (Award No. DUE-1431399, $99,003). Working collaboratively with PI's at two other universities who hold similar awards – Virginia Tech (Dr. Cliff Shaffer, award #1432008) and Duke University, (Dr. Susan Rodger, award #1431667). Project focuses on assessment of learning achieved by students who use the open-source on-line interactive textbook at *http://algoviz.org/OpenDSA/*.