

Suzanne Michelle Shontz
Curriculum Vitae

Dept. of Computer Science and Engineering
The Pennsylvania State University
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Education

Cornell University

2005 Ph.D. in Applied Mathematics (Completed December 2004)
Dissertation: *Numerical Methods for Problems with Moving Meshes*
Stephen A. Vavasis, advisor
Minors: Computer Science and Mathematics

2002 M.S. in Computer Science
M.S. in Applied Mathematics

University of Northern Iowa

1999 B.A. in Mathematics (*Summa cum laude*)
B.S. in Chemistry (*Summa cum laude*)

Research Interests

Parallel scientific computing with a focus on unstructured mesh and numerical optimization methods and their applications to computational medicine and materials.

Employment Summary

2009-09 **ASEE Contractor to Naval Research Laboratory**

Office of Naval Research Summer Faculty Fellow

2006- **The Pennsylvania State University**

Assistant Professor, Computer Science and Engineering Department

Affiliated with the Computational Science Graduate Program

Affiliated with the Institute for Cyberscience

2004-06 **University of Minnesota**

Postdoctoral Associate working with Yousef Saad, Computer Science and Engineering Department.

1999- **Cornell University**

2004 NPSC Fellow working with Stephen A. Vavasis, Computer Science Department

2003 & **Cornell University**

2004 Summer Research Assistant for Stephen A. Vavasis, Computer Science Department

2003 **Sandia National Laboratories**

Summer research intern in the Computer Science Research Institute

2001-2 **Argonne National Laboratory**

Summer research intern in the Mathematics and Computer Science Division

1999- **Sandia National Laboratories**

2000 Summer research intern in the Computational Sciences and Mathematics Research Division

1998 **Cornell University**

Summer REU student in Mathematics

1997 **University of Kentucky**

Summer REU student in Applied Mathematics

1996 **University of Minnesota, Geometry Center**

Summer Institute for Undergraduates Participant

Teaching Experience

The Pennsylvania State University

- 2006- Assistant Professor – *Department of Computer Science and Engineering*
Have taught seven sections of CSE/Math 451 – Numerical Computations (Fall 2006 (2), Fall 2007(1), Spring 2009(2), Fall 2009(2)). Designed and taught CSE 598C Meshing Techniques, a graduate-level meshing course I designed, in Spring 2008. Taught CSE/Math 555 – Numerical Optimization, Fall 2008.

University of Minnesota

- 2006 **Co-Advisor** – *Minnesota Supercomputing Institute Summer Internship Program*
Met with two undergraduate interns and one graduate student on a regular basis to provide guidance and feedback on their research project which was to design a Matlab code for electronic structures computations. Two of the students are seriously considering attending graduate school.
- 2005 **Co-Mentor** – *Minnesota Supercomputing Institute Summer Internship Program*
Met with three undergraduate interns on a regular basis in a group setting to provide guidance and feedback on their research project which was to design a visualization toolbox for an electronic structure computations code. All three interns are seriously considering attending graduate school.
- 2004- **Substitute Lecturer** – *Department of Computer Science and Engineering*
Gave substitute lectures in undergraduate and graduate level Scientific Computing courses for Yousef Saad.

Cornell University

- 2002 **Instructor** - *COM S 322: Introduction to Scientific Computing*
A position usually held by a member of the faculty. I was responsible for all aspects of this course including: lecturing, writing homework assignments, quizzes and exams, supervising a teaching assistant, grading exams, assigning grades, and holding office hours. COM S 322 is the introductory course in scientific computing as is normally taken by junior Computer Science majors and many Computer Science minors.
- 2002 **Teaching Assistant** – *COM S 322: Introduction to Scientific Computing*
Taught two recitation sections in an interactive lecture format, held office hours, proctored exams, graded homeworks, quizzes, and exams.
- 2000- **Substitute Lecturer** – *Department of Computer Science*
Gave substitute lectures in undergraduate and graduate level Scientific Computing and Numerical Analysis courses for Stephen Vavasis and Charles Van Loan.

University of Northern Iowa

1996-9 **Tutor, Mathematics Department**

Tutor for all undergraduate courses in mathematics, statistics, and mathematics education.

1996-9 **Grader, Mathematics Department**

Graded homework, projects, quizzes, and exams for several sections of Calculus I, II, and III and Introduction to Statistics.

1995-8 **General Chemistry Laboratory Assistant, Chemistry Department**

Assisted students performing general chemistry laboratories, helped with chemical preparation, performed chemical stockroom duties.

1996 **Volunteer Tutor, Chemistry Department**

Tutored undergraduate students in chemistry on a volunteer basis.

1996- **Private Tutor**

2000 Tutored mathematics, statistics, chemistry, and physics at many different levels from second grade through undergraduates and students ages 7 to 40+.

Awards

2009 Office of Naval Research Summer Faculty Fellowship at Naval Research Laboratory

2007 Chosen by undergraduate student to be the Computer Engineering Faculty Marshall for the College of Engineering, Spring Commencement 2007.

2005-06 Minnesota Supercomputing Institute Research Scholarship. Funded my research proposal entitled "Geometric Approaches to Preconditioning Methods"

2005 Invited Conference Attendee. NSF Faculty Horizons Workshop, ADVANCE Program, University of Maryland, Baltimore County

2005 Listed in *The Chancellor's List* for 2004-05

1999-04 National Physical Science Consortium (NPSC) Fellowship

2003 SIAM Student Travel Grant
Cornell University Travel Grant

- 2000 Invited Conference Attendee. "Connecting Women in Mathematics to Industry," Institute for Mathematics and its Applications, University of Minnesota.
- 1999 Honorable Mention, Alice T. Schafer Prize for Excellence in Mathematics by an Undergraduate, Association for Women in Mathematics
Purple and Old Gold Award in Chemistry and Mathematics (outstanding graduate in each major), University of Northern Iowa
Top Four Award for research presentation at National Kappa Mu Epsilon Convention
- 1998-9 C.W. Lantz Scholarship, College of Natural Sciences, University of Northern Iowa.
- 1997-9 Marcia E. Traer Scholarship in Mathematics, University of Northern Iowa.
- 1996-9 University of Northern Iowa Alumni Scholarship in Mathematics
- 1994-9 Dean's List, College of Natural Sciences, University of Northern Iowa.
- 1998 College of Natural Sciences Dean's Student Award (outstanding student in the college), University of Northern Iowa.
Outstanding Student in Physical Chemistry Award, University of Northern Iowa.
Honorable Mention, COMAP Math Modeling Contest.
SOAR Grant for Undergraduate Research in Chemistry, University of Northern Iowa (2 times).
Conspicuous Achievement Award for presentation at the Iowa MAA Convention
- 1997-8 McCollum Scholarship, College of Natural Sciences, University of Northern Iowa.
- 1994-8 Hach Scientific Scholarship, Hach Chemical Company, Ames, IA.
University of Northern Iowa Merit Scholarship
Listed in *National Dean's List*
- 1997 Honor Roll of Chemistry Seniors, University of Northern Iowa.
Top Four Award for presentation at National Kappa Mu Epsilon Convention
Conspicuous Achievement Award for research presentation at Iowa MAA Convention
- 1996 Hypercube Scholar Award (for outstanding promise in chemistry, mathematics, and computers), Chemistry Department, University of Northern Iowa.
- 1994-6 National Sciences Scholarship, United States Department of Education.
- 1994-5 University of Northern Iowa Resident Scholarship
State of Iowa Scholarship

Member, Kappa Mu Epsilon, mathematics honor society
Member, Sigma Xi, scientific research honor society
Member, Sigma Pi Sigma, physics honor society
Member, Omicron Delta Kappa, leadership honor society
Member, Golden Key, academic honor society
Member, Phi Eta Sigma, academic honor society

Publications in Refereed Journals

Yousef Saad, James Chelikowsky, and Suzanne Shontz, *Numerical methods for electronic structure calculations*, SIAM Review, Accepted February 2009.

L.Diachin, P. Knupp, T. Munson, and S. Shontz, *A comparison of two optimization methods for mesh quality improvement*, Engineering with Computers 22(2): 61-74, May 2006.

Publications in Refereed Conference Proceedings

Shankar Prasad Sastry and Suzanne M. Shontz, *A Comparison of Gradient- and Hessian-Based Optimization Methods for Tetrahedral Mesh Quality Improvement*, To appear in the Proceedings of the 18th International Meshing Roundtable, October 2009, Salt Lake City, UT.

Suzanne M. Shontz, Victoria E. Howle, and Patricia D. Hough, *Experience with Approximations in the Trust-Region Parallel Direct Search Algorithm*, 2009 International Conference on Computational Science and Engineering, May 2009, p. 501-510.

Suzanne M. Shontz, Patrick Knupp, *The Effect of Vertex Reordering on 2D Local Mesh Optimization Efficiency*, in Proceedings of the 17th International Meshing Roundtable, October 2008, Pittsburgh, PA, p. 107-124.

L. Diachin, P. Knupp, T. Munson, and S. Shontz, *A comparison of inexact Newton and coordinate descent mesh optimization techniques*, in Proceedings of the 13th International Meshing Roundtable, September 2004, Williamsburg, VA, p. 243-254.

S.M. Shontz and S.A. Vavasis, *A mesh warping algorithm based on weighted Laplacian smoothing*, in Proceedings of the 12th International Meshing Roundtable, September 2003, Santa Fe, NM, p. 147-158.

L. Freitag, P. Knupp, T. Munson, and S. Shontz, *A survey of numerical optimization software for nonlinear, constrained mesh quality objective functions*, in Proceedings of the 11th International Meshing Roundtable, September 2002, Ithaca, NY, p. 19-40.

Publications Submitted to Refereed Conferences

Nicholas Voshell, Suzanne Shontz, Lori Diachin, Patrick Knupp, Todd Munson, *A Patch-Based Mesh Optimization Algorithm for Partitioned Meshes*, 9th International Workshop on State-of-the-Art in Scientific and Parallel Computing, 2008, Under review.

Publications in Nonrefereed Journals

Suzanne Shontz, *Computing homoclinic bifurcations*, The Pentagon, Volume 60, Number 2, Spring 2001, p. 3-15.

Beth Koch, Suzanne Shontz, and Gary Spieler, *A is not for achievement*, The Pentagon, Volume 58, Number 2, Spring 1999, p. 14-22.

Suzanne Shontz, *Molecules and their symmetries: Determining the hybridization of a central atom using point groups*, The Pentagon, Volume 56, Number 2, Spring 1997, p. 38-46.

Publications in Nonrefereed Proceedings

R. Anderssen, P.G. Hjorth, A.S. Kane, P. Kitanov, K. Ladipo, O. Marcotte, B. Orser, W. Schilders, S.M. Shontz, W. Sun, and B.A. Wane. *Model Order Reduction for Electronic Circuits: Mathematical and Physical Approaches*, edited by P.G. Hjorth and S.M. Shontz, Proceedings of the 2008 Fields-MITACS Industrial Problem-Solving Workshop, Fields Institute, University of Toronto, March 2009.

D. Aruliah, C. Bowman, G. Fan, R. Melnick, S. Shontz, S. Wang, and J. Zhu. *Nonlinear dimension reduction for microarray data (Small n and Large p)*, edited by S. Shontz, Proceedings of the 2006 Fields-MITACS Industrial Problem-Solving Workshop, Fields Institute, University of Toronto, November 2006.

Other Publications

Suzanne Michelle Shontz, *Numerical Methods for Problems with Moving Meshes*, Ph.D. Thesis, Cornell University, December 2004.

V.E. Howle, S.M. Shontz, and P.D. Hough, *Some parallel extensions to optimization methods in OPT++*, Sandia Technical Report SAND 2000-8877, October 2000.

Invited Presentations

- March 2009 **SIAM Computational Science and Engineering Conference**
Miami, FL
“Efficiency of Static Vertex Reordering Schemes for Local Mesh Optimization”
- July 2008 **REU Program, Mathematics and Statistics Department, James Madison University**
Harrisonburg, VA
“Mesh Warping Algorithms with Applications to Cardiology”
- July 2008 **REU Program, Mathematics and Statistics Department, James Madison University**
Harrisonburg, VA
“A Patch-based Mesh Smoothing Algorithm”
- May 2008 **9th Intl. Workshop on State-of-the-Art in Scientific and Parallel Computing**
Trondheim, Norway
“A Patch-Based Mesh Optimization Algorithm for Partitioned Meshes”
- May 2008 **SIAM Optimization Conference**
Boston, MA
“Experience with Gradient-Based Optimization Methods in Electronic Structure Calculations”
- April 2008 **Computational Visualization Center, ICES, University of Texas at Austin**
Austin, TX
“A Comparison of Vertex Relocation Strategies for Mesh Quality Improvement”
- March 2008 **SIAM Parallel Processing for Scientific Computing Conference**
Atlanta, GA
“Parallel Mesh Quality Improvement Techniques for Blood Clot Entrapment”

- March 2008 **Garfield Thomas Water Tunnel Seminar**
Applied Research Laboratory, Penn State, University Park, PA
“The Development of an Efficient Geometric Mesh Quality Improvement Method via Vertex Reordering and Elemental Patches”
- September 2007 **Science Today Seminar**
SUNY Oswego, Oswego, NY
“Generation and Adaptation of Computational Meshes for Biomedical Applications”
- April 2007 **Industrial Engineering Seminar**
The Pennsylvania State University, University Park, PA
“Experience with Approximations in the TRPDS Algorithm”
- April 2007 **PDE and Applied PDE Seminar**
The Pennsylvania State University, Altoona, PA
“M⁴: Mesh Smoothing, Mesh Node Reordering, and Mesh Warping for Medical Applications”
- March 2007 **Institute for Computational Science Seminar**
The Pennsylvania State University, University Park, PA
“Mesh Warping Techniques with Applications to Cardiology and Nonlinear Elasticity”
- March 2007 **Industrial and Professional Advisory Committee Presentation**
The Pennsylvania State University, University Park, PA
“Optimal Meshes with Applications to Graphics and Bioengineering”
- February 2007 **SIAM Computational Science and Engineering Conference**
Costa Mesa, CA
Title: “The Effect of Node Reordering on 2D Local Mesh Smoothing Efficiency with Application to Mesh Warping”
- September 2006 **Computational and Applied Mathematics Colloquium**
The Pennsylvania State University, University Park, PA
“Optimization Techniques for Mesh Warping and Nonlinear Elasticity”
- March 2006 **Colloquium, Mathematical Sciences Department**
Rensselaer Polytechnic Institute, Troy, NY
“Optimization Techniques for Mesh Warping and the Geometry of Materials”
- February 2006 **Colloquium, Mathematical Sciences Department**
George Mason University, Fairfax, VA
“Optimization Techniques for Mesh Warping and the Geometry of Materials”

- February 2006 **Colloquium, Mathematics Department**
University of Northern Iowa, Cedar Falls, IA
“Optimization Techniques for Mesh Warping and the Geometry of Materials”
- February 2006 **Colloquium, Computer Science and Engineering Department**
The Pennsylvania State University, State College, PA
“Optimization Techniques for Mesh Warping and the Geometry of Materials”
- February 2006 **Jr. Colloquium, Mathematics Department**
University of Minnesota, Minneapolis, MN.
“Optimization Techniques for Mesh Warping and the Geometry of Materials”
- February 2006 **Colloquium, Mathematics and Statistics Department**
University of Maryland – Baltimore County, Baltimore, MD
“Numerical Methods for Problems in Electronic Structure Calculations”
- December 2005 **Colloquium, Mathematics Department**
University of Iowa, Iowa City, IA.
“Numerical Methods for Problems in Electronic Structure Calculations”
- December 2005 **Numerical Analysis Seminar, Mathematics Department,**
University of Iowa, Iowa City, IA.
“A Tetrahedral Meshing Warping Algorithm with Applications to Cardiology”
- April 2005 **Colloquium, Mathematics Department,**
University of Northern Iowa, Cedar Falls, IA.
“Algorithms for Mesh Warping with Applications to Cardiology”
- April 2004 **NA Seminar, Computer Science & Engineering Department,**
University of Minnesota, Minneapolis, MN.
"Algorithms for Mesh Warping with Applications to Cardiology"
- April 2004 **NA Seminar, Applied Physics and Applied Mathematics Department,**
Columbia University, New York, NY.
"Algorithms for Mesh Warping with Applications to Cardiology"
- March 2004 **SCOREC Seminar, Scientific Computation Research Center,**
Rensselaer Polytechnic Institute, Troy, NY.
"Algorithms for Mesh Warping with Applications to Cardiology"

- March 2004 **Mathematical Sciences Seminar, Center for Applied Mathematics,
Cornell University, Ithaca, NY.**
"Algorithms for Mesh Warping with Applications to Cardiology"
- March 2004 **Colloquium, College of Engineering,
Virginia Polytechnic Institute and State University, Blacksburg, VA.**
"Algorithms for Mesh Warping with Applications to Cardiology"
- February 2004 **Colloquium, Mathematics and Statistics Department,
Miami University, Oxford, OH.**
"Algorithms for Mesh Warping with Applications to Cardiology"
- February 2004 **Colloquium, Mathematics Department,
Western Illinois University, Macomb, IL.**
"Algorithms for Mesh Warping with Applications to Cardiology"
- February 2004 **Colloquium, Mathematics and Statistics Department,
Texas Tech University, Lubbock, TX.**
"Algorithms for Mesh Warping with Applications to Cardiology"
- February 2004 **Seminar, Sandia National Laboratories, Albuquerque, NM.**
"Algorithms for Mesh Warping with Applications to Cardiology"
- February 2004 **Numerical Analysis Seminar, Courant Institute,
New York University, New York, NY.**
"Algorithms for Mesh Warping with Applications to Cardiology"
- January 2004 **Applied and Computational Mathematics Seminar,
The Pennsylvania State University, State College, PA.**
"Algorithms for Mesh Warping with Applications to Cardiology"
- January 2004 **Seminar, Center for Cardiovascular Bioinformatics and Modeling,
Johns Hopkins University, Baltimore, MD.**
"Algorithms for Mesh Warping with Applications to Cardiology"
- February 2003 **SIAM Computational Science and Engineering Conference,
San Diego, CA.**
"A Mesh Warping Algorithm Based on Weighted Laplacian Smoothing"
- April 1998 **Colloquium, Mathematics Department,
University of Northern Iowa, Cedar Falls, IA.**
"Numerical Linear Algebra and Medical Imaging"

September 1996 **Colloquium, Mathematics Department,
University of Northern Iowa, Cedar Falls, IA.**
"Combinatorial Models of Algebraic Curves"

Other Presentations

October 2009 **18th International Meshing Roundtable Conference
Salt Lake City, UT**
"A Comparison of Gradient- and Hessian-Based Tetrahedral Mesh Quality Improvement"

July 2009 **10th U.S. National Congress on Computational Mechanics
Columbus, OH**
"An investigation into efficient local tetrahedral mesh quality improvement methods for various shape quality metrics"

May 2009 **International Conference on Computational Science
Baton Rouge, LA**
"Experience with Approximations in the Trust-Region Parallel Direct Search Algorithm"

October 2008 **17th International Meshing Roundtable Conference
Pittsburgh, PA**
"The Effect of Vertex Reordering on 2D Local Mesh Optimization Efficiency"

August 2008 **Fields-MITACS Industrial Problem-Solving Workshop
Fields Institute, University of Toronto, Toronto, Ontario, Canada**
"NXP Semiconductor Problem: Model Order Reduction"
Joint talk with Ortho Flint.

May 2007 **Penn State Bio and Medical Informatics Retreat
University Park, PA**
"Advanced Virtual Environments for Biomedical Applications"

February 2007 **SIAM Computational Science and Engineering Conference
Costa Mesa, CA**
"Optimization of the Geometry of Materials"

- November 2006 **Finite Element Circus**
State College, PA
“A Robust Solution Procedure for Hyperelastic Solids with Large Boundary Deformation”
- August 2006 **Fields-MITACS Industrial Problem-Solving Workshop**
Fields Institute, University of Toronto, Toronto, Ontario, Canada
“Nonlinear Dimension Reduction for Microarray Data (Small n and Large p)”
Joint talk with Steven Wang
- July 2006 **World Congress on Computational Mechanics**
Los Angeles, CA
“A Robust Solution Procedure for Hyperelastic Solids with Large Boundary Deformation”
- October 2005 **Technology Forum, Department of Computer Science and Engineering,**
University of Minnesota, Minneapolis, MN.
Poster Presentation: “New Developments in Numerical Methods for Electronic Structure Calculations” (with Yunkai Zhou)
- September 2005 **Numerical Analysis Seminar, Department of Computer Science and Engineering,**
University of Minnesota, Minneapolis, MN.
“Efficient Geometry Optimization of Molecular Clusters”
- July 2005 **Institute for the Theory of Advanced Materials in Information Technology**
Workshop, University of Minnesota, Minneapolis, MN.
“Efficient Geometry Optimization of Molecular Clusters”
- May 2005 **Midwest Numerical Analysis Days**
University of Iowa, Iowa City, IA.
“A Linear Weighted Laplacian Smoothing Framework for Warping Tetrahedral Meshes”
- February 2005 **Contributed Talk, SIAM Conference on Computational Science and Engineering,**
Orlando, FL.
“A Linear Weighted Laplacian Smoothing Framework for Warping Tetrahedral Meshes”
- November 2004 **Numerical Analysis Seminar, Department of Computer Science and Engineering,**
University of Minnesota, Minneapolis, MN.
“Numerical Methods for Problems with Moving Meshes”

- September 2004 **Ph.D. Thesis Defense, Center for Applied Mathematics, Cornell University, Ithaca, NY.**
"Numerical Methods for Problems with Moving Meshes"
- February 2004 **Contributed Talk, SIAM Parallel Processing for Scientific Computing Conference, San Francisco, CA.**
"Using Approximation Models in Simulation-based Optimization"
- November 2003 **Applied Math Days, Rensselaer Polytechnic Institute, Troy, NY.**
"A Mesh Warping Algorithm Based on Weighted Laplacian Smoothing"
- September 2003 **Plenary Session, 12th International Meshing Roundtable, Santa Fe, NM.**
"A Mesh Warping Algorithm Based on Weighted Laplacian Smoothing"
- February 2002 **Cornell Day at United Technologies Research Center, Hartford, CT.**
"A Mesh Warping Algorithm Based on Weighted Laplacian Smoothing"
- February 2001 **Mathematical Sciences Graduate Student Seminar, Cornell University, Ithaca, NY.**
"Women and Graduate School: Improving the Experience and Success of Female Students"
- October 2000 **First Annual Applied Mathematics Days, Rensselaer Polytechnic Institute, Troy, NY.**
"Parallel Optimization Using Approximation Models"
- September 2000 **Mathematical Sciences Graduate Student Seminar, Cornell University, Ithaca, NY.**
"Parallel Optimization Using Approximation Models"
- August 2000 **Computational Sciences and Mathematics Research Group Seminar, Sandia National Laboratory, Livermore, CA.**
"Parallel Optimization Using Approximation Models"
- August 2000 **Student Research Symposium, Sandia National Laboratory, Livermore, CA.**
"Parallel Optimization Using Approximation Models"
- August 1999 **Computational Sciences and Mathematics Research Group Seminar, Sandia National Laboratory, Livermore, CA.**
"Some Parallel Extensions to Optimization Methods in OPT++"

- March 1999 **National American Chemical Society Conference, Anaheim, CA.**
Poster Presentation: "Limitations to Selectivity in Ion Isolation Using a Pulsed Bipolar Electrostatic Particle Guide" (joint work with N.A. Adams, C.L. Just, C.D. Hanson, T. Hardy)
- January 1999 **National Joint Meetings of the AMS-MAA-SIAM, San Antonio, TX.**
"Computing Homoclinic Bifurcations"
- July 1998 **MAA Mathfest, Toronto, Ontario, Canada.**
"Computing Homoclinic Bifurcations"
- April 1998 **Iowa MAA Convention, Luther College, Decorah, IA.**
"Numerical Linear Algebra and Medical Imaging"
- January 1998 **National Joint Meetings of the AMS-MAA-SIAM, Baltimore, MD.**
Poster Presentation: "Numerical Linear Algebra and Medical Imaging"
- August 1997 **MAA Mathfest, Atlanta, GA.**
"Combinatorial Models of Algebraic Curves"
- April 1997 **Iowa MAA Convention, Iowa State University, Ames, IA.**
"Combinatorial Models of Algebraic Curves"
- January 1997 **National Joint Meetings of the AMS-MAA-SIAM, San Diego, CA.**
Poster Presentation: "Combinatorial Models of Algebraic Curves"

Grants Funded

- 05/16/09-08/14/09 PSU Institute for Cyberscience (with Manning, Lynch, Medvitz); \$12,640; PI.
- 08/15/07-08/14/10 NSF CSR-SMA (with Raghavan, Irwin, Kandemir, Li); \$700,000; Co-PI.
- 07/01/07-06/30/08 PSU Grace Woodward Grant (with Lynch, Singer); \$25,000; PI.
- 07/01/08-06/30/11 NSF MRI (with Raghavan, Chen, Hudson, Kandemir, Smith); \$1,995,000;
Senior Personnel.
- 09/01/08-08/31/10 NSF CPATH (with Narayanan, Acharya, Albert, Lesk, Irwin); \$149,028;
Senior Personnel.

Graduate Students Advised

- 2009 Advisor of Jibum Kim, Ph.D. Student, Joined group in Spring 2009. Ph.D. in Computer Science and Engineering expected May 2013.
- 2008 Advisor of JeongHyung Park, Ph.D Student, Joined group in Fall 2008. M.S. in Computer Science and Engineering, *Derivative-free optimization algorithms for mesh quality improvement*, August 2009; Ph.D. In Computer Science and Engineering expected May 2013.
- 2007 Advisor of Nicholas Voshell, Ph.D. Student, Joined group in Fall 2007. Ph.D. in Computer Science and Engineering expected May 2012.
- 2007 Advisor of Shankar Prasad Sastry, Ph.D. Student, Joined group in Fall 2007. Ph.D. in Computer Science and Engineering expected May 2012.

Undergraduate Honors Students Advised

- 2007 Supervision of undergraduate student, Patrick Kasting, on his honors thesis entitled: "Model reduction and a performance evaluation of stiff ODE solvers for a photochemical model of the haze formation in the early atmosphere". B.S. in Computer Science (with honors), May 2007.

Undergraduate Research Student Advised

- 2008 Supervising Kyle Wray on a research problem involving meshing for computer graphics.

Undergraduate Majors Advised

- 2007- Advisor to 10-14 undergraduate Computer Science/Computer Engineering majors (junior/senior students) per semester starting Fall 2007.

Student Committees

- Ph.D. Committee Member, Ning Yang, Bioengineering.
- Ph.D. Committee Member, Varun Reddy, Bioengineering.
- Ph.D. Committee Member, Junseok Oh, Civil Engineering.
- Ph.D. Committee Member, Anirban Chatterjee, Computer Science and Engineering.
- Ph.D. Committee Member, Inghmar Rauschert, Computer Science and Engineering.
- M.S. Committee Member, Daniel Kwon, Civil Engineering, M.S. August 2009.
- Ph.D. Committee Member, Sue Kase, Information Sciences and Technology, Ph.D. December 2008.

Ph.D. Committee Member, Xin Yang, Computer Science and Engineering, Ph.D. December 2007.

Ph.D. Committee Member, Jiakou Wang, Mathematics , Ph.D. August 2007.

The Pennsylvania State University Service Activities

Service to the University

2009 Penn State Medical Informatics Retreat Committee

Service to the College

2007 Engineering Center, General advisor to all Computer Science and Computer Engineering Students at the Freshman/Sophomore Level, Fall 2007.

2007 Panelist, Clare Boothe Luce Fellowship Luncheon.

2006 Presenter, College of Engineering, Graduate Cohort Workshop.

Service to the Department

2009-10 Member, Faculty Development and Teaching Issues Committee.

2009-10 Member, IT and Lab Evaluation Committee.

2009-10 Chair, Climate/Social Committee.

2008-09 Colloquium Chair.

2007-08 Chair, Scientific Computing/Numerical Analysis Qualifying Exam Committee (3 semesters).

2006-10 Member, Scientific Computing/Numerical Analysis Qualifying Exam Committee.

2006-10 Member, Graduate Committee.

2006-09 Member, Climate and Social Committee.

2006-07 Member, English Proficiency Exam Committee.

University of Minnesota Service and Professional Activities

2005-06 Executive Board Member, Postdoctoral Association.

2004-06 Participant, Women in the Institute of Technology meetings.

2004-06 Member, Women in Computing.

Cornell University Service and Professional Activities

2004, Expanding Your Horizons Volunteer; Assisted with cryptography, computational genomics, and symmetry workshops.

2002, Treasurer, Engineering Graduate Student Association.

2000

2001-3 Mathematical Sciences Graduate Student Seminar Series Co-organizer, Center for Applied Mathematics.

Mentor to two Ph.D. Students in Applied Mathematics, Center for Applied Mathematics.

2001 Secretary, Engineering Graduate Student Association.

2001 Diversity Committee Member, Engineering Graduate Student Association.

2000 Bill Sears Club Colloquium Co-organizer, Center for Applied Mathematics.

1999 Media Relations, Engineering Graduate Student Association.

Service to the Profession and Professional Activities

Conferences Committees/Organization/Session Chair

- 2010 Chair, Program Committee, 19th International Meshing Roundtable .
- 2009- SIAM Visiting Lecturer
- 2009 CUBIT External Review Panel (CUBIT is a mesh generation software package developed by Sandia National Laboratories)
- 2009 Session Chair, 18th International Meshing Roundtable, Salt Lake City, UT.
- 2009 Reviewer, Grace Hopper Celebration of Women in Computing Scholarships
- 2009 Session Chair, International Conference on Computational Science, Baton Rouge, LA.
- 2009 Professional Development Committee, SIAM Annual Meeting.
- 2009 Doctoral Showcase Committee, Supercomputing Conference.
- 2009 Co-organizer, 3 Minisymposia on Mesh Quality Measurement and Improvement: An Overview of Recent Techniques, SIAM Conference on Computational Science and Engineering.
- 2009 Program Committee, 18th International Meshing Roundtable.
- 2008 Organizer, Minisymposium on Parallel Mesh Techniques for Medical Imaging, SIAM Conference on Parallel Processing for Scientific Computing.
- 2008 Reviewer, Grace Hopper Celebration of Women in Computing Scholarships
- 2007 Member, Poster Committee, Supercomputing Conference, Reno, NV.
- 2006 Member, Grace Hopper Conference Committee on Presentations, Panels, and Workshops.
- 2004 Session Chair, SIAM Parallel Processing for Scientific Computing Conference, San Francisco, CA.

Journal and Conference Refereeing

- 2009- Referee, Engineering with Computers.
- 2009- Referee, International Conference on Parallel Processing.
- 2009- Referee, Journal of Computational Physics.
- 2008- Referee, Journal of Chemical Physics.
- 2008- Referee, Transactions on Mathematical Software.
- 2007- Referee, Computer Physics Communications.
- 2007- Referee, Computational Materials Science.
- 2007- Referee, International Meshing Roundtable Conference.
- 2007- Referee, ACM Crossroads Magazine.
- 2005- Referee, SIAM Journal on Scientific Computing.

Panel Reviews

- 2009 Panelist, NDSEG Fellowship Panel, Arlington, VA.
- 2009 Panelist, NSF Graduate Research Fellowship Panel, Arlington, VA.
- 2008 Panelist, Department of Defense, NDSEG Graduate Fellowship Panel, Arlington, VA.
- 2007 Panelist, National Science Foundation, Broadening Participation in Computing Panel, Arlington, VA.
- 2007 Panelist, SMART Scholarship Panel, Department of Defense, Arlington, VA.

Conference and Workshop Participation

- 2009 Attendee, FDA/NHLBI/NSF Workshop on Computer Methods for Cardiovascular Devices, Rockville, MD
- 2008 Invited Academic Expert, Fields-Mitacs Industrial Problem Solving Workshop, Fields Institute, University of Toronto, Toronto, Ontario, Canada.
- 2008 Attendee, UT/ICES Workshop in Honor of Jim Chelikowsky
- 2008 Attendee, FDA/NHLBI/NSF Workshop on Computer Methods for Cardiovascular Device Design, Bethesda, MD.
- 2008 Attendee, CRA Academic Careers Workshop, Washington, D.C.
- 2008 Attendee, Junior professors Retreat for Junior Female CSE Faculty, College Park, MD.
- 2007 Participant, First Annual Microsoft High Performance Computing Summit, Reno, NV.
- 2007 Attendee, CRA-W Career Mentoring Workshop, San Diego, CA.
- 2007 Participant, Road Scholars Tour, The Pennsylvania State University.
- 2006 Attendee, Grace Hopper Conference for Women in Computing, San Diego, CA.
- 2006 Invited Participant, Fields-Mitacs Industrial Problem Solving Workshop, Fields Institute, University of Toronto, Toronto, Ontario, Canada.

Mentoring

- 2005- Mentor, Association for Women in Mathematics Mentor Network.

Professional Society Memberships

Member of SIAM, IEEE, ACM, AMS, AWM, USACM, ASEE. Member of six academic honor societies: Kappa Mu Epsilon, Sigma Xi, Sigma Pi Sigma, Omicron Delta Kappa, Golden Key, Phi Eta Sigma.

References are available upon request.