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Education:

- Brown University, Doctor of Philosophy degree in Applied Mathematics, Completed August 2002/Awarded May 2003.
  Dissertation Title: "Toward Dynamic Spectral/hp Refinement: Algorithms and Applications to Flow-Structure Interactions"
  Advisor: Professor George Em Karniadakis
- Brown University, Master of Science degree in Computer Science, May 2001.
  Project Title: "Visualizing Fluid Flow Data: From the Canvas to the Cave"
  Advisor: Professor Andries van Dam
- Brown University, Master of Science degree in Applied Mathematics, May 1999.
  Advisor: Professor George Em Karniadakis
- Florida State University, Bachelor of Science degree, May 1997; Majors: Applied Mathematics and Computer and Information Sciences; Graduated *Summa Cum Laude*.

Research Focus and Interests:

Large-scale scientific computation and visualization, with an emphasis on the scientific cycle of mathematical modeling, high-performance computation and parallelization, visualization, evaluation, and understanding. Primary research interests are:

- Computational Science and Engineering
- High-Order Methods: Algorithm Development and Applications Scientific Visualization
- Concurrent Programming: Verification and Applications
- High Performance Computing

Work Experience:

- July 2014 – present: Professor of Computing
  School of Computing and Scientific Computing and Imaging Institute, University of Utah
- July 2014 – present: Adjunct Professor of Mathematics
  Department of Mathematics, University of Utah
- July 2014 – present: Adjunct Professor of Bioengineering
  Department of Bioengineering, University of Utah
- December 2008 – June 2009: Leverhulme Visiting Professor
  Department of Aeronautics, Imperial College London (UK)
- September 2008 – November 2008: Visiting Academic
  Department of Aeronautics, Imperial College London (UK)
- September 2008 – November 2008: Visiting Academic
  Center for Mathematical Sciences and Cavendish Laboratory, Cambridge University (UK)

- July 2008 – June 2014: Adjunct Associate Professor of Mathematics
  Department of Mathematics, University of Utah
- July 2008 – June 2014: Adjunct Associate Professor of Bioengineering
  Department of Bioengineering, University of Utah
- July 2008 – June 2014: Associate Professor of Computing
  School of Computing and Scientific Computing and Imaging Institute, University of Utah
- July 2007 – June 2008: Adjunct Assistant Professor of Mathematics
  Department of Mathematics, University of Utah
- January 2007 – June 2008: Adjunct Assistant Professor of Bioengineering
  Department of Bioengineering, University of Utah
- September 2002 – June 2008: Assistant Professor Computing
  School of Computing and Scientific Computing and Imaging Institute, University of Utah
- September 1997 – August 2002: Graduate Research Assistant
  Center for Fluid Mechanics, Brown University
- April 1997 – August 1997: Computer Systems Manager
  The Geophysical Fluid Dynamics Institute at The Florida State University
- June 1992 – March 1997: Computer Programmer/ Research Assistant
  The Geophysical Fluid Dynamics Institute at The Florida State University

Awards and Honors:

- Awarded Leverhulme Visiting Professorship, 2008-2009.
- Best Paper Award, ACM Solid and Physical Modeling Symposium (SPM'08), 2008.
- Best Paper Award, Parallel and Distributed Systems: Testing and Debugging (PADTAD), 2007.
- Best Paper Award, Formal Methods for Industry Critical Systems (FMICS), 2007.
- Outstanding Paper Award, EuroPVM-MPI, 2006.
- NSF CAREER Award NSF-CCF0347791, 2004.
- Joukowski Award for Outstanding Dissertation in the Physical Sciences, Brown University Graduate School, May 2003.

Leadership Positions:

- Associate Director, School of Computing, University of Utah, 2014 – present.
- Assistant Program Manager, Multi-Scale Multidisciplinary Modeling of Electronic Materials (MSME) Collaborative Research Alliance (CRA), University of Utah, 2012 – present.
- Chair, Scientific Computing Track, Computing PhD Program, School of Computing, University of Utah, 2004 – 2014.
- Director of Graduate Studies, School of Computing, University of Utah, 2012 – 2014.
- Associate Director, Computational Engineering and Science Program, University of Utah, 2004–2005, 2012 – 2014.
- Senator, Academic Senate, University of Utah, 2006 – 2008.
- Director, Computational Engineering and Science Program, University of Utah, 2005 – 2008.
- Associate Director, Scientific Computing and Imaging Institute, University of Utah, 2006–2007.

Publications

Book:

1. Tiago Etiene, Robert M. Kirby and Claudio Silva, *An Introduction to Verification of Visualization Techniques*, Morgan & Claypool Publishers, 2015.

2. Robert M. Kirby, Martin Berzins and Jan S. Hesthaven (Editors), *Spectral and High Order Methods for Partial Differential Equations: Selected Papers from the ICOSAHOM'14 Conference, June 23-27, 2014, Salt Lake City, UT, USA.*, Lecture Notes in Computational Science and Engineering, Springer, 2015.

3. George Em Karniadakis and Robert M. Kirby, *Parallel Scientific Computing in C++ and MPI*, Cambridge University Press, UK, 628 pages, 2003.

Book Chapters:

1. Robert M. Kirby, Daniel F. Keefe and David H. Laidlaw, "Painting and Visualization", *Visualization Handbook*, Academic Press, pages 873 – 891, 2004. Editors: C. Hansen and C. Johnson.

2. Robert M. Kirby and George Em Karniadakis, "Spectral Element and hp Methods", *Encyclopedia of Computational Mechanics*, John Wiley and Sons, NY, Volume 3, Chapter 3, pages 61 – 88, 2004. Editors: E. Stein, R. de Borst and T.J.R. Hughes.

3. Robert M. Kirby and George Em Karniadakis, "Under-Resolution and Diagnostics in Spectral Simulations of Complex-Geometry Flows", *Turbulent Flow Computation*, Kluwer Academic Publishers, The Netherlands, pages 1 – 42, 2001. Editors: D. Drikakis and B. Geurts.

4. R.M. Kirby, G.E. Karniadakis, O. Mikulchenko and K. Mayaram, "Integrated Simulation for MEMS: Coupling Flow-Structure-Thermal-Electrical Domains", *The CRC Handbook of MEMS*, CRC Press, Boca Raton, FL, pages 5-1 – 5-25, 2001. Editor: M. Gad-el-Hak.

Peer-Reviewed Journal Publications:

1. Carlo Forestiere, Yanyan He, Ren Wang, Robert M. Kirby and Luca Dal Negro, "Inverse Design of Metal Nanoparticles' Morphology", *ACS Photonics*, In Press, 2015.

2. Hadi Meidani, Justin B. Hooper, Dmitry Bedrov and Robert M. Kirby, "Calibration and Ranking of Coarse-Grained Models in Molecular Simulations Using Bayesian Formalism", *International Journal for Uncertainty Quantification*, In Press, 2015.

3. Yanyan He, Mahsa Mirzargar, Sophia Hudson, Robert M. Kirby and Ross T. Whitaker, "An Uncertainty Visualization Technique Using Possibility Theory: Possibilistic Marching Cubes", *International Journal for Uncertainty Quantification*, In Press, 2015.

4. X. Li, J.K. Ryan, R.M. Kirby and C. Vuik, "Smoothness-Increasing Accuracy-Conserving (SIAC) Filters for Derivative Approximations of discontinuous Galerkin (DG) Solutions over Nonuniform Meshes and Near Boundaries", *Journal of Computational and Applied Mathematics*, In Press, 2015.

5. Mahsa Mirzargar, Jennifer K. Ryan and Robert M. Kirby, "Smoothness-Increasing Accuracy-Conserving (SIAC) Filtering and Quasi-Interpolation: A Unified View", *Journal of Scientific Computing*, In Press, 2015.

6. Sergey Yakovlev, David Moxey, Robert M. Kirby and Spencer J. Sherwin,"To CG or to HDG: A Comparative Study in 3D", *Journal of Scientific Computing*, In Press, 2015.

7. Yanyan He, Mahsa Mirzargar and Robert M. Kirby,"Mixed Aleatory and Epistemic Uncertainty Quantification Using Fuzzy Set Theory", *International Journal of Approximate Reasoning*, Vol. 66, pages 1–15, 2015.

8. Varun Shankar, Grady B. Wright, Robert M. Kirby and Aaron L. Fogelson, "Augmenting the Immersed Boundary Method with Radial Basis Functions (RBFs) for the Modeling of Platelets in Hemodynamic Flows", *International Journal for Numerical Methods in Fluids*, In Press, 2015.

9. Mukund Raj, Mahsa Mirzargar, Robert M. Kirby and Ross T. Whitaker, "Evaluating Alignment of Shapes by Ensemble Visualization", *IEEE Computer Graphics and Applications*, In Press, 2015.

10. C.D. Cantwell, D. Moxey, A. Comerford, A. Bolis, G. Rocco, G. Mengaldo, D. de Grazia, S. Yakovlev, J-E Lombard, D. Ekelschot, B. Jordi, H. Xu, Y. Mohamied, C. Eskilsson, B. Nelson, P. Vos, C. Biotto, R.M. Kirby and S.J. Sherwin, "Nektar++: An open-source spectral/hp element framework", *Computer Physics Communications*, In Press, 2015.

11. Jennifer K. Ryan, Xiaozhou Li, Robert M. Kirby and Kees Vuik, "One-Sided Position-Dependent Smoothness-Increasing Accuracy-Conserving (SIAC) Filtering Over Uniform and Non-Uniform Meshes", *Journal of Scientific Computing*, In Press, 2014

12. Varun Shankar, Grady B. Wright, Robert M. Kirby and Aaron L. Fogelson, "A Radial Basis Function (RBF)-Finite Difference (FD) Method for Diffusion and Reaction-Diffusion Equations on Surfaces", *Journal of Scientific Computing*, Volume 63, pages 745-768, 2015.

13. Mahsa Mirzargar, Ross T. Whitaker and Robert M. Kirby, "Curve Boxplot: Generalization of Boxplot for Ensembles of Curves", *IEEE Transactions on Visualization and Computer Graphics (IEEE Visualization Issue)*, Volume 20, Number 12, pages 2654-2663, 2014.

14. Zhisong Fu, Sergey Yakovlev, Robert M. Kirby and Ross T. Whitaker, "Fast Parallel Solver for Levelset Equations on Unstructured Meshes", *Concurrency and Computation: Practice and Experience*, Volume 27, pages 1639-1657, 2015.

15. Liam C. Jacobson, Robert M. Kirby and Valeria Molinero,"How Short Is Too Short for the Interactions of a Water Potential? Exploring the Parameter Space of a Coarse-Grained Water Model Using Uncertainty Quantification", *Journal of Physical Chemistry B*, Volume 119, pages 8190–8202, 2014.

16. A. Bolis, C.D. Cantwell, R.M. Kirby and S.J. Sherwin, "h to p efficiently: Optimal implementation strategies for explicit time-dependent problems using the spectral/hp element method", *International Journal for Numerical Methods in Fluids*, Volume 75, Issue 8, pages 591-607, 2014.

17. Varun Shankar, Grady B. Wright, Aaron L. Fogelson and Robert M. Kirby, "A Radial Basis Function (RBF)-Finite Difference Method for the Simulation of Reaction-Diffusion Equations on Stationary Platelets within the Augmented Forcing Method", *International Journal for Numerical Methods in Fluids*, Volume 75, Issue 1, pages 1-22, 2014.

18. James King, Sergey Yakovlev, Zhisong Fu, Robert M. Kirby and Spencer J. Sherwin, "Exploiting Batch Processing on Streaming Architectures to Solve 2D Elliptic Finite Element Problems: A Hybridized Discontinuous Galerkin (HDG) Case Study", *Journal of Scientific Computing*, Volume 60, pages 457-482, 2014.

19. C.D. Cantwell, S. Yakovlev, R.M. Kirby, N.S. Peters and S.J. Sherwin, "High-order continuous spectral/hp element discretisation for reaction-diffusion problems on a surface", *Journal of Computational Physics*, Vol. 257, Part A, pages 813-829, 2014.

20. Zhisong Fu, T. James Lewis, Robert M. Kirby and Ross T. Whitaker, "Architecting the Finite Element Method Pipeline for the GPU", *Journal of Computational and Applied Mathematics*, Volume 257, pages 195-211, 2014.

21. Blake Nelson, Robert M. Kirby and Steven Parker,"Optimal Expression Evaluation Through the Use of Expression Templates When Evaluating Dense Linear Algebra Operations", *ACM Transactions on Mathematical Software*, Vol. 40, Issue 3, pages 21:1-21:21, 2014.

22. Ross Whitaker, Mahsa Mirzargar and Robert M. Kirby, "Contour Boxplots: A Method for Characterizing Uncertainty in Feature Sets from Simulation Ensembles", *IEEE Transactions on Visualization and Computer Graphics (IEEE Visualization Issue)*, Vol. 19, Issue 12, pages 2713-2722, 2013.

23. Zhisong Fu, Robert M. Kirby and Ross T. Whitaker, "A Fast Iterative Method for Solving the Eikonal Equation on Tetrahedral Domains", *SIAM Journal of Scientific Computing*, Vol. 35, No. 5, pages C473-C494, 2013.

24. Hanieh Mirzaee, Jennifer K. Ryan and Robert M. Kirby, "Smoothness-Increasing Accuracy-Conserving (SIAC) Filtering for Discontinuous Galerkin Solutions: Applications to Structured Tetrahedral Meshes", *Journal of Scientific Computing*, Vol. 58, No. 3, pages 690-704, 2014.

25. Tiago Etiene, Daniel Jönsson, Timo Ropinski, Carlos Scheidegger, Joao Comba, L. Gustavo Nonato, Robert M. Kirby, Anders Ynnerman and Claudio T. Silva, , "Verifying Volume Rendering Using Discretization Error Analysis", *IEEE Transactions on Visualization and Computer Graphics*, Vol. 20, No. 1, pages 140-154, 2014.

26. Blake Nelson, Robert M. Kirby, Robert Haimes, "GPU-Based Volume Visualization From High-Order Finite Element Fields", *IEEE Transactions on Visualization and Computer Graphics*, Vol. 20, No. 1, pages 70-83, 2014.

27. Dafang Wang, Robert M. Kirby, Rob S. MacLeod and Chris R. Johnson, "Inverse electrocardiographic source localization of ischemia: an optimization framework and finite element solution", *Journal of Computational Physics*, Vol. 250, Issue 1, pages 403-424, 2013.

28. Robert M. Kirby and Miriah Meyer, "Visualization Collaborations: Reflections on What Works and Why", *IEEE Computer Graphics and Applications*, Volume 33, Issue 6, pages 82-88, 2013.

29. Varun Shankar, Grady B. Wright, Aaron L. Fogelson and Robert M. Kirby, "A Study Of Different Modeling Choices For Simulating Platelets With The Immersed Boundary Method", *Applied Numerical Mathematics*, Vol. 63, pages 58-77, 2013.

30. Hanieh Mirzaee, James King, Jennifer K. Ryan and Robert M. Kirby, "Smoothness-Increasing Accuracy-Conserving (SIAC) Filters for Discontinuous Galerkin Solutions Over Unstructured Triangular Meshes", *SIAM Journal of Scientific Computing*, Vol. 35, No. 1, pages 212-230, 2013.

31. Chao Yang, Dongbin Xiu and Robert M. Kirby, "Visualization of Covariance and Cross-Covariance Fields", *International Journal for Uncertainty Quantification*, Vol. 3, Issue 1, pages 25-38, 2013.

32. Torben Patz, Tobias Preusser and Robert M. Kirby, "Ambrosio-Tortorelli Segmentation of Stochastic Images: Model Extensions, Theoretical Investigations and Numerical Methods", *International Journal of Computer Vision*, Vol. 103, Issue 2, pages 190-212, 2013.

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34. Hanne Tiesler, Robert M. Kirby, Dongbin Xiu and Tobias Preusser, "Stochastic Collocation for Optimal Problems with Stochastic PDE Constraints", *SIAM Journal of Control and Optimization*, Vol. 50, Issue 5, pages 2659-2682, 2012.

35. James King, Hanieh Mirzaee, Jennifer K. Ryan and Robert M. Kirby, "Smoothness-Increasing Accuracy-Conserving (SIAC) Filtering for discontinuous Galerkin Solutions: Improved Errors Versus Higher-Order Accuracy", *Journal of Scientific Computing*, Vol. 53, Issue 1, pages 129-149, 2012.

36. Kristin Potter, Robert M. Kirby, Dongbin Xiu and Chris R. Johnson, "Interactive Visualization of Probability And Cumulative Density Functions", *International Journal for Uncertainty Quantification*, Vol. 2, Issue 4, pages 397-412, 2012.

37. Tobias Martin, Elaine Cohen and Robert M. Kirby, "Mixed-Element Volume Completion for NURBS Surfaces", *Computers & Graphics*, Vol. 36, Issue 5, pages 548-554, 2012.

38. Inga Altrogge, Tobias Preusser, Tim Kroger, Sabrina Haase, Tobren Patz and Robert M. Kirby, "Sensitivity Analysis for the Optimization of Radiofrequency Ablation in the Presence of Material Parameter Uncertainty", *International Journal for Uncertainty Quantification*, Vol. 2, Issue 3, pages 295-321, 2012.

39. Blake Nelson, Robert Haimes and Robert M. Kirby, "GPU-Based Interactive Cut-Surface Extraction From High-Order Finite Element Fields", *IEEE Transactions on Visualization and Computer Graphics (IEEE Visualization Issue)*, Vol. 17, No. 12, pages 1803-1811, 2011.

40. Darrell Swenson, Sarah E. Geneser, Jeroen G. Stinstra, Robert M. Kirby and Robert S. MacLeod,"Cardiac Position Sensitivity Study in the Electrocardiographic Forward Problem Using Stochastic Collocation and Boundary Element Methods", *Annals of Biomedical Engineering*, Vol. 39, No. 12, pages 2900-2910, 2011.

41. Hanieh Mirzaee, Jennifer K. Ryan and Robert M. Kirby, "Efficient Implementation of Smoothness-Increasing Accuracy-Conserving (SIAC) Filters for Discontinuous Galerkin Solutions", *Journal of Scientific Computing*, Vol. 52, No. 1, pages 85-112, 2012.

42. Hanieh Mirzaee, Liangyue, Jennifer K. Ryan and Robert M. Kirby, "Smoothness-Increasing Accuracy-Conserving (SIAC) Postprocessing for Discontinuous Galerkin Solutions Over Structured Triangular Meshes", *SIAM Journal of Numerical Analysis*, Vol. 49, No. 5, pages 1899-1920, 2011.

43. Z. Fu, W.-K. Jeong, Y. Pan, R. M. Kirby, and R. T. Whitaker, "A fast iterative method for solving the Eikonal equation on triangulated surfaces", *SIAM Journal of Scientific Computing*, Vol. 33, No. 5, pages 2468-2488, 2011.

44. Ganesh Gopalakrishnan, Robert M. Kirby, Stephen Siegel, Rajeev Thakur, William Gropp, Ewing Lusk, Bronis R. de Supinski, Martin Schultz and Greg Bronevetsky, "Formal Analysis of MPI-Based Parallel Programs: Present and Future", *Communications of the ACM*, Vol. 54, No. 12, pages 82-91, 2011.

45. Robert M. Kirby, Bernardo Cockburn and Spencer J. Sherwin, "To CG or to HDG: A Comparative Study", *Journal of Scientific Computing*, Vol. 51, No. 1, pages 183-212, 2012.

46. Tiago Etiene, L. Gustavo Nonato, Carlos Scheidegger, Julien Tierny, Thomas J. Peters, Valerio Pascucci, Robert M. Kirby and Claudio T. Silva, "Topology Verfication for Isosurface Extraction", *IEEE Transactions on Visualization and Computer Graphics*, Vol. 18, No. 6, pages 952-965, 2012.

47. Tobias Martin, Elaine Cohen and Robert M. Kirby, "Direct Isosurface Visualization of Hex-Based High-Order Geometry and Attribute Representations", *IEEE Transactions on Visualization and Computer Graphics*, Vol. 58, No. 5, pages 753-766, 2012.

48. C.D. Cantwell, S.J. Sherwin, R.M. Kirby and P.H. Kelly, "From h to p Efficiently: Selecting the Optimal Spectral/hp Discretisation in Three Dimensions", *Math. Model. Nat. Phenom.*, Vol. 6, No. 3, pages 84-96, 2011.

49. Samuel A. Isaacson and Robert M. Kirby, "Numerical Solution of Linear Volterra Integral Equations of the Second Kind with Sharp Gradients", *Journal of Computational and Applied Mathematics*, Vol. 235, Issue 14, pages 4383-4401, 2011.

50. Dafang Wang, Robert M. Kirby and Chris R. Johnson, "Finite-Element-Based Discretization and Regularization Strategies for 3D Inverse Electrocardiography", *IEEE Transactions on Biomedical Engineering*, Vol. 58, Issue 6, pages 1827-1837, 2011.

51. Peter E.J. Vos, Sehun Chun, Alessandro Bolis, Claes Eskilsson, Robert M. Kirby and Spencer J. Sherwin, "A Generic Framework for Time-Stepping PDEs: General Linear Methods, Object-Oriented Implementations and Applications to Fluid Problems", *International Journal of Computational Fluid Dynamics*, Vol. 25, Issue 3, pages 107-125, 2011.

52. C.D. Cantwell, S.J. Sherwin, R.M. Kirby and P.H.J. Kelly, "From h to p Efficiently: Strategy Selection for Operator Evaluation on Hexahedral and Tetrahedral Elements", *Computers and Fluids*, Vol. 43, Issue 1, pages 23-28, 2011.

53. Peter K. Jimack and Robert M. Kirby, "Towards the Development on an h-p-Refinement Strategy Based Upon Error Estimate Sensitivity", *Computers and Fluids*, Vol. 46, Issue 1, pages 277-281, 2011.

54. S.E. Geneser, J.D. Hinkle, R.M. Kirby, B. Wang, B. Salter and S. Joshi, "Quantifying Variability in Radiation Dose Due to Respiratory-Induced Tumor Motion", *Medical Image Analysis*, Vol. 15, Issue 4, pages 640-649, 2011.

55. Peter E. J. Vos, Spencer J. Sherwin and Robert M. Kirby, "h-p Efficiently: Implementing Finite and Spectral/hp Element Methods to Achieve Optimal Performance for Low- and High-Order Discretisations", *Journal of Computational Physics*, Vol. 229, Issue 13, pages 5161-5181, 2010.

56. Yu Yang, Xiaofang Chen, Ganesh Gopalakrishnan and Robert M. Kirby, "Distributed Dynamic Partial Order Reduction", *International Journal on Software Tools for Technology Transfer*, Vol. 12, Number 2, pages 113-122, 2010.

57. Guodong Li, Robert Palmer, Michael DeLisi, Ganesh Gopalakrishnan and Robert M. Kirby, "Formal Specification of MPI 2.0: Case Study in Specifying a Practical Concurrent Programming API", *Science of Computer Programming*, Vol. 76, pages 65-81, 2010.

58. Hanieh Mirzaee, Jennifer K. Ryan and Robert M. Kirby, "Quantification of Errors Introduced in the Numerical Approximation and Implementation of Smoothness-Increasing Accuracy Conserving (SIAC) Filtering of Discontinuous Galerkin (DG) Fields", *Journal of Scientific Computing*, Vol. 12, Number 2, pages 113-122, 2010.

59. Dafang Wang, Robert M. Kirby and Chris R. Johnson, "Resolution Strategies for the Finite Element Based Solution of the Electrocardiographic Inverse Problem", *IEEE Transactions on Biomedical Engineering*, Vol. 57, Issue 2, pages 220-237, 2010.

60. Salman Pervez, Ganesh Gopalakrishnan, Robert M. Kirby, Rajeev Thakur and William Gropp, "Formal methods applied to high performance computing software design: a case study of MPI one-sided communication based locking", *Software: Practice and Experience*, Vol. 40, Issue 1, pages 23-43, 2010.

61. Michael Steffen, Robert M. Kirby and Martin Berzins, "Decoupling and Balancing of Space and Time Errors in the Material Point Method (MPM)", *International Journal for Numerical Methods in Engineering* , Vol. 82, pages 1207-1243, 2010.

62. E. Cohen, T. Martin, R.M. Kirby, T. Lyche and R.F. Riesenfeld, "Analysis-aware Modeling: Understanding Quality Considerations in Modeling for Isogeometric Analysis", *Computer Methods in Applied Mechanics and Engineering*, Vol. 199, Issues 5-8, pages 334-356, 2010.

63. Joseph D. Frazier, Peter K. Jimack and Robert M. Kirby, "On the Use of Adjoint-Based Sensitivity Estimates to Control Local Mesh Refinement", *Communications on Computational Physics*, Vol. 7, Number 3, pages 631-638, 2010.

64. T. Etiene, C. Scheidegger, L.G. Nonato, R.M. Kirby and C.T. Silva, "Verifiable Visualization for Isosurface Extraction", *IEEE Transactions on Visualization and Computer Graphics (IEEE Visualization Issue)*, Vol 15., Number 6, pages 1227-1234, 2009.

65. J. Samuel Preston, Tolga Tasdizen, Christi M. Terry, Alfred K. Cheung and Robert M. Kirby, "Using the Stochastic Collocation Method for the Uncertainty Quantification of Drug Concentration due to Depot Shape Variability", *IEEE Transactions on Biomedical Engineering*, Vol. 56, Number 3, pages 609-619, 2009.

66. Tobias Martin, Elaine Cohen and Robert M. Kirby, "Volumetric Parameterization and Trivariate B-spline Fitting using Harmonic Functions", *Computer Aided Geometric Design*, Vol. 26, Issue 6, pages 648-664, 2009.

67. M. Steffen, P.C. Wallstedt, J.E. Guilkey, R.M. Kirby and M. Berzins, "Examination and Analysis of Implementation Choices within the Material Point Method", *Computer Modeling in Engineering and Science*, Vol. 31, Number 2, pages 107-128, 2008.

68. Miriah Meyer, Ross Whitaker, Robert M. Kirby, Christian Ledergerber and Hanspeter Pfister, "Particle-based Sampling and Meshing of Surfaces in Multimaterial Volumes", *IEEE Transactions on Visualization and Computer Graphics* (IEEE Visualization Issue), Vol. 14, Number 6, pages 1539-1546, 2008.

69. David Walfisch, Jennifer K. Ryan, Robert M. Kirby and Robert Haimes, "One-Sided Smoothness-Increasing Accuracy-Conserving Filtering for Enhanced Streamline Integration through Discontinuous Fields", *Journal of Scientific Computing*, Vol. 38, Number 2, pages 164-184, 2009.

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72. Robert M. Kirby and Claudio Silva, "The Need For Verifiable Visualization", *IEEE Computer Graphics and Applications*, Vol. 28, Number 5, pages 78-83, 2008.

73. Tobias Preusser, Hanno Scharr, Kai Krajsek and Robert M. Kirby, "Building Blocks for Computer Vision with Stochastic Partial Differential Equations", *International Journal of Computer Vision*, Vol. 28, Number 5, pages 78-83, 2008.

74. C.W. Hamman, J.C. Klewicki and R.M. Kirby, "On the Lamb vector divergence in Navier-Stokes flows", *Journal of Fluid Mechanics*, Vol. 610, pages 261-284, 2008.

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76. Michael Steffen, Sean Curtis, Robert M. Kirby and Jennifer K. Ryan, "Investigation of Smoothness-Increasing Accuracy-Conserving Filters for Improving Streamline Integration Through Discontinuous Fields", *IEEE Transactions on Visualization and Computer Graphics*, Vol. 14, Number 3, pages 680-692, 2008.

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86. Elijah P. Newren, Aaron L. Fogelson, Robert D. Guy and Robert M. Kirby, "Unconditionally Stable Discretizations of the Immersed Boundary Equations", *Journal of Computational Physics*, Vol. 222, Issue 2, pages 702-719, 2007.

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92. Robert M. Kirby and Spencer J. Sherwin, "Stabilisation of spectral/*hp* element methods through spectral vanishing viscosity: Application to fluid mechanics modelling", *Computer Methods in Applied Mechanics and Engineering*, Vol. 195, pages 3128-2144, 2006.

93. Robert M. Kirby and George Em Karniadakis, "Selecting the Numerical Flux in Discontinuous Galerkin Methods for Diffusion Problems", *Journal of Scientific Computing*, Vol. 22/23, pages 385-411, 2005.

94. David H. Laidlaw, Robert M. Kirby, Cullen D. Jackson, J. Scott Davidson, Timothy S. Miller, Marco da Silva, William H. Warren and Michael Tarr, "Comparing 2D Vector Field Visualization Methods: A User Study", *IEEE Transactions on Visualization and Computer Graphics*, Vol. 11, Number 1, pages 59-70, 2005.

95. Zohar Yosibash and Robert M. Kirby, "Dynamic response of various von-Kármán non-linear plate models and their 3-D counterparts", *International Journal of Solids and Structures*, Vol. 42, pages 2517-2531, 2005.

96. Frank Stenger, Thomas Cook and Robert M. Kirby, "Sinc Solution of Biharmonic Problems", *Canadian Applied Mathematics Quarterly*, Vol. 12, Number 3, pages 391–413, 2004.

97. Z. Yosibash, R.M. Kirby and D. Gottlieb, "Collocation methods for the solution of von-Kármán dynamic non-linear plate systems", *Journal of Computational Physics*, Vol. 200, Issue 2, pages 432-461, 2004.

98. Robert M. Kirby and Zohar Yosibash, "Solution of von-Kármán dynamic non-linear plate equations using a pseudo-spectral method", *Computer Methods in Applied Mechanics and Engineering*, Vol. 193/6-8, pages 575-599, 2004.

99. Robert M. Kirby and George Em Karniadakis, "De-Aliasing on Non-Uniform Grids: Algorithms and Applications", *Journal of Computational Physics*, Vol. 191, pages 249-264, 2003.

100. Robert M. Kirby and George Em Karniadakis, "Coarse Resolution Turbulence Simulations With Spectral Vanishing Viscosity - Large-Eddy Simulations (SVV-LES)", *Journal of Fluids Engineering*, Vol. 124, Number 4, pages 886-891, 2002.

101. R.M. Kirby, G.E. Karniadakis, O. Mikulchenko, and K. Mayaram, "An Integrated Simulator for Coupled Domain Problems in MEMS", *Journal of Microelectromechanical Systems*, Vol. 10, Number 3, pages 379-399, 2001.

102. R.M. Kirby, T.C. Warburton, I. Lomtev, and G.E. Karniadakis, "A Discontinuous Galerkin Spectral/hp Method on Hybrid Grids", *Journal of Applied Numerical Mathematics*, Vol. 33, pages 393-405, 1999.

103. I. Lomtev, R.M. Kirby, and G.E. Karniadakis, "A Discontinuous Galerkin ALE Method for Compressible Viscous Flows in Moving Domains", *Journal of Computational Physics*, Vol. 155, pages 128-159, 1999.

Peer-Reviewed Conference Publications:

1. T. James Lewis, Shankar P. Sastry, Robert M. Kirby and Ross T. Whitaker, "A GPU-Based MIS Aggregation Strategy: Algorithms, Comparisons and Applications Within AMG", IEEE International Conference on High-Performance Computing (HiPC), Bengaluru, Bangalore, December 16-19, 2015.

2. Shankar P. Sastry, Vidhi Zala and Robert M. Kirby, "Thin-Plate-Spline Curvilinear Meshing on a Calculus-of-Variations Framework", 24th International Meshing Roundtable, Austin, TX, October 12-14, 2015.

3. Yanyan He, Mahsa Mirzargar and Robert M. Kirby, "Application of Uncertainty Modeling Frameworks to Uncertain Isosurface Extraction", The Fourth International Symposium on Integrated Uncertainty in Knowledge Modelling and Decision Making (IUKM 2015), October 15-17, 2015.

4. L. Liu, M. Hirzangar, R.M. Kirby, R. Whitaker and D.H. House, "Visualizing Time-Specific Hurricane Predictions, with Uncertainty, from Storm Path Ensembles", Eurographics Conference on Visualization (EuroVis), Cagliari, Sardinia, Italy, May 25-29, 2015.

5. H. Bhatia, V. Pascucci, R.M. Kirby and P.-T. Bremer, "Extracting Features from Time-Dependent Vector Fields Using Internal Reference Frames", Eurographics Conference on Visualization (EuroVis), Swansea, Wales, UK, June 9-13, 2014.

6. James King and Robert M. Kirby,"A Scalable, Efficient Scheme for the Evaluation of Stencil Computations over Unstructured Meshes", IEEE SuperComputing 2013, Denver, CO, November 17-22, 2013.

7. Shankar Shastry and Robert M. Kirby, "On Interpolation Errors over Quadratic Nodal Triangular Finite Elements", 22nd International Meshing Roundtable, Orlando, FL, October 13-16, 2013.

8. Anh Vo, Ganesh Gopalakrishnan, Robert M. Kirby, Bronis R. de Supinski, Martin Schulz and Greg Bronevetsky, "Large Scale Verification of MPI Programs Using Lamport Clocks with Lazy Update", Parallel Architectures and Compilation Techniques (PACT), Galveston Island, TX, October 10-14, 2011.

9. Sarvani Vakkalanka, Anh Vo, Ganesh Gopalakrishnan and Robert M. Kirby, "Precise Dynamic Analysis for Slack Elasticity: Adding Buffering Without Adding Bugs", Proceedings of EuroMPI 2010, Stuttgart, Germany, September 12-15, 2010.

10. Sarvani Vakkalanka, Anh Vo, Ganesh Gopalakrishnan and Robert M. Kirby, "Reduced Execution Semantics of MPI: From theory to practice", Proceedings of the 16th International Symposium on Formal Methods 2009 (FM2009), Eindhoven, the Netherlands, November 2-6, 2009.

11. Sriram Aananthakrishnan, Michael DeLisi, Sarvani Vakkalanka, Anh Vo, Ganesh Gopalakrishnan, Robert M. Kirby and Rajeev Thakur, "How Formal Dynamic Verification Tools Facilitate Novel Currency Visualizations", Proceedings of EuroPVM-MPI 2009, Espoo, Finland, September 7-10, 2009.

12. Anh Vo, Sarvani Vakkalanka, Jason Williams, Ganesh Gopalakrishnan, Robert M. Kirby and Rajeev Thakur, "Sound and Efficient Dynamic Verification of MPI Programs with Probe Non-Determinism", Proceedings of EuroPVM-MPI 2009, Espoo, Finland, September 7-10, 2009.

13. S.E. Geneser, R.M. Kirby, B. Wang, B. Salter and S. Joshi, "Incorporating Patient Breathing Variability into a Stochastic Model of Dose Deposition for Stereotactic Body Radiation Therapy", Proceedings of Information Processing in Medical Imaging 2009, Williamsburg, VA, Lecture Notes in Computer Science (LNCS) 5636, pages 688-700, July 5-10, 2009.

14. Anh Vo, Sarvani Vakkalanka, Michael Delisi, Ganesh Gopalakrishnan, Robert M. Kirby and Rajeev Thakur, "Formal Verification of Practical MPI Programs", Proceedings of 14th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP), Raleigh, NC, February 14-18, 2009.

15. R. Whitaker, R.M. Kirby, J. Sinstra and M. Meyer, "Multimaterial Meshing of MRI Head Data for Bioelectric Field Simulation", Proceedings of the 17th International Meshing Roundtable, 2008.

16. Subodh Sharma, Sarvani Vakkalanka, Ganesh Gopalakrishnan, Robert M. Kirby, Rajeev Thakur and William Gropp, "A Formal Approach to Detect Functionally Irrelevant Barriers in MPI Programs", Proceedings of EuroPVM-MPI 2008, Dublin, Ireland, September 7-10, 2008.

17. Sarvani Vakkalanka, Michael DeLisi, Ganesh Gopalakrishnan, Robert M. Kirby, Rajeev Thakur and William Gropp, "Implementing Efficient Dynamic Formal Verification Methods for MPI Programs", Proceedings of EuroPVM-MPI 2008, Dublin, Ireland, September 7-10, 2008.

18. Sarvani Vakkalanka, Michael DeLisi, Ganesh Gopalakrishnan and Robert M. Kirby, "Scheduling Considerations for building Dynamic Verification Tools for MPI", Proceedings of Parallel and Distributed Systems: Testing and Debugging (PADTAD), Seattle, WA, July 20-21, 2008.

19. Sarvani Vakkalanka, Ganesh Gopalakrishnan and Robert Kirby, "Dynamic Verification of MPI programs with Reductions in Presence of Split Operations and Relaxed Orderings", 20th International Conference on Computer Aided Verification (CAV 2008), Princeton, NJ, July 7-14, 2008.

20. Tobias Martin, Elaine Cohen and Robert M. Kirby, "Volumetric Parameterization and Trivariate B-spline Fitting using Harmonic Functions", Proceedings of ACM Solid and Physical Modeling, Stony Brook, NY, June 2-4, 2008.

21. Tim Kröger, Inga Altrogge, Olaf Konrad, Robert M. Kirby and Tobias Preusser, "Estimation of Probability Density Functions for Parameter Sensitivity Analyses", Proceedings of Simulation and Visualization (SimVis) 2008, Magdeburg, Germany, February 28-29, 2008.

22. Salman Pervez, Ganesh Gopalakrishnan, Robert M. Kirby, Robert Palmer, Rajeev Thakur and William Gropp, "Practical Model Checking Method for Verifying Correctness of MPI Programs", Proceedings of EuroPVM-MPI 2007, Paris, France, September 30 - October 3, 2007.

23. Robert Palmer, Ganesh Gopalakrishnan and Robert M. Kirby, "Semantics Driven Dynamic Partial-Order Reduction of MPI-based Parallel Programs". Proceedings of Parallel and Distributed Systems: Testing and Debugging (PADTAD), London, England, July 9, 2007.

24. Robert Palmer, Michael DeLisi, Ganesh Gopalakrishnan and Robert M. Kirby, "An Approach to Formalization and Analysis of Message Passing Libraries". Proceedings of the 12th International Workshop on Formal Methods for Industrial Critical Systems (FMICS), Berlin, Germany, July 1-2, 2007. Winner of Best Paper Award.

25. Salman Pervez, Ganesh Gopalakrishnan, Robert M. Kirby, Rajeev Thakur and William Gropp, "Formal Verification of Programs That Use MPI One-Sided Communications". Proceedings of EuroPVM-MPI 2006, Bonn, Germany, September 17-20, 2006. Winner of Outstanding Paper Award.

26. R.M. Kirby, C.R. Johnson and M. Berzins, "Involving Undergraduates in Computational Science and Engineering Research: Successes and Challenges". *Lecture Notes in Computer Science*, Volume 3992. Proceedings of Computational Science - ICCS 2006: 6th International Conference, Reading, UK, May 28-31, 2006.

27. Robert Palmer, Steve Barrus, Yu Yang, Ganesh Gopalakrishnan, and Robert M. Kirby, "Gauss: A Framework for Verifying Scientific Computing Software," *Electronic Notes on Theoretical Computer Science (ENTCS)*, Vol. 144, No. 3, pages 95-106, February 2006.

28. M. Berzins, R.M. Kirby, and C.R. Johnson, "Integrating Teaching and Research in HPC: Experiences and Opportunities". *Lecture Notes in Computer Science*, Volume 3515. Proceedings of Computational Science - ICCS 2005, 5th International Conference, Atlanta, GA, USA, May 22-25, 2005.

29. I. Ionescu, J. Guilkey, M. Berzins, R.M. Kirby and J. Weiss. "Computational Simulation of Penetrating Trauma in Biological Soft Tissues Using the Material Point Method". *Proceedings of Medicine Meets Virtual Reality 13 (MMVR 2005)*, Long Beach, California, USA, pages 213-218, January 26-29, 2005.

30. Allen Sanderson, Chris R. Johnson, and Robert M. Kirby, "Display of Vector Fields Using a Reaction-Diffusion Model", Proceedings of IEEE Visualization 2004, Austin, TX, pages 115 – 122, October 2004.

31. D.H. Laidlaw, R.M. Kirby, J.S. Davidson, T.S. Miller, M. da Silva, W.H. Warren, and M. Tarr, "Quantitative Comparative Evaluation of 2D Vector Field Visualization Methods", Proceedings of IEEE Visualization 2001, San Diego, CA, pages 143 – 150, October 2001.

32. A. Forsberg, R.M. Kirby, D.H. Laidlaw, G.E. Karniadakis, A. van Dam, and J. Elion, "Immersive Virtual Reality for Visualizing Flow Through an Artery", Proceedings of IEEE Visualization 2000, Salt Lake City, UT, pages 457 – 460, October 2000.

33. G-S Karamanos, C. Evangelinos, R.C. Boes, R.M. Kirby and G.E. Karniadakis, "Direct Numerical Simulation of Turbulence with a PC/Linux Cluster: Fact or Fiction?", Proceedings of SuperComputing 1999, Portland, OR, November 1999.

34. R.M. Kirby, H. Marmanis and D.H. Laidlaw, "Visualizing Multivalued Data from 2D Incompressible Flows Using Concepts from Painting", Proceedings of IEEE Visualization 1999, San Francisco, CA, pages 333 – 340 October 1999.

Peer-Reviewed Workshop Publications:

1. Tiago Etiene, Robert M. Kirby and Claudio Silva, "A Study of Discretization Errors in Volume Rendering Integral Approximations", EuroRVVV Workshop (held in conjunction with EuroVis), June 17-18, 2013.

2. Yu Yang, Xiaofang Chen, Ganesh Gopalakrishnan and Robert M. Kirby, "Efficient Stateful Dynamic Partial Order Reduction", Proceedings of Model Checking Software: 15th International SPIN Workshop, Los Angeles, CA, August 10-12, 2008.

3. Yu Yang, Xiaofang Chen, Ganesh Gopalakrishnan and Robert M. Kirby, "Distributed Dynamic Partial Order Reduction Based Verification of Threaded Software", Proceedings of Model Checking Software: 14th International SPIN Workshop, Berlin, Germany, July 1-3, 2007.

4. I. Melatti, R. Palmer, G. Sawaya, Y. Yang, R.M. Kirby and G. Gopalakrishnan, "Parallel and distributed model checking in Eddy." *Lecture Notes in Computer Science*, Volume 3925. Proceedings of Model Checking Software: 13th International SPIN Workshop, Vienna, Austria, March 30 - April 1, 2006.

Other Publication Venues:

1. (Invited) Tiago Etiene, Hoa Nguyen, Robert M. Kirby and Claudio T. Silva, " 'Flow Visualization' Juxtaposed With 'Visualization of Flow': Synergistic Opportunities Between Two Communities", *51st AIAA Aerospace Meeting*, January 7-10, 2013.

2. Kirk E. Jordan, Robert M. Kirby, Claudio Silva and Thomas J. Peters,"Through a New Looking Glass: Mathematically Precise Visualization", *SIAM News*, Vol. 43, Number 5, June 2010.

Presentations

Presentations as a University of Utah Faculty Member

Invited Talks:

1. (Speaker) Salt Lake City Data Science Meetup, Salt Lake City, UT. Presented a talk entitled "Ensemble Visualization and Uncertainty Characterization Using Generalized Notions of Data Depth", December 2015.
2. (Speaker) Imperial College London School of Computing and Department of Aeronautics, London, UK. Presented a talk entitled "Ensemble Visualization and Uncertainty Characterization Using Generalized Notions of Data Depth", November 2015.
3. (Speaker) University of East Anglia Department of Mathematics, Norwich, UK. Presented a talk entitled: "Ensemble Visualization and Uncertainty Characterization Using Generalized Notions of Data Depth", November 2015.
4. (Speaker) Rensselaer Polytechnic Institute Scientific Computation Research Center, Troy, NY. Presented a talk entitled: "Multiscale modeling and uncertainty quantification as part of 'Materials by Design'", October 2015.
5. (Speaker) National Hurricane Center, Florida International University. Presented a talk entitled: "Ensemble Visualization and Uncertainty Characterization Using Generalized Notions of Data Depth", October 2015.
6. (Speaker) Nektar++ Workshop 2015. Presented a talk entitled: "Nektar ++: A look into the future", July 2015.
7. (Speaker) 2015 MACH Conference (Annapolis, MD). Presented a talk entitled: "Surrogate-Based Bayesian Model Ranking of Atomistic Models", April 2015.
8. (Speaker) Technical University Munich, Germany. Presented a talk entitled: "Sensitivity Analysis and Its Relation to UQ", January 2014.
9. (Speaker) Los Alamos National Laboratory Data Science / IS&T Seminar Series. Presented a talk entitled: "Lessons Learned in the Search for 'Verifiable Visualizations'", August 2014.
10. (Speaker) Schloss Dagstuhl Seminar on Scientific Visualization, Germany. Presented a talk entitled "Lessons Learned in the Search for 'Verifiable Visualization"', June 2014.
11. (Speaker) European Geosciences Union (EGU) General Assembly 2014 (Vienna, Austria). Presented a talk entitled: "Contour Boxplots: A Method for Characterizing Uncertainty in Feature Sets for Simulation Ensembles", April 2014.
12. (Speaker) 2014 MACH Conference (Annapolis, MD). Presented a talk entitled: "Uncertainty-aware multi scale modeling of atomic systems", March 2014.
13. (Speaker) Technical University Munich, Germany. Presented a talk entitled: "Contour Boxplots: A Method for Characterizing Uncertainty in Feature Sets from Simulation Ensembles", March 2014.
14. (Speaker) National Hurricane Center, Florida International University. Presented a talk entitled: "Contour Boxplots: A Method for Characterizing Uncertainty in Feature Sets from Simulation Ensembles", March 2014.
15. (Speaker) School of Computing, Clemson University. Presented a talk entitled: "Lessons Learned in the Search for 'Verifiable Visualizations'", October 2013.
16. (Speaker) Fraunhofer MeVis, Bremen, Germany. Presented a talk entitled: "Lessons Learned in the Search for 'Verifiable Visualizations'", June 2013.
17. (Speaker) EuroRVVV 2013 (Workshop Co-located with EuroVis 2013, Leipzig, Germany). Presented a talk entitled: "Lessons Learned in the Search for 'Verifiable Visualizations'", June 2013.

18. (Speaker) 2013 MACH Conference (Annapolis, MD). Presented a talk entitled: "VVUQ: A Tutorial on Validation, Verification and Uncertainty Quantification", April 2013.

19. (Speaker) 51st AIAA Aerospace Sciences Meeting. Presented a talk entitled: "Widening Verification to Include Visualization: Expanding the Simulation Science Pipeline", January 2013.

20. (Speaker) Department of Computer Science, Florida State University. Presented the "Grad Gone Good" Alumni Lecture entitled: "Visualization of High-Order Finite Element Methods", October 2012.

21. (Speaker) Department of Computer Science, NYU-Poly. Presented a talk entitled: "Visualization of High-Order Finite Element Methods", August 2012.

22. (Speaker) Department of Computer Science, University of Minnesota. Presented a talk entitled: "Visualization of High-Order Finite Element Methods", July 2012.

23. (Speaker) World Congress of Computational Mechanics (WCCM) 2012 held in Sao Paolo, Brazil. Invited to speak in Minisymposium on "Advances in High-Order Methods"; Presented a talk entitled: "To CG or to HDG: A Progress Report", July 2012.

24. (Speaker) Department of Mathematics, Imperial College London, UK. Presented a talk entitled "Quantifying Uncertainty in an Attempt to Answer Biomedical Questions: From the Computer Lab to the Clinic", March 2012.

25. (Speaker) Division of Applied Mathematics, Brown University. Presented a talk entitled "Turning the V&V Lens Towards Visualization Techniques", October 2011.

26. (Speaker) Department of Applied Mathematics, Technical University Delft, The Netherlands. Presented a talk entitled "A Fast Iterative Method for Solving the Eikonal Equation on Triangular and Tetrahedral Domains Using GPUs", October 2011.

27. (Speaker) USA/South America Symposium on Stochastic Modeling & Uncertainty Quantification, Rio de Janeiro, Brazil. Presented a talk entitled "Quantifying Uncertainty in an Attempt to Answer Biomedical Questions: From the Computer Lab to the Clinic", August 2011.

28. (Speaker) Schloss Dagstuhl Seminar on Scientific Visualization, Germany. Presented a talk entitled "Verifiable Visualization", June 2009.

29. (Speaker) School of Engineering, University of Swansea, United Kingdom. Presented a sabbatical talk in the Civil and Computational Engineering Centre Seminar Series entitled: "Bridging the Gaps: H-to-P Efficiently and CG-to-DG Transparently", May 2009.

30. (Speaker) Department of Computer Science, University of Swansea, United Kingdom. Presented a Leverhulme Lecture entitled "Building Symbiotic Relationships between Formal Verification and High-Performance Computing", May 2009.

31. (Speaker) School of Engineering and Science, Jacobs University, Germany. Presented a sabbatical talk in the Applied Computational Mathematics Seminar Series entitled "Analysis-Guided Improvements of the Material Point Method", April 2009.

32. (Speaker) Department of Applied Mathematics, University of Waterloo, Canada. Presented a sabbatical talk in the Computational Mathematics Seminar Series entitled "Visualization of High-Order Finite Element Methods", March 2009.

33. (Speaker) School of Computing, Imperial College London, United Kingdom. Presented a Leverhulme Lecture entitled "Living with the Bipolar Nature of Computer Science: Experiences in Research and Teaching", March 2009.

34. (Speaker) Maths Institute, Imperial College London, United Kingdom. Presented a Leverhulme Lecture entitled "Computational Methods for Quantifying Uncertainty in Biological Modelling", February 2009.

35. (Speaker) School of Computing, University of Leeds, United Kingdom. Presented a Leverhulme Lecture entitled "Computational Methods for Quantifying Uncertainty in Biological Modelling", February 2009.

36. (Speaker) Center for Computation and Technology, Louisiana State University. Presented a sabbatical talk as a Special Guest Lecture entitled "Building Symbiotic Relationships Between Formal Verification and High-Performance Computing", December 2008.

37. (Speaker) Center for Computation and Technology, Louisiana State University. Presented a sabbatical talk in the Computational Mathematics Seminar Series entitled "Visualization of High-Order Finite Element Methods", December 2008.

38. (Speaker) Department of Mathematics, University of Reading, United Kingdom. Presented a sabbatical talk entitled "Analysis-Guided Improvements of the Material Point Method", November 2008.

39. (Speaker) School of Mathematics, University of Edinburgh, United Kingdom. Presented a sabbatical talk entitled "Computational Methods for Quantifying Uncertainty in Biological Modelling", October 2008.

40. (Speaker) Department of Applied Mathematics, Technical University Delft, The Netherlands. Presented a talk entitled "Visualization of High-Order Finite Element Methods", August 2008.

41. (Speaker) Meeting on Extreme Engineering – Opportunities Using Petaflop Computing, Daresbury Laboratory (UK). Presented a talk entitled "Building Symbiotic Relationships between Formal Verification and High-Performance Computing", July 2008.

42. (Speaker) Intelligent Visualization and Simulation Lab, University of Kaiserslautern, Germany. Presented a talk entitled "Visualization of High-Order Finite Element Methods", June 2008.

43. (Speaker) Center of Complex Systems and Visualization, University of Bremen, Germany. Presented a talk entitled "Topology, Accuracy, and Quality of Isosurface Meshes Using Dynamic Particles", February 2008.

44. (Speaker) School of Computing, University of Leeds (UK). Presented a talk entitled "Simulation Science: The Modeling of Real-World Problems", July 2007.

45. (Speaker) International Workshop on High-Order Finite Element Methods, Herrsching am Ammersee (near Munich), Germany. Presented a talk entitled "Visualization of High-Order Finite Element Methods", May 2007.

46. (Speaker) Institute for Numerical Simulation, University of Bonn, Germany. Presented a talk entitled "Simulation Science: The Modeling of Real-World Problems", April 2007.

47. (Speaker) Center of Complex Systems and Visualization, University of Bremen, Germany. Presented a talk entitled "Particle Systems for Efficient and Accurate High-Order Finite Element Visualization", March 2007.

48. (Speaker) Center of Complex Systems and Visualization, University of Bremen, Germany. Presented a talk entitled "Computational Methods for Quantifying Uncertainty in Biological Modeling", June 2006.

49. (Speaker) Department of Mathematics, Virginia Tech. Presented a talk entitled "Simulation Science: The Modeling of Real-World Problems", March 2006.

50. (Speaker) Center of Complex Systems and Visualization, University of Bremen, Germany. Presented a talk entitled "Simulation Science: The Modeling of Real-World Problems", January 2006.

51. (Speaker) BIRS Workshop "Mathematical Foundations of Scientific Visualization, Computer Graphics, and Massive Data Exploration", Banff, Canada. Presented a talk entitled "Computing and Visualization in Spectral/hp Element Methods", May 2004.

52. (Speaker) Department of Mechanical Engineering, Ben Gurion University, Beer-Sheva, Israel. Presented a talk entitled "Simulation Science: The Modeling of Real-World Problems", December 2003.

53. (Speaker) ACM SIGGRAPH/Eurographics Campfire: Visualization Meets Visual Effects. Presented a talk in the "Volume Models and Grid Generation (CFD People)" Campfire Session, September 2003.

54. (Speaker) Bad Honnef, Germany WE-Heraeus-Seminar on Adaptivity in Finite Element Analysis: Models, Meshes and Polynomial Order. Presented a talk entitled "Spectral/hp Element Methods for Fluid-Structure Interaction Problems. Part II: From the Fluid Perspective", September 2003.

55. (Speaker) Department of Mathematics, University of Utah. Presented a talk entitled "Simulation Science: The Modeling of Real-World Problems", September 2003.

Short Courses and Tutorials:

1. Robert M. Kirby (with Spencer J. Sherwin and Yvon Maday), Presented three of nine lectures on current scientific computing topics, *6th Montreal Scientific Computing Days*, University of Montréal, Montréal, Canada, May 4-6, 2009.

2. Spencer J. Sherwin and Robert M. Kirby, "A Hands-On Approach to Implementing and Using Spectral/*hp* Elements", *16th Annual Conference Conference of the CFD Society of Canada*, Saskatoon, Saskatchewan, Canada, June 12-13, 2008.

Conference Abstracts, Publications and Presentations:

1. Chris Cantwell, Sergey B. Yakovlev, Rheeda Ali, Nicholas Peters, Robert M. Kirby and Spencer J. Sherwin, "High-Order Finite Element Methods for Cardiac Electrophysiology", SIAM CS&E Meeting, Salt Lake City, UT, March 2015.

2. Chris Cantwell, David Moxey, Robert M. Kirby and Spencer J. Sherwin, "Architecting Spectral/hp Element Codes for Modern Hardware", SIAM CS&E Meeting, Salt Lake City, UT, March 2015.

3. Robert M. Kirby and Sergey B. Yakovlev, "To CG or HDG: Updates on Our Comparative Study", SIAM CS&E Meeting, Salt Lake City, UT, March 2015.

4. David Moxey and Robert M. Kirby, "H-to-P Efficiently: a Nektar++ Update on Comparisons of CG and HDG", SIAM CS&E Meeting, Salt Lake City, UT, March 2015.

5. David Moxey, Chris Cantwell, Spencer J. Sherwin and Robert M. Kirby, "Spectral/hp Element Modelling in Nektar++", SIAM CS&E Meeting, Salt Lake City, UT, March 2015.

6. Hadi Meidani, Robert M. Kirby and Dmitry Bedrov, "Surrogate-Based Bayesian Model Ranking of Atomistic Models Incorporating the Fidelity of Surrogates", SIAM CS&E Meeting, Salt Lake City, UT, March 2015.

7. Mahsa Mirzargar, Jennifer K. Ryan and Robert M. Kirby, "Smoothness-Increasing Accuracy-Conserving (SIAC) Filtering and Quasi-Interpolation: A Unified View", International Conference on Spectral and High-Order Methods (ICOSAHOM'16), Salt Lake City, UT, June 2014.

8. (Speaker) Chris Cantwell, Sergey B. Yakovlev, Robert Kirby, Nicholas Peters and Spencer Sherwin, "H-to-P Efficiently: A Progress Report on High-Order FEM on Manifolds with Applications in Electrophysiology", SIAM Annual Meeting, San Diego, CA, July 2013.

9. Sergey B. Yakovlev, David Moxey, Robert Kirby and Spencer Sherwin, "H-to-P Efficiently: A Progress Report on HDG in 3D", SIAM Annual Meeting, San Diego, CA, July 2013.

10. Varun Shankar, Grady B. Wright, Aaron L. Fogelson and Robert M. Kirby, "An RBF-FD Method for the Simulation of Reaction-Diffusion Equations on Stationary Platelets Within the Augmented Forcing Method", SIAM Annual Meeting, San Diego, CA, July 2013.

11. (Speaker) Robert M. Kirby, "Smoothness-Increasing Accuracy-Conserving (SIAC) Filtering: Practical Considerations When Applied to Visualization", The Mathematics of Finite Elements and Applications (MAFELAP) 2013, June 2013.

12. (Speaker) Robert M. Kirby and Spencer J. Sherwin, "H-to-P Efficiently: A Progress Report", SIAM Computational Science and Engineering (CSE) Conference 2013, February 2013.

13. Varun Shankar, Robert M. Kirby, Grady B. Wright and Aaron L. Fogelson, "Augmenting the Immersed Boundary Method with RBFs: Applications to Modeling of Platelets in Hemodynamic Flows", SIAM Computational Science and Engineering (CSE) Conference 2013, February 2013.

14. (Speaker) Hanieh Mirzaee, Jennifer K. Ryan and Robert M. Kirby, "Smoothness-Increasing Accuracy-Conserving (SIAC) Filtering: Practical Considerations When Applied to Visualization", International Conference on Scientific Computation and Differential Equations (SciCADE 2011), July 2011.

15. Hanieh Mirzaee, Jennifer K. Ryan and Robert M. Kirby, "Accuracy Enhancement of Discontinuous Galerkin Solutions over Structured Triangular Meshes", SIAM Conference on Computational Science and Engineering, Reno, NV, February 28-March 4, 2011.

16. (Speaker) S.E. Geneser, R.M. Kirby, B. Wang, B. Salter and S. Joshi, "Incorporating Patient Breathing Variability Into A Stochastic Model of Dose Deposition for Stereotactic Body Radiation Therapy", International Conference on Spectral and High-Order Methods (ICOSAHOM), June 2009.

17. (Speaker) D.F. Wang, R.M. Kirby and C.R. Johnson, "High-Order Resolution Strategies for the Finite Element Based Solution of the Electrocardiograph Inverse Problem", International Conference on Spectral and High-Order Methods (ICOSAHOM), June 2009.

18. (Speaker) H. Mirzaee, C. Eskilsson, R.M. Kirby and S.J. Sherwin, "Comparison of Consistent Integration Versus Adaptive Quadrature for Taming Aliasing Errors", International Conference on Spectral and High-Order Methods (ICOSAHOM), June 2009.

19. H. Mirzaee, J.K. Ryan and R.M. Kirby, "Quantification of Errors Introduced in the Numerical Approximation of SIAC Filtering", International Conference on Spectral and High-Order Methods (ICOSAHOM), June 2009.

20. P.E.J. Vos, R.M. Kirby and S.J. Sherwin "From H to P Efficiently: What Makes A High and Low Order Finite Element Code Efficiently?" International Conference on Spectral and High-Order Methods (ICOSAHOM), June 2009.

21. S. Chun, S.J. Sherwin, R.M. Kirby and D.D. Holm, "High-Order Methods for Simulating Cardiac Electrophysiological Phenomena", International Conference on Spectral and High-Order Methods (ICOSAHOM), June 2009.

22. S.J. Sherwin, R.M. Kirby and P.E.J. Vos , "Bridging the Gaps: H-to-P Efficiently and CG-to-DG Transparently", International Conference on Spectral and High-Order Methods (ICOSAHOM), June 2009.

23. Randy Jay Christopherson, Robert M. Kirby, Christi M. Terry, Alfred K. Cheung, and Yan-Ting Shiu, "Modeling Of Perivascular Delivery Of Dipyridamole And Rapamycin To An Arteriovenous Hemodialysis Graft", American Institute of Chemical Engineers Annual Meeting, November 2007.

24. Randy Jay Christopherson, Robert M. Kirby, Christi M. Terry, Alfred K. Cheung, and Yan-Ting Shiu, "Computational Modeling Of Perivascular Tissue Pharmacokinetics Of Dipyridamole and Rapamycin", Biomedical Engineering Society Annual Fall Meeting, September 2007.

25. Miriah Meyer, Blake Nelson, Robert M. Kirby and Ross Whitaker, "Particle Systems for Efficient and Accurate High-Order Finite Element Visualization", International Conference on Spectral and High-Order Methods, June 2007.

26. (Speaker) Robert M. Kirby and Spencer J. Sherwin, "Aliasing Errors Due to Quadratic Non-Linearities On Triangular Spectral/hp Element Discretisations", International Conference on Spectral and High-Order Methods, June 2007.

27. (Speaker) Blake Nelson and Robert M. Kirby, "Ray-Tracing Polymorphic Multi-Domain Spectral/hp Elements for Isosurface Rendering", International Conference on Spectral and High-Order Methods, June 2007.

28. (Speaker) Sarah E. Geneser, Robert M. Kirby, Dongbin Xiu and Frank B. Sachse, "Application of the Stochastic Galerkin and Collocation Methods for Analysis of Human Cardiac Ion Channel Models", International Conference on Spectral and High-Order Methods, June 2007.

29. (Speaker) Sarah E. Geneser, Robert M. Kirby and Robert S. MacLeod,"2D Stochastic High-Order Finite Element Study of the Influence of Organ Conductivity in ECG Forward Modeling", International Conference on Spectral and High-Order Methods, June 2007.

30. Sarah E. Geneser, Robert M. Kirby, Dongbin Xiu, and Frank B. Sachse, "Application of the Stochastic Galerkin Method for Analysis of Human Cardiac Ion Channel Models", SIAM Conference on Computational Science and Engineering, February 2007.

31. (Speaker) Salman Pervez, Ganesh Gopalakrishnan, Robert M. Kirby, Rajeev Thakur and William Gropp, "Formal Verification of Programs That Use MPI One-Sided Communications". EuroPVM-MPI 2006, Bonn, Germany, September 17-20, 2006.

32. (Speaker) Sean Curtis, Robert M. Kirby and Jennifer K. Ryan, "Accuracy Enhancing Filtering With Application To Visualization", 7th World Congress on Computational Mechanics, July 2006.

33. (Speaker) Robert M. Kirby and Spencer J. Sherwin, "Aliasing Errors Due to Quadratic Non-Linearities On Triangular Spectral/hp Element Discretisations", SIAM Annual Meeting, July 2006.

34. (Speaker) Robert M. Kirby and Ganesh Gopalakrishnan, "Building Symbiotic Relationships Between Formal Verification and High Performance Computing", 20th IEEE International Parallel and Distributed Processing Symposium, April 2006.

35. (Speaker) Robert M. Kirby and Ganesh Gopalakrishnan, "Building Symbiotic Relationships Between Formal Verification and High Performance Computing", SIAM Conference on Parallel Processing, February 2006.

36. Dimitri V. Yatsenko, R. Larry Anderton, Krzysztof Sikorski and Robert M. Kirby, "Spatial X-Ray Gating: A Tool for Automated Regional X-Ray Exposure Management", The International Society for Optical Engineering Medical Imaging 2006, February 2006.

37. I. Ionescu, J.A. Weiss, J. Guilkey, M. Cole, R.M. Kirby and M. Berzins, "Ballistic injury simulation using the material point method", Stud Health Technol Inform., Volume 119, pages 228-233, 2005.

38. Sarah E. Geneser, Robert M. Kirby and Frank B. Sachse, "Sensitivity Analysis of Cardiac Electrophysiological Models Using Polynomial Chaos", (Poster) 1st Annual Mountain West Biomedical Engineering Conference, September 2005.

39. Sarah E. Geneser, Seungkeol Choe, Robert M. Kirby and Robert M. MacLeod, "The Influence of Stochastic Organ Conductivity in 2D ECG Forward Modeling: A Stochastic Finite Element Study", (Podium) 1st Annual Mountain West Biomedical Engineering Conference, September 2005.

40. Sarah E. Geneser, Robert M. Kirby and Frank B. Sachse, "Sensitivity Analysis of Cardiac Electrophysiological Models Using Polynomial Chaos", (Poster) Proceedings of the 27th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, September 2005.

41. Sarah E. Geneser, Seungkeol Choe, Robert M. Kirby and Robert M. MacLeod, "The Influence of Stochastic Organ Conductivity in 2D ECG Forward Modeling: A Stochastic Finite Element Study", (Podium) Proceedings of the 27th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, September 2005.

42. (Speaker) R.M. Kirby, S.J. Sherwin, J. Peiro, R.L. Taylor and O.C. Zienkiewicz, "2D elliptic discontinuous Galerkin methods: Implementation and static Condensation for spectral/hp type discretisations", 8th US National Congress on Computational Mechanics, July 2005.

43. (Speaker) R.M. Kirby, Z. Yosibash and G.E. Karniadakis, "High-Order Methods for Fluid-Structure Interaction Simulations", International Conference on Computational Methods for Coupled Problems in Science and Engineering, May 2005.

44. (Speaker) M. Berzins, R.M. Kirby and C.R. Johnson, "Integrating Teaching and Research in HPC: Experiences and Opportunities", International Conference on Computational Science, May 2005.

45. (Speaker) Sarah E. Geneser, Seungkeol Choe, Robert M. Kirby and Robert M. MacLeod, "2D Stochastic Finite Element Study of the Influence of Organ Conductivity in ECG Forward Modeling", The Joint Meeting of 5th International Conference on Bioelectromagnetism and 5th International Symposium on Noninvasive Functional Source Imaging, May 2005.

46. I. Ionescu, J. Guilkey, M. Berzins, R.M. Kirby, J.A. Weiss, "Computational Simulation of Penetrating Trauma in Biological Soft Tissues using the Material Point Method", Medicine Meets Virtual Reality 13, eds. James D Westwood et al., IOS Press, 2005 (presented at The 13th Annual Medicine Meets Virtual Reality Conference, Long Beach, California, January 26 - 29, 2005).

47. M. Cole, F.B. Sachse, D.M. Weinstein, R.M. Kirby, and S. Parker, "A Software Framework for Solving Problems of Bioelectricity Applying High-Order Finite Elements", 26th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, September 2004.

48. S.J. Sherwin, R.M. Kirby, J. Peiro, R.L. Taylor and O.C. Zienkiewicz, "2D elliptic discontinuous Galerkin methods: Implementation and static Condensation for spectral/hp type discretisations", International Conference on Spectral and High-Order Methods, June 2004.

49. (Speaker) Robert M. Kirby and Jan S. Hesthaven, "Filtering in Legendre spectral methods", International Conference on Spectral and High-Order Methods, June 2004.

50. Z. Yosibash, R.M. Kirby and G.E. Karniadakis, "P-FEM for Fluid-Structure Interaction Problems", 7th U.S. National Conference on Computational Mechanics, August 2003.

51. (Speaker) R.M. Kirby, "Flux Choices for Parabolic/Elliptic Problems: Algorithms and Applications", 7th U.S. National Conference on Computational Mechanics, August 2003.

52. Z. Yosibash, R.M. Kirby, K. Myers, B. Szabó and G. Karniadakis, "High-Order Finite Elements for Fluid-Structure Interaction Problems", 44th AIAA/ASME/ASCE/AHS Structures, Structural Dynamics, and Materials Conference, Norfolk, Virginia, April 7-10, 2003.

53. (Speaker) R.M. Kirby, J. Xu and G.E. Karniadakis, "A Spectral Vanishing Viscosity Method for LES Applied to Turbulent Channel Flows", Presented at the SIAM Conference on Computational Science and Engineering, February 10-13, 2003.

Other Presentations:

1. (Speaker) IEEE Visualization 2015 Workshop "On Visualization For Decision Making Under Uncertainty" Panel Presentation. Presented a talk entitled: "Where is UQ/UVis Now? A Case Study", October 2015.

2. (Speaker) Microsoft Grant Review Held In Conjunction with International SuperComputing 2007. Presented a talk entitled "Formal Analysis for Debugging and Performance Optimization of MPI", June 2007.

3. (Speaker) University of Utah Center for Accidental Fires and Explosions (C-SAFE) Site Visit. Presented a talk entitled "Computational Engineering and Science Program: C-SAFE Educational Partnership", October 2005.

4. (Speaker) University of Utah School of Computing Graduate Sampler. Presented a talk entitled "Simulation Science: The Modeling of Real-World Problems", September 2003.

Teaching

Teaching Efforts as a University of Utah Faculty Member

Classroom Experience:

- Taught the undergraduate course CS 2100: Discrete Structures, Spring 2015, School of Computing, University of Utah.
- Taught the undergraduate course CS 4960: Computational and Data Science, Fall 2014, School of Computing, University of Utah.
- Taught the graduate course CS 6220: Advanced Scientific Computing II, Spring 2014, School of Computing, University of Utah.
- Taught the graduate course CS 6210: Advanced Scientific Computing I, Fall 2013, School of Computing, University of Utah.
- Taught the graduate course CS 6220: Advanced Scientific Computing II, Spring 2013, School of Computing, University of Utah.
- Taught the graduate course CS 6210: Advanced Scientific Computing I, Fall 2012, School of Computing, University of Utah.
- Taught the graduate course CS 6220: Advanced Scientific Computing II, Spring 2012, School of Computing, University of Utah.
- Taught the graduate course CS 6210: Advanced Scientific Computing I, Fall 2011, School of Computing, University of Utah.
- Taught the undergraduate course CS 2100: Discrete Structures, Fall 2011, School of Computing, University of Utah.
- Taught the graduate course CS 6230: High-Performance Computing and Parallelization, Spring 2011, School of Computing, University of Utah.
- Taught the undergraduate course CS 2100: Discrete Structures, Fall 2009, School of Computing, University of Utah.
- Taught a graduate course entitled "High-Performance Scientific Computing", Fall Term 2008, Cavendish Laboratory, Cambridge University.
- Taught the graduate course CS 6220: Advanced Scientific Computing II, Spring 2008, School of Computing, University of Utah.
- Taught the undergraduate course CS 2100: Discrete Structures, Fall 2007, School of Computing, University of Utah.
- Taught the graduate course CS 6220: Advanced Scientific Computing II, Spring 2007, School of Computing, University of Utah.
- Taught the undergraduate course CS 2100: Discrete Structures, Fall 2006, School of Computing, University of Utah.
- Taught the graduate course CS 6220: Advanced Scientific Computing II, Spring 2006, School of Computing, University of Utah.
- Taught the undergraduate course CS 2100: Discrete Structures, Fall 2005, School of Computing, University of Utah.

- Taught the graduate course CS 6220: Advanced Scientific Computing II, Spring 2005, School of Computing, University of Utah.
- Taught the undergraduate course CS 2100: Discrete Structures, Fall 2004, School of Computing, University of Utah.
- Co-taught the graduate course MATH 6790-1: Case Studies in CES, Spring 2004, CES Program in conjunction with the School of Computing, University of Utah.
- Administered the Scientific Computing and Imaging Institute Seminar Series (course CS 7940), Spring 2004, SCI Institute, University of Utah.
- Taught the graduate course CS 6220: Advanced Scientific Computing II, Spring 2004, School of Computing, University of Utah.
- Taught the graduate seminar course CS 6938: Spectral Methods, Fall 2003, School of Computing, University of Utah.
- Taught the undergraduate course CS 2100: Discrete Structures, Fall 2003, School of Computing, University of Utah.
- Administered the Scientific Computing and Imaging Institute Seminar Series (course CS 7940), Fall 2003, SCI Institute, University of Utah.
- Taught the undergraduate course CS 2100: Discrete Structures, Fall 2003, School of Computing, University of Utah.
- Taught the graduate course CS 6965/7960-2: Adaptive Methods, Spring 2003, School of Computing, University of Utah.
- Administered the Scientific Computing and Imaging Institute Seminar Series (course CS 6938-1), Spring 2003, SCI Institute, University of Utah.
- Administered the Scientific Computing and Imaging Institute Seminar Series (course CS 6932-1), Fall 2002, SCI Institute, University of Utah.

Post-Doc Mentoring

Current Mentoring:

- Mahsa Mirzargar, PhD (Computer Science, University of Florida). Fall 2012 – present
- Yanyan He, PhD (Mathematics, Florida State University). Spring 2014 – present

Former Mentoring:

- Linh Ha, PhD (Computer Science, Utah). Post-Doc Fall 2011–Spring 2012.
- Hadi Meidani, PhD (Civil Engineering, University of Southern California). Post-Doc Summer 2013 – Summer 2014.
- Shankar Sastry, PhD (Computer Science, Penn State University). Fall 2012 – Spring 2015.
- Sergey Yakovlev, PhD (Mathematics, RPI). Post-Doc Fall 2013–Fall 2014.

Graduate Student Advising:

Current Student Advising:

- Ashok Jallepalli, Seeking Ph.D. degree in Computing.
- James King, Seeking Ph.D. degree in Computing.
- Harshitha Venkata, Seeking MS degree in Computer Science.

- M.S. Srivatsa, Seeking MS degree in Computer Science.
- Vidhi Zala, Seeking MS degree in Computer Science.

Graduated Students:

- Steve Barrus, B.S./M.S. degree in Computer Science, University of Utah, May 2006. Co-Advised with Prof. Ganesh Gopalakrishnan.
- Chris Berthiaume, M.S. degree in Computational Engineering and Science, University of Utah, December 2005.
- Ken Farnsworth, M.S. degree in Computational Engineering and Science, University of Utah, December 2008.
- Seung-Keol Choe, M.S. degree in Computational Engineering and Science, University of Utah, May 2004.
- Tom Cook, M.S. degree in Computational Engineering and Science, University of Utah, December 2004.
- Zhisong Fu, Ph.D. degree in Computing, University of Utah, December 2013. Co-Advised with Professor Ross Whitaker.
- Sarah Geneser, Ph.D. degree in Computer Science, University of Utah, May 2008.
- Sonjong Hwang, B.S./M.S. degree in Computer Science, University of Utah, May 2006. Co-Advised with Prof. Ganesh Gopalakrishnan.
- James Lewis, B.S./M.S. degree in Computer Science, University of Utah, August 2014.
- Hanieh Mirzaee, Ph.D. degree in Computing, University of Utah, December 2012.
- Blake Nelson, M.S. degree in Computer Science, University of Utah, August 2005. Ph.D. degree in Computing (Scientific Computing Emphasis), May 2012.
- Salman Pervez, M.S. degree in Computer Science, University of Utah, May 2007. Co-Advised with Professor Ganesh Gopalakrishnan.
- Nazmus Saquib, M.S. degree in Computational Engineering and Science, University of Utah, December 2013.
- Varun Shankar, Ph.D. degree in Computing (Scientific Computing Emphasis), University of Utah, August 2014. Co-Advised with Professor Aaron Fogelson.
- Michael Steffen, Ph.D. degree in Computing (Scientific Computing Emphasis), University of Utah, December 2009.
- Sarvani Vakkalanka, Ph.D. degree in Computer Science, University of Utah, 2010. Co-Advised with Professor Ganesh Gopalakrishnan.
- Ahn Vo, Ph.D. degree in Computer Science, University of Utah, 2011. Co-Advised with Professor Ganesh Gopalakrishnan.
- Dafang Wang, Ph.D. degree in Computing (Scientific Computing Emphasis), University of Utah, 2012. Co-Advised with Professor Chris Johnson.

Undergraduate Student Advising:

- Steve Barrus, NSF REU Program. Co-advised with Prof. Ganesh Gopalakrishnan.
- Michael Bentley, NSF REU Program.
- Sean Curtis, NSF REU Program.
- Michael DeLisi, Microsoft Research Project. Co-advised with Prof. Ganesh Gopalakrishnan.
- Curtis Hamman, Engineering Scholars Program and NSF REU Program.
- Safia Hassan, NSF REU Program.

- Sophia Hudson, NSF REU Program. Earned B.S. degree in Mathematics, University of Utah, May 2014.
- Mario Irizarry, Summer Research Opportunity Program, Summer 2004. Co-advised with Prof. Martin Berzins.
- T. James Lewis, NSF REU Program.
- Geof Sawaya, NSF REU Program and Microsoft Research Project. Co-advised with Prof. Ganesh Gopalakrishnan.
- Jason Williams, NSF REU Program and Microsoft Research Project. Co-advised with Prof. Ganesh Gopalakrishnan.
- Evan Young, NSF REU Program.

Graduate Student Committee Membership:

- Ph.D. Committees
  - Matt Berger, School of Computing, University of Utah. Graduated December 2012.
  - Chaiwoot Boonyasiritwat, School of Computing, University of Utah. Graduated May 2009.
  - Steve Callihan, School of Computing, University of Utah. Graduated May 2008.
  - Roni Choudhury, School of Computing, University of Utah. Graduated August 2012.
  - Lindsay Crowl, Department of Mathematics, University of Utah. Graduated December 2010.
  - Joel Daniels, School of Computing, University of Utah. Graduated May 2009.
  - Tiago Etiene, School of Computing, University of Utah. Graduated Spring 2014.
  - Daniel Gerszewski, School of Computing, University of Utah. Graduated Spring 2015.
  - Mark Kim, School of Computing, University of Utah. Graduated Fall 2015.
  - Karin Leiderman, Department of Mathematics, University of Utah. Graduated December 2010.
  - Miriah Meyer, School of Computing, University of Utah. Graduated May 2008.
  - Tobias Martin, School of Computing, University of Utah. Graduated May 2012.
  - Elijah Newren, Department of Mathematics, University of Utah. Graduated May 2007.
  - Robert Palmer, School of Computing, University of Utah. Graduated May 2007.
  - Kristi Potter, School of Computing, University of Utah. Graduated December 2009.
  - Carlos Scheidegger, School of Computing, University of Utah. Graduated December 2009.
  - John Schreiner, School of Computing, University of Utah. Graduated May 2009.
  - Jason Shepherd, School of Computing, University of Utah. Graduated May 2007.
  - Lethuy Tran, School of Computing, University of Utah. Graduated December 2012.
  - Robert Van Uitert, School of Computing, University of Utah. Graduated December 2004.
  - Yu Yang, School of Computing, University of Utah. Graduated May 2009.
  - Asghar Yarahmadi, School of Computing, University of Utah.
- M.S. Committees
  - Lugang Bai, CES Program, University of Utah. Graduated May 2005.
  - Jason Butcher, School of Computing, University of Utah.
  - Chaiwoot Boonyasiriwat, CES Program, University of Utah. Graduated May 2004.
  - Steven Callahan, CES Program, University of Utah. Graduated August 2005.
  - Ashok Jallepalli, School of Computing, University of Utah. Graduated May 2012.
  - Jihwan Kim, CES Program, University of Utah. Graduated December 2004.

- Youngsong Kim, CES Program, University of Utah. Graduated in May 2012.
- Pavel Koshevoy, CES Program, University of Utah. Graduated August 2005.
- Anastasia Mironova, CES Program, University of Utah. Graduated August 2008.
- Sang Oh, CES Program, University of Utah. Graduated December 2004.
- Chuanbin Peng, CES Program, University of Utah. Graduated May 2005.
- Amjidanutpan Ramanujam, CES Program, University of Utah. Graduated May 2007.
- Andrew Shaeffer, CES Program, University of Utah. Graduated May 2005.
- Wesley Simon, School of Computing, University of Utah.
- Jake Van Alstyne, School of Computing, University of Utah. Graduated December 2012.
- Dimitri Yatsenko, CES Program, University of Utah. Graduated May 2005.
- Cheng Ye, School of Computing, University of Utah. Graduated May 2012.
- Peihong Zhu, School of Computing, University of Utah. Graduated December 2012.

Service

Professional Service:

Associate Editor for the following journals:

- *Mathematics and Computers in Simulation*, 2007 – 2009.

Have reviewed for the following journals:

- *Computer Methods in Applied Mechanics and Engineering*
- *IEEE Transactions on Visualization and Computer Graphics*
- *IEEE Transactions on Parallel and Distributed Systems*
- *International Journal for Uncertainty Quantification*
- *Journal of Applied Numerical Mathematics*
- *Journal of Computational Physics*
- *Journal of Fluids Engineering*
- *Journal of Fluids and Structures*
- *Journal of Mathematical Analysis and Applications*
- *Journal of Scientific Computing*
- *SIAM Journal on Scientific Computing*

Have reviewed for the following conferences:

- Two papers reviewed for IEEE VisWeek 2015.
- Five papers reviewed for IEEE VisWeek 2014.
- Six papers reviewed for IEEE VisWeek 2013.
- Six papers reviewed for IEEE VisWeek 2012.
- One paper reviewed for EuroVis 2012.
- One paper reviewed for IEEE VisWeek 2011.
- Nine papers reviewed for the International Conference on High-Performance Computing (HiPC 2007).
- Two papers reviewed for the International Conference on Computational Science (ICCS 2006).
- Six papers reviewed for International Conference on Computational Science and its Applications (ICCSA 2005).
- One paper for 2004 LNCS-Springer Special Volume on Software Engineering for Large-Scale Multi-Agent Systems.
- Four papers reviewed for IEEE Visualization 2005.
- Four papers reviewed for IEEE Visualization 2003.

Have served on the following conference / workshop functions:

- SciVis Papers Co-Chair, Initiated duties in 2015 for the IEEE Visualization 2016 and 2017 Conferences.
- Organizing Committee and Panel Speaker, IEEE Visualization 2015 Workshop entitled "On Visualization For Decision Making Under Uncertainty" , Chicago, IL, October 2015.
- Organizing Committee and Speaker, Nektar++ Workshop 2015, Imperial College London, London, UK, July 2015.
- Local Committee Conference Chair, International Conference for Spectral and High-Order Methods (ICOSA-HOM), 2012-2014 (Conference to be held June 2014).

- Paper Committee Member, IEEE Visualization, 2014.
- Paper Committee Member, IEEE Visualization, 2013.
- Organizer (with Paul Rosenthal, Robert Laramee and Gordon Kindlmann) of EuroVis Workshop EuroRV^2, 2012-2013 (Workshop to be held June 2013 as part of EuroVis 2013).
- Invited Speaker and Panel Member, American Institutes of Aeronautics and Astronautics (AIAA) Annual Meeting, Grapevine, TX, January 2013.
- Paper Committee Member, IEEE Visualization, 2012.
- Participated as a panelist in a Panel at IEEE VisWeek 2012 entitled "Work the Line: Balancing Personal and Professional Life as a Visualization Scientist", October 2012.
- Organized with Claudio Silva (NYU-Poly) and participated as a panelist in a Panel at IEEE VisWeek 2011 entitled "Verification in Visualization: Building a Common Culture", October 2011.
- Paper Committee Member, IEEE Visualization, 2009.
- Minisymposium Co-Chair (with Prof. Spencer J. Sherwin), International Conference on Spectral and High Order Methods, June 2009.
- Paper Committee Member, IEEE Visualization, 2008.
- Panels Co-Chair, IEEE Visualization, 2008.
- Paper Committee Member, IEEE Visualization, 2007.
- Panels Co-Chair, IEEE Visualization, 2007.
- Program Committee, 14th International Conference on High Performance Computing (HiPC), 2007.
- Program Committee, Thread Verification Workshop, August 2006.
- Minisymposium Co-Chair (with Prof. Martin Berzins), World Congress on Computational Mechanics (WCCM), July 2006.
- International Program Committee, The 2006 International Conference on Computational Science and its Applications
- Minisymposium Co-Chair (with Prof. Martin Berzins), International Conference on Spectral and High Order Methods, June 2004.
- Paper Committee Member, IEEE SuperComputing, 2004.

Reviewed Proposals for the following agencies:

- Department of Energy Office of Science
- National Science Foundation (CISE and DMS)
- German-Israeli (Science) Foundation (GIF)

Academic Service:

Senator, Academic Senate of the University of Utah (2006–2008)

Director, Computational Engineering and Science Program, University of Utah (2005 – 2008)

Member of the School of Computing Curriculum Committee (2006–2009, 2010 – 2012)

Member of the School of Computing Graduate Studies Committee (2006 – 2014)

Member of the School of Computing CES Committee (2004–2009)

Member of the University Committee for Computational Science and Engineering (SoC Delegate) (2004–2009)

Chairperson of the Scientific Computing Track, Computing Degree Program, School of Computing (2004–2014)

Member of the School of Computing Graduate Admissions Committee (2004–2009, 2011–2013)

Associate Director, Scientific Computing and Imaging Institute (2006–2007)

Associate Director, CES Program (2012 – 2014)

Director of Graduate Studies, School of Computing (2012– 2014)

Assistant Program Manager, Multi-Scale Multidisciplinary Modeling of Electronic Materials (MSME) Collaborative Research Alliance (CRA) (2012–present)

Associate Director, School of Computing (2014–present)

Community Service:

Judge for the Computer and Technology Category of the Sterling Scholars Awards, February 2003.

Faculty Mentoring:

Faculty Mentor of Miriah Meyer, Assistant Professor, School of Computing, 2011–.

Faculty Mentor of Hari Sundar, Assistant Professor, School of Computing, 2014–.