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School of Computing
University of Utah
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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:

- Best Poster Award, The 26th International Conference on Information Processing in Medical Imaging (IPMI), June 2019.
- Awarded *Distinguished Mentor Award*, University of Utah, May 2018.
- Elected Senior Member, IEEE, 2018.
- Best Paper Award, Fifth International Symposium on Computing and Networking (CANDAR'17), 2017.
- Awarded *Top Researcher* at the Celebrate U: A Showcase of Extraordinary Faculty Achievements Event, April 2017.
- Awarded PRACE-ISC Prize, International SuperComputing (ISC), 2016.
- 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:

- Special Advisor to the President (University of Utah), 2022 – present.

- Executive Director, Utah Informatics Initiative (UI2), University of Utah, 2019 – present.
- Director and Program Manager, Multi-Scale Multidisciplinary Modeling of Electronic Materials (MSME) Collaborative Research Alliance (CRA), University of Utah, 2016 – 2022.
- Interim Director, Scientific Computing and Imaging (SCI) Institute, University of Utah, 2018 – 2020.
- Associate Director, School of Computing, University of Utah, 2014 – 2020.
- Assistant Program Manager, Multi-Scale Multidisciplinary Modeling of Electronic Materials (MSME) Collaborative Research Alliance (CRA), University of Utah, 2012 – 2016.
- 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

Books:

1. Tobias Preusser, Robert M. Kirby and Torben Pätz, *Stochastic Partial Differential Equations for Computer Vision with Uncertain Data*, Morgan & Claypool Publishers, 2017.
2. Tiago Etienne, Robert M. Kirby and Claudio Silva, *An Introduction to Verification of Visualization Techniques*, Morgan & Claypool Publishers, 2015.
3. 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.
4. George Em Karniadakis and Robert M. Kirby, *Parallel Scientific Computing in C++ and MPI*, Cambridge University Press, UK, 628 pages, 2003.

Book Chapters:

1. Yue Yu, Robert M. Kirby and George Em Karniadakis, “Spectral Element and hp Methods”, *Encyclopedia of Computational Mechanics*, John Wiley and Sons, NY, 1:143. Editors: E. Stein, R. de Borst and T.J.R. Hughes.
2. 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.
3. 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.
4. 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.
5. 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. Michael Penwarden, Shandian Zhe, Akil Narayan and Robert M. Kirby, “A Metalearning Approach for Physics-Informed Neural Networks (PINNs) Tasks: Testbed Applications with Parameterized PDEs”, *Journal of Computational Physics*, In Press, 2023.
2. Vahid Keshavarzadeh, Robert M. Kirby and Akil Narayan, “Variational Inference for Nonlinear Inverse Problems via Neural Net Kernels: Comparison to Bayesian Neural Networks, Application to Topology Optimization”, *Computer Methods in Applied Mechanics and Engineering*, Volume 400, pages 115495, 2022.
3. Timbwaoga Ouermi, Robert M. Kirby and Martin Berzins, “ENO-Based High-Order Data-Bounded and Constrained Positivity-Preserving Interpolation”, *Numerical Algorithms*, Volume 92, pages 1517-1551, 2023.
4. Edward Laughton, Vidhi Zala, Akil Narayan, Robert M. Kirby and David Moxey, “Fast Barycentric-Based Evaluation Over Spectral/hp Elements”, *Journal of Scientific Computing*, Volume 90, pages 78-102, 2022.
5. Michael Penwarden, Shandian Zhe, Akil Narayan and Robert M. Kirby, “Multifidelity Modeling for Physics-Informed Neural Networks (PINNs)”, *Journal of Computational Physics*, Volume 451, pages 110844, 2022.

6. M. Keith Ballard, Roman Amici, Varun Shankar, Lauren A. Ferguson, Michael Braginsky and Robert M. Kirby, "Towards an Extrinsic, CG-XFEM Approach Based on Hierarchical Enrichments for Modeling Progressive Fracture", *Computer Methods in Applied Mechanics and Engineering*, Volume 388, pages 114221, 2022.
7. Yiming Xu, Vahid Keshavarzzadeh, Robert M. Kirby and Akil Narayan, "A Bandit-Learning Approach To Multifidelity Approximation", *SIAM Journal on Scientific Computing*, Volume 44, Number 1, pages A150-175, 2022.
8. Karl Garbrecht, Miguel Aguilo, Allen Sanderson, Anthony Rollett, Robert M. Kirby and Jacob Hochhalter, "Interpretable Machine Learning for Texture-Dependent Constitutive Models with Automatic Code Generation for Topological Optimization", *Integrating Materials and Manufacturing Innovation (Special Issue)*, Volume 10, pages 373-392, 2021.
9. Vahid Keshavarzzadeh, Robert M. Kirby and Akil Narayan, "Robust Topology Optimization with Low Rank Approximation Using Artificial Neural Networks", *Computational Mechanics*, Volume 68, pages 1297-1323, 2021.
10. Nghia Truong, Cem Yuskel, Chakrit Watcharopas, Joshua A. Levine and Robert M. Kirby, "Particle Merging-and-Splitting", *IEEE Transactions on Visualization and Computer Graphics*, Volume 28, pages 4546-4557, 2022.
11. Vidhi Zala, Robert M. Kirby and Akil Narayan, "Structure-preserving Nonlinear Filtering for Continuous and Discontinuous Galerkin Spectral/hp Element Methods", *SIAM Journal on Scientific Computing*, Volume 43, Number 6, pages A3713-3732, 2021.
12. W.W. Xing, A.A. Shah, P. Wang, S. Zhe and R.M. Kirby, "Residual Gaussian process: A tractable non-parametric Bayesian emulator for multi-fidelity simulations", *Applied Mathematical Modelling*, Vol. 97, pages 36-56, 2021.
13. Vahid Keshavarzzadeh, Robert M. Kirby and Akil Narayan, "Multilevel Designed Quadrature For Partial Differential Equations With Random Inputs", *SIAM Journal on Scientific Computing*, Volume 43, Number 2, pages A1412-A1440, 2021.
14. John Chilleri, Yanyan He, Dmitry Bedrov and Robert M. Kirby, "Optimal allocation of computational resources based on Gaussian process: Application to molecular dynamics simulations", *Computational Materials Science*, Computational Materials Science, Volume 188, 110178, 2021.
15. Wei Xing, Robert M. Kirby and Shandian Zhe, "Deep Coregionalization for the Emulation of Simulation-Based Spatial-Temporal Fields", *Journal of Computational Physics*, Volume 428, 109984, 2021.
16. Max Carlson, Xiaoning Zheng, Hari Sundar, George Em Karniadakis and Robert M. Kirby, "An open-source parallel code for computing the spectral fractional Laplacian on 3D complex geometry domains", *Computer Physics Communications*, Volume 261, 107695, 2021.
17. Vahid Keshavarzzadeh, Mitra Alirezaei, Tolga Tasdizen and Robert M. Kirby, "Image-Based Multiresolution Topology Optimization Using Deep Disjunctive Normal Shape Model", *Computer-Aided Design*, Volume 130, 102947, 2021.
18. Mani Razi, Robert M. Kirby and Akil Narayan, "Kernel Optimization For Low-Rank Multi-Fidelity Algorithms", *International Journal for Uncertainty Quantification*, Volume 11, Issue 1, pages 31-54, 2021.
19. Vidhi Zala, Robert M. Kirby and Akil Narayan, "Structure-preserving function approximation via convex optimization", *SIAM Journal on Scientific Computing*, Volume 42, Issue 5, pages A3006-A3029, 2020.
20. W. Xing, M. Razi, R.M. Kirby, K. Sun and A.A. Shah, "Greedy Nonlinear Autoregression For Multifidelity Computer Models at Different Scales", *Energy and AI*, Volume 1, 100012, 2020.
21. David Moxey, Roman Amici and Robert M. Kirby, "Efficient Matrix-Free High-Order Finite Element Evaluation For Simplicial Elements", *SIAM Journal on Scientific Computing*, Volume 42, Issue 3, pages C97-C123, 2020.

22. Harsh Bhatia, Robert M. Kirby, Valerio Pascucci and Peer-Timo Bremer, “Vector Field Decompositions using Multiscale Poisson Kernel”, *IEEE Transactions on Visualization and Computer Graphics*, doi: 10.1109/TVCG.2020.2984413, 2020.
23. Vahid Keshavarzzadeh, Robert M. Kirby and Akil Narayan, “Stress-Based Topology Optimization under Uncertainty via Simulation-Based Gaussian Process”, *Computer Methods in Applied Mechanics and Engineering*, Volume 365, 112992, 2020.
24. M. Razi, A. Narayan, R.M. Kirby and D. Bedrov, “Force-Field Coefficient Optimization of Coarse-Grained Molecular Dynamics Models with a Small Computational Budget”, *Computational Materials Science*, Volume 176, 109518, 2020.
25. Wei Xing, Shireen Y. Elhabian, Vahid Keshavarzzadeh and Robert M. Kirby, “Shared-GP: Learning Interpretable Shared ‘Hidden’ Structure Across Data Spaces for Design Space Analysis and Exploration”, *Journal of Mechanical Design*, Volume 142, Issue 8, 081707, 2020.
26. David Moxey, Chris D. Cantwell, Yan Bao, Andrea Cassinelli, Giacomo Castiglioni, Sehun Chun, Emilia Juda, Ehsan Kazemi, Kilian Lackhove, Julian Marcon, Giancarlo Mengaldo, Douglas Serson, Michael Turner, Hui Xu, Joaquim Peiro, Robert M. Kirby and Spencer J. Sherwin, “*Nektar++*: enhancing the capability and application of high-fidelity spectral/*hp* element methods”, *Computer Physics Communications*, Volume 249, 107110, 2020.
27. Yanyan He, John Chilleri, Stephen O’Leary, Michael Shur and Robert M. Kirby, “Sensitivity Analysis for an Electron Transport System: Application to the Case of Wurtzite Gallium Nitride”, *Journal of Computational Electronics*, Volume 19, pages 103-110, 2020.
28. Vahid Keshavarzzadeh, Akil Narayan and Robert M. Kirby, “Generation of Nested Quadrature Rules for Generic Weight Functions via Numerical Optimization: Application to Sparse Grids”, *Journal of Computational Physics*, Volume 400, 108991, 2020.
29. Ashok Jallepalli, Joshua A. Levine and Robert M. Kirby, “The effect of data transformation methodologies on the topological analysis of high-order FEM solutions”, *IEEE Transactions on Visualization and Computer Graphics (IEEE Visualization Issue)*, Volume 26, Issue 1, pages 162-172, 2020.
30. Martin Vymazal, David Moxey, Chris D. Cantwell, Spencer J. Sherwin and Robert M. Kirby, “On weak Dirichlet boundary conditions for elliptic problems in the continuous Galerkin method”, *Journal of Computational Physics*, Volume 394, pages 732-744, 2019.
31. Ashok Jallepalli and Robert M. Kirby, “Efficient Algorithms for the Line-SIAC Filter”, *Journal of Scientific Computing*, Volume 80, pages 743-761, 2019.
32. Vahid Keshavarzzadeh, Robert M. Kirby and Akil Narayan, “Convergence Acceleration for Time-Dependent Parametric Multifidelity Models”, *SIAM Journal on Numerical Analysis*, Volume 57, Number 3, pages 1344–1368, 2019.
33. Vahid Keshavarzzadeh, Robert M. Kirby and Akil Narayan, “Parametric Topology Optimization with Multi-Resolution Finite Element Models”, *International Journal on Numerical Methods in Engineering*, Volume 119, Issue 7, pages 567-589, 2019.
34. Xiaozhou Li, Jennifer K. Ryan, Robert M. Kirby, Kees Vuik, “Smoothness-Increasing Accuracy-Conserving (SIAC) Filtering for Discontinuous Galerkin Solutions over Nonuniform Meshes: Superconvergence and Optimal Accuracy”, *Journal of Scientific Computing*, Volume 81, pages 1150-1180, 2019.
35. Daniel J. Perry, Robert M. Kirby, Akil Narayan and Ross Whitaker, “Allocation Strategies for High Fidelity Models in the Multifidelity Regime”, *SIAM Journal on Uncertainty Quantification*, Volume 7, Number 1, pages 203–231, 2019.
36. Mani Razi, Robert M. Kirby and Akil Narayan, “Fast Predictive Multi-fidelity Prediction with Models of Quantized Fidelity Levels”, *Journal of Computational Physics*, Volume 376, pages 992–1008, 2019.

37. Ashok Jallepalli, Robert Haimes and Robert M. Kirby, “Adaptive Characteristic Length for L-SIAC Filtering of FEM Data”, *Journal of Scientific Computing*, Volume 79, pages 542-563, 2019.
38. David Moxey, Shankar P. Sastry and Robert M. Kirby, “Interpolation error bounds for curvilinear finite elements and their implications on adaptive mesh refinement”, *Journal of Scientific Computing*, Volume 78, Issue 2, pages 1045–1062, 2019.
39. Varun Shankar, Akil Narayan and Robert M. Kirby, “RBF-LOI: Augmenting Radial Basis Functions (RBFs) with Least Orthogonal Interpolation (LOI) for Solving PDEs on Surfaces”, *Journal of Computational Physics*, Volume 373, pages 722–735, 2018.
40. Mani Razi, Ren Wang, Yanyan He, Robert M. Kirby and Luca Dal Negro, “Optimization of Large-Scale Vogel Spiral Arrays of Plasmonic Nanoparticles”, *Plasmonics*, Volume 14, Issue 1, pages 253-261, 2019.
41. Varun Shankar, Robert M. Kirby and Aaron Fogelson, “Robust Node Generation For Meshfree Discretizations on Irregular Domains and Surfaces”, *SIAM Journal on Scientific Computing*, Volume 40, Issue 4, pages A2584–A2608, 2018.
42. Timbwaoga Ouermi, Robert M. Kirby and Martin Berzins, “Performance Optimization Strategies for WRF Physics Schemes Used in Weather Modeling”, *International Journal of Networking and Computing*, Volume 8, Number 2, pages 301–327 , 2018.
43. Anindya Bharuri, Yanyan He, Michael D. Sheilds, Lori Graham-Brady and Robert M. Kirby, “Stochastic collocation approach with adaptive mesh refinement for parametric uncertainty analysis”, *Journal of Computational Physics*, Volume 371, pages 732–750, 2018.
44. M. Razi, A. Narayan, R.M. Kirby and D. Bedrov, “Fast Predictive Models Based on Multi-fidelity Sampling of Properties in Molecular Dynamics Simulations”, *Computational Material Science*, Volume 152, pages 125–133, 2018.
45. Vahid Keshavarzzadeh, Robert M. Kirby and Akil Narayan, “Numerical Integration in Multiple Dimensions With Designed Quadrature”, *SIAM Journal on Scientific Computing*, Vol. 40, Number 4, pages A2033-A2061, 2018.
46. Vidhi Zala, Varun Shankar, Shankar P. Sastry and Robert M. Kirby, “Curvilinear Mesh Adaptation using Radial Basis Function Interpolation and Smoothing”, *Journal of Scientific Computing*, Volume 77, Issue 1, pages 397–418, 2018.
47. Y. He, M. Razi, C. Forestiere, L. Dal Negro and R.M. Kirby, “Uncertainty Quantification Guided Robust Design for Nanoparticles’ Morphology”, *Computer Methods in Applied Mechanics and Engineering*, Volume 336, pages 578–593, 2018.
48. Marc Rautenhaus, Michael Böttinger, Stephan Siemen, Robert Hoffman, Robert M. Kirby, Mahsa Mirzargar, Niklas Röber and Rüdiger Westermann, “Visualization in Meteorology – A Survey of Techniques and Tools for Data Analysis Tasks”, *IEEE Transactions on Visualization and Computer Graphics*, Volume 24, Issue 12, pages 3268-3296, 2018.
49. Mahsa Mirzargar, Ashok Jallepalli, Jennifer K. Ryan and Robert M. Kirby, “Hexagonal Smoothness-Increasing Accuracy-Conserving Filtering”, *Journal of Scientific Computing*, Volume 73, Issues 2–3, pages 1072 – 1093, 2017.
50. Ashok Jallepalli, Julia Docampo-Sanchez, Jennifer K. Ryan, Robert Haimes and Robert M. Kirby, “On the Treatment of Field Quantities and Elemental Continuity in FEM Solutions”, *IEEE Transactions on Visualization and Computer Graphics (IEEE Visualization Issue)*, Volume 24, Issue 1, pages 903 – 912, 2017.
51. Julia Docampo-Sanchez, Jennifer K. Ryan, Mahsa Mirzargar and Robert M. Kirby, “Multi-dimensional filtering: Reducing the dimension through rotation”, *SIAM Journal on Scientific Computing*, Volume 39, Number 5, pages A2179–2200, 2017.

52. Chris Gritton, James Guilkey, Justin Hooper, Dmitry Bedrov, Robert M. Kirby and Martin Berzins, “Using the material point method to model chemical/mechanical coupling in the deformation of a silicone anode”, *Modelling and Simulation in Materials Science and Engineering*, Volume 25, Number 4, 2017.
53. David Moxey, Chris D. Cantwell, Robert M. Kirby and Spencer J. Sherwin, “Optimizing the Performance of the Spectral/hp Element Method With Collective Linear Algebra Operations”, *Computer Methods in Applied Mechanics and Engineering*, Volume 310, pages 628–645, 2016.
54. Mukund Raj, Mahsa Mirzargar, Robert Ricci, Robert M. Kirby and Ross T. Whitaker, “Path Boxplots: A Method for Characterizing Uncertainty in Path Ensembles on a Graph”, *Journal of Computational and Graphical Statistics*, Volume 26, Issue 2, pages 243–252, 2016.
55. Carlo Forestiere, Yanyan He, Ren Wang, Robert M. Kirby and Luca Dal Negro, “Inverse Design of Metal Nanoparticles’ Morphology”, *ACS Photonics*, Volume 3, Issue 1, pages 68–78, 2016.
56. 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*, Volume 2, Issue 2, pages 99–115, 2017.
57. 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*, Volume 5, pages 433–451, 2016.
58. 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*, Volume 294, pages 275–296, 2016.
59. 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*, Volume 67, Issue 1, pages 237–261, 2016.
60. 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*, Volume 67, Issue 1, pages 192–220, 2016.
61. 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.
62. 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*, Volume 79, Issue 10, pages 536–557, 2015.
63. Mukund Raj, Mahsa Mirzargar, Robert M. Kirby and Ross T. Whitaker, “Evaluating Alignment of Shapes by Ensemble Visualization”, *IEEE Computer Graphics and Applications*, Volume 36, Issue 3, pages 60–71, 2016.
64. 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*, Volume 192, pages 205–219, 2015.
65. 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*, Volume 64, Issue 3, pages 773–817, 2015.
66. 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.
67. 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.

68. 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.
69. 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.
70. 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.
71. 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.
72. 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.
73. 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.
74. 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.
75. 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.
76. 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.
77. Zhisong Fu, Robert M. Kirby and Ross T. Whitaker, “A Fast Iterative Method for Solving the Eikonal Equation on Tetrahedral Domains”, *SIAM Journal on Scientific Computing*, Vol. 35, No. 5, pages C473-C494, 2013.
78. 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.
79. Tiago Etienne, 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.
80. 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.
81. 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.
82. 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.

83. 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.
84. 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 on Scientific Computing*, Vol. 35, No. 1, pages 212-230, 2013.
85. 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.
86. 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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1. Shibo Li, Zheng Wang, Akil Narayan, Robert M. Kirby and Shandian Zhe, “Meta-Learning with Adjoint Methods”, The 26th International Conference on Artificial Intelligence and Statistics (AISTATS 2023), Palau de Congressos, Valencia, Spain, April 25-27, 2023.
2. Shibo Li, Zheng Wang, Robert Kirby and Shandian Zhe, “Infinite-Fidelity Coregionalization for Physical Simulation”, The 36th Annual Conference on Neural Information Processing Systems (NeurIPS 2022), New Orleans, LA, November 26-December 4, 2022.
3. Shibo Li, Jeff Phillips, Xin Yu, Robert M. Kirby and Shandian Zhe, “Batch Multi-Fidelity Active Learning with Budget Constraints”, The 36th Annual Conference on Neural Information Processing Systems (NeurIPS 2022), New Orleans, LA, November 26-December 4, 2022.

4. Tan M. Nguyen, Richard G. Baraniuk, Robert M. Kirby, Stanley J. Osher and Bao Wang, “Momentum Transformer: Closing the Performance Gap Between Self-attention and Its Linearization”, Mathematical and Scientific Machine Learning (MSML 2022), Beijing, China, August 13-21, 2022.
5. De Long, Zheng Wang, Aditi Krishnapriyan, Robert M. Kirby, Shandian Zhe and Michael W. Mahoney, “AutoIP: A United Framework to Integrate Physics into Gaussian Processes”, The 39th International Conference on Machine Learning (ICML 2022), Baltimore, Maryland, July 17-23, 2022.
6. Shikai Fang, Akil Narayan, Robert M. Kirby and Shandian Zhe, “Bayesian Continuous-Time Tucker Decomposition”, The 39th International Conference on Machine Learning (ICML 2022), Baltimore, Maryland, July 17-23, 2022.
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9. Zheng Wang, Wei Xing, Robert M. Kirby and Shandian Zhe, “Physics-Informed Deep Kernel Learning”, The 25th International Conference on Artificial Intelligence and Statistics (AISTATS 2022), Virtual-only Conference, March 28-30, 2022.
10. Han Tran, Milinda Fernando, Kumar Saurabh, Baskar Ganapathysubramanian, Robert M. Kirby and Hari Sundar, “A Scalable Adaptive-Matrix Solver for Heterogeneous Architectures”, The 36th International Parallel & Distributed Processing Symposium (IPDPS 2022), Lyon, France, May 30 - June 3, 2022.
11. Aditi S. Krishnapriyan, Amir Gholami, Shandian Zhe, Robert M. Kirby and Michael W. Mahoney, “Characterizing possible failure modes in physics-informed neural networks”, The 35th Conference on Neural Information Processing Systems (NeurIPS 2021), Virtual-only Conference, December 6-14, 2021.
12. Shibo Li, Robert M. Kirby and Shandian Zhe, “Batch Multi-Fidelity Bayesian Optimization with Deep Auto-Regressive Networks”, The 35th Conference on Neural Information Processing Systems (NeurIPS 2021), Virtual-only Conference, December 6-14, 2021.
13. Harsh Bhatia, Steve N. Petruzza, Rushil Anirudh, Attila G. Gyulassy, Robert M. Kirby, Valerio Pascucci and Peer-Timo Bremer, “Data-Driven Estimation of Temporal-Sampling Errors in Unsteady Flows”, The 16th International Symposium on Visual Computing (ISVC21), Virtual-only Conference, October 4-6, 2021.
14. Shikai Fang, Robert M. Kirby and Shandian Zhe, “Bayesian Streaming Sparse Tucker Decomposition”, The 37th Conference on Uncertainty in Artificial Intelligence (UAI2021), Virtual-only Conference, July 27-30, 2021.
15. Zheng Wang, Wei Xing, Robert M. Kirby, and Shandian Zhe, “Multi-Fidelity High-Order Gaussian Processes for Physical Simulation”, The 24th International Conference on Artificial Intelligence and Statistics (AISTATS 2021), Virtual-only Conference, April 13-15, 2021.
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43. 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.
44. 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.
45. R. Whitaker, R.M. Kirby, J. Sintra and M. Meyer, “Multimaterial Meshing of MRI Head Data for Bioelectric Field Simulation”, Proceedings of the 17th International Meshing Roundtable, 2008.
46. 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.
47. 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.
48. 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.
49. 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.

50. 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.
51. 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.
52. 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.
53. 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.
54. 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.
55. 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.
56. 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.
57. 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.
58. 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.
59. 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.
60. 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.
61. 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.
62. 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.
63. 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.
64. 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.

65. 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.
66. 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.
67. 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.
68. 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 Etienne, 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. Timbwaoga Ouermi, Robert M. Kirby and Martin Berzins, “Performance Optimization Techniques for Accelerating WRF Physics Codes on Intel Micro-Architectures, IXPUG Fall 2018 Meeting, September 25-28, 2018.
2. Timbwaoga Ouermi, Martin Berzins and Robert M. Kirby, “Optimization Strategies for WSM6 on KNL”, IXPUG Fall 2017 Meeting, September 26-28, 2017.
3. Mary Hall, Robert M. Kirby, Feifei Li, Miriah Meyer, Valerio Pascucci, Jeff M. Phillips, Rob Ricci, Jacobus Van der Merwe and Suresh Venkatasubramanian, “Rethinking Abstractions for Big Data: Why, Where, How, and What”, arXiv:1306.3295v1, 2013.
4. (Invited) Tiago Etienne, 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.
5. 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) Nektar++ Workshop 2022. Presented a talk entitled: “Nektar ++: Utah Library-Level Updates”, September 2022.
2. (Speaker) Nektar++ Workshop 2021. Presented a talk entitled: “Nektar ++: Utah Library-Level Updates”, December 2021.
3. (Speaker) Department of Materials Engineering, Shanghai University. Presented a talk entitled: “Simulation and Data Science Applied to Material Design: Developing Better Designs and Better Designers”, October 2021.
4. (Speaker) 2019 High-Order Methods and Its Applications Workshop, Yonsei University. Presented a talk entitled: “Allocation Strategies and Applications for High Fidelity Models in the Multifidelity Regime”, December 2019.
5. (Speaker) 2019 High-Order Methods and Its Applications Workshop, Yonsei University. Presented a talk entitled: “Challenges and insights from the application of spectral/hp methods to problems in computation medicine”, December 2019.
6. (Speaker) International Symposium on High-Fidelity Computational Methods & Applications. Presented a talk entitled: “Challenges and insights from the application of spectral/hp methods to problems in computation medicine”, December 2019.
7. (Speaker) Department of Mathematics, Beihang University (Beijing). Presented a two-part talk with titles “SCI Institute Overview” and “Allocation Strategies and Applications for High Fidelity Models in the Multifidelity Regime”, December 2019.
8. (Speaker) Oden Institute, University of Texas at Austin. Presented a talk entitled: “Challenges and insights from the application of spectral/hp methods to problems in computation medicine”, September 2019.
9. (Speaker) Halliburton Innovation Forum & Expo (LIFE) Conference. Presented a talk entitled “Artificial Intelligence (AI) or Intelligence Augmentation (IA)? How to produce not only better engineering designs but better designers”, August 2019.
10. (Speaker) Joint Statistics Meeting Panel on Better Deciding Through Discretization: The State of the Art in Uncertainty Visualization. Presented a talk entitled: “Uncertainty Displays for Helping Engineers Make Better Decisions”, August 2019.
11. (Speaker) Nektar++ Workshop 2019. Presented a talk entitled: “Nektar ++: Library and Developer Guide Overview”, June 2019.
12. (Speaker) Salt Lake City Work & Faith Forum. Presented a talk entitled: “Uncertainty Quantification and Its Role in Materials By Design”, June 2019.
13. (Speaker) Schloss Dagstuhl Seminar on Material Science and Visualization, Germany. Presented a talk entitled “Uncertainty Quantification and Its Role in Materials By Design”, April 2019.
14. (Speaker) California Institute of Technology (Caltech). Presented a talk entitled: “The Role of Quantification and Visualization of Uncertainty in the Engineering Design Process”, March 2019.
15. (Speaker) Ohio State University. Presented a talk entitled: “Challenges and insights from the application of spectral/hp methods to problems in computation medicine”, January 2019.
16. (Speaker) University of Colorado Boulder. Presented a talk entitled: “Challenges and insights from the application of spectral/hp methods to problems in computation medicine”, November 2018.

17. (Speaker) Brown University, Providence, RI. Presented a talk entitled: “Allocation Strategies and Applications for High Fidelity Models in the Multifidelity Regime”, March 2018.
18. (Speaker) Nektar++ Workshop 2017. Presented a talk entitled: “Nektar ++: Overview”, June 2017.
19. (Speaker) University of Colorado Boulder. Presented a talk entitled: “The Role of Quantification and Visualization of Uncertainty in the Engineering Design Process”, April 2017.
20. (Speaker) International Conference on Spectral and High-Order Methods (ICOSAHOM) 2016, Rio de Janeiro, Brazil. Presented a talk entitled: “Nektar++: Design and Implementation of Spectral/hp Methods to Achieve h-to-p Efficiently”, June 2016.
21. (Speaker) Army Research Laboratory Distinguished Lecture Series. Presented a talk entitled: “Uncertainty Quantification and Its Role in Materials By Design”, June 2016.
22. (Speaker) Fraunhofer MeVis, Bremen, Germany. Presented a talk entitled: “Ensemble Visualization and Uncertainty Characterization Using Generalized Notions of Data Depth”, April 2016.
23. (Speaker) Technical University Munich, Germany. Presented a talk entitled: “Lessons Learned From The SIAM UQ Conference 2016”, April 2016.
24. (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.
25. (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.
26. (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.
27. (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.
28. (Speaker) National Hurricane Center, Florida International University. Presented a talk entitled: “Ensemble Visualization and Uncertainty Characterization Using Generalized Notions of Data Depth”, October 2015.
29. (Speaker) Nektar++ Workshop 2015. Presented a talk entitled: “Nektar ++: A look into the future”, July 2015.
30. (Speaker) 2015 MACH Conference (Annapolis, MD). Presented a talk entitled: “Surrogate-Based Bayesian Model Ranking of Atomistic Models”, April 2015.
31. (Speaker) Technical University Munich, Germany. Presented a talk entitled: “Sensitivity Analysis and Its Relation to UQ”, January 2014.
32. (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.
33. (Speaker) Schloss Dagstuhl Seminar on Scientific Visualization, Germany. Presented a talk entitled “Lessons Learned in the Search for ‘Verifiable Visualization’”, June 2014.
34. (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.
35. (Speaker) 2014 MACH Conference (Annapolis, MD). Presented a talk entitled: “Uncertainty-aware multi scale modeling of atomic systems”, March 2014.

36. (Speaker) Technical University Munich, Germany. Presented a talk entitled: “Contour Boxplots: A Method for Characterizing Uncertainty in Feature Sets from Simulation Ensembles”, March 2014.
37. (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.
38. (Speaker) School of Computing, Clemson University. Presented a talk entitled: “Lessons Learned in the Search for ‘Verifiable Visualizations’”, October 2013.
39. (Speaker) Fraunhofer MeVis, Bremen, Germany. Presented a talk entitled: “Lessons Learned in the Search for ‘Verifiable Visualizations’”, June 2013.
40. (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.
41. (Speaker) 2013 MACH Conference (Annapolis, MD). Presented a talk entitled: “VVUQ: A Tutorial on Validation, Verification and Uncertainty Quantification”, April 2013.
42. (Speaker) 51st AIAA Aerospace Sciences Meeting. Presented a talk entitled: “Widening Verification to Include Visualization: Expanding the Simulation Science Pipeline”, January 2013.
43. (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.
44. (Speaker) Department of Computer Science, NYU-Poly. Presented a talk entitled: “Visualization of High-Order Finite Element Methods”, August 2012.
45. (Speaker) Department of Computer Science, University of Minnesota. Presented a talk entitled: “Visualization of High-Order Finite Element Methods”, July 2012.
46. (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.
47. (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.
48. (Speaker) Division of Applied Mathematics, Brown University. Presented a talk entitled “Turning the V&V Lens Towards Visualization Techniques”, October 2011.
49. (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.
50. (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.
51. (Speaker) Schloss Dagstuhl Seminar on Scientific Visualization, Germany. Presented a talk entitled “Verifiable Visualization”, June 2009.
52. (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.
53. (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.

54. (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.
55. (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.
56. (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.
57. (Speaker) Maths Institute, Imperial College London, United Kingdom. Presented a Leverhulme Lecture entitled “Computational Methods for Quantifying Uncertainty in Biological Modelling”, February 2009.
58. (Speaker) School of Computing, University of Leeds, United Kingdom. Presented a Leverhulme Lecture entitled “Computational Methods for Quantifying Uncertainty in Biological Modelling”, February 2009.
59. (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.
60. (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.
61. (Speaker) Department of Mathematics, University of Reading, United Kingdom. Presented a sabbatical talk entitled “Analysis-Guided Improvements of the Material Point Method”, November 2008.
62. (Speaker) School of Mathematics, University of Edinburgh, United Kingdom. Presented a sabbatical talk entitled “Computational Methods for Quantifying Uncertainty in Biological Modelling”, October 2008.
63. (Speaker) Department of Applied Mathematics, Technical University Delft, The Netherlands. Presented a talk entitled “Visualization of High-Order Finite Element Methods”, August 2008.
64. (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.
65. (Speaker) Intelligent Visualization and Simulation Lab, University of Kaiserslautern, Germany. Presented a talk entitled “Visualization of High-Order Finite Element Methods”, June 2008.
66. (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.
67. (Speaker) School of Computing, University of Leeds (UK). Presented a talk entitled “Simulation Science: The Modeling of Real-World Problems”, July 2007.
68. (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.
69. (Speaker) Institute for Numerical Simulation, University of Bonn, Germany. Presented a talk entitled “Simulation Science: The Modeling of Real-World Problems”, April 2007.
70. (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.
71. (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.

72. (Speaker) Department of Mathematics, Virginia Tech. Presented a talk entitled “Simulation Science: The Modeling of Real-World Problems”, March 2006.
73. (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.
74. (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.
75. (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.
76. (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.
77. (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.
78. (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 of the CFD Society of Canada*, Saskatoon, Saskatchewan, Canada, June 12-13, 2008.

Conference Abstracts, Publications and Presentations:

1. (Speaker) Robert M. Kirby, “Advancing High-Order Methods Toward Being Common Practice”, Workshop on computational methods for simulation science, uncertainty quantification and physics-informed machine learning, MIT, September 2019.
2. Mani Razi, Robert M. Kirby and Akil Narayan, “Hierarchical Construction of Predictive Models for Incompressible Fluid Flows Using Turbulence Models of Different Fidelity Levels”, *15th US National Congress on Computational Mechanics (USNCCM’15)*, July 2019.
3. Vahid Keshavarzzadeh, Robert M. Kirby and Akil Narayan, “Emerging Topology and Shape Optimization Techniques in Computational Materials”, *15th US National Congress on Computational Mechanics (USNCCM’15)*, July 2019.
4. Shandian Zhe and Robert M. Kirby, “Multi-Fidelity Nonlinear Coregionalization for Physical Simulations”, Research Challenges and Opportunities at the Interface of Machine Learning and Uncertainty Quantification, July 2019.
5. Vidhi Zala, Akil Narayan and Robert M. Kirby, “Towards positivity, monotonicity and boundedness preservation characteristics of polynomial projections using constrained optimization approach”, *The Mathematics of Finite Elements and Applications (MAFELAP) 2019*, June 2019.
6. (Speaker) SIAM CS&E Meeting, Spokane, WA. Presented a talk entitled: “SIAC Filtering for Visualization and Feature Detection”, February 2019.
7. Dave Moxey, Roman Amici and Robert M. Kirby, “Vectorisation for High-order Simplicial Elements”, SIAM CS&E Meeting, Spokane WA, February 2019.

8. Varun Shankar, Grady Wright and Robert M. Kirby, “RBF-FD for PDEs on Manifolds: Stable and Stagnation-free Formulations”, SIAM CS&E Meeting, Spokane WA, February 2019.
9. (Speaker) International Conference on Spectral and High-Order Methods (ICOSAHOM) 2018, London, UK. Presented a talk entitled: “SIAC Filtering for Visualization and Feature Detection”, July 2018.
10. Chris Cantwell, David Moxey, Michael Turner, Martin Vymazal, Douglas Serson, Joaquim Peiró, Robert M. Kirby and Spencer Sherwin, “Nektar++: Latest advancements for large-scale simulations on complex geometries”, International Conference on Spectral and High-Order Methods (ICOSAHOM) 2018, London, UK, July 2018.
11. Martin Vymazal, David Moxey, Chris Cantwell, Robert M. Kirby and Spencer Sherwin, “On a mixed CG-HDG formulation for high-order simulations”, International Conference on Spectral and High-Order Methods (ICOSAHOM) 2018, London, UK, July 2018.
12. Mahsa Mirzargar, Ashok Jallepalli, Jennifer K. Ryan and Robert M. Kirby, “Hexagonal Smoothness-Increasing Accuracy-Conserving Filtering”, International Conference on Spectral and High-Order Methods (ICOSAHOM) 2018, London, UK, July 2018.
13. (Speaker) Robert M. Kirby and Akil Narayan, “Time Discretization Bi-fidelity Modeling”, SIAM UQ Meeting, Garden Grove, CA, April 2018.
14. (Speaker) Robert M. Kirby, Chris Cantwell, Martin Vymazal, David Moxey, Jan Eichstaedt, Michael Turner and Spencer Sherwin, “Porting the Spectral/hp Element Framework Nektar++ to Kokkos”, SIAM CS&E Meeting, Atlanta, GA, March 2017.
15. D. Moxey, C. Cantwell, S.J. Sherwin and R.M. Kirby, “h-to-p efficiently: the use of collections with accelerators within Nektar++”, SIAM CS&E Meeting, Atlanta, GA, March 2017.
16. Martin Vymazal, David Moxey, Spencer Sherwin, Robert M. Kirby and Chris Cantwell, “Towards combined CG-DG for elliptic problems”, SIAM CS&E Meeting, Atlanta, GA, March 2017.
17. (Speaker) Robert M. Kirby, Hari Sundar and Spencer J. Sherwin, “h-to-p Efficiently: Solving HDG Systems Via AMG Within the Nektar++ Framework”, SIAM Annual Meeting, Boston, MA, July 2016.
18. (Speaker) Robert M. Kirby, Mahsa Mirzargar and Jennifer K. Ryan, “Revisiting Accuracy Preserving Properties of SIAC Filtering From An Approximation Perspective”, MAFELAP, Brunel University (UK), June 2016.
19. 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.
20. 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.
21. 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.
22. 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.
23. 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.
24. 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.
25. 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.

26. (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.
27. 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.
28. 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.
29. (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.
30. (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.
31. 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.
32. (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.
33. 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.
34. (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.
35. (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.
36. (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.
37. 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.
38. 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.
39. 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.
40. 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.
41. 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.

42. 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.
43. 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.
44. (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.
45. (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.
46. (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.
47. (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.
48. 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.
49. (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.
50. (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.
51. (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.
52. (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.
53. (Speaker) Robert M. Kirby and Ganesh Gopalakrishnan, "Building Symbiotic Relationships Between Formal Verification and High Performance Computing", SIAM Conference on Parallel Processing, February 2006.
54. 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.
55. 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.
56. 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.
57. 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.

58. 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.
59. 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.
60. (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.
61. (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.
62. (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.
63. (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.
64. 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).
65. 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.
66. 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.
67. (Speaker) Robert M. Kirby and Jan S. Hesthaven, “Filtering in Legendre spectral methods”, International Conference on Spectral and High-Order Methods, June 2004.
68. 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.
69. (Speaker) R.M. Kirby, “Flux Choices for Parabolic/Elliptic Problems: Algorithms and Applications”, 7th U.S. National Conference on Computational Mechanics, August 2003.
70. 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.
71. (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 graduate course CS 6210: Scientific and Data Computing I, Fall 2018, School of Computing, University of Utah.
- Taught the undergraduate course COMP 1020: Programming for All 2: Extended Applications, Spring 2018, School of Computing, University of Utah.
- Taught the graduate course CS 6210: Scientific and Data Computing I, Fall 2017, School of Computing, University of Utah.
- Taught the graduate course CS 6220: Advanced Scientific Computing II, Spring 2016, School of Computing, University of Utah.
- 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:

- Jarom Hogue, Ph.D. (Applied Mathematics, Arizona State University), Post-Doc, Spring 2021 – present.

Former Mentoring:

- Ehsan Adeli, Ph.D. (Computational Engineering, Technische Universität), Post-Doc, Spring 2020 – Fall 2020.
- Linh Ha, PhD (Computer Science, Utah). Post-Doc, Fall 2011 – Spring 2012.
- Yanyan He, PhD (Mathematics, Florida State University). Post-Doc, Spring 2014 – Summer 2016.

- Mahsa Mirzargar, PhD (Computer Science, University of Florida). Post-Doc, Fall 2012 – Summer 2016.
- Hadi Meidani, PhD (Civil Engineering, University of Southern California). Post-Doc, Summer 2013 – Summer 2014.
- Mani Razi (Aerospace Engineering, University of Oklahoma). Post-Doc, Fall 2016 – Fall 2019.
- Shankar Sastry, PhD (Computer Science, Penn State University). Post-Doc, Fall 2012 – Spring 2015.
- Vahid Keshavarzzadeh (Structural Engineering, University of Southern California), Spring 2017 – Spring 2022.
- Wei Xing (Computer Science and Mathematics, Warwick University). Post-Doc, Fall 2017 – Spring 2020.
- Songzhe Xu (Mechanical Engineering, Iowa State University). Post-Doc, Summer 2019 – Spring 2020.
- Sergey Yakovlev, PhD (Mathematics, RPI). Post-Doc, Fall 2013 – Fall 2014.

Graduate Student Advising:

Current Student Advising:

- Madison Cooley, Seeking PhD in Computer Science (co-advised with Shandian Zhe)
- Shikai Fang, Seeking PhD in Computer Science (co-advised with Shandian Zhe)
- Tushar Gautam, Seeking MS in Computing (co-advised with Shandian Zhe)
- Michael Penwarden, Seeking PhD in Computing

Graduated Students:

- Roman Amici, M.S. degree in Computer Science, University of Utah, August 2020.
- 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.
- Kyli McKay-Bishop, M.S. degree in Computer Science, University of Utah, August 2020. Co-advised with Professor Shireen Elhabian.
- James Brissette, M.S. degree in Computing, University of Utah, August 2020.
- Ken Farnsworth, M.S. degree in Computational Engineering and Science, University of Utah, December 2008.
- Max Carlson, PhD degree in Computing, University of Utah, August 2022. Co-advised with Professor Hari Sundar.
- 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.
- Ashok Jallepalli, Ph.D. degree in Computing, University of Utah, August 2020.
- James King, Ph.D. degree in Computing, University of Utah, May 2016.
- 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.
- M.S. Srivatsa, M.S. degree in Computer Science, University of Utah, May 2016.
- 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.
- Harshitha Venkata, M.S. degree in Computer Science, University of Utah, May 2016.
- 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.
- Vidhi Zala, Ph.D. degree in Computer Science, University of Utah, 2021.

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 Etienne, 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 Boonyasirawat, 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:

- *SIAM Journal on Scientific Computing*, 2020 – present.
- *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:

- Paper Committee Member, IEEE Visualization, 2021.
- Conference Co-Chair (with Valerio Pascucci), IEEE Visualization, 2020.
- SciVis Papers Co-Chair, Initiated duties in 2015 for the IEEE Visualization 2016 and 2017 Conferences.
- Organizing Committee and Speaker, Nektar++ Workshop 2017, Imperial College London, London, UK, June 2017.

- Organizing Committee and Speaker, Nektar++ Workshop 2016, Imperial College London, London, UK, June 2016.
- 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 held in June 2014).
- Paper Committee Member, IEEE Visualization, 2014.
- Paper Committee Member, IEEE Visualization, 2013.
- Organizer (with Paul Rosenthal, Robert Laramée and Gordon Kindlmann) of EuroVis Workshop EuroRV², 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)

Interim Director, Scientific Computing and Imaging Institute (2018 – present)

Executive Director, Utah Informatics Initiative (2019 – present)

Community Service:

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

Faculty Mentoring:

Faculty Mentor of Alan Kuntz, Assistant Professor, School of Computing, 2020 – present.

Faculty Mentor of Miriah Meyer, Assistant Professor, School of Computing, 2011 – 2017.

Faculty Mentor of Hari Sundar, Assistant Professor, School of Computing, 2014 – 2020.