

Katherine E. Isaacs

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Education

- 2015 Ph.D., Computer Science, University of California, Davis, Davis, CA USA
- 2011 B.S., Computer Science, San José State University, San José, CA USA
B.A., Mathematics, San José State University, San José, CA USA
- 2001 B.S., Physics, California Institute of Technology, Pasadena, CA USA

Honors and Awards

- 2012 – 2015 US Department of Energy Office of Science Graduate Fellowship (DOE SCGF)
- 2015 Google Anita Borg Memorial Scholarship
- 2014 Facebook Grace Hopper Scholarship
- 2012 National Science Foundation Graduate Research Fellowship (NSF GRFP)
Declined for DOE SCGF
- 2011 – 2012 Graduate Scholars Fellowship, University of California, Davis
- 2011 Hoggatt Award for Outstanding Research Potential, San José State University,
Department of Mathematics
- 2011 Outstanding Graduating Senior, San José State University, Department of
Computer Science
- 2009 Frederick N. Fitting Scholarship, San José State University, College of Science
- 2009 Department Scholarship, San José State University, Department of Computer Science

Journal Publications

- [1] K. E. Isaacs, T. Gamblin, A. Bhatele, M. Schulz, B. Hamann, and P.-T. Bremer. Ordering traces logically to identify lateness in message passing programs. *IEEE Transactions on Parallel and Distributed Systems*, 27(3):829–840, 2016
- [2] K. E. Isaacs, P.-T. Bremer, I. Jusufi, T. Gamblin, A. Bhatele, M. Schulz, and B. Hamann. Combing the communication hairball: Visualizing large-scale parallel execution traces using logical time. *IEEE Transactions on Visualization and Computer Graphics, Proceedings of InfoVis '14*, 20(12):2349–2358, 2014
- [3] E. A. Dinsdale, R. A. Edwards, B. A. Bailey, I. Tuba, S. Akhter, K. McNair, R. Schmieder, N. Apkarian, M. Creek, E. Guan, M. Hernandez, K. Isaacs, C. Peterson, T. Regh, and V. Ponomarenko. Multivariate analysis of functional metagenomes. *Frontiers in Genetics*, 4(41), 2013
- [4] A. G. Landge, J. A. Levine, K. E. Isaacs, A. Bhatele, T. Gamblin, M. Schulz, S. H. Langer, P.-T. Bremer, and V. Pascucci. Visualizing network traffic to understand the performance of massively parallel simulations. *IEEE Transactions on Visualization and Computer Graphics, Proceedings of InfoVis '12*, 18(12):2467–2476, 2012

Conference and Workshop Publications

- [1] K. E. Isaacs, A. Bhatele, J. Lifflander, D. Böhme, T. Gamblin, M. Schulz, B. Hamann, and P.-T. Bremer. Recovering logical structure from Charm++ traces. In *Proceedings of the ACM/IEEE Conference on Supercomputing (SC15)*, SC '15, Nov. 2015

- [2] A. Bhatele, N. Jain, K. E. Isaacs, R. Buch, T. Gamblin, S. H. Langer, and L. V. Kale. Optimizing the performance of parallel applications on a 5D torus via task mapping. In *Proceedings of IEEE International Conference on High Performance Computing, HiPC '14*, Dec. 2014
- [3] C. M. McCarthy, K. E. Isaacs, A. Bhatele, P.-T. Bremer, and B. Hamann. Visualizing the five-dimensional torus network of the IBM Blue Gene/Q. In *Proceedings of the 1st Workshop on Visual Performance Analysis*, pages 24 – 27, Nov. 2014
- [4] K. E. Isaacs, A. Giménez, I. Jusufi, T. Gamblin, A. Bhatele, M. Schulz, B. Hamann, and P.-T. Bremer. State of the art of performance visualization. In *Eurographics/IEEE Conference on Visualization State-of-the-Art Reports*, EuroVis '14, 2014
- [5] A. Bhatele, K. Mohror, S. H. Langer, and K. E. Isaacs. There goes the neighborhood: performance degradation due to nearby jobs. In *Proceedings of the ACM/IEEE Conference on Supercomputing (SC13)*, SC '13, Nov. 2013
- [6] A. Bhatele, T. Gamblin, S. H. Langer, P.-T. Bremer, E. W. Draeger, B. Hamann, K. E. Isaacs, A. G. Landge, J. A. Levine, V. Pascucci, M. Schulz, and C. H. Still. Mapping applications with collectives over sub-communicators on torus networks. In *Proceedings of ACM/IEEE Conference on Supercomputing (SC12)*, SC '12, Nov. 2012
- [7] A. Bhatele, T. Gamblin, K. E. Isaacs, B. T. N. Gunney, M. Schulz, P.-T. Bremer, and B. Hamann. Novel views of performance data to analyze large-scale adaptive applications. In *Proceedings of ACM/IEEE Conference on Supercomputing (SC12)*, SC '12, Nov. 2012
- [8] M. Schulz, A. Bhatele, P.-T. Bremer, T. Gamblin, K. Isaacs, J. A. Levine, and V. Pascucci. Creating a tool set for optimizing topology-aware node mappings. In *5th Parallel Tools Workshop*, Sept. 2011

Extended Abstracts

- [1] K. E. Isaacs, T. Gamblin, A. Bhatele, P.-T. Bremer, M. Schulz, and B. Hamann. Extracting logical structure and identifying stragglers in parallel execution traces. In *Proceedings 19th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming, PPOPP '14*, pages 397–398, 2014
- [2] K. E. Isaacs, A. G. Landge, T. Gamblin, P.-T. Bremer, V. Pascucci, and B. Hamann. Exploring performance data with Boxfish. In *Proceedings of the 2012 SC Companion: ACM/IEEE Conference on Supercomputing, SCC '12*, pages 1380–1381, Nov. 2012

Book Chapters

- [1] M. Schulz, J. Belak, A. Bhatele, P.-T. Bremer, G. Bronevetsky, M. Casa, T. Gamblin, K. E. Isaacs, I. Laguna, J. A. Levine, V. Pascucci, D. Richards, and B. Rountree. Performance analysis techniques for the exascale co-design process. In M. Bader, A. Bode, H.-J. Bungartz, M. Gerndt, G. R. Joubert, and F. Peters, editors, *Parallel Computing: Accelerating Computational Science and Engineering, Proceedings of the International Conference on Parallel Programming, ParCo 2013*, Advances in Parallel Computing, pages 19–32. IOS Press, Mar. 2014
- [2] K. Isaacs, J. Hsieh, and M. Moh. Extending OSPF for MANET routing. In S. Khan, J. Lloret, J. Ortiz, and J. Loo, editors, *Mobile Ad hoc Networks: Current Status and Future Trends*. CRC Press: Taylor and Francis, Auerbach-Publications, 2011

Presentations

- [1] K. Isaacs. The state of the practice of performance visualization. Keynote. 3rd Workshop on Visual Performance Analysis, VPA '16, Salt Lake City, UT, USA, November 18, 2016
- [2] K. Isaacs. Understanding parallel computing through visualization. Computer Science Colloquium, Sonoma State University, November 12, 2015
- [3] K. Isaacs. An organized view of MPI and Charm++ traces. Contributed Talk. 13th Annual Workshop on Charm++ and its Applications, Charm++ Workshop '15, Urbana, IL, USA, May 7, 2015

- [4] K. E. Isaacs. Boxfish: Mapping performance data and visualizations. Invited Talk. Lawrence Berkeley National Laboratory, Berkeley, CA USA, March 26, 2015
- [5] K. E. Isaacs and T. Gamblin. Introduction to performance analysis. Workshop on Visualization and Analysis of Performance on Large-scale Software, Atlanta, Georgia USA, October 14, 2013
- [6] K. Isaacs. A statistical method for environmental prediction in metagenomic samples. Contributed Talk. Joint Math Meetings, San Francisco, California USA, January 14, 2010

Professional Experience

- 2016 – Present Assistant Professor, University of Arizona, Department of Computer Science
Interests: Information Visualization, High Performance Computing

- Summer 2015 Software Engineering Intern, Facebook
Team: Data Science Infrastructure, Decision Tools

- Summer 2011 Computation Intern, Lawrence Livermore National Laboratory
& Summer 2012 Supervisor: Dr. Peer-Timo Bremer
Research topic: Visualization of communication performance data

- 9/2009 – 9/2010 Undergraduate Researcher, Department of Computer Science, San José State University
Supervisor: Professor Melody Moh
Research topic: Routing algorithms for mobile ad-hoc networks

- Fall 2009 Research Team Leader, Department of Mathematics, San José State University
Supervisor: Professor Martina Bremer
Research topic: Linear state space models to detect avionics failures

- Summer 2009 Research Fellow, Department of Mathematics, San Diego State University
Supervisor: Professor Imre Tuba
Research topic: Statistical analysis of metagenome data

- Spring 2008 Undergraduate Researcher, Department of Mathematics, San José State University
Supervisor: Professor Slobodan Simić
Research topic: Gamma ray propagation in discrete spacetime

Professional Activities

- 2015, 2016 Co-Chair, Student Volunteers, IEEE VIS
- Program LDAV 2016, VPA 2016, VISSOFT NIER Track 2016
- Committees
- Reviewer InfoVis 2016, VAST 2016, EuroVis 2016, VISSOFT AEC 2015,
VAST 2015, EuroVis 2015, VMLS 2013
- TPDS
- SC16 BoFs
- Memberships ACM, IEEE CS, IEEE VGTC

Community Involvement

- 2013 – Present Moderator, Student ResearchHers, a Systems technical interest community
- 2015 Organizer, Birds of a Feather: *It's Okay to Fail*, Grace Hopper Celebration
- 2015 Panelist, *Women in Computing Societies at University*, Grace Hopper Celebration
- 2013 – 2015 Instructor, GirlsWhoCode Club, Dougherty Valley High School
- 2011 – 2015 Co-Organizer, Women in Computer Science, University of California, Davis
- 2012 – 2013 Mentor, Women in Science and Engineering (WISE), University of California, Davis
- 2009 – 2011 Events Coordinator, Math Club, San José State University
- Spring 2010 Co-Organizer, Women in Computing Speaker Series, San José State University

Software

- Ravel <http://github.com/scalability-llnl/ravel>
- Boxfish <http://github.com/scalability-llnl/boxfish>