

# Olga Pearce

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## Research Interests

- Scientific simulations, parallel algorithms and programming models, performance modeling and optimization
- System software, network communication, performance measurement tools, performance analysis tools
- HPC architectures, system benchmarking, software sustainability, reproducible benchmarking, continuous benchmarking

## Education

- 2014 **Ph.D., Computer Science**, *Texas A&M University*.  
*Load Balancing Scientific Applications*. Advisor: Prof. Nancy M. Amato, Ph.D.
- 2004 **B.S., Computer Science and Mathematics**, *Western Oregon University*, Magnum Cum Laude.
- 2000 **A.A., Business Administration**, *International Christian University*, Kyiv, Ukraine.

## Awards

- 2024 LLNL WSC award for leading benchmarking for acceptance of El Capitan
- 2023 LLNL WSC award for response to the National Academy of Sciences request for information
- 2022 LLNL WCI award for leading benchmarking for acceptance of Early Access System for El Capitan
- 2021 LLNL WSC award for developing GPU capabilities of the Next Gen multi-physics code, MARBL
- 2020 LLNL WSC award for leading the JOWOG 34 Applied Computer Science (ACS) meeting
- 2019 LLNL WCI award for porting&optimization of codes on LLNL's first accelerated supercomputer
- 2018 LLNL WSC award for developing & applying RAJA performance portability programming model
- 2015 LLNL Deputy Director's Science and Technology award for load balancing scientific simulations
- 2009-2014 LLNL Lawrence Graduate Scholar. *Technical Supervisor*: Bronis R. de Supinski, Ph.D.
- 2006-2009 NSF Graduate Research Fellowship, Texas A&M University
- 2003,2004 Computing Research Association Distributed Mentor Project (DMP)
- 1997 U.S. Department of State Future Leaders Exchange Program; one of 100 recipients nationwide

## Experience

- 2021-present **LLNL**, *Principal Member of Technical Staff (MTS 4)*, Center for Applied Scientific Computing.
- Lead: Benchmarking for procurement and acceptance of LLNL's Advanced Technology Systems (ATS), including El Capitan (sited 2024)
  - Lead: Research and development of **Benchpark**, an open collaborative repository for reproducible specifications of HPC benchmarks on HPC systems, enabling continuous benchmarking
  - Lead: Benchmarking WG in the DOE/MEXT collaboration
  - Lead: **Thicket**, an open source exploratory data analysis (EDA) tool for multi-experiment, multi-architecture, multi-tool parallel perf.data, as part of Performance Analysis and Visualization at Exascale (PAVE) project
  - Lead: Performance modeling thrust of the FRACTALE SI
  - (2018-2024) LLNL application point of contact for CORAL1 and CORAL2 Tools Working Groups
  - (2018-2024) LLNL application POC for CORAL1 and CORAL2 Messaging WGs
  - (2020-2022) Predictive Science Academic Alliance Program (**PSAAP**) Tri-Lab Strategy Team, Center for Understandable, Performant Exascale Communication Systems, University of New Mexico, University of Tennessee at Chattanooga, and University of Alabama at Birmingham
- 2021-present **Texas A&M University, Dept of Computer Sci & Engineering**, *Associate Professor of Practice*, Teaching CSCE 435 Parallel Computing, 400 students over 4 years.

- 2014-2021 **LLNL, Senior Member of Technical Staff (MTS 3), Center for Applied Scientific Computing.**
- Lead: [Hatchet](#), a call-tree based tool for performance analysis, as part of Performance Analysis and Visualization at Exascale (PAVE) project
  - Developed techniques & tools for analyzing & optimizing performance of large scale multiphysics simulations on homogeneous & heterogeneous architectures, e.g., [Caliper](#)
  - Developed techniques and tools for load balancing scientific applications
  - Developed parallel programming models and tools, including [RAJA](#)
  - Developed communication techniques for heterogeneous architectures, exploratory benchmark [Comb](#)
  - Member of the [MPI Hybrid & Accelerator Working Group](#)
- 2009-2014 **LLNL, Lawrence Graduate Scholar.**
- Developed a model for selection of load balancing algorithms for a given simulation state [15]
  - Developed a fast & accurate load balance method for highly non-uniform density N-Body simulations [14]
  - Developed a tool for decoupling & offloading load balance computation, enabling lazy load balancing [13]
- 2004-2009 **Texas A&M University, Department of Computer Science, Research Assistant.**
- Developed distributed data structures, parallel algorithms, and adaptive algorithm selection methods [17] in the Standard Template Adaptive Parallel Library (STAPL), a parallel superset of C++ STL [16, 36, 37]
  - Designed lock-free containers for multi-threaded programming
  - Developed a Dynamic Graph Composition Library for updating graph metrics of large, dynamic graphs
- May-Oct 2007, **LLNL, Research Intern.**
- July-Aug 2008
- Designed techniques to cheaply estimate processor loads and decide when to rebalance a simulation
  - Designed load balancing techniques for multi-physics simulations, including multi-constraint domain repartitioning (data parallelism) and domain replication (task parallelism)

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## Conferences & Workshops Organized

- 2019-Present **Salishan Conf. on High Speed Computing, Co-Chair, LLNL, LANL, Sandia, 180 attendees.**
- 2018-2023 **JOWOG34 Applied Computer Science, Co-Chair, Scalable algo & simulation. 180+ attendees.**
- 2018-2021 **Nuclear Explosives Code Development Conference (NECDC), Co-Chair, 300+ attendees.**
- 2018 **Students@SC Program at ACM/IEEE Supercomputing Conference, Vice-chair, 200+ att.**

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## Student Research Mentoring

- 2024-Present **Advisor, Stephanie Lam, CS Masters, Texas A&M University, HPC and cloud convergence.**
- 2021-Present **Committee member, Daryl Hawkins, NUEN PhD, Texas A&M University, Novel particle transport algorithms. Performance of multi-physics simulations on Cloud/AWS.**
- 2020-Present **Committee member, Connor Scully-Allison, CS PhD, U of Utah, Interactive vis. for [Thicket](#).**
- 2020-Present **Committee member, Ian Lumsden, CS major (PhD), University of Tennessee, Query language for calltrees. HPC I/O for performance.**
- 2019-Present **Committee member, Bengisu Elis, CS PhD, Technical University of Munich, Germany, MPI on heterogeneous architectures. HPC tools.**
- 2022-2024 **Advisor, Michael McKinsey, CS Masters, Texas A&M University, Multi-dimensional data composition for [Thicket](#). Parallel algorithm classification.**
- 2019-2023 **Committee member, Suraj Kesavan, CS PhD, U of California, Davis, Perf. visualization.**

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## Committees

- 2025 **IEEE International Parallel & Distributed Processing Symposium (IPDPS), System s/w.**
- 2024 **ACM/IEEE Supercomputing Conf. (SC), Performance measurement, modeling, and tools.**
- 2023-present **International Workshop on HPC Testing and Evaluation of Systems, Tools, and Software (HPCTESTS) at Supercomputing Conference (SC), Steering Committee.**
- 2023 **IEEE International Parallel & Distributed Processing Symposium (IPDPS), Tech. Papers.**
- 2022 **ACM/IEEE Supercomputing Conference (SC), Area Chair, Progr. Frameworks & System s/w.**
- 2022 **ACM/IEEE Supercomputing Conference, BoF organizer, Benchmarking HPC Architectures.**

- 2022 **Platform for Advanced Scientific Computing (PASC)**, *Area co-chair, CompSci.&Applied Math.*
- 2022 **International Conference on Parallel Processing (ICPP)**, *Area co-chair, Performance.*
- 2021-2022 **Exascale Computing Project (ECP)**, *Software Technology Advisory and Review Team.*
- 2021 **International Conference on Supercomputing (ISC)**, *Chair, Ph.D. Forum.*
- 2021 **International Conference on Supercomputing (ISC)**, *HPC Algos &Apps Papers Committee.*
- 2019-2021 **LLNL**, *Labwide Laboratory Directed Research and Development (LW LDRD) Review Committee.*
- 2020,2021 **IEEE International Parallel & Distributed Processing Symposium (IPDPS)**, *Programming Models and Compilers Track Technical Papers Committee.*
- 2020 **ACM/IEEE Supercomputing Conference (SC)**, *Performance Technical Papers Committee.*
- 2020 **EuroMPI**, *Technical Papers Committee Member.*
- 2019,2020 **IEEE Cluster**, *Programming and System Software Track Technical Papers Committee.*
- 2020 **Journal of Concurrency and Computation**, *Reviewer.*
- 2020 **International Conference on Supercomputing (ISC)**, *Vice-Chair, Ph.D. Forum.*
- 2020 **International Conference on Supercomputing (ISC)**, *Tutorials Review Committee.*
- 2015-2019 **LLNL**, *Computation Directorate representative, Livermore Graduate Scholar Review Committee.*
- 2015,2019 **ACM/IEEE Supercomputing Conference (SC)**, *Research Posters Review Committee.*
- 2019 **LLNL**, *Science and Technology Awards Committee.*
- 2019 **International Conference on Supercomputing (ISC)**, *Ph.D. Forum Committee.*
- 2019 **IEEE International Parallel & Distributed Processing Symposium (IPDPS)**, *Multidisciplin.*
- 2019 **Journal of Signal Processing Systems**, *Reviewer.*
- 2018 **International Conference on Parallel Processing (ICPP)**, *Chair of the Software Track.*
- 2010,2011,2018 **ACM/IEEE Supercomputing Conference (SC)**, *Tutorials Committee.*
- 2018 **IEEE International Conference on Cluster Computing (Cluster)**, *System Software Track.*
- 2018-present **Parallel Computing Journal**, *Reviewer.*
- 2018 **IEEE International Parallel & Distributed Processing Symposium (IPDPS)**, *Progr. Models.*
- 2018 **IEEE/ACM Intl Conf Cluster, Cloud, &Grid Computing (CCGrid)**, *Perf. Modeling & Eval.*
- 2017 **EuroMPI/USA 2017**, *Research Posters Program Committee.*
- 2017 **ACM/IEEE Supercomputing Conference (SC)**, *Perf. Measurement, Modeling, and Tools.*
- 2017 **IEEE International Conference on Cluster Computing (Cluster)**, *Apps, Algos, & Libraries.*
- 2017 **International Conference on Parallel Processing (ICPP)**, *Software.*
- 2017 **IEEE International Parallel & Distributed Processing Symposium (IPDPS)**, *Software.*
- 2016,2017 **Grace Hopper Conference**, *Computer Systems Engineering.*
- 2015 **ACM/IEEE Supercomputing Conference (SC)**, *BoF: Progr. Languages, Models, & Compilers.*
- 2011 **Small Business Innovation Research (SBIR)**, *DOE Office of Science Grant Review.*
- 2011 **ACM/IEEE Supercomputing Conference (SC)**, *Student Cluster Challenge.*
- 2008 **ACM/IEEE Supercomputing Conference (SC)**, *Broader Engagement.*

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## Invited Talks and Panels

- November 2024 **SC|24**, *Panelist on Extreme-Scale Performance Evaluation Tools.*
- September 2024 **International Conference on Parallel Processing & Applied Mathematics (PPAM)**, *Keynote: Collaborative continuous benchmarking for HPC.*
- September 2024 **Workshop on Clusters, Clouds, and Data for Scientific Computing (CCDSC)**, *An update on continuous benchmarking.*
- February 2024 **Society for Industrial and Applied Mathematics Conference on Parallel Processing for Scientific Computing (SIAM PP)**, *Livermore's perspective on functional reproducibility, automation, and community collaboration in HPC benchmarking.*

- November 2022 **SC|22, BoF Chair: Benchmarking across HPC architectures.**
- November 2022 **ProTools Workshop at SC|22**, *Analyze your multi-experiment, multi-architecture, and multi-tool performance data with Thicket.*
- September 2022 **Workshop on Clusters, Clouds, and Data for Scientific Computing (CCDSC)**, *Finding the forest in the trees: Enabling performance optimization on heterogeneous architectures through data science analysis of ensemble performance data.*
- June 2022 **ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC)**, *Panel: 1st Workshop on Performance Engineering, Modeling, Analysis, and Visualization Strategy (PERMAVOST 2021).*
- September 2021 **EuroMPI**, *Keynote: MPI & Accelerators: So you thought you were waiting for data to transfer?.*

## Tutorials

- August 2024 **Lawrence Livermore National Laboratory, HPC Software Tutorial Series**, *half-day tutorial*, Automated application performance analysis with Caliper and Hatchet.
- August 2023 **Lawrence Livermore National Laboratory, HPC Software Tutorial Series**, *half-day tutorial*, Automated application performance analysis with Caliper, Hatchet, and Thicket.
- May 2022 **Exascale Computing Project (ECP)**, *half-day tutorial*, [Automated application performance analysis with Caliper, Spot, and Hatchet.](#)
- Nov 2021 **ACM/IEEE Int'l Conf. for HPC, Networking, Storage, and Analysis (SC)**, *full-day tutorial*, [User-centric Automated Performance Analysis of Hybrid Parallel Programs.](#)
- Mar 2021 **Exascale Computing Project (ECP)**, *full-day tutorial*, [Automating application performance analysis with Caliper, Spot, and Hatchet.](#)
- July 2020 **Weapons Simulation Codes (WSC)**, *2 tutorials*, Performance Analysis With Hatchet.

## Publications

[Selected Refereed Publications.](#) \* denotes students I supervised.

- [1] [Olga Pearce](#), Jason Burmark, Rich Hornung, Befikir Bogale\*, Ian Lumsden\*, Michael McKinsey\*, Dewi Yokelson, David Boehme, Stephanie Brink, Michela Taufer, and Tom Scogland. RAJA Performance Suite: Performance Portability Analysis with Caliper and Thicket. In *Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis (SC-W 2024)*.
- [2] [Olga Pearce](#), Alec Scott, Gregory Becker, Riyaz Haque, Nathan Hanford, Stephanie Brink, Doug Jacobsen, Heidi Poxon, Jens Domke, and Todd Gamblin. Towards Collaborative Continuous Benchmarking for HPC. In *Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis (SC-W 2023)*.
- [3] Bengisu Elis\*, [Olga Pearce](#), David Boehme, Jason Burmark, and Martin Schulz. Non-Blocking GPU-CPU Notifications to Enable More GPU-CPU Parallelism. In *Proceedings of the International Conference on High Performance Computing in Asia-Pacific Region, HPCAsia '24*, page 1–11, New York, NY, USA, 2024. Association for Computing Machinery.
- [4] H. Abu-Shawareb et al. (Indirect Drive ICF Collaboration). Achievement of Target Gain Larger than Unity in an Inertial Fusion Experiment. In *Physical Review Letters* 132, 065102, Feb 2024. (N210808).
- [5] Stephanie Brink, Michael McKinsey\*, David Boehme, Daryl Hawkins\*, Connor Scully-Allison\*, Ian Lumsden\*, Treece Burgess\*, Vanessa Lama\*, Katherine E. Isaacs, Jakob Luettgau, Michela Taufer, and [Olga Pearce](#). Thicket: Seeing the performance experiment forest for the individual run trees. In *ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC'23)*, 2023.

- [6] H. Abu-Shawareb et al. (Indirect Drive ICF Collaboration). Lawson's criteria for ignition exceeded in an inertial fusion experiment. In *Physical Review Letters* 129, 075001, 8 August 2022. (N210808).
  - [7] David Boehme, Pascal Aschwenden, **Olga Pearce**, Kenneth Weiss, and Matthew LeGendre. Ubiquitous Performance Analysis. In *International Supercomputing Conf. (ISC'21)*, June 2021.
  - [8] Bengisu Elis\*, Dai Yang, **Olga Pearce**, Kathryn Mohror, and Martin Schulz. QMPI: A Next Generation MPI Profiling Interface for Modern HPC Platforms. In *Journal of Parallel Computing*, 2020. LLNL-JRNL-787898.
  - [9] David Alexander Beckingsale, Jason Burmark, Rich Hornung, Holger Jones, William Killian, Adam J. Kunen, **Olga Pearce**, Peter Robinson, Brian S. Ryujin, and Thomas R. W. Scogland. RAJA: Portable Performance for Large-Scale Scientific Applications. In *SC'19 P3HPC Workshop*, 2019. LLNL-CONF-788757.
  - [10] Christopher Zimmer, Scott Atchley, Ramesh Pankajakshan, Brian E. Smith, Ian Karlin, Matt Leininger, Adam Bertsch, Brian S. Ryujin, Jason Burmark, André Walker-Loud, M. A. Clark, and **Olga Pearce**. An Evaluation of the CORAL Interconnects. In *ACM/IEEE International Conference for High Performance Computing, Networking, Storage, and Analysis (SC'19)*, 2019. LLNL-CONF-772398.
  - [11] David Beckingsale, **Olga Pearce**, Ignacio Laguna, and Todd Gamblin. Apollo: Reusable Models for Fast, Dynamic Tuning of Data-Dependent Code. In *IEEE International Parallel & Distributed Processing Symposium (IPDPS'17)*, Orlando, Florida, USA, May 29 - June 2, 2017.
  - [12] David Boehme, Todd Gamblin, David Beckingsale, Peer-Timo Bremer, Alfredo Giménez, Matthew LeGendre, **Olga Pearce**, and Martin Schulz. Caliper: Performance Introspection for HPC Software Stacks. In *ACM/IEEE International Conference for High Performance Computing, Networking, Storage, and Analysis (SC'16)*, Salt Lake City, Utah, USA, November 13-18, 2016. LLNL-CONF-699263. (18%).
  - [13] **Olga Pearce**, Todd Gamblin, Bronis R. de Supinski, Martin Schulz, and Nancy M. Amato. MPMD Framework for Offloading Load Balance Computation. In *IEEE International Parallel & Distributed Processing Symposium (IPDPS'16)*, Chicago, Illinois, USA, May 23-27, 2016. LLNL-CONF-678165. (23%).
  - [14] **Olga Pearce**, Todd Gamblin, Bronis R. de Supinski, Tom Arsenlis, and Nancy M. Amato. Load Balancing N-Body Simulations with Highly Non-Uniform Density. In *International Conference on Supercomputing (ICS'14)*, Munich, Germany, June 10-13, 2014. LLNL-CONF-648577. (21%).
  - [15] **Olga Pearce**, Todd Gamblin, Bronis R. de Supinski, Martin Schulz, and Nancy M. Amato. Quantifying the Effectiveness of Load Balance Algorithms. In *International Conference on Supercomputing (ICS'12)*, Venice, Italy, June 25-29, 2012. LLNL-CONF-523343. (22%).
  - [16] Gabriel Tanase, Antal A. Buss, Adam Fidel, Harshvardhan\*, Ioannis Papadopoulos, **Olga Pearce**, Timmie G. Smith, Nathan Thomas, Xiabing Xu, Nedat Mourad, Jeremy Vu, Mauro Bianco, Nancy M. Amato, and Lawrence Rauchwerger. The STAPL Parallel Container Framework. In *ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)*, pages 235–246, 2011. (16%).
  - [17] Nathan Thomas, Gabriel Tanase, **Olga Tkachyshyn**, Jack Perdue, Nancy M. Amato, and Lawrence Rauchwerger. A Framework for Adaptive Algorithm Selection in STAPL. In *ACM SIGPLAN Principles and Practice of Parallel Programming (PPoPP)*, pages 277–288, 2005. (31%).
- Refereed Publications in Conferences and Journals (additional). \* denotes students I supervised.**
- [18] Gerald Collom\*, Amanda Bienz, Jason Burmark, and **Olga Pearce**. Persistent and Partitioned MPI for Stencil Communication. In *IEEE High Performance Extreme Computing Conference*, 2024.



- [19] Bengisu Elis\*, David Boehme, [Olga Pearce](#), and Martin Schulz. A Mechanism to Generate Interception Based Tools for HPC Libraries. In Jesus Carretero, Sameer Shende, Javier Garcia-Blas, Ivona Brandic, Katzalin Olcoz, and Martin Schreiber, editors, *Euro-Par 2024: Parallel Processing*, pages 107–120, Cham, 2024. Springer Nature Switzerland.
- [20] Suraj P. Kesavan\*, Harsh Bhatia, Keshav Dasu, [Olga Pearce](#), and Kwan-Liu Ma. Data movement visualized: A unified framework for tracking and visualizing data movements in heterogeneous architectures. In *2024 IEEE 17th Pacific Visualization Conference (PacificVis)*, pages 32–41, 2024.
- [21] Ian Lumsden\*, Hariharan Devarajan, Jack Marquez, Stephanie Brink, David Boehme, [Olga Pearce](#), Jae-Seung Yeom, and Michela Taufer. Empirical study of molecular dynamics workflow data movement: Dyad vs. traditional i/o systems. In *2024 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*, pages 543–553, 2024.
- [22] Michael McKinsey\*, Stephanie Brink, and [Olga Pearce](#). Using parallel performance data to classify parallel algorithms. In *International Conference on Parallel Processing & Applied Mathematics (PPAM)*, 2024.
- [23] Connor Scully-Allison\*, Ian Lumsden\*, Katy Williams\*, Jesse Bartels, Michela Taufer, Stephanie Brink, Abhinav Bhatele, [Olga Pearce](#), and Katherine E. Isaacs. Design concerns for integrated scripting and interactive visualization in notebook environments. *IEEE Transactions on Visualization and Computer Graphics*, 30(9):6572–6585, 2024.
- [24] Connor Scully-Allison\*, Katy Williams\*, Stephanie Brink, [Olga Pearce](#), and Katherine E. Isaacs. A tale of two models: Understanding data workers internal and external representations of heterogenous data. *IEEE VIS*, 2024.
- [25] [Olga Pearce](#) and Stephanie Brink. Finding the forest in the trees: Enabling performance optimization on heterogeneous architectures through data science analysis of ensemble performance data. *The International Journal of High Performance Computing Applications*, 37(3-4):434–441, 2023.
- [26] Ian Lumsden\*, Jakob Luettgau, Vanessa Lama\*, Connor Scully-Allison\*, Stephanie Brink, Katherine E. Isaacs, [Olga Pearce](#), and Michela Taufer. Enabling Call Path Querying in Hatchet to Identify Performance Bottlenecks in Scientific Applications. In *IEEE eScience*, October 2022. LLNL-CONF-83569.
- [27] David Eberius\*, David Boehme, and [Olga Pearce](#). Did the GPU obfuscate the load imbalance in my MPI simulation? In *SC’21 Hierarchical Parallelism for Exascale Computing (HiPar) Workshop*, Nov 2021. LLNL-CONF-826447.
- [28] Suraj P. Kesavan\*, Harsh Bhatia, Abhinav Bhatele, Stephanie Brink, [Olga Pearce](#), Todd Gamblin, Peer-Timo Bremer, and Kwan-Liu Ma. Scalable Comparative Visualization of Ensembles of Call Graphs using CallFlow. In *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, November 2021.
- [29] J. P. Dahm, D. F. Richards, A. Black, A. D. Bertsch, L. Grinberg, I. Karlin, S. Kokkila-Schumacher, E. A. Leon, R. Neely, R. Pankajakshan, and [Olga Pearce](#). Sierra Center of Excellence: Lessons Learned. In *IBM Journal of Research and Development*, 2020. LLNL-JRNL-789080.
- [30] Stephanie Brink, Ian Lumsden\*, Connor Scully-Allison\*, Katy Williams\*, [Olga Pearce](#), Todd Gamblin, Michela Taufer, Katherine E. Isaacs, and Abhinav Bhatele. Usability and Performance Improvements in Hatchet. In *SC’20 ProTools Workshop*, Nov 2020. LLNL-CONF-814318.
- [31] [Olga Pearce](#). Exploring Utilization Options of Heterogeneous Architectures for Multi-Physics Simulations. In *Parallel Computing Journal*, May 2019. LLNL-JRNL-762237.
- [32] [Olga Pearce](#), Hadia Ahmed\*, Rasmus W. Larsen\*, Peter Pirkelbauer, and David F. Richards. Exploring Dynamic Load Imbalance Solutions with the CoMD Proxy Application. In *Future Generation Computer Systems (FGCS)*, 2018. LLNL-JRNL-725317.

- [33] Alexandre Bergel, Abhinav Bhatele, David Boehme, Patrick Gralka, Kevin Griffin, Marc-Andre Hermanns, Dusan Okanovic, **Olga Pearce**, and Tom Vierjahn. Visual Analytics Challenges in Analyzing Calling Context Trees. In *Workshop on Visual Performance Analysis (VPA 18) at SC18*, November 2018. LLNL-CONF-756548.
- [34] **Olga Pearce**. Experiences Using CPUs and GPUs for Cooperative Computation in a Multi-Physics Simulation. In *Workshop on Parallel Programming Models and Systems Software for High-End Computing (P2S2 2018) at the International Conference on Parallel Processing (ICPP 2018) Conference*, August 2018. LLNL-CONF-738086.
- [35] **Olga Pearce**, Hadia Ahmed\*, Rasmus W. Larsen\*, and David F. Richards. Enabling Work Migration in CoMD to Study Dynamic Load Imbalance Solutions. In *Performance Modeling, Benchmarking and Simulation of High Performance Computer Systems (PMBS'16) held as part of ACM/IEEE International Conference for High Performance Computing, Networking, Storage, and Analysis (SC'16)*, Salt Lake City, Utah, USA, November 13, 2016. LLNL-CONF-704368. (22%).
- [36] Antal A. Buss, Harshvardhan\*, Ioannis Papadopoulos, **Olga Pearce**, Timmie G. Smith, Gabriel Tanase, Nathan Thomas, Xiabing Xu, Mauro Bianco, Nancy M. Amato, and Lawrence Rauchwerger. STAPL: Standard Template Adaptive Parallel Library. In *3rd Annual Haifa Experimental Systems Conference (SYSTOR)*, 2010.
- [37] Gabriel Tanase, Xiabing Xu, Antal A. Buss, Harshvardhan, Ioannis Papadopoulos, **Olga Pearce**, Timmie G. Smith, Nathan Thomas, Mauro Bianco, Nancy M. Amato, and Lawrence Rauchwerger. The STAPL pList. In *22nd International Workshop on Languages and Compilers for Parallel Computing (LCPC)*, pages 16–30, 2009.

Unrefereed Publications and Technical Reports. \* denotes students I supervised.

- [38] Stephanie Brink, Todd Gamblin, and **Olga Pearce**. Pinpointing Performance Bottlenecks with Hatchet. In *Nuclear Explosives Code Development Conference (NECDC) and Journal of Weapons Physics (JWP)*, January 2022. LLNL-JRNL-827068.
- [39] **Olga Pearce**. Caliper, SPOT, and Hatchet: Enabling the Whys and the Wherefores of Personal Analysis. In *CASC Newsletter*, June 2020.
- [40] **Olga Pearce**. What if Components of Your Multiphysics Simulation Need to Use Your Heterogeneous Machine Differently? In *Nuclear Explosives Code Development Conference (NECDC) and Journal of Weapons Physics (JWP)*, January 2019. LLNL-PROC-765162.
- [41] **Olga Pearce**. Impact of Mesh Decomposition on Performance of Teton. In *Nuclear Explosives Code Development Conference (NECDC)*, January 2017. LLNL-PROC-718463.
- [42] Richard Hornung, **Olga Pearce**, Adam Kunen, Jeff Keasler, Holger Jones, Rob Neely, and Todd Gamblin. Demonstrating Advances in Proxy Applications Through Performance Gains and/or Performance Portable Abstractions: CoMD and Kripke with RAJA. In *SIAM Conference on Parallel Processing for Scientific Computing (SIAM PP)*, March 2016. LLNL-TR-677453.
- [43] Rasmus Wriedt Larsen\* and **Olga Pearce**. Enabling Load Balancing in CoMD through Overdecomposition. Technical Report LLNL-TR-678978, Lawrence Livermore National Laboratory, November 2015.
- [44] Rich Hornung, Holger Jones, Jeff Keasler, Rob Neely, **Olga Pearce**, Si Hammond, Christian Trott, Paul Lin, Courtenay Vaughan, Jeanine Cook, Mahesh Rajan, Rob Hoekstra, Ben Bergen, Josh Payne, and Geoff Womeldorff. ASC Tri-lab Co-design Level 2 Milestone Report. Technical Report LLNL-TR-677453, Lawrence Livermore National Laboratory, Sandia National Laboratories, Los Alamos National Laboratory, September 2015.
- [45] Anna Tikhonova\*, Gabriel Tanase, **Olga Tkachyshyn**, Nancy M. Amato, and Lawrence Rauchwerger. Parallel algorithms in STAPL: Sorting and the selection problem. Technical Report TR05-005, Parasol Lab, Department of Computer Science, Texas A&M University, August 2005.

- [46] Jie Liu, **Olga Tkachyshyn**, Cory Kissinger, and Brian McGee. Teaching parallel programming and building parallel computers. In *International Conference on Frontiers in Education: Computer Science and Computer Engineering*, pages 149–155, June 2005.
- [47] **Olga Tkachyshyn**, Ping An, Gabriel Tanase, and Nancy M. Amato. pArray as an efficient static parallel container in STAPL. Technical Report TR03-003, Parasol Lab, Department of Computer Science, Texas A&M University, August 2003.

#### Ph.D. Dissertation

- [48] **Olga Pearce**. *Load Balancing Scientific Applications*. PhD thesis, Texas A&M University, College Station, TX, December 2014. LLNL-TH-663256.

#### Posters and Presentations. \* denotes students I supervised.

- [49] **Olga Pearce**, Jason Burmark, Rich Hornung, Befikir Bogale\*, Ian Lumsden\*, Michael McKinsey\*, Dewi Yokelson, David Boehmen, Stephanie Brink, Michela Taufer, and Tom Scogland. RAJA Performance Suite: Performance Portability Analysis with Caliper and Thicket. In *Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis (SC-W 2024)*.
- [50] **Olga Pearce**, Alec Scott, Gregory Becker, Riyaz Haque, Nathan Hanford, Stephanie Brink, Doug Jacobsen, Heidi Poxon, Jens Domke, and Todd Gamblin. Towards Collaborative Continuous Benchmarking for HPC. In *Workshops of The International Conference on High Performance Computing, Network, Storage, and Analysis (SC-W 2023)*.
- [51] Michael McKinsey\*, Stephanie Brink, and **Olga Pearce**. Using parallel performance data to classify parallel algorithms. In *International Conference on Parallel Processing & Applied Mathematics (PPAM)*, 2024.
- [52] Befikir Bogale\*, Michela Taufer, and **Olga Pearce**. Cluster-based Methodology for Characterizing the Performance of Portable Applications. In *SC'24*, November 2024.
- [53] Dragana Grbic\*, John Mellor-Crummey, Matthew Legendre, and **Olga Pearce**. Programmatic analysis of large-scale performance data. In *SC'24*, November 2024.
- [54] Ian Lumsden\*, **Olga Pearce**, and Michela Taufer. Empirical Study of Molecular Dynamics Workflow Data Movement: DYAD vs. Traditional I/O Systems. In *SC'24*, November 2024.
- [55] Connor Scully-Allison\*, **Olga Pearce**, and Kate Isaacs. Missing the Trees for the Branches: Graphical-Scripting Interaction with Large-Scale Calling Context Trees. In *SC'21*, November 2021. LLNL-POST-825367.
- [56] **Olga Pearce**. Visualizing GPU Metrics. In *Summit Series*, NVIDIA, Oct 27, 2021. LLNL-PRES-828300.
- [57] Todd Gamblin Olga Pearce, Stephanie Brink. Pinpointing performance bottlenecks with Hatchet. In *Nuclear Explosives Code Development Conference (NECDC'21)*, LLNL, May 12, 2021. LLNL-PRES-821461.
- [58] Suraj P. Kesavan\*, Harsh Bhatia, Abhinav Bhatele, Stephanie Brink, **Olga Pearce**, Todd Gamblin, Peer-Timo Bremer, and Kwan-Liu Ma. Scalable Comparative Visualization of Ensembles of Call Graphs using CallFlow. In *SC'20*, November 2020. LLNL-POST-813361.
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