Publications

Book & Book Chapters

- **Sunita Chandrasekaran** and Guido Juckeland. OpenACC for Programmers: Concepts and Strategies
  Co-Edited Book published by Pearson Addison-Wesley Professional; 1 edition. ISBN-13: 978-0134694283, November 2017
- **Sunita Chandrasekaran,** Rengan Xu and Barbara Chapman. Using OpenACC for stencil and Feldkamp algorithms
  Co-authored a Chapter in an Edited Book: Parallel Programming with OpenACC Edited by Rob Farber. Morgan Kaufmann. ISBN-13: 978-0124103979, November 2016
- Barbara Chapman, Deepak Eachempati and **Sunita Chandrasekaran**. Chapter on OpenMP
  Co-authored a Chapter in an Edited Book: Programming Models for Parallel Computing Edited by Pavan Balaji, MIT Press. ISBN-13: 978-0262528818, 2015

Refereed Journals

- Eric Wright*, Mauricio Ferrato*, Alex Bryer, Robert Searles*, Juan Perilla and **Sunita Chandrasekaran**. Accelerating Prediction of Chemical Shift of Protein Structures on GPUs.
  PLOS Computational Biology. 16(5): e1007877.
  DOI: https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1007877
- Robert Searles*, **Sunita Chandrasekaran**, Wayne Joubert and Oscar Hernandez (2019). MPI+ OpenACC: Accelerating Radiation Transport Mini-application, Minisweep, on Heterogeneous Systems. Journal of Computer Physics Communications (CPC).
  https://doi.org/10.1016/j.cpc.2018.10.007. Volume 236, pp. 176-187, 2019.
- Millad Ghane*, **Sunita Chandrasekaran** and Margaret S. Cheung (2019). Pointerchain: Tracing pointers to their roots: A case study in molecular dynamics simulations. Journal of Parallel Computing (PARCO).
  https://doi.org/10.1016/j.parco.2019.04.007. Volume 85, pp. 190-203. 2019.
- Jose Manuel Monsalve Diaz*, Kyle Friedline^{+}, Swaroop Pophale, Oscar Hernandez, David Bernholdt and **Sunita Chandrasekaran**. Analysis of OpenMP 4.5 Offloading in Implementations: Correctness and Overhead. Journal of Parallel Computing (PARCO).
  https://doi.org/10.1016/j.parco.2019.102546. Volume 89, pp. 102546, 2016.
- Michael Wolfe, Jungwon Kim, Xiaonan Tian, Rengan Xu, Barbara Chapman and **Sunita Chandrasekaran**. The OpenACC Data Model: Preliminary Study on Its Major Challenges and Implementations. Journal of Parallel Computing (PARCO).
  https://doi.org/10.1016/j.parco.2018.07.003, Volume 78, pp. 15-27. 2018.
- **Sunita Chandrasekaran**, Guido Juckeland, Meifeng Lin et. al., Best Practices in Running Collaborative GPU Hackathons. Journal of IEEE Computing in Science and Engineering (IEEE CiSE). 10.1109/MCSE.2018.042781332. NSPEC Accession Number: 17916295, pg. 95-106, 2018.
- Robert Searles*, Stephen Herbein*, Travis Johnston, Michela Taufer and **Sunita Chandrasekaran**. Creating a Portable, High-Level Graph Analytics Framework for Compute and Data-Intensive Applications

In Proceedings of the International Journal of High Performance Computing and Networking (IJHPCN). DOI: 10.1504/IJHPCN.2017.10007922, Vol.13. No.1, pp.105 - 118. 2017.

- Xiaonan Tian, Rengan Xu, Yonghong Yan, **Sunita Chandrasekaran**, Deepak Eachempati, and Barbara Chapman. Compiler Transformation of Nested Loops for GPGPUs
  Journal of Concurrency and Computation: Practice and Experience.
  http://dx.doi.org/10.1002/cpe.3648, ISSN: 1532-0634, 2015.

- Rengan Xu, **Sunita Chandrasekaran** and Barbara Chapman. Multi-GPU Support on Shared Memory System using Directive-based Programming Model
  Journal of Scientific Programming.
  http://dx.doi.org/10.1155/2015/621730, Volume 2015, Article ID 621730, 2015
  Impact factor:1.344

- **Sunita Chandrasekaran**, Shilpa Shanbagh, Ramkumar Jayaraman, HuiYan Cheah and Douglas Maskell. C2FPGA: A Dependency-Timing Graph Design Methodology.
  Journal of Parallel and Distributed Computing (JPDC)
  http://dx.doi.org/10.1016/j.jpdc.2012.09.001, Volume 73, Pages 1417-1429. 2012
  Impact factor:1.815

Refereed Conferences

- Joshua Hoke Davis^{+}, Tao Gao, **Sunita Chandrasekaran**, Heike Jagode, Anthony Danalis, Jack J. Dongarra, Pavan Balaji, Michela Taufer. Characterization of Power Usage and Performance in Data-Intensive Applications Using MapReduce over MPI.
  Proceedings of the International Conference on Parallel Computing (ParCO).
  DOI:10.3233/APC200053, 287-298, September 2019.

- Robert Searles*, **Sunita Chandrasekaran**, Oscar Hernandez and Wayne Joubert. Abstractions and Directives for Adapting Wavefront Algorithms to Future Architectures
  5th Platform for Advanced Scientific Computing Conference (PASC)
  DOI: https://doi.org/10.1145/3218176.3218228 pp. 1-10, July 2018.

- Jose Monsalve Diaz*, Swaroop Pophale, Kyle Friedline^{+}, Oscar Hernandez, David E. Bernholdt and **Sunita Chandrasekaran**. Evaluating Support for OpenMP Offload Features.
  47th International Conference on Parallel Processing Companion (ICPP),
  DOI: 10.1145/3229710.3229717, pp. 1-10, August 2018.

- Millad Ghane*, **Sunita Chandrasekaran**, Robert Searles*, Margaret S. Cheung and Oscar Hernandez. Path forward for softwarization to tackle evolving hardware
  The International Society for Optics and Photonics (SPIE), Volume 10652
  DOI: https://doi.org/10.1117/12.23048132018 May 2018.

- Cheng Wang, **Sunita Chandrasekaran**, and Barbara Chapman, CusFFT: A High-Performance Sparse Fast Fourier Transform Algorithm on GPUs, 30th, IEEE International Parallel & Distributed Processing Symposium (IPDPS), Chicago,
  DOI: 10.1109/IPDPS.2016.95, pp. 963-972, May 23-27, 2016.

- Rengan Xu, **Sunita Chandrasekaran**, and Barbara Chapman, An Analytical Model-based Auto-tuning Framework for Locality-aware Loop Scheduling, International Supercomputing Conference (ISC), Frankfurt,
  DOI:10.1007/978-3-319-41321-1_1pp. 3-20, June 19-23, 2016.

- Peng Sun, **Sunita Chandrasekaran**, and Barbara Chapman, Deploying OpenMP Task Parallelism on Multicore Embedded Systems with MCA Task APIs, IEEE High Performance Computing and Communications (HPCC),
DOI: 10.1109/HPCC-CSS-ICESS.2015.88, pp. 843-847, 2015.

Refereed Workshops

- Millad Ghane*, **Sunita Chandrasekaran** and Margaret S. Cheung. Towards a portable hierarchical view of distributed shared memory systems: Challenges and Solutions
11th International Workshop on Programming Models and Applications for Multicores and Manycores (PMAM) https://doi.org/10.1145/3380536.3380542 pp. 1-10, March 2020.
- Millad Ghane*, **Sunita Chandrasekaran**, and Margaret S. Cheung. Gecko: Hierarchical Distributed View of Heterogeneous Shared Memory Architectures
10th International Workshop on Programming Models and Applications for Multicores and Manycores (PMAM), https://doi.org/10.1145/3303084.3309489 pp. 21-30, February 2019.
- Jose Monsalve Diaz*, Swaroop Pophale, Oscar Hernandez, David E. Bernholdt and **Sunita Chandrasekaran**. OpenMP 4.5 Validation and Verification Suite for Device Offload. 13th International Workshop on OpenMP (IWOMP), Volume 11128, pp. 82-95, September 2018.
- Kyle Friedline^{+}, **Sunita Chandrasekaran**, Graham Lopez and Oscar Hernandez. OpenACC 2.5 Validation Testsuite targeting multiple architectures. 2nd International Workshop on Performance Portable Programming Models for Accelerators (P3MA), Volume 10524, pp. 557-575, June 2017.
- Sergio Pena*, **Sunita Chandrasekaran** and Lori Pollock. Exploring translation of OpenMP to OpenACC 2.5: Lessons Learned. 7th International Workshop on Accelerators and Hybrid Exascale Systems (AsHES) co-located with IPDPS 2017, pp. 673- 682, 2017.
- Michael Wolfe, Seyong Lee, Jungwon Kim, Xiaonan Tian, Rengan Xu, **Sunita Chandrasekaran** and Barbara Chapman. Implementing the OpenACC Data Model. 7th International Workshop on Accelerators and Hybrid Exascale Systems (AsHES) co-located with IPDPS 2017, pp. 662-672, May 2017.
- Robert Searles*, Stephen Herbein, **Sunita Chandrasekaran**. A portable, high-level graph analytics framework targeting distributed, heterogeneous systems. 3rd International Workshop on Accelerator Programming Using Directives (WACCPD) co-located with SC16 DOI 10.1109/WACCPD.2016.012, pp. 79-88, November 2016.
- Suyang Zhu, **Sunita Chandrasekaran**, Peng Sun, Barbara Chapman, Tobias Schuele and Marcus Winter, Exploring Task Parallelism for Heterogeneous Systems Using Multicore Task Management API, 4th Workshop on Runtime and Operating Systems for the Many-core Era co-located with Europar, pp. 607-708, 2016.
- Peng Sun, **Sunita Chandrasekaran**, and Barbara Chapman. OpenMP-MCA: Leveraging Multiprocessor Embedded Systems using industry standards. In Proceedings of the 2015 IEEE International Parallel & Distributed Processing Symposium Workshops, (PLC) co-located with IPDPS, 10.1109/IPDPSW.2015.13, pp. 679-688, Hyderabad, India, 2015
- Guido Juckeland, William Brantley, **Sunita Chandrasekaran**, et al. SPEC ACCEL - A Standard Application Suite for Measuring Hardware Accelerator Performance. In International Workshop on Performance s Modeling, Benchmarking and Simulation of High Performance Computer Systems (PMBS) co-located with SC14, Volume 8966 of the series Lecture Notes in Computer Science, Springer Verlag, pp. 46-67, New Orleans, USA, 2014. *(Acceptance rate 26%) (Workshop level)*

- Rengan Xu, Maxime Hugues, Henri Calandra, **Sunita Chandrasekaran** and Barbara Chapman. Accelerating Kirchhoff Migration on GPU using Directives. In Proceedings of ACM SIGHPC, The first Workshop on Accelerator Programming using Directives (WACCPD 2014) co-located with SC14, pp. 37-46, New Orleans, USA, 2014
- Rengan Xu*, Cheng Wang*, **Sunita Chandrasekaran**, Barbara Chapman. An OpenACC 1.0 Validation Suite. In Proceedings of the 2014 IEEE Workshop on Multi-threaded Architectures and Applications(MTAAP) co-located with IPDPS, pp. 1407-1416, Phoenix, USA, 2014 (Workshop Level)
- Rengan Xu*, Xiaonan Tian*, Yonghong Yan, **Sunita Chandrasekaran**, Barbara M. Chapman. Reduction Operations in Parallel Loops for GPGPUs. In Proceedings of ACM, Programming Models and Applications on Multicores and Manycores (PMAM) co-located with PPoPP, pp. 10:10–10:20, Orlando, USA, 2014 (Workshop Level)
- Rengan Xu*, Xiaonan Tian*, **Sunita Chandrasekaran**, Yonghong Yan and Barbara Chapman. NAS Parallel Benchmarks on GPGPUs using a Directive-based Programming Model. In Proceedings of Springer Verlag, The 27th International Workshop on Languages and Compilers for Parallel Computing (LCPC), pp. 67-81, Oregon, USA, 2014
- Cheng Wang, **Sunita Chandrasekaran**, Barbara Chapman, Jim Holt. Portable Mapping of OpenMP to Multicore Embedded Systems Using MCA APIs. In Proceedings of the 14th ACM SIGPLAN/SIGBED conference on Languages, compilers and tools for embedded systems (LCTES), pp. 153-162, Seattle, US, 2013
- Cheng Wang, Mauricio Araya, **Sunita Chandrasekaran**, Barbara Chapman, Detlef Hohl. Parallel Sparse FFT. In Proceedings of ACM, The 3rd Workshop on Irregular Applications: Architectures and Algorithms (IA$\hat{3}$), co-located with SC 2013, pp. 10:1–10:8, Colorado, USA, 2013
- Xiaonan Tian*, Rengan Xu*, Yonghong Yan, Zhifeng Yun, **Sunita Chandrasekaran**, and Barbara Chapman. Compiling A High-Level Directive-based Programming Model for Accelerators. In Proceedings of Springer Verlag, 26th International Workshop on Languages and Compilers for High Performance Computing (LCPC), pp. 105-120, San Jose, USA, 2013
- Sayan Ghosh, **Sunita Chandrasekaran**, Barbara Chapman. Statistical Modeling of Power/Energy of Scientific Kernels on a Multi-GPU system. In Proceedings of IEEE, Third International Workshop on Power Measurement and Profiling (PMP) co-located with IGCC, pp.1-6, Virginia, USA, 2013 (Workshop Level)
- Cheng Wang, **Sunita Chandrasekaran**, Barbara Chapman, Jim Holt. libEOMP: a portable OpenMP runtime library based on MCA APIs for embedded systems. In Proceedings of ACM, International Workshop on Programming Models and Applications for Multicores and Manycore (PMAM) co- located with PPoPP, pp 83-92, New Orleans, USA, 2013
- Cheng Wang, v, Barbara Chapman. An OpenMP3.1 Validation testsuite. In Proceedings of IWOMP 2012, LNCS, Volume 7312/2012,p.237-249, Rome, Italy, 2012
- Rengan Xu, **Sunita Chandrasekaran**, Barbara Chapman, Christoph F. Eick. Directive-based Programming Models for Scientific Applications - A Comparison. In Proceedings of IEEE, Second International Workshop on Domain-Specific Languages and High-Level Frameworks for High Performance Computing (Wolfhpc) co-located with Supercomputing (SC), pp 1-9, Salt Lake City, USA, 2012
- Lei Huang, Eric Stotzer, Hangjun Yi, Barbara Chapman, **Sunita Chandrasekaran**. Parallelizing Ultrasound Image Processing using OpenMP on Multicore Embedded Systems. n Proceedings of 2012 IEEE Global High Tech Congress on Electronics (GHTCE), 131-138,
DOI: 10.1109/GHTCE.2012.6490139, Shenzen, China, 2012

- Sayan Ghosh, **Sunita Chandrasekaran**, Barbara Chapman. Energy Analysis of Parallel Scientific Kernels on Multiple GPUs. In Proceedings of IEEE Symposium on Application Accelerators in High Performance Computing (SAAHPC), p.54-63, Chicago , July 2012
- **Sunita Chandrasekaran**, Shilpa Shanbagh, Douglas. L. Maskell. A Dependency Graph based Methodology for Parallelizing HLL Applications on FPGA. In Proceedings of the 18th ACM/SIGDA International Symposium on Field-Programmable Gate Arrays Proceedings (FPGA), Monterey, USA, 2010
- Kevin A. Huck, Oscar Hernandez, Van Bui, **Sunita Chandrasekaran**, Barbara Chapman, Allen D. Malony, Lois Curfman McInnes, Boyana Norris. Capturing Performance Knowledge for Automated Analysis. IEEE/ACM International Conference for High Performance Computing, Networking, Storage and Analysis (SC), pp. 1-10, Austin, 2008
- **Sunita Chandrasekaran**, Oscar Hernandez, Douglas Maskell, Barbara Chapman, Van Bui. Compilation and Parallelization Techniques with Tool Support to realize Sequence Alignment Algorithm on FPGA and Multicore. IEEE Int. Conf. on High Performance Computing (HiPC), Goa, India, 2007

Invited Technical Reports Not Published Elsewhere

- Mauricio Ferrato*, Erin Crowgey, **Sunita Chandrasekaran**. Developing and Accelerating Predictive Models for Predicting Relapse of Pediatric Oncology patients using Smart Cyberinfrastructure.
  By Invitation-only NSF Workshop: Developing a Roadmap towards the Next Generation of Smart Cyberinfrastructure, Feb 25-27, Seattle, 2020.
- Millad Ghane, **Sunita Chandrasekaran**, Margaret S. Cheung. Assessing Performance Implications of Deep Copy Operations via Microbenchmarking. arXiv preprint arXiv:1906.01128, June, 2019
- **Sunita Chandrasekaran**. Extreme Heterogeneity for Sn Transport Codes.
  By Invitation-only Big Data and Extreme-Scale Computing (BDEC) Meeting, Indiana University, November 28-30, 2018
- **Sunita Chandrasekaran**. Development of a parallel algorithm for whole genome alignment for rapid delivery of personalized genomics.
  By Invitation-only Big Data and Extreme-Scale Computing (BDEC) Meeting, Indiana University, November 28-30, 2018

Unpublished Technical Report

- Robert Henschel, Junjie Li, Rudolf Eigenmann, **Sunita Chandrasekaran**. Explore True Performance Using Application Benchmark for the Next Generation HPC Systems: First NSF EAGER SPEC HPG Workshop Report. September 2019
  https://scholarworks.iu.edu/dspace/handle/2022/25344
  DOI= 10.5967/jmkd-6p64

Non-proceedings poster

- Robert Searles, **Sunita Chandrasekaran**, Abstractions and Directives for Adapting Wavefront Algorithms to Future Architectures
  GPU Technology Conference (GTC), March 17-21, 2019. CA. USA
- Eric Wright and Mauricio Ferrato, **Sunita Chandrasekaran**, Accelerating Chemical Shift Prediction for Large-scale Biomolecular Modeling.
  GPU Technology Conference (GTC), March 17-21, 2019. CA. USA

- Thomas Huber, Robert Henschel, Junjie Li, **Sunita Chandrasekaran**. Impact of Virtualization and Containers on Application Performance and Energy Consumption.
  PEARC, July 22-26, 2018, 2018. PA. USA
- Joel Bricker, **Sunita Chandrasekaran**, OpenACC Enabled Benchmark Suite on Intel Ivy Bridge.
  GPU Technology Conference (GTC), March 21-24, 2016. CA. USA