Publications

2018


2017

- DAMMP: A Distributed Actor Model for Mobile Platforms. Arghya Chatterjee, Srdjan Milakovic, Bing Xue, Zoran Budimlic, Vivek Sarkar. 14th International Conference on Managed Languages & Runtimes (ManLang’17), September 2017. [slides]

2016

• Fine-grained parallelism in probabilistic parsing with Habanero Java. Matthew Francis-Landau
(Johns Hopkins University), Bing Xue (Rice University), Jason Eisner (Johns Hopkins University)
, and Vivek Sarkar (Rice University). In Proceedings of the Sixth Workshop on Irregular
Applications: Architectures and Algorithms (IA3, co-located with SC16), November 2016 [slides].

• Exploring Compiler Optimization Opportunities for the OpenMP 4.x Accelerator Model on a
POWER8+GPU Platform. Akihiro Hayashi, Jun Shirako, Ettore Tiotto, Robert Ho, Vivek
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with SC16), November 2016.

• Optimized Distributed Work-Stealing. Vivek Kumar, Karthik Murthy, Vivek Sarkar and Yili Zheng.
6th workshop on Irregular Applications: Architectures and Algorithms (IA*3), ACM, November 2016 [slides].

• Automatic Parallelization of Pure Method Calls via Conditional Future Synthesis. Rishi
Surendran and Vivek Sarkar. 2016 ACM SIGPLAN International Conference on Object-

• Pedagogy and Tools for Teaching Parallel Computing at the Sophomore Undergraduate Level.
Parallel and Distributed Computing Special Issue on Parallel, Distributed, and High
Performance Computing Education. 2016.

• OpenMP as a High-Level Specification Language for Parallelism. Max Grossman, Jun Shirako,

• An Extended Polyhedral Model for SPMD Programs and its use in Static Data Race Detection.
Prasanth Chatarasi, Jun Shirako, Martin Kong, Vivek Sarkar. The 29th International Workshop
on Languages and Compilers for Parallel Computing (LCPC), September 2016 [slides].

• The Open Community Runtime: A Runtime System for Extreme Scale Computing. Timothy G.
Mattson, Romain Cledat, Vincent Ceve, Vivek Sarkar, Zoran Budimlic, Sanjay Chatterjee, Josh
Pryman, Ivan Ganev, Robin Knauerhase, Min Lee, Benet Meister, Brian Nickerson, Nick
Pepperling, Balá Seshasayee, Sagnak Tasiril, Justin Teller, Nick Vrvelo. In 2016 IEEE High
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• Dynamic Determinacy Race Detection for Task Parallelism with Futures. Rishi Surendran and
Vivek Sarkar. 16th International Conference on Runtime Verification (RV'16), September 2016.

• Declarative Tuning for Locality in Parallel Programs. Sanjay Chatterjee, Nick Vrvelo, Zoran
Budimlic, Kathleen Knobe, Vivek Sarkar. The 45th International Conference on Parallel
Processing (ICPP-2016), August 2016. (slides)

• Integrating Asynchronous Task Parallelism with OpenSHMEM. Max Grossman, Vivek Kumar,

• A Distributed Selectors Runtime System for Java Applications. Arghya Chatterjee, Branko
Gvoka, Bing Xue, Zoran Budimlic, Shams Imam, Vivek Sarkar. 13th International Conference on
the Principles and Practice of Programming on the Java Platform: virtual machines, languages,
and tools (PPFJ'16), August 2016 [slides].

• Design and verification of distributed phasers. Karthik Murthy, Sri Raj Paul, Kuldeep S. Meel,
Tiago Cogumbeiro, and John M. Mellor-Crummey. 23rd International European Conference on
Parallel and Distributed Computing (EuroPAR), August 2016.

• Brief Announcement: Dynamic Determinacy Race Detection for Task Parallelism with Futures.
Rishi Surendran and Vivek Sarkar. 28th ACM Symposium on Parallelism in Algorithms and
Architectures (SPAA), July 2016.

• SWAT: A Programmable, In-Memory, Distributed, High-Performance Computing Platform. Max
Grossman, Vivek Sarkar. International ACM Symposium on High-Performance Parallel and
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• Efficient Checkpointing of Multi-Threaded Applications as a Tool for Debugging, Performance
Tuning, and Resilience. Max Grossman, Vivek Sarkar. IEEE International Parallel and
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• Code optimization of phase ordering. Tiago Cogumbeiro, Jun Shirako, Vivek Sarkar. Programming
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April 2016 [resource page].

• Automatic Data Layout Generation and Kernel Mapping for GPU+CPU Architectures. DeepakMajeti,
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Applications, Chapters and Architectures, November 2015.

• Distributed, Heterogeneous Scheduling Techniques Motivated by Production Geophysical
Applications. Max Grossman, Mauricio Araya-Polo. Workshop on Many-Task Computing on

• Concurrent Collections. Kathleen Knobe, Michael G. Burke, and Frank

• Auto-Grading for Parallel Programs. Maha Aziz,Heng Chi, Anant Tibrewal, Max Grossman,
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• LLVM-based Communication Optimizations for PGAS Programs. Akihiro Hayashi, Jisheng Zhao, Michael Ferguson, Vivek Sarkar. The 2nd Workshop on the LLVM Compiler Infrastructure in HPC (LLVM, co-located with SC15), November, 2015.


• Extending Polyhedral Model for Analysis and Transformations of OpenMP Programs. Prasanth Chatarasi, and Vivek Sarkar. PACT ACM Student Research Competition, October 2015. [accepted as poster with accompanying extended abstract][poster]

• Polyhedral Optimizations of Explicitly Parallel Programs. Prasanth Chatarasi, Jun Shirako, and Vivek Sarkar. 24th International Conference on Parallel Architectures and Compilation Techniques (PACT), October 2015. One of four papers selected for Best Paper session [slides].

• Compiling and Optimizing Java 8 Programs for GPU Execution. Kazuaki Ishizaki, Akihiro Hayashi, Gita Koblents, Vivek Sarkar. 24th International Conference on Parallel Architectures and Compilation Techniques (PACT), October 2015.


• Polyhedral Optimizations for a Data-Flow Graph Language. Alina Sbirlea, Jun Shirako, Louis-Noel Pouchet, Vivek Sarkar. The 28th International Workshop on Languages and Compilers for Parallel Computing (LCPC), September 2015.


• A Composable Deadlock-free Approach to Object-based Isolation. Shams Imam, Jisheng Zhao, Vivek Sarkar. 21st International European Conference on Parallel and Distributed Computing (Euro-Par'15), August 2015. [paper]


• Load Balancing Prioritized Tasks via Work-Stealing. Shams Imam, Vivek Sarkar. 21st International European Conference on Parallel and Distributed Computing (Euro-Par'15), August 2015. [paper]


• Polyhedral Transformations of Explicitly Parallel Programs. Prasanth Chatarasi, Jun Shirako, Vivek Sarkar. 5th International Workshop on Polyhedral Compilation Techniques (IMPACT 2015), January 2015. [slides]
- LLVM Optimizations for PGAS Programs -Case Study: LLVM Wide Optimization in Chapel-. Akihiro Hayashi, Rishi Surendran, Jisheng Zhao, Michael Ferguson, Vivek Sarkar. The 1st Chapel Implementers and Users Workshop (co-located with IPDPS2014), May 2014.

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- Speculative Execution of Parallel Programs with Precise Exception Semantics on GPUs. Akihiro Hayashi, Max Grossman, Jisheng Zhao, Jun Shirako, Vivek Sarkar. The 26th International Workshop on Languages and Compilers for Parallel Computing (LCPC), September 2013.
- Expressing DOACROSS Loop Dependencies in OpenMP. Jun Shirako, Priya Unnikrishnan, Sanjay Chatterjee, Kelvin Li, Vivek Sarkar. 9th International Workshop on OpenMP (IWOMP), September 2013.
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- **Oil and Water can mix! Experiences with integrating Polyhedral and AST-based Transformations.** Jun Shirako, Vivek Sarkar. 17th Workshop on Compilers for Parallel Programming (CPC), July 2013.
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- **Finish Accumulators: a Deterministic Reduction Construct for Dynamic Task Parallelism.** Jun Shirako, Vincent Cave, Jisheng Zhao, Vivek Sarkar. The 4th Workshop on Determinism and Correctness in Parallel Programming (WoDet), March 2013.

**2012**

- **Scalable and Precise Dynamic Data Race Detection for Structured Parallelism.** Raghavan Raman, Jisheng Zhao, Vivek Sarkar, Martin Vechev, Eran Yahav. 33rd ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI), June 2012. [slides]
  - An extended version of this paper along with the correctness proofs can be found in Technical Report TR12-01.
- **Mapping a Data-Flow Programming Model onto Heterogeneous Platforms.** Alina Sbirlea, Yi Zou, Zoran Budimlic, Jason Cong, Vivek Sarkar. Conference on Languages, Compilers, Tools and Theory for Embedded Systems (LCTES), June 2012. [slides] [clp]
- **Practical Permissions for Race-Free Parallelism.** Edwin Westbrook, Jisheng Zhao, Zoran Budimlic, Vivek Sarkar. 26th European Conference on Object-Oriented Programming (ECOOP), June 2012.
- **CnC-Python: Multicore Programming with High Productivity.** Shams Imam, Vivek Sarkar. 4th USENIX Workshop on Hot Topics in Parallelism (HotPar ’12), June 2012. [accepted as poster with accompanying paper]. [paper]
• Report on Inter-Agency Workshop on HPC Resilience at Extreme Scale. (Editor: John T. Daly.) February 2012.

2011

• Intermediate Language Extensions for Parallelism. Jisheng Zhao, Vivek Sarkar. 5th Workshop on Virtual Machine and Intermediate Languages (VMIL'11), October 2011.
• Interfacing Chapel with Traditional HPC Programming Languages. Adrian Prantl, Thomas Bopp, Shams Imam, Vivek Sarkar. PQS11 Proceedings, October 2011. [paper, slides]
• Unifying Barrier and Point-to-Point Synchronization in OpenMP with Phasers. Jun Shirako, Kamal Sharma, Vivek Sarkar. 7th International Workshop on OpenMP (IWOMP), June 2011. [slides]
• Communication Optimizations for Distributed-Memory X10 Programs. Rajkishore Barik, Jisheng Zhao, David Grove, Igor Peshansky, Zoran Budimlic, Vivek Sarkar. 25th IEEE International Parallel and Distributed Processing Symposium (IPDPS), May 2011.
• Scheduling Macro-Dataflow Programs on Task-Parallel Runtime Systems. Sagnak Tasiril, Master’s thesis, April 2011. [slides]

2010

• Efficient Date Race Detection for Async-Finish Parallelism. Raghavan Raman, Jisheng Zhao, Vivek Sarkar, Martin Vechev, Eran Yahav. Proceedings of the 1st International Conference on Runtime Verification (RV ’10), November 2010. Recipient of Best Paper Award. [slides]

• Parallel Object-Oriented Scientific Computing with Habanero-Java. Zoran Budimlic, Vincent Cave, Jun Shirako, Yonghong Yan, Jisheng Zhao, Vivek Sarkar, Michael Glinsky, James Cunringer. 9th Workshop on Parallel/High-Performance Object-Oriented Scientific Computing (POOSC'10), co-located with SPLASH 2010, October 2010.


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• Hierarchical Place Trees: A Portable Abstraction for Task Parallelism and Date Movement. Yonghong Yan, Jisheng Zhao, Yi Guo, Vivek Sarkar. Proceedings of the 22nd Workshop on Languages and Compilers for Parallel Computing (LCPC), October 2009.


2008


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