

## 2023

**AAAI 2023 SLIQ: Resource-Efficient Quantum Similarity Networks for Unlabeled Data on Noisy Quantum Computers.**

Daniel Silver, William Cutler, Tirthak Patel, Harshitta Gandhi, Aditya Ranjan, Devesh Tiwari, *Proceedings of the Thirty-Seventh AAAI Conference on Artificial Intelligence (AAAI), 2023.*

## 2022

**SC 2022 (a) DayDream: Executing Dynamic Scientific Workflows on Serverless Platforms with Hot Starts.**

Rohan Basu Roy, Tirthak Patel, Devesh Tiwari, *Proceedings of the 35th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC), 2022. Accepted; to appear in Nov. 2022.*

**SC 2022 (b) CHARTER: Identifying the Most-Critical Gate Operations in Quantum Circuits via Amplified Gate Reversibility.**

Tirthak Patel, Daniel Silver, Devesh Tiwari, *Proceedings of the 35th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC), 2022. Accepted; to appear in Nov. 2022.*

**AAAI 2022 QUILT: Effective Multi-Class Classification on Quantum Computers Using an Ensemble of Diverse Quantum Classifiers.**

Daniel Silver, Tirthak Patel, Devesh Tiwari, *Proceedings of the Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI), 2022.*

**ASPLOS 2022 (a) IceBreaker: warming serverless functions better with heterogeneity.**

Rohan Basu Roy, Tirthak Patel, Devesh Tiwari, *Proceedings of the 27th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2022.*

**ASPLOS 2022 (b) QUEST: systematically approximating Quantum circuits for higher output fidelity.**

Tirthak Patel, Ed Younis, Costin Iancu, Wibe de Jong, Devesh Tiwari, *Proceedings of the 27th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*, 2022.

**ISCA 2022 Geyser: a compilation framework for quantum computing with neutral atoms.**

Tirthak Patel, Daniel Silver, Devesh Tiwari, *Proceedings of the 49th International Symposium on Computer Architecture (ISCA)*, 2022.

**HPCA 2022 AI-Enabling Workloads on Large-Scale GPU-Accelerated System: Characterization, Opportunities, and Implications.**

Baolin Li, Rohin Arora, Siddharth Samsi, Tirthak Patel, et al., *Proceedings of the 28th International Symposium on High-Performance Computer Architecture (HPCA)*, 2022.

**PPoPP 2022 Mashup: making serverless computing useful for HPC workflows via hybrid execution.**

Rohan Basu Roy, Tirthak Patel, Devesh Tiwari, *Proceedings of the 27th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)*, 2022.

**SOCC 2022 MISO: Exploiting Multi-Instance GPU Capability on Multi-Tenant GPU Clusters.**

Baolin Li, Tirthak Patel, Vijay Gadepally, Sid Samsi, Devesh Tiwari, *Proceedings of the 13th Symposium on Cloud Computing (SOCC)*, 2022. Acceptance rate: 24%.

**NAACL 2022 Great Power, Great Responsibility: Recommendations for Reducing Energy for Training Language Models.**

Joseph McDonald, Baolin Li, Nathan C. Frey, Devesh Tiwari, Vijay Gadepally, Siddharth Samsi, *Proceedings of the Findings of the Association for Computational Linguistics (NAACL)*, 2022.

**DATE 2022 (a) OPTIC: A Practical Quantum Binary Classifier for Near-Term Quantum Computers.**

Tirthak Patel, Daniel Silver, Devesh Tiwari, *Proceedings of the Design, Automation and Test in Europe Conference and Exhibition (DATE)*, 2022.

**DATE 2022 (b) Do Temperature and Humidity Exposures Hurt or Benefit Your SSDs?**

Adnan Maruf, Sashri Brahmakshatriya, Baolin Li, Devesh Tiwari, Gang Quan, Janki Bhimani, *Proceedings of the Design, Automation and Test in Europe Conference and Exhibition (DATE)*, 2022. Best Paper Award Finalist.

2021

**SC 2021 (a) Systematically Inferring I/O Performance Variability by Examining Repetitive Job Behavior.**

Emily Costa, Tirthak Patel, Benjamin Schwaller, James Brandt, Devesh Tiwari, *Proceedings of the 34th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC)*, 2021. Accepted; to appear in Nov. 2021. Acceptance rate: 24%.

**SC 2021 (b) Ribbon: Cost-Effective and QoS-Aware Deep Learning Model Inference using a Diverse Pool of Cloud Computing Instances.**

Baolin Li, Rohan Basu Roy, Tirthak Patel, Vijay Gadepally, Karen Gettings, Devesh Tiwari, *Proceedings of the 34th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC)*, 2021. Accepted; to appear in Nov. 2021. Acceptance rate: 24%.

**ISCA 2021 SATORI: Efficient and Fair Resource Partitioning by Sacrificing Short-Term Benefits for Long-Term Gains.**

Rohan Basu Roy, Tirthak Patel, Devesh Tiwari, *Proceedings of the 48th International Symposium on Computer Architecture (ISCA)*, 2021. Acceptance rate: 18%.

**HPCA 2021 Operating Liquid-Cooled Large-Scale Systems: Long-Term Monitoring, Reliability Analysis, and Efficiency Measures.**

Rohan Basu Roy, Tirthak Patel, Raj Kettimuthu, Paul Rich, Adam Scovel, William Allcock, Devesh Tiwari, *Proceedings of the 27th International Symposium on High-Performance Computer Architecture (HPCA)*, 2021. Acceptance rate: 24%.

**DSN 2021 Examining Failures and Repairs on Supercomputers with Multi-GPU Compute Nodes.**

Amir Taherin, Tirthak Patel, Giorgis Georgakoudis, Ignacio Laguna, Devesh Tiwari, *Proceedings of the 51th Annual IEEE/IFIP Int'l Conference on Dependable Systems and Networks (DSN)*, 2021. Acceptance rate: 16%.

**PLDI 2021 BLISS: Auto-tuning Complex Applications Using A Pool of Diverse Lightweight Learning Models.**

Rohan Basu Roy, Tirthak Patel, Vijay Gadepally, Devesh Tiwari, *Proceedings of the 42nd ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI)*, 2021. Acceptance rate: 27%.

**IISWC 2021 Serverless Storage Scalability Challenges: Characterization, Implications, and Mitigation.**

Rohan Basu Roy, Tirthak Patel, Devesh Tiwari, *Proceedings of the IEEE International Symposium on Workload Characterization(IISWC)*, 2021. Acceptance rate: 40%.

**HPEC 2021 Serving Machine Learning Inference Using Heterogeneous Hardware.**

Baolin Li, Vijay Gadepally, Siddharth Samsi, Mark Veillette, Devesh Tiwari, *Proceedings of the 25th International IEEE High Performance Extreme Computing (HPEC) Conference, 2021. Outstanding Student Paper Award.*

**ASPLOS 2021 QRAFT: Reverse Your Quantum Circuit and Know the Correct Program Output.**

Tirthak Patel, Devesh Tiwari, *Proceedings of the 26th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS), 2021. Acceptance rate: 19%.*

**2020**

**USENIX ATC 2020 UREQA: Leveraging Operation-Aware Error Rates for Effective Quantum Circuit Mapping on NISQ-Era Quantum Computers.**

Tirthak Patel, Baolin Li, Rohan Basu Roy, Devesh Tiwari, *Proceedings of the USENIX Annual Technical Conference (USENIX ATC), 2020. Acceptance rate: 18%.*

**USENIX FAST 2020 (a) GIFT: A Coupon Based Throttle-and-Reward Mechanism for Fair and Efficient I/O Bandwidth Management on Parallel Storage Systems.**

Tirthak Patel, Rohan Garg, Devesh Tiwari, *Proceedings of the 18th USENIX Conference on File and Storage Technologies (FAST), 2020. Acceptance rate: 17%.*

**USENIX FAST 2020 (b) Uncovering Access, Reuse, and Sharing Characteristics of I/O-Intensive Files on Large-Scale Production HPC Systems.**

Tirthak Patel, Suren Byna, Glenn K Lockwood, Nicholas J Wright, Philip Carns, Robert Ross, Devesh Tiwari, *Proceedings of the 18th USENIX Conference on File and Storage Technologies (FAST), 2020. Acceptance rate: 17%.*

**USENIX FAST 2020 Making Disk Failure Predictions SMARTer!**

(c) Sidi Lu, Bing Luo, Tirthak Patel, Yongtao Yao, Devesh Tiwari, Weisong Shi, *Proceedings of the 18th USENIX Conference on File and Storage Technologies (FAST), 2020. Acceptance rate: 17%.*

**SC 2020 (a) VERITAS: Accurately Estimating the Correct Output on Noisy Intermediate-Scale Quantum Computers.**

Tirthak Patel, Devesh Tiwari, *Proceedings of the 33th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC), 2020. Acceptance rate: 25%.*

**SC 2020 (b) Experimental Evaluation of NISQ Quantum Computers: Error Measurement, Characterization, and Implications.**  
**Best Paper Finalist, Best Student Paper Finalist**

Tirthak Patel, Abhay Potharaju, Baolin Li, Rohan Basu Roy, Devesh Tiwari, *Proceedings of the 33th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC), 2020. Acceptance rate: 25%.*

**SC 2020 (c) Job Characteristics on Large-Scale Systems: Long-Term Analysis, Quantification and Implications.**

Tirthak Patel, Zhengchun Liu, Rajkumar Kettimuthu, Paul Rich, William Allcock, Devesh Tiwari, *Proceedings of the 33th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC), 2020. Acceptance rate: 25%.*

**ICCAD 2020 DisQ: A Novel Quantum Output State Classification Method on IBM Quantum Computers using OpenPulse.**  
**Best Paper Finalist**

Tirthak Patel, Devesh Tiwari, *Proceedings of the 39<sup>th</sup> IEEE/ACM International Conference On Computer Aided Design (ICCAD), 2020. Acceptance rate: 25%.*

**HPCA 2020 CLITE: Efficient and QoS-Aware Co-Location of Multiple Latency-Critical Jobs for Warehouse Scale Computers.**

Tirthak Patel, Devesh Tiwari, *Proceedings of the 26nd International Symposium on High-Performance Computer Architecture (HPCA), 2020. Acceptance rate: 19%.*

**IPDPS 2020 What does the Power Consumption Behavior of HPC Jobs Reveal?**

Tirthak Patel, Adam Wagenhauser, Christopher Eibel, Timo Honig, Thomas Zeiser, Devesh Tiwari, *Proceedings of the 34th IEEE International Parallel and Distributed Processing Symposium (IPDPS), 2020. Acceptance rate: 16% (acceptance rate for papers accepted in the first-round without revision).*

**JSNAM 2020 Resilience and Coevolution of Preferential Interdependent Networks.**

Auroop Ganguly, Tanay Mehta, Tirthak Patel, Ravi Sundaram, Devesh Tiwari, *Journal of Social Network Analysis and Mining, Springer Vienna, 2020.*

**JMR 2020 Comparing Performances of Five Distinct Automatic Classifiers for Fin Whale Vocalizations in Beamformed Spectrograms of Coherent Hydrophone Array.**

Heriberto Garcia, Trenton Couture, Amit Galor, Jessica M Topple, Wei Huang, Devesh Tiwari and Purnima Ratilal, *Journal of Remote Sensing, Multidisciplinary Digital Publishing Institute, 2020.*

**TDSC 2020 Characterizing and Exploiting Soft Error Vulnerability Phase Behavior in GPU Applications.**

Fritz Previlon, Charu Kalra, Devesh Tiwari, David Kaeli *IEEE Transactions on Dependable and Secure Computing*, 2020.

## 2019

**TPDS 2019 An Analysis Workflow-Aware Storage System for Multi-Core Active Flash Arrays.**

Hyogi Sim, Geoffroy Vallee, Youngjae Kim, Sudharshan S. Vazhkudai, Devesh Tiwari, Ali Butt, *IEEE Transactions on Parallel and Distributed Systems*, 2019.

**SC 2019 Revisiting I/O Behavior in Large-Scale Storage Systems: The Expected and the Unexpected.**

Tirthak Patel, Suren Byna, Glenn L. Lockwood, Devesh Tiwari, *Proceedings of the 32th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC)*, 2019. Acceptance rate: 21%.

**HPDC 2019 PERQ: Fair and Efficient Power Management of Power-Constrained Large-Scale Computing Systems.**

Tirthak Patel, Devesh Tiwari, *Proceedings of the 28th International Symposium on High-Performance Parallel and Distributed Computing (HPDC)*, 2019. Acceptance rate: 21%.

**DAC 2019 What Does Vibration Do To Your SSD?**

Janki Bhimani, Tirthak Patel, Ningfang Mi, Devesh Tiwari, *Proceedings of the 56th ACM/IEEE Design Automation Conference*, June, 2019. Acceptance rate: 24%.

**CLOUD 2019 Exploring Potential for Non-Disruptive Vertical Auto Scaling and Resource Estimation in Kubernetes.**

Gourav Rattihalli, Madhusudhan Govindaraju, Hui Lu, Devesh Tiwari, *Proceedings of 12th IEEE International Conference on Cloud Computing (CLOUD)*, 2019. Acceptance rate: 20%

**ICAC 2019 Characterizing Disk Health Degradation and Proactively Protecting Against Disk Failures for Reliable Storage Systems.**

Song Huang, Shuwen Liang, Song Fu, Weisong Shi, Devesh Tiwari, Hsing-bung Chen, *Proceedings of 16th IEEE International Conference on Autonomic Computing (ICAC)*, 2019. Acceptance rate: 27%

**CCGrid 2019** Towards Enabling Dynamic Resource Estimation and Correction for Improving Utilization in an Apache Mesos Cloud Environment.

Gourav Rattihalli, Madhusudhan Govindaraju, Devesh Tiwari, *Proceedings of 19th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGRID), 2019.*

**DATE 2019** PCFI: Program Counter Guided Fault Injection for Accelerating GPU Reliability Assessment.

Fritz G. Previlon, Charu Kalra, Devesh Tiwari, David R. Kaeli, *Proceedings of the IEEE Design, Automation & Test in Europe Conference, March, 2019. Acceptance rate: 25%*

## 2018

**BIGDATA 2018** Reliability Characterization of Solid State Drives in a Scalable Production Datacenter.

Shuwen Liang, Zhi Qiao, Jacob Hochstetler, Song Huang, Song Fu, Weisong Shi, Devesh Tiwari, Hsing-Bung Chen, Bradley Settlemyer, David Montoya, *Proceedings of the IEEE International Conference on Big Data (Big Data), Seattle, December 2018. Acceptance rate: 20%.*

**ASONAM 2018** Resilience and the Coevolution of Interdependent Multiplex Networks.

Tanay Mehta, Ravi Sundaram, Auroop Ganguly, Devesh Tiwari, *Proceedings of the IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM 2018), Spain, August 2018. Acceptance rate: 15%.*

**ICCCN 2018** Exploring the Optimal Platform Configuration for Power-Constrained HPC Workflows.

Kun Tang, Xubin He, Saurabh Gupta, Sudharshan Vazhkudai, Devesh Tiwari, *Proceedings of the 27th International Conference on Computer Communication and Networks (ICCCN), China, July 2018. Acceptance rate: 29%.*

**DSN 2018 (a)** Shiraz: Exploiting System Reliability and Application Resilience Characteristics to Improve Large Scale System Throughput.

Rohan Garg, Tirthak Patel, Gene Cooperman, Devesh Tiwari, *Proceedings of the 48th Annual IEEE/IFIP Int'l Conference on Dependable Systems and Networks (DSN 2018), Luxembourg, June 2018. Acceptance rate: 25%.*

**DSN 2018 (b)** Machine Learning Models for GPU Error Prediction in a Large Scale HPC System.

Bin Nie, Ji Xue, Saurabh Gupta, Tirthak Patel, Christian Engelmann, Evgenia Smirni, Devesh Tiwari, *Proceedings of the 48th Annual IEEE/IFIP Int'l Conference on Dependable Systems and Networks (DSN 2018), Luxembourg, June 2018. Acceptance rate: 25%.*

**DSN 2018 (c) Understanding and Analyzing Interconnect Errors and Network Congestion on a Large Scale HPC System.**

Mohit Kumar, Saurabh Gupta, Tirthak Patel, Michael Wilder, Weisong Shi, Song Fu, Christian Engelmann, Devesh Tiwari, *Proceedings of the 48th Annual IEEE/IFIP Int'l Conference on Dependable Systems and Networks (DSN 2018)*, Luxembourg, June 2018. Acceptance rate: 25%.

**2017**

**SC 2017 (a) Failures in Large Scale Systems: Long-Term Measurement, Analysis, and Implications.**

Saurabh Gupta, Tirthak Patel, Christian Engelmann, Devesh Tiwari, *Proceedings of the 30th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC)*, Denver, Colorado, November 2017. Acceptance rate: 18%.

**SC 2017 (b) GUIDE: A Scalable Information Directory Service to Collect, Federate, and Analyze Logs for Operational Insights into a Leadership HPC Facility.**

Sudharshan S. Vazhkudai, Ross Miller, Devesh Tiwari, Christopher Zimmer, Feiyi Wang, Sarp Oral, Raghul Gunasekaran, Deryl Steinert, *Proceedings of the 30th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC)*, Denver, Colorado, November 2017. Acceptance rate: 18%.

**MASCOTS 2017 (a) Toward Managing HPC Burst Buffers Effectively: Draining Strategy to Regulate Bursty I/O Behavior.**

Kun Tang, Ping Huang, Xubin He, Tao Lu, Sudharshan S. Vazhkudai, Devesh Tiwari, *Proceedings of the 25th IEEE International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2017)*, Banff, Canada, September 2017. Acceptance rate: 24%.

**MASCOTS 2017 (b) Characterizing Temperature, Power, and Soft-error Behaviors in Data Center Systems: Insights, Challenges, and Opportunities.**

Bin Nie, Ji Xue, Saurabh Gupta, Christian Engelmann, Evgenia Smirni, Devesh Tiwari, *Proceedings of the 25th IEEE International Symposium on Modeling, Analysis and Simulation of Computer and Telecommunication Systems (MASCOTS 2017)*, Banff, Canada, September 2017. Acceptance rate: 24%.

**CLUSTER 2017 Effective Running of End-to-end HPC Workflows on Emerging Heterogeneous Architectures.**

Kun Tang, Devesh Tiwari, Saurabh Gupta, Sudharshan Vazhkudai, Xubin He, *Proceedings of the 19th IEEE International Conference on Cluster Computing (CLUSTER)*, Hawaii, September 2017. Acceptance rate: 30%.



**MWSCAS 2017 Combining Architectural Fault-injection and Neutron Beam Testing Approaches Toward Better Understanding of GPU Soft-error Resilience.**

Fritz G. Previlon, Babatunde Egbantan, Devesh Tiwari, Paolo Rech, David R. Kaeli, *Proceedings of the 60th IEEE International Midwest Symposium on Circuits and Systems, August, 2017.*

**TECS 2017 Compiler-directed Soft Error Detection and Recovery to Avoid DUE and SDC via Tail-DMR.**

Qingrui Liu, Changhee Jung, Dongyoon Lee, Devesh Tiwari, *ACM Transactions on Embedded Computing Systems (TECS), 2017.*

**TOMPECS 2017 Obtaining and Managing Answer Quality for Online Data-intensive Services.**

Jaimie Kelley, Christopher Stewart, Nathaniel Morris, Devesh Tiwari, Yuxiong He, and Sameh Elnikety, *ACM Transactions on Modeling and Performance Evaluation of Computing Systems (TOMPECS), 2017.*

**2016**

**SC 2016 (a) Granularity and the Cost of Error Recovery in Resilient AMR Scientific Applications.**

Anshu Dubey, Hajime Fujita, Daniel Graves, Andrew Chien, Devesh Tiwari, *Proceedings of the 29th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC), Salt Lake City, Utah, November 2016. Acceptance rate: 18%.*

**SC 2016 (b) Compiler Directed Lightweight, Fine-grained, Guaranteed Recovery for Soft Error Resilience.**

**Best Student Paper Award Finalist**

Qingrui Liu, Changhee Jung, Dongyoon Lee, Devesh Tiwari, *Proceedings of the 29th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC), Salt Lake City, Utah, November 2016. Acceptance rate: 18%.*

**MICRO 2016 Low-Cost Soft Error Resilience with Unified Data Verification and Fine-Grained Recovery for Acoustic Sensor Based Detection.**

Qingrui Liu, Changhee Jung, Dongyoon Lee, Devesh Tiwari, *Proceedings of 49th IEEE/ACM International Symposium on Microarchitecture (MICRO), Taipei, Taiwan, October 2016. Acceptance rate: 21%.*

**ICAC 2016 Adaptive Power Profiling for Many-Core HPC Architectures.**

Jaimie Kelley, Christopher Stewart, Devesh Tiwari, Saurabh Gupta, *Proceedings of IEEE International Conference on Autonomic Computing (ICAC 2016), Wurzburg, Germany, July 2016.*

**DSN 2016 Power-aware Checkpointing: Toward the Optimal Checkpointing Interval under Power Capping**

Kun Tang, Devesh Tiwari, Saurabh Gupta, Ping Huang, QiQi Lu, Christian Engelmann, Xubin He, *Proceedings of the 46th Annual IEEE/IFIP Int'l Conference on Dependable Systems and Networks (DSN 2016), France, June 2016. Acceptance rate: 22%*

**IPDPS 2016 Reducing Waste in Large Scale Systems Through Introspective Analysis.**

Leonardo Bautista-Gomez, Ana Gainaru, Swann Perarnau, Devesh Tiwari, Saurabh Gupta, Franck Cappello, Christian Engelmann, Marc Snir, *Proceedings of the 30th IEEE Int'l Parallel & Distributed Processing Symposium (IPDPS'16), Chicago, USA, May 2016. Acceptance rate: 24%.*

**HPCA 2016 A Large-Scale Study of Soft-Errors on GPUs in the Field.**

Bin Nie, Devesh Tiwari, Saurabh Gupta, Evgenia Smirni, Jim Rogers, *Proceedings of the 22nd International Symposium on High-Performance Computer Architecture (HPCA), March 2016. Acceptance rate: 24%.*

**2015**

**SC 2015 (a) Reliability Lessons Learned From GPU Experience With The Titan Supercomputer at Oak Ridge Leadership Computing Facility.**

Devesh Tiwari, Saurabh Gupta, George Gallarno, Jim Rogers, and Don Maxwell, *Proceedings of the 28th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC), Austin, Texas, November 2015. Acceptance rate: 22%.*

**SC 2015 (b) A Practical Approach to Reconciling Availability, Performance, and Capacity in Provisioning Extreme-scale Storage Systems.**

Lipeng Wan, Feiyi Wang, Sarp Oral, Devesh Tiwari, Sudharshan Vazhkudai, and Qing Cao, *Proceedings of the 28th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC), Austin, Texas, November 2015. Acceptance rate: 22%.*

**SC 2015 (c) AnalyzeThis: An Analysis Workflow-Aware Storage System.**

Hyogi Sim, Youngjae Kim, Sudharshan Vazhkudai, Devesh Tiwari, Ali Anwar, Ali Butt, and Lavanya Ramakrishnan, *Proceedings of the 28th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC), Austin, Texas, November 2015. Acceptance rate: 22%.*

**SC 2015 (d) Node Variability in Large-Scale Power Measurements: Perspectives from the Green500, Top500 and EEHPCWG.**

Thomas Scogland, Jonathan Azose, David Rohr, Suzanne Rivoire, Natalie Bates, Daniel Hackenberg, Torsten Wilde, Jim Rogers, Devesh Tiwari\*, *Proceedings of the 28th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC), Austin, Texas, November 2015. Acceptance rate: 22%. \*Listed as a co-author, but not included in the paper meta-data due to the PC member author limit.*

**ICAC 2015 Ubora: Measuring and Managing Answer Quality for Online Data-Intensive Services.**

Jaimie Kelley, Christopher Stewart, Devesh Tiwari, Yuxiong He, Sameh Elnikety, Nathaniel Morris, *Proceedings of IEEE International Conference on Autonomic Computing (ICAC 2015), Grenoble, France, July 2015.*

**DSN 2015 Understanding and Exploiting Spatial Properties of System Failures on Extreme-Scale HPC Systems.**

Saurabh Gupta, Devesh Tiwari, Christopher Jantzi, Jim Rogers, and Don Maxwell, *Proceedings of the 45th Annual IEEE/IFIP Int'l Conference on Dependable Systems and Networks (DSN 2015), Brazil, June 2015. Acceptance rate: 22%.*

**LCTES 2015 Clover: Compiler Directed Lightweight Soft Error Resilience.**

Qingrui Liu, Changhee Jung, Dongyoon Lee, and Devesh Tiwari, *Proceedings of ACM SIGPLAN/SIGBED Conference on Languages, Compilers, Tools and Theory for Embedded Systems (LCTES 2015), Portland, Oregon, USA, June 2015. Acceptance rate: 27%.*

**HPCA 2015 Understanding GPU Errors on Large-scale HPC Systems and the Implications for System Design and Operation.**

Devesh Tiwari, Saurabh Gupta, Jim Rogers, Don Maxwell, Paolo Rech, Sudharshan Vazhkudai, Daniel Oliveira, Dave Londo, Nathan Debardeleben, Philippe Navaux, Luigi Carro, Arthur S. Bland, *Proceedings of the 21st International Symposium on High-Performance Computer Architecture (HPCA), February 2015. Acceptance rate: 24%.*

**CUG 2015 Experience with GPUs on the Titan Supercomputer from a Reliability, Performance and Power Perspective.**

Devesh Tiwari, Saurabh Gupta, Jim Rogers, and Don Maxwell, *Proceedings of the Cray User Group Conference (CUG), 2015.*

**JPDC 2015 Application Configuration Predication for Energy-Efficient Execution on Multicore Systems.**

Shinan Wang, Bing Luo, Weisong Shi, and Devesh Tiwari, *Proceedings of the Journal of Parallel and Distributed Computing, 2015.*

**2014**

**SC 2014 Best Practices and Lessons Learned from Deploying and Operating Large-Scale Data-Centric Parallel File Systems.**  
**Best Paper Finalist (14 out of 394 papers)**

Sarp Oral, James Simmons, Jason Hill, Dustin Leverman, Feiyi Wang, Matt Ezell, Ross Miller, Doug Fuller, Raghul Gunasekaran, Youngjae Kim, Saurabh Gupta, Devesh Tiwari, Sudharshan Vazhkudai, James Rogers, David Dillow, Galen M. Shipman and Arthur S. Bland, *Proceedings of the 27th IEEE/ACM Int'l Conference on High Performance Computing, Networking, Storage and Analysis (SC)*, New Orleans, Louisiana, November 2014. Acceptance rate: 20%.

**DSN 2014 Lazy Checkpointing: Exploiting Temporal Locality in Failures to Mitigate Checkpointing Overheads on Extreme-Scale Systems.**  
**Best Paper Award Nominee (3 out of 180 papers)**

Devesh Tiwari, Saurabh Gupta and Sudharshan Vazhkudai, *Proceedings of the 44th Annual IEEE/IFIP Int'l Conference on Dependable Systems and Networks (DSN 2014)*, Atlanta, Georgia, USA, June 2014. Top 2%.

**IPDPS 2014 MapReuse: Reusing Computation in an In-Memory MapReduce System**

Devesh Tiwari and Yan Solihin, *Proceedings of the 28th IEEE Int'l Parallel & Distributed Processing Symposium (IPDPS'14)*, Arizona, USA, May 2014. Acceptance rate: 21%.

**CUG 2014 I/O Router Placement and Fine-Grained Routing on Titan to Support Spider II**

Matt Ezell, Dave Dillow, Sarp Oral, Feiyi Wang, Devesh Tiwari, Don Maxwell, Dustin Leverman and Jason Hill, *Proceedings of the Cray User Group Conference (CUG)*, May, 2014.

**ICPADS 2014 Improving Large-scale Storage System Performance via Topology-aware and Balanced Data Placement**

Feiyi Wang, Sarp Oral, Saurabh Gupta, Devesh Tiwari, Sudharshan Vazhkudai, *Proceedings of the 20th IEEE Int'l Conference on Parallel and Distributed Systems (ICPADS)*, 2014. Acceptance rate: 29%.

**LUG 2014 SSD Provisioning for Exascale Storage System: When, Where and How much?**

Devesh Tiwari, Sarp Oral, Feiyi Wang, Saurabh Gupta and Josh Judd, *Presentation in the Lustre User Group Conference (LUG)*, April, 2014.

**2013 and before**

**FAST 2013 Active Flash: Towards Energy-Efficient, In-Situ Data Analytics on Extreme-Scale Machine**

Devesh Tiwari, Simona Boboila, Sudharshan Vazhkudai, Youngjae Kim, Xiasong Ma, Peter Desnoyers and Yan Solihin, *Proceedings of the 11th USENIX Conference on File and Storage Technologies (FAST '13)*, California, USA, February 2013. Acceptance rate: 19%.

**HotPower 2012 Reducing Data Movement Cost using Energy-Efficient Active Computation on SSD**

Devesh Tiwari, Sudharshan Vazhkudai, Youngjae Kim, Xiaosong Ma, Simona Boboila and Peter Desnoyers, *2012 USENIX Workshop on Power-Aware Computing and Systems (HotPower'12, co-located with OSDI'12)*, California, USA, October 2012.

**IPDPS 2012 Modeling and Analyzing Key Performance Factors of Shared Memory Map Reduce Best Paper Award Nominee**

**Best Talk Award at IBM TJ Watson Student Cloud Computing Workshop**

Devesh Tiwari and Yan Solihin, *Proceedings of the 26th IEEE Int'l Parallel & Distributed Processing Symposium (IPDPS'12)*, Shanghai, China, May 2012. Acceptance rate: 21%.

**ISPASS 2012 Architectural Characterization and Similarity Analysis of Sunspider and Google's V8 Javascript Benchmarks**

Devesh Tiwari and Yan Solihin, *Proceedings of International Symposium on Performance Analysis and System Software (ISPASS)*, April 2012. Acceptance rate: 30%.

**HPCA 2011 HAQu: Hardware Accelerated Queueing for Fine-Grained Threading on a Chip Multi-Processor**

**Media Coverage in HPCWire, ACMTech News, PhyOrg**

Sanghoon Lee, Devesh Tiwari, Yan Solihin and James Tuck, *Proceedings of International Conference on High Performance Computer Architecture (HPCA)*, February 2011. Acceptance rate: 18%.

**IPDPS 2010 MMT: Exploiting Fine-Grained Parallelism in Dynamic Memory Management**

**Media Coverage in HPCWire, ACMTech News, PhyOrg  
Appeared on Slashdot.org**

Devesh Tiwari, Sanghoon Lee, James Tuck and Yan Solihin, *Proceedings of International Parallel and Distributed Processing Symposium (IPDPS)*, April, 2010. Acceptance rate: 25%.

**MEDEA Workshop Memory Management Thread for Heap Intensive Sequential Applications**

**PACT 2009** Devesh Tiwari, Sanghoon Lee, James Tuck and Yan Solihin, *Proceedings of 10th MEDEA Workshop, with PACT 2009*.

- Wild and Crazy Idea Session** **Explicit Sequential Programming for Implicit Parallel Performance on Many Cores**  
Devesh Tiwari and Yan Solihin, *WACI Session, ASPLOS 2009*.
- Ceramics International 2009** **Simulation of Thermal and Electric Field Evolution during Spark Plasma Sintering**  
Devesh Tiwari, Bikramjit Basu and Kaushik Biswas, *Journal of Ceramics International 2009*.
- Ceramics International 2009** **Is Weibull distribution the most appropriate statistical strength distribution for brittle materials?**  
Bikramjit Basu, Devesh Tiwari and Debashish Kundu, *Journal of Ceramics International 2009*.

## Open-source Artifacts

Besides peer-reviewed research publications, our group also makes our contributions available as open-source artifacts. Although not required by the publication venues, we make these artifacts available at the time of the publication of our regular peer-reviewed research publications. The goal behind making these contributions open-source are threefold: (1) expedite the research progress as a community, (2) lower the barrier to entry to new fields (e.g., quantum computing), and (3) promote research reproducibility. Our artifacts are often one of the largest of their kind, and introduce novel methods and datasets to the community – consequently, have been downloaded and used by hundreds of researchers around the world.

- **Ribbon: Cost-Effective and QoS-Aware Deep Learning Model Inference System**  
<http://doi.org/10.5281/zenodo.5037569>
- **I/O Performance Variability Detection and Measurement Library**  
<https://doi.org/10.5281/zenodo.5236852>
- **SATORI: Bayesian Optimization based multi-core resource partitioning framework for throughput-oriented workloads**  
<https://github.com/rohanbasuoy/satori>
- **Failure dataset for two generations of GPU-accelerated supercomputers**  
<http://doi.org/10.5281/zenodo.4606221>
- **BLISS: performance auto-tuning framework for parallel applications**  
<https://github.com/rohanbasuoy/bliss>
- **QRAFT: quantum program output estimation framework using reversibility**  
<https://doi.org/10.5281/zenodo.4527305>
- **GIFT: coupon-based I/O bandwidth allocation framework**  
<https://github.com/GoodwillComputingLab/GIFT>
- **UREQA: machine learning based qubit allocation for quantum programs**  
<https://github.com/GoodwillComputingLab/UREQA>