

Maurice Peter Herlihy

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Research Interests

Practical and theoretical aspects of concurrent and distributed systems.

Positions

Brown University

Since 2016

An Wang Professor of Computer Science.

1998-2016

Professor, Computer Science Department.

1994 - 1998

Associate Professor, Computer Science Department.

1989 - 1994

Digital Equipment Corporation
Researcher, Cambridge Research Laboratory. Promoted to Consulting Engineer 1994.

Cambridge MA

1984 - 1989

Carnegie Mellon University
Assistant Professor, Computer Science Department.

Pittsburgh PA

October 2010 - August 2011

Technion
Visiting (on sabbatical).

Haifa, Israel

September 2004 - August 2005

Microsoft Research
On leave, visiting researcher.

Cambridge, UK

Honors and Awards

2017

Research Innovation Award, Brown University.

2016

Appointed to An Wang Chair of Computer Science. Brown University.

2015

Elected to the *American Academy of Arts and Sciences*.

SIGOPS Hall of Fame awarded to “Transactional Memory: architectural support for lock-free data structures.” In *Proceedings of the 1993 International Symposium on Computer Architecture*, May 1993, San Diego, CA.

2014

Elected fellow of the *National Academy of Inventors*.

2013

Elected to the *National Academy of Engineering*, “for concurrent computing techniques for linearizability, non-blocking data structures, and transactional memory”.

2013

the IEEE Computer Society’s *W. Wallace McDowell Award*, “for fundamental contributions to the theory and practice of multi-processor computation”.

2012

Dijkstra Prize in Distributed Computing. Awarded for “Transactional Memory: architectural support for lock-free data structures.” In *Proceedings of the 1993 International Symposium on Computer Architecture*, May 1993, San Diego, CA.

2010

Fulbright Distinguished Chair in the Natural Sciences and Engineering Lecturing Fellowship.

2008

ISCA *Influential Paper Prize* awarded to *Transactional Memory* by Maurice Herlihy and J.E.B. Moss, International Symposium on Computer Architecture, 1993.

2005

Named *fellow of the Association for Computing Machinery* “for contributions to distributed and parallel systems.”

2004

Gödel Prize for outstanding journal articles in theoretical Computer Science.

2003

Dijkstra Prize in Distributed Computing. Awarded for “Wait-free synchronization”, *ACM Transactions on Programming Languages and Systems*, 13(1):124–149, January 1991.

Education

June 1984

Massachusetts Institute of Technology.
Ph.D. in Computer Science.

Cambridge MA

June 1980

Massachusetts Institute of Technology.
M.S. in Computer Science.

Cambridge MA

June 1975

Harvard University
A.B. in Mathematics.

Cambridge MA

Books

Distributed Computing Through Combinatorial Topology, Morgan Kaufman 2013. ISBN 9780124045781.

The Art of Multiprocessor Programming by Maurice Herlihy and Nir Shavit. Morgan Kaufmann 2008. ISBN 0123705916.

Journal Publications

Costas Busch, Maurice Herlihy, Miroslav Popovic, Gokarna Sharma: Time-communication impossibility results for distributed transactional memory. *Distributed Computing* 31(6): 471-487 (2018)

Dimitra Papagiannopoulou, Andrea Marongiu, Tali Moreshet, Luca Benini, Maurice Herlihy, R. Iris Bahar: Hardware Transactional Memory Exploration in Coherence-Free Many-Core Architectures. *International Journal of Parallel Programming* 46(6): 1304-1328 (2018)

Maurice Herlihy, Sergio Rajsbaum, Michel Raynal, Julien Stainer: From wait-free to arbitrary concurrent solo executions in colorless distributed computing. *Theor. Comput. Sci.* 683: 1-21 (2017)

Maurice Herlihy, Zhiyu Liu: Well-Structured Futures and Cache Locality. *ACM Transactions on Parallel Computing* 2(4): 22 (2016)

Hammurabi Mendes, Maurice Herlihy, Nitin H. Vaidya, Vijay K. Garg: Multi-dimensional agreement in Byzantine systems. *Distributed Computing* 28(6): 423-441 (2015)

Dimitra Papagiannopoulou, Giuseppe Capodanno, Tali Moreshet, Maurice Herlihy, R. Iris Bahar: Energy-Efficient and High-Performance Lock Speculation Hardware for Embedded Multicore Systems. *ACM Trans. Embedded Comput. Syst.* 14(3): 51 (2015)

- Armando Castaeda, Maurice Herlihy, Sergio Rajsbaum: An Equivariance Theorem with Applications to Renaming. *Algorithmica* 70(2): 171-194 (2014)
- Maurice Herlihy, Sergio Rajsbaum, Michel Raynal: Power and limits of distributed computing shared memory models. *Theor. Comput. Sci.* 509: 3-24 (2013) Maurice Herlihy, Sergio Rajsbaum: The topology of distributed adversaries. *Distributed Computing* 26(3): 173-192 (2013)
- Maurice Herlihy, Sergio Rajsbaum, Michel Raynal: Power and limits of distributed computing shared memory models. *Theor. Comput. Sci.* 509: 3-24 (2013)
- Flavio Paiva Junqueira, Keith Marzullo, Maurice Herlihy, Lucia Draque Penso: Threshold protocols in survivor set systems. *Distributed Computing* 23(2): 135-149 (2010)
- Cesare Ferri, Samantha Wood, Tali Moreshet, R. Iris Bahar, Maurice Herlihy: Embedded-TM: Energy and complexity-effective hardware transactional memory for embedded multicore systems. *J. Parallel Distrib. Comput.* 70(10): 1042-1052 (2010)
- Maurice Herlihy, Sergio Rajsbaum, Mark R. Tuttle: An Axiomatic Approach to Computing the Connectivity of Synchronous and Asynchronous Systems. *Electr. Notes Theor. Comput. Sci.* 230: 79-102 (2009)
- Rachid Guerraoui, Maurice Herlihy, Bastian Pochon: A topological treatment of early-deciding set-agreement. *Theor. Comput. Sci.* 410(6-7): 570-580 (2009)
- Tim Harris, Simon Marlow, Simon L. Peyton Jones, Maurice Herlihy: Composable memory transactions. *Commun. ACM* 51(8): 91-100 (2008)
- Ferri, C., Moreshet, T., Bahar, R. I., Benini, L., and Herlihy, M. 2007. A hardware/software framework for supporting transactional memory in a MP-SoC environment. *SIGARCH Comput. Archit. News* 35, 1 (Mar. 2007), 47-54. <http://doi.acm.org/10.1145/1241601.1241611>
- Subconsensus Tasks: Renaming Is Weaker Than Set Agreement. Eli Gafni, Sergio Rajsbaum, and Maurice Herlihy. *Lecture Notes in Computer Science*, 2006. Pages 329-338. http://dx.doi.org/10.1007/11864219_23/ ISBN: 978-3-540-44624-8.
- Dynamic Analysis of the Arrow Distributed Protocol. Maurice Herlihy, Fabian Kuhn, Srikanta Tirthapura, and Roger Wattenhofer. *Theory of Computing Systems*. Volume 39, Number 6, November, 2006. pp 875-901.
- Ori Dvir, Maurice Herlihy, and Nir Shavit. Virtual Leashing: Creating a computational foundation for software protection. *Journal of Parallel and*

Distributed Computing Volume 66, Issue 9, September 2006, Pages 1233-1240

Srikanta Tirthapura, Maurice Herlihy: Self-Stabilizing Distributed Queuing. *IEEE Trans. Parallel Distrib. Syst.* 17(7): 646-655 (2006)

Maurice Herlihy, V. Luchangco, P. Martin, and M. Moir. Nonblocking memory management support for dynamic-sized data structures. *ACM Transactions on Computer Systems (TOCS)* 23(2), May 2005.

C. Cole and Maurice Herlihy. Snapshots and Software Transactional Memory. *Science of Computer Programming*. December 2005, Pages 310-324.

Maurice Herlihy, Srikanta Tirthapura, Self-stabilizing smoothing and balancing networks, *Distributed Computing*, Dec 2005.

Maurice Herlihy and Srikanta Tirthapura, Randomized Smoothing Networks. *Journal of Parallel and Distributed Computing*. 2005, to appear.

M. Herlihy, V. Luchangco, P. Martin, and M. Moir. Nonblocking memory management support for dynamic-sized data structures. *ACM Transactions on Computer Systems* 23(2), May 2005.

P. Fatourou and Maurice Herlihy. Read-Modify-Write Networks. *Distributed Computing*, (2004) 17:33-46.

M. Herlihy and S. Rajsbaum. A classification of wait-free loop agreement tasks. *Theoretical Computer Science*, 291(1): 55-77, January 2003.

C. Busch and M. Herlihy. Sorting and Counting Networks of Small Depth and Arbitrary Width. *Theory of Computing Systems* 35(2): 99-128 (2002).

C. Busch, N. Demetriou, M. Herlihy and M. Mavronicolas. Threshold Counters with Increments and Decrements. *Theoretical Computer Science*. Vol. 270, No 1-2, pp. 811-826, January 2002. (A preliminary version appears in SIROCCO'99.)

C. Busch, N. Demetriou, M. Herlihy and M. Mavronicolas. A Combinatorial Characterization of Properties Preserved by Antitokens. *Bulletin of the European Association for Theoretical Computer Science*. Number 71, pp. 114-132, June 2000. (A preliminary version appears in Euro-Par 2000.)

W. Aiello, C. Busch, M. Herlihy, M. Mavronicolas, N. Shavit and D. Touitou. Supporting Increment and Decrement Operations in Balancing Networks. *Chicago Journal of Theoretical Computer Science*: <http://cjtcs.cs.uchicago.edu/ar> (A preliminary version appears in STACS'99.)

M. Herlihy, M. P. Warres. A tale of two directories: implementing distributed shared objects in Java. *Concurrency - Practice and Experience* 12(7): 555-572 (2000)

- Maurice Herlihy, Sergio Rajsbaum. Algebraic spans. *Mathematical Structures in Computer Science* 10(4): 549-573 (2000)
- S. Chaudhuri, Maurice Herlihy, and M.R. Tuttle. Tight Bounds for k-Set Agreement. *Journal of the ACM*. 47, 5 (Sep. 2000), Pages 912 - 943
- Maurice Herlihy and N. Shavit. The Topological Structure of Asynchronous Computability. *Journal of the ACM*, November 1999.
- S. Chaudhuri, Maurice Herlihy, and M.R. Tuttle. Wait-Free Implementations in Message-Passing Systems, *Theoretical Computer Science*, (220)1, 1999, pp 211–245.
- C. Dwork, Maurice Herlihy, S. Plotkin, and O. Waarts. Time-Lapse snapshots. *SIAM Journal on Computing*, 28(5) 1848-1874 , 1999.
- F. Fich, M. Herlihy, and N. Shavit. On the Space Complexity of Randomized Synchronization *Journal of the ACM*, 45(5), pp. 843–862, September 1998.
- C. Dwork, Maurice Herlihy, and O. Waarts. Contention in Shared Memory Algorithms. *Journal of the ACM*, 44(6), pp 779–805, November 1997.
- Maurice Herlihy, N. Shavit, and O. Waarts. Linearizable Counting Networks. *Distributed Computing*, 9(4), 1996.
- Maurice Herlihy, B-H. Lim, and N. Shavit. Scalable Concurrent Counting. *ACM Transactions on Computer Systems*, 13(4), pp. 343–364, November 1995.
- H. Attiya, Maurice Herlihy, and O. Rachman. Atomic Snapshots in Expected $O(n)$ Operations Using Lattice Agreement. *Distributed Computing*, 8(3): pp 121–132, March 1995.
- J. Aspnes, Maurice Herlihy, and N. Shavit. Counting Networks. *Journal of the ACM*, 41(5): pp 1020–1048, September 1994.
- Maurice Herlihy. A methodology for implementing highly concurrent data objects. *ACM Transactions on Programming Languages and Systems*, 15(9): 745–770, November 1993.
- Maurice Herlihy, N.A. Lynch, M. Merritt, and W.E. Weihl. On the correctness of orphan elimination algorithms. *Journal of the ACM*, 39(4):881–930, October 1992.
- Maurice Herlihy and J.E.B. Moss. Lock-Free garbage collection for multiprocessors. *IEEE Transactions on Parallel and Distributed Systems*, 3(2), April 1992.
- Maurice Herlihy. Wait-free synchronization. *ACM Transactions on Programming Languages and Systems*, 13(1):124–149, January 1991.

- Maurice Herlihy and J.M. Wing. Specifying graceful degradation. *IEEE Transactions on Parallel and Distributed Systems*, 2(1):93–104, January 1991.
- Maurice Herlihy and W.E. Weihl. Hybrid concurrency control for abstract data types. *Journal of Computer and System Sciences*, 43:25–61, 1991.
- Maurice Herlihy and J.M. Wing. Linearizability: A correctness condition for concurrent objects. *ACM Transactions on Programming Languages and Systems*, 12(3):463–492, July 1990.
- J. Aspnes and Maurice Herlihy. Fast randomized consensus using shared memory. *Journal of Algorithms*, 15(1):441–460, September 1990.
- Maurice Herlihy. Apologizing versus asking permission: Optimistic concurrency control for abstract data types. *ACM Transactions on Database Systems*, March 1990.
- Maurice Herlihy. Concurrency and availability as dual properties of replicated atomic data. *Journal of the ACM*, 37(2):257–278, April 1990.
- Maurice Herlihy and M.S. McKendry. Timestamp-based orphan elimination. *IEEE Transactions on Software Engineering*, 15(7):825–831, July 1989.
- D.L. Detlefs, Maurice Herlihy, and J.M. Wing. Inheritance of synchronization and recovery properties in Avalon/C++. *IEEE Computer*, 21(12):57–69, December 1988. Also in “Advanced Language Implementation Techniques”, Peter Lee Editor, MIT Press, 1990.
- Maurice Herlihy. Availability vs. concurrency: atomicity mechanisms for replicated data. *ACM Transactions on Computer Systems*, 4(3):249–274, August 1987.
- Maurice Herlihy. Dynamic quorum adjustment for partitioned data. *ACM Transactions on Database Systems*, 12(2):170–194, June 1987.
- Maurice Herlihy. Extending multiversion timestamping protocols to exploit type information. *IEEE Transactions on Computers*, C-35(4):443–449, April 1987. Special issue on parallel and distributed computing.
- Maurice Herlihy. A quorum-consensus replication method for abstract data types. *ACM Transactions on Computer Systems*, 4(1):32–53, February 1986. Also CMU-CS-84-164B.
- Maurice Herlihy and B.H. Liskov. A value transmission method for abstract data types. *ACM Transactions on Programming Languages and Systems*, 4(4):527–551, October 1982.

Conference Publications

- Dave Dice, Maurice Herlihy, Alex Kogan: Improving Parallelism in Hardware Transactional Memory. TACO 15(1): 9:1–9:24 (2018)

- Victor Cacciari Miraldo, Harold Carr, Alex Kogan, Mark Moir, Maurice Herlihy: Authenticated modular maps in Haskell.
- Maurice Herlihy: Atomic Cross-Chain Swaps. PODC 2018: 245-254
- Michal Friedman, Maurice Herlihy, Virendra J. Marathe, Erez Petrank: A persistent lock-free queue for non-volatile memory. PPOPP 2018: 28-40
- Shishir Rai, Gokarna Sharma, Costas Busch, Maurice Herlihy: Load Balanced Distributed Directories. SSS 2018: 221-238
- Rida A. Bazzi, Maurice Herlihy: Clairvoyant State Machine Replications. SSS 2018: 254-268
- Thomas D. Dickerson, Paul Gazzillo, Maurice Herlihy, Eric Koskinen: Adding Concurrency to Smart Contracts. PODC 2017: 303-312.
- Costas Busch, Maurice Herlihy, Miroslav Popovic, Gokarna Sharma: Fast Scheduling in Distributed Transactional Memory. SPAA 2017: 173-182
- Zhiyu Liu, Irina Calciu, Maurice Herlihy, Onur Mutlu: Concurrent Data Structures for Near-Memory Computing. SPAA 2017: 235-245
- Hammurabi Mendes, Maurice Herlihy: Tight Bounds for Connectivity and Set Agreement in Byzantine Synchronous Systems. DISC 2017: 35:1-35:16
- Dimitra Papagiannopoulou, Andrea Marongiu, Tali Moreshet, Maurice Herlihy, and R. Iris Bahar. 2017. Edge-TM: Exploiting Transactional Memory for Error Tolerance and Energy Efficiency. ACM Trans. Embed. Comput. Syst. 16, 5s, Article 153 (September 2017), 18 pages. DOI: <https://doi.org/10.1145/3126>
- Thomas Carle, Dimitra Papagiannopoulou, Tali Moreshet, Andrea Marongiu, Maurice Herlihy, R. Iris Bahar: Thrifty-malloc: A HW/SW codesign for the dynamic management of hardware transactional memory in embedded multicore systems. CASES 2016: 20:1-20:10
- Dave Dice, Maurice Herlihy, Alex Kogan: Fast non-intrusive memory reclamation for highly-concurrent data structures. ISMM 2016: 36-45
- Maurice Herlihy, Mark Moir: Blockchains and the Logic of Accountability. LICS 2016: 27-30
- Oana Balmau, Rachid Guerraoui, Maurice Herlihy, Igor Zablotchi: Fast and Robust Memory Reclamation for Concurrent Data Structures. SPAA 2016: 349-359
- Vikram Saraph, Maurice Herlihy, Eli Gafni: Asynchronous Computability Theorems for t-Resilient Systems. DISC 2016: 428-441
- Shahar Timnat, Maurice Herlihy, Erez Petrank: A Practical Transactional Memory Interface. Euro-Par 2015: 387-401

- Dimitra Papagiannopoulou, Andrea Marongiu, Tali Moreshet, Luca Benini, Maurice Herlihy, R. Iris Bahar: Playing with Fire: Transactional Memory Revisited for Error-Resilient and Energy-Efficient MPSoC Execution. ACM Great Lakes Symposium on VLSI 2015: 9-14
- Costas Busch, Maurice Herlihy, Miroslav Popovic, Gokarna Sharma: Impossibility Results for Distributed Transactional Memory. PODC 2015: 207-215
- Laurent Rveillre, Tim Harris, Maurice Herlihy: Proceedings of the Tenth European Conference on Computer Systems, EuroSys 2015, Bordeaux, France, April 21-24, 2015. ACM 2015, ISBN 978-1-4503-3238-5
- Maurice Herlihy, Vikram Saraph: The Relative Power of Composite Loop Agreement Tasks. OPODIS 2015.
- James A. Jablin, Thomas B. Jablin, Onur Mutlu, Maurice Herlihy: Warp-aware trace scheduling for GPUs. PACT 2014: 163-174
- Irina Calciu, Justin Gottschlich, Tatiana Shpeisman, Gilles Pokam, Maurice Herlihy: Invyswell: a hybrid transactional memory for haswell's restricted transactional memory. PACT 2014: 187-200
- Maurice Herlihy, Eric Koskinen: Composable Transactional Objects: A Position Paper. ESOP 2014: 1-7
- Dan Alistarh, Patrick Eugster, Maurice Herlihy, Alexander Matveev, Nir Shavit: StackTrack: an automated transactional approach to concurrent memory reclamation. EuroSys 2014: 25
- Eli Gafni, Maurice Herlihy: Sporadic Solutions to Zero-One Exclusion Tasks. ICALP (1) 2014: 1-10
- Maurice Herlihy, Sergio Rajsbaum, Michel Raynal, Julien Stainer: Computing in the Presence of Concurrent Solo Executions. LATIN 2014: 214-225
- Alex Kogan, Maurice Herlihy: The future(s) of shared data structures. PODC 2014: 30-39
- Maurice Herlihy, Zhiyu Liu: Well-structured futures and cache locality. PPOPP 2014: 155-166
- Dimitra Papagiannopoulou, Tali Moreshet, Andrea Marongiu, Luca Benini, Maurice Herlihy, R. Iris Bahar: Speculative synchronization for coherence-free embedded NUMA architectures. ICSAMOS 2014: 99-106 (*best paper award*).
- Maurice Herlihy: Fun with hardware transactional memory. SIGMOD Conference 2014: 575

- Hammurabi Mendes, Christine Tasson, Maurice Herlihy: Distributed computability in Byzantine asynchronous systems. STOC 2014: 704-713
- Zhiyu Liu, Maurice Herlihy: Approximate Local Sums and Their Applications in Radio Networks. DISC 2014: 243-257
- Irina Calciu, Hammurabi Mendes, Maurice Herlihy: The Adaptive Priority Queue with Elimination and Combining. DISC 2014: 406-420
- Dimitra Papagiannopoulou, R. Iris Bahar, Tali Moreshet, Maurice Herlihy, Andrea Marongiu, Luca Benini: Transparent and energy-efficient speculation on NUMA architectures for embedded MPSoCs. MES 2013: 58-61
- Hagit Attiya, Armando Castaeda, Maurice Herlihy, Ami Paz: Upper bound on the complexity of solving hard renaming. PODC 2013: 190-199
- Hammurabi Mendes, Maurice Herlihy: Multidimensional approximate agreement in Byzantine asynchronous systems. STOC 2013: 391-400
- Maurice Herlihy, Sergio Rajsbaum: Simulations and reductions for colorless tasks. PODC 2012: 253-260.
- Armando Castaeda, Maurice Herlihy, Sergio Rajsbaum: An Equivariance Theorem with Applications to Renaming. LATIN 2012: 133-144.
- Justin Emile Gottschlich, Maurice Herlihy, Gilles Pokam, Jeremy G. Siek: Visualizing transactional memory. PACT 2012: 159-170.
- Cesare Ferri, Andrea Marongiu, Benjamin Lipton, R. Iris Bahar, Tali Moreshet, Luca Benini, Maurice Herlihy: SoC-TM: integrated HW/SW support for transactional memory programming on embedded MPSoCs. CODES+ISSS 2011: 39-48
- Maurice Herlihy, Nir Shavit: On the Nature of Progress. OPODIS 2011: 313-328
- Maurice Herlihy, Yoram Moses, Mark R. Tuttle: Transforming worst-case optimal solutions for simultaneous tasks into all-case optimal solutions. PODC 2011: 231-238
- Aleksandar Dragojevic, Maurice Herlihy, Yossi Lev, Mark Moir: On the power of hardware transactional memory to simplify memory management. PODC 2011: 99-108
- Armando Castaeda, Maurice Herlihy, Sergio Rajsbaum: An Equivariance Theorem with Applications to Renaming (Preliminary Version) CoRR abs/1102.4946: (2011)
- Maurice Herlihy, Sergio Rajsbaum: Concurrent Computing and Shellable Complexes. DISC 2010: 109-123

Maurice Herlihy, Sergio Rajsbaum: The topology of shared-memory adversaries. PODC 2010: 105-113

Cesare Ferri, Samantha Wood, Tali Moreshet, R. Iris Bahar, Maurice Herlihy: Energy and Throughput Efficient Transactional Memory for Embedded Multicore Systems. HiPEAC 2010.

Eric Koskinen, Matthew Parkinson, Maurice Herlihy: Coarse-grained transactions. POPL 2010: 19-30.

Hany E. Ramadan, Indrajit Roy, Maurice Herlihy, Emmett Witchel: Committing conflicting transactions in an STM. PPOPP 2009: 163-172

Cesare Ferri, Amber Viescas, Tali Moreshet, R. Iris Bahar, Maurice Herlihy: Energy efficient synchronization techniques for embedded architectures. ACM Great Lakes Symposium on VLSI 2008: 435-440

Maurice Herlihy, Flavio Paiva Junqueira, Keith Marzullo, Lucia Draque Penso: Optimizing Threshold Protocols in Adversarial Structures. DISC 2008: 335-349

Maurice Herlihy, Nir Shavit, Moran Tzafrir: Hopscotch Hashing. DISC 2008: 350-364

Maurice Herlihy, Eric Koskinen: Transactional boosting: a methodology for highly-concurrent transactional objects. PPOPP 2008: 207-216

Eric Koskinen, Maurice Herlihy: Checkpoints and continuations instead of nested transactions. SPAA 2008: 160-168

Eric Koskinen, Maurice Herlihy: Deadlocks: efficient deadlock detection. SPAA 2008: 297-303

Language Support and Compiler Optimizations for STM and Transactional Boosting. Guy Eddon, Maurice Herlihy: ICDCIT 2007: 209-224

On the weakest failure detector ever Rachid Guerraoui, Maurice Herlihy, Petr Kouznetsov, Nancy A. Lynch, Calvin C. Newport: PODC 2007: 235-243

A Simple Optimistic Skiplist Algorithm. Maurice Herlihy, Yossi Lev, Victor Luchangco, Nir Shavit: SIROCCO 2007: 124-138

A Provably Correct Scalable Skiplist (Brief Announcement) Yossi Lev, Maurice Herlihy, Victor Luchangco, and Nir Shavit OPODIS 2006

Maurice Herlihy, Victor Luchangco, Mark Moir: A flexible framework for implementing software transactional memory. OOPSLA 2006: 253-262

Rachid Guerraoui, Maurice Herlihy, Bastian Pochon: A Topological Treatment of Early-Deciding Set-Agreement. OPODIS 2006: 20-35. Best paper award.

- Eli Gafni, Sergio Rajsbaum, and Maurice Herlihy. Subconsensus Tasks: Renaming Is Weaker Than Set Agreement. Proceedings of the 20th International Symposium on Distributed Computing (DISC 2006)
- Viktor Vafeiadis, Maurice Herlihy, Tony Hoare, Marc Shapiro. Proving correctness of highly-concurrent linearisable objects. PPOPP 2006: 129-136
- Tali Moreshet, R. Iris Bahar, and Maurice Herlihy. Energy implications of multiprocessor synchronization. SPAA 2006: 329 (brief announcement).
- Tali Moreshet, R. Iris Bahar, Maurice Herlihy: Energy reduction in multiprocessor systems using transactional memory. International Symposium on Low Power Electronics and Design: 331-334. 2006.
- Felix Freiling, Maurice Herlihy, and Lucia Penso, Optimal Randomized Omission-Tolerant Uniform Consensus in Message Passing Systems, 9th International Conference on Principles of Distributed Systems, December 12–14, 2005, Pisa, Italy.
- Steve Heller, Maurice Herlihy, Victor Luchangco, Mark Moir, Bill Scherer, Nir Shavit, A Lazy Concurrent List-based Set Algorithm, 9th International Conference on Principles of Distributed Systems, December 12–14, 2005, Pisa, Italy.
- Rachid Guerraoui, Maurice Herlihy, and Sebastian Pochon, Polymorphic Contention Management, Proceedings of the 19th International Symposium on Distributed Computing (DISC 2005), Cracow, Poland, September 26-29, 2005.
- Maurice Herlihy and Ye Sun, Distributed Transactional Memory for Metric-Space Networks, Proceedings of the 19th International Symposium on Distributed Computing (DISC 2005), Cracow, Poland, September 26-29, 2005.
- Rachid Guerraoui, Maurice Herlihy, and Sebastian Pochon, Toward a Theory of Transactional Contention Management. Proceedings of the *Twenty-Fourth Annual Symposium on Principles of Distributed Computing (PODC)*. Las Vegas, NV July 2005.
- O. Dvir, Maurice Herlihy, N. Shavit. Virtual Leashing: Internet-Based Software Piracy Protection. *25th International Conference on Distributed Computing Systems (ICDCS)*. Columbus, OH. June 2005.
- R. Rajwar, Maurice Herlihy, and K. Lai. Virtualizing Transactional Memory. The 32nd Annual *International Symposium on Computer Architecture (ISCA)*. Madison, WI, June, 2005.
- Tim Harris, Simon Marlowe, Simon Peyton-Jones, and Maurice Herlihy. Composable Memory Transactions. Proceedings of *the ACM SIGPLAN Sym-*

posium on Principles and Practice of Parallel Programming (PPoPP), Chicago, IL, June 2005.

Simon Doherty, Maurice Herlihy, Victor Luchangco, and Mark Moir. *Bringing practical lock-free synchronization to 64-bit applications*. PODC 2004: 31-39

Maurice Herlihy, S. Rajsbaum, and M. Tuttle. An axiomatic approach to computing the connectivity of synchronous and asynchronous systems. Sixth workshop on Geometric and Topological Methods in Concurrency and Distributed Computing, October 2004.

Maurice Herlihy, Srikanta Tirthapura. *Randomized Smoothing Networks*. IPDPS 2004

Maurice Herlihy, Srikanta Tirthapura. *Self-Stabilizing Smoothing and Counting* ICDCS 2003: 4-11.

M.P Herlihy and L.D. Penso, Tight bounds for k-set agreement with limited-scope failure detectors. *Proceedings of the 17th International Symposium on Distributed Computing (DISC)* October 1-3, 2003 - Sorrento, Italy.

Maurice Herlihy, V. Luchangco, M. Moir and W.M. Scherer. Software Transactional Memory for Dynamic-sized Data Structures, *Proceedings of the Twenty-Second Annual ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing (PODC)*, July 2003.

Maurice Herlihy, V. Luchangco, and M. Moir. Obstruction-Free Synchronization: Double-Ended Queues as an Example. *23rd International Conference on Distributed Computing Systems (ICDCS 03)*, May 19-22, 2003 Providence, Rhode Island USA.

Maurice Herlihy and S. Tirthapura. Self-Stabilizing Smoothing and Counting. *23rd International Conference on Distributed Computing Systems, (ICDCS 03)*, May 19-22, 2003 Providence, Rhode Island USA.

Maurice Herlihy, V. Luchangco, and M. Moir. The Repeat Offender Problem: A Mechanism for Supporting Dynamic-Sized, Lock-Free Data Structures. *Proceedings of 16th International Symposium on Distributed Computing (DISC 2002)*, Toulouse, France, October 28-30, 2002.

Maurice Herlihy, S. Tirthapura and R. Wattenhofer Competitive Concurrent Distributed Queuing. *Proceedings of the 20th ACM Symposium on Principles of Distributed Computing (PODC 2001)*.

Maurice Herlihy. On beyond registers: wait-free readable objects. *Proceedings of the 20th ACM Symposium on Principles of Distributed Computing (PODC 2001)*. Invited paper.

- Maurice Herlihy and S. Tirthapura. Self-Stabilizing Distributed Queuing. *Proceedings of 15th International Symposium on Distributed Computing* Lisbon, Portugal, October 3-5, 2001.
- Maurice Herlihy and S. Rajsbaum and M.R. Tuttle. A New Synchronous Lower Bound for Set Agreement *Proceedings of 15th International Symposium on Distributed Computing* (DISC 2001), Lisbon, Portugal, October 3-5, 2001.
- Maurice Herlihy and S. Tirthapura and R. Wattenhofer. Ordered Multicast and Distributed Swap. *Operating Systems Review* 35(1): 85-96 (2001) Also in the Proceedings of the PODC Middleware Symposium, Portland, Oregon, July 2000.
- P. Fatourou and Maurice Herlihy. Adding Networks. *Proceedings of 15th International Symposium on Distributed Computing* Lisbon, Portugal, October 3-5, 2001.
- C. Busch, M. Herlihy, and R. Wattenhofer. Routing without Flow Control. *Proceedings of the 13th Annual ACM Symposium on Parallel Algorithms and Architectures*, pp. 11-20, Hersonissos, Greece, July 2001.
- C. Busch, N. Demetriou, M. Herlihy, M. Mavronicolas. A Combinatorial Characterization of Properties Preserved by Antitokens. *Euro-Par 2000*: 575-582.
- M. Herlihy and E. Ruppert. On the Existence of Booster Types. In *Thirty-Second IEEE Symposium on Foundations of Computer Science (FOCS)*, November 12-14, 2000.
- C. Busch, Maurice Herlihy, and R. Wattenhofer. Hard Potato Routing. In *Thirty-Second Annual ACM Symposium on Theory of Computing (STOC)*, Portland, Oregon, May 21-23, 2000.
- C. Busch, Maurice Herlihy, and R. Wattenhofer. Randomized Greedy Hot-Potato Routing , In *Eleventh Annual ACM-SIAM Symposium on Discrete Algorithms*. January 2000. San Francisco.
- Maurice Herlihy and S. Rajsbaum. New Perspectives in Distributed Computing. In *Mathematical Foundations of Computer Science. Invited paper*. September 1999, Szklarska Poreba, Poland.
- Maurice Herlihy and M.P. Warres. A Tale of Two directories: Implementing Distributed Shared Objects in Java. In *ACM Java Grande Conference*. June 1999, Palo Alto CA.
- C. Busch and Maurice Herlihy. Counting and Sorting Networks of Small Depth and Arbitrary Width. In *Eleventh ACM Symposium on Parallel Algorithms and Architectures (SPAA'99)*. June 1999, Saint Malo, France.

- C.Busch, N. Demetriou, Maurice Herlihy, and Marios Mavronicolas. Threshold Counters with Increments and Decrements. In *6th International Colloquium on Structural Information and Communication Complexity (SIROCCO'99)*. June 1999, Lacaneau, France.
- W. Aiello, C.Busch, M. Herlihy, M.Mavronicolas, N.Shavit, and D.Touitou. Supporting Increment and Decrement Operations in Balancing Networks. In *16th International Symposium on Theoretical Aspects of Computer Science* March 1999, Trier, Germany.
- M Herlihy. The Aleph Toolkit: Support for Scalable Distributed Shared Objects. In *Workshop on Communication, Architecture, and Applications for Network-based Parallel Computing*, January 1999, Orlando, FL.
- M Herlihy and S. Rajsbaum. A Wait-Free Classification of Loop Agreement Tasks in *12th International Symposium on Distributed Computing*, September 1998, Greece.
- M. Demmer and Maurice Herlihy. The Arrow Directory Protocol. in *12th International Symposium on Distributed Computing*, September 1998, Greece. Won best student paper award.
- Maurice Herlihy, S. Rajsbaum, and M.R. Tuttle Unifying Synchronous and Asynchronous Message-Passing Models In *Proceedings of the 16th Annual ACM Symposium on Principles of Distributed Computing*, July 1998, Puerto Vallarta, Mexico.
- Maurice Herlihy and S. Rajsbaum. The decidability of Distributed Decision Problems. In *Proceedings of the 29th Annual Symposium on Theory of Computing*, May 1997, El Paso, Texas.
- Maurice Herlihy and S. Rajsbaum. Algebraic Spans. In *Proceedings of the 13th Annual ACM Symposium on Principles of Distributed Computing*, August 1995, Ottawa.
- Maurice Herlihy and S. Rajsbaum. Set Consensus Using Arbitrary Objects. In *Proceedings of the 12th Annual ACM Symposium on Principles of Distributed Computing*, August 1994, Los Angeles.
- Maurice Herlihy and N. Shavit A Simple Constructive Computability Theorem for Wait-free Computation. In *Proceedings of the 26th Annual Symposium on Theory of Computing*, May 1994, Montreal, pp. 243–252.
- S. Chaudhuri, Maurice Herlihy, N. Lynch, and M. Tuttle. Tight Bounds for k -Set Agreement. In *Proceedings of the ACM Symposium on Foundations of Computer Science*, October 1993.
- F. Fich, Maurice Herlihy, and N. Shavit. On the complexity of randomized

synchronization. In *Proceedings of the 12th Annual ACM Symposium on Principles of Distributed Computing*, August 1993, Ithaca, NY.

C. Dwork, Maurice Herlihy, and O. Waarts. Bounded Round Numbers. In *Proceedings of the 12th Annual ACM Symposium on Principles of Distributed Computing*, August 1993, Ithaca, NY.

C. Dwork, Maurice Herlihy, and O. Waarts. Contention in Shared Memory Algorithms. In *Proceedings of the 25th Annual Symposium on Theory of Computing*, May 1993, San Diego.

Maurice Herlihy and N. Shavit. The Asynchronous Computability Theorem for t -Resilient Tasks. In *Proceedings of the 25th Annual Symposium on Theory of Computing*, May 1993, San Diego.

Maurice Herlihy and J.E.B. Moss. Transactional Memory: architectural support for lock-free data structures. In *Proceedings of the 1993 International Symposium on Computer Architecture*, May 1993, San Diego, CA.

H. Attiya, M. Herlihy and O. Rachman. Efficient Atomic Snapshots Using Lattice Agreement. In *Proceedings of the 6th International Workshop on Distributed Algorithms*, November 1992, (A. Segall and S. Zaks, eds.), Lecture Notes in Computer Science #647, Springer-Verlag, pp. 35–53. Revised version: Technical Report #759, Department of Computer Science, The Technion, Haifa.

Maurice Herlihy, B-H. Lim, and N. Shavit. Low Contention Load Balancing on Large-Scale Multiprocessors. In *Proceedings of the 3rd Annual ACM Symposium on Parallel Algorithms and Architectures*, July 1992, San Diego, CA.

C. Dwork, Maurice Herlihy, S. Plotkin, and O. Waarts. Time-Lapse Snapshots. In *Proceedings of the Israeli Symposium on the Theory of Computing and Systems*, May 1992, Haifa, Israel.

Maurice Herlihy, N. Shavit, and O. Waarts. Low Contention Linearizable Counting. In *Proceedings of the ACM Symposium on Foundations of Computer Science*, October 1991, San Juan, Puerto Rico.

Maurice Herlihy. Randomized Wait-Free Concurrent Objects. In *Proceedings of the 10th Annual ACM Symposium on Principles of Distributed Systems*, August 1991, Montreal, Canada.

Maurice Herlihy. Impossibility results for asynchronous PRAM. In *Proceedings of the 2nd Annual Symposium on Parallel Algorithms and Architectures*, July 1991, Hilton Head, North Carolina.

Maurice Herlihy and J.E.B. Moss. Lock-Free garbage collection for multiprocessors. In *Proceedings of the 2nd Annual Symposium on Parallel Algorithms*

and Architectures, July 1991, Hilton Head, North Carolina.

J. Aspnes, Maurice Herlihy, and N. Shavit. Counting Networks and Multi-Processor Coordination. In *Proceedings of the 23rd Annual Symposium on Theory of Computing*, May 1991, New Orleans, Louisiana.

Maurice Herlihy and M.R. Tuttle. Lower Bounds for Wait-Free Computation in Message-Passing Systems. In *Proceedings of the 9th Annual Symposium on Principles of Distributed Systems*, August 1990, Quebec City, Canada.

J. Aspnes and Maurice Herlihy. Wait-Free Data Structures in the Asynchronous PRAM Model. In *Proceedings of the 2nd Annual Symposium on Parallel Algorithms and Architectures*, July 1990, pages 340–349, Crete, Greece.

Maurice Herlihy. A methodology for implementing highly concurrent data structures. In *Proceedings of the Second ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming*, pages 197–206, Seattle, WA, March 14-16 1990.

Maurice Herlihy and J.D. Tygar. Implementing distributed capabilities without a trusted kernel. In *Proceedings of the International Working Conference on Dependable Computing for Critical Applications*, Santa Barbara, CA, August 1989. Reprinted in *Dependable Computing for Critical Applications*, Vol. 4 in the series “Dependable Computing and Fault-Tolerant Systems” 1991, Springer-Verlag, p. 283 – 300.

Maurice Herlihy and J.M. Wing. Specifying security constraints with relaxation lattices. In *Proceedings of the Computer Security Foundations Workshop II*, pages 47–53, June 1989.

Maurice Herlihy. Impossibility and universality results for wait-free synchronization. In *Seventh ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing*, pages 276–290, August 1988.

Maurice Herlihy and J.M. Wing. Reasoning about atomic objects. In *Symposium on Formal Techniques in Real-Time and Fault-Tolerant Systems*, pages 193–208, September 1988.

Maurice Herlihy and W.E. Weihl. Hybrid concurrency control for abstract data types. In *Seventh ACM-SIGMOD-SIGACT Symposium on Principles of Database Systems*, pages 201–210, March 1988.

D.L. Detlefs, Maurice Herlihy, and J.M. Wing. Inheritance of synchronization and recovery properties in Avalon/C++. In *Proceedings of HICSS-21*, January 1988.

Maurice Herlihy and J.D. Tygar. How to make replicated data secure. In *Proceedings of CRYPTO-87*, August 1987. Also CMU-CS-87-143.

Maurice Herlihy and J.M. Wing. Specifying graceful degradation in distributed systems. In *Sixth ACM SIGACT-SIGOPS Symposium on Principles of Distributed computing*, August 1987. Also CMU-CS-87-120.

Maurice Herlihy and J.M. Wing. Avalon: language support for reliable distributed systems. In *17th Symposium on Fault-Tolerant Computer Systems*, July 1987. Also CMU-CS-86-167.

Maurice Herlihy, N.A. Lynch, M. Merritt, and W.E. Weihl. On the correctness of orphan elimination algorithms. In *17th Symposium on Fault-Tolerant Computer Systems*, July 1987. Abbreviated version of MIT/LCS/TM-329.

Maurice Herlihy and J.M. Wing. Axioms for concurrent objects. In *14th ACM Symposium on Principles of Programming Languages*, pages 13–26, January 1987. Also CMU-CS-86-154.

Maurice Herlihy. Optimistic concurrency control for abstract data types. In *Fifth ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing*, pages 206–217, August 1986. Reprinted in Readings in *Object-Oriented Database Systems*, and Maier, eds., Morgan Kaufmann, and CMU-CS-86-120.

B.H. Liskov, Maurice Herlihy, and L. Gilbert. Limitations of synchronous communication with static process structure in languages for distributed computing. In *13th ACM Symposium on Principles of Programming Languages*, January 1986. Reprinted in *Concurrent Programming*, Gehani and McGettrick eds., Addison-Wesley, and CMU-CS-85-168.

M.S. McKendry and Maurice Herlihy. Time-driven orphan elimination. In *Fifth Symposium on Reliability in Distributed Software and Database Systems*, January 1986. Also CMU-CS-85-138.

Maurice Herlihy. Comparing how atomicity mechanisms support replication. In *Fourth ACM SIGACT-SIGOPS Symposium on Principles of Distributed Computing*, August 1985. Reprinted in *Operating Systems Review* 20(3), and CMU-CS-85-123.

B.H. Liskov and Maurice Herlihy. Issues in process and communication structure for distributed programs. In *Third Symposium on Reliability in Distributed Software and Database Systems*, October 1983.

Book Chapters

Maurice Herlihy and N. Shavit, Applications of Algebraic Topology to Concurrent Computation, in *Applications on Advanced Architecture Computers*, Greg Astfalk Editor, SIAM press, 1996. ISBN 0-89871-368-4.

Maurice Herlihy and S. Rajsbaum, Algebraic Topology and Distributed Computing — a Primer, in *Computer Science Today - Recent Trends and Develop-*

ments, Jan van Leeuwen Editor, Springer-Verlag Lecture Notes in Computer Science #1000, 1996. ISBN-3-54060105-8.

Recent Program Committees

Symposium on Principles of Distributed Computing (PODC) 2019

Netys 2017, 2018.

OPODIS 2016.

Symposium on Distributed Computing (DISC 2016).

Symposium on Reliable Distributed Systems (SRDS 2016)

Program Committee Chair, European Conference on Computer Systems (EUROSYS 2015).

Symposium on Distributed Computing (DISC 2015).

European Conference on Computer Systems (EUROSYS 2014).

The International Conference on Networked Systems (NetYs 2014)

9th ACM SIGPLAN Workshop on Transactional Computing (TRANSACT 2014)

16th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS 2014)

The 27th International Symposium on Distributed Computing (DISC 2013)

Program committee chair, 24th ACM Symposium on Parallelism in Algorithms and Architectures. Pittsburgh, Pennsylvania, USA. June 25 - 27, 2012

39th International Colloquium on Automata, Languages and Programming (ICALP 2012).

7th ACM SIGPLAN Workshop on Transactional Computing, (TRANSACT 2012)

International Conference on Distributed Computing and Networking (ICDCN 2012).

European Conference on Computer Systems (EuroSys 2012).

9th International Conference on Distributed Computing and Internet Technologies (ICDCIT 2013).

14th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS 2012).

3rd USENIX Workshop on Hot Topics in Parallelism (HotPar 2011)

The Twentieth International Conference on Parallel Architectures and Compilation Techniques (PACT 2011)

The 25th International Symposium on Distributed Computing (DISC 2011)

Systems for Future Multi-Core Architectures (SFMA 2011)

2nd USENIX Workshop on Hot Topics in Parallelism (HotPar 2010)

12th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS 2010)

Recent Professional Activities

Steering Committee, ACM Advances in Financial Technology 2019

Steering and Program Committees: Tokenomics 2019

Steering Committee, Eurosys 2015-2018.

Editor, Journal of the ACM (since 1998-2010).

Associate Editor, ACM Transactions on Computer Systems (1993-2010).

Editor, SIAM Journal of Computing (1994 - 2000).

Steering Committee, TRANSACT: ACM SIGPLAN Workshop on Languages, Compilers, and Hardware Support for Transactional Computing.

Steering Committee, Symposium on Parallel Algorithms and Architectures (SPAA).

Steering Committee, Federated Computing Research Conference 1999-2002).

Editor, Chicago Journal of Theory (1994).

Editor, Journal of Parallel and Distributed Computing (1992-1995).

ACM Doctoral Dissertation Award Committee (1993-1996, chair 1995).

Steering committee, ACM Symposium on Principles of Distributed Computing (1992-1994, chair 1995-1996).

Recent Invited Talks

University of Neuchatel, November 2018 Atomic Cross-Chain swaps November 2018

University of Paris, November 2018 Blockchains and the Future of Distributed Computing. November 2018

University of Utah, Organick Lecture (2 talks), Blockchains and the Future of Distributed Computing, Atomic Cross-Chain Swaps October 2018

Kent State University, Blockchains and the Future of Distributed Computing. October 2018

Symposium on Principles of Distributed Computing (PODC), Keynote Address: Blockchains and the Future of Distributed Computing. July 2017.

University of Southern California, Distinguished Lecture Series. “Hardware Transactional Memory and Beyond”. December 2016.

University of Texas at Austin. Jay Misra festival: Playing with Fire: Transactions and Power. April 2016.

Symposium on Logic in Computer Science (LICS). Keynote address: Blockchains and the Logic of Accountability. July 2016

University of California, Irvine. Distinguished Lecture Series. “Hardware Transactional Memory and Beyond”. April 2015.

Texas A&M University, “Hardware Transactional Memory and Beyond” June 2015.

Course on concurrent data structures, LASER school, September 2015 - Elba Island, Italy.

Course on concurrent data structures, Segunda Escuela/Conferencia d Analisis Topologico de Datos. December 2015 - Queretaro, Mexico.

Symposium on Parallel, Distributed, and network-based Processing (PDP) 2014, February, “Locks, Transactions, and Concurrent Objects”

Keynote, European Symposium on Programming (ESOP) 2014, April, “Why Concurrent Data Structures are Still Hard”.

Keynote, PARALLEL 2014, May, “Energy Implications of Transactional Memory for Embedded Architectures”.

Keynote, SIGMOD 2014, June, “Fun with Hardware Transactional Memory”.

Keynote, ICALP, July 2014, “Distributed Computing and Combinatorial Topology: Puzzles and Open Problems”.

Mathematical Methods in Theoretical Distributed Computing, 26-30 August 2013, Bremen, Germany.

TransForm Summer School on Research Directions in Distributed Computing, 10-14 June 2013, Heraklion, Greece.

Consistency In Distributed Systems, 16-18 February 2013, Schloss Dagstuhl, Germany.

Arizona State University, Distinguished Lecture Series. “The Multicore Revolution”, October 2012.

Washington University of St. Louis, CSE colloquium. “The Multicore Revolution”. September 2012.

Invited speaker, 2012 Summer School on Concurrency St. Petersburg, Russia. 22-29 August 2012.

Invited speaker, 4th Workshop on the Theory of Transactional Memory. Funchal, Portugal 19 July 2012.

Invited speaker, NSF Workshop on Research Directions in the Principles of Parallel Computing, Pittsburgh, PA. 25-27 June 2012.

Invited speaker, MSR India 2012 Summer School on Distributed Algorithms, Systems, and Programming. Bangalore, India. 28 May to 8 June.

Invited speaker, Winter School: Hot Topics in Distributed Computing. La Plagne, France. 25-30 March 2012.

Invited speaker, Banff International Research Station for Mathematical Innovation and Discovery (BIRS), “Probabilistic versus Deterministic Techniques for Shared Memory Computation” n 5-10 February 10, 2012.

Invited speaker, Encuentro Conjunto de la Real Sociedad Matemtica Espaola y de la Sociedad Matemtica Mexicana. Torremolinos, Mlaga, Espaa, 17-20 January 2012.

Chennai Mathematical Institute, Tata Consulting 2011.

Patents

8412894 Value recycling facility for multithreaded computations

8375062 Simple optimistic skiplist

8244990 Obstruction-free synchronization for shared data structures

8181158 Viewing and modifying transactional variables

8176264 Software transactional memory for dynamically sizable shared data structures

8074030 Using transactional memory with early release to implement non-blocking dynamic-sized data structure

8055570 Controlled depletion of a stochastically varying resource pool

8019785 Space-and time-adaptive nonblocking algorithms

7937378 Concurrent lock-free skiplist with wait-free contains operator

7908441 Value recycling facility for multithreaded computations

7895401 Software transactional memory for dynamically sizable shared data structures

7809916 Method for dynamically refining locks in resizable concurrent hashing

7805467 Code preparation technique employing lock-free pointer operations

7788242 Method and system for implementing a concurrent set of objects

7703098 Technique to allow a first transaction to wait on condition that affects its working set

7685583 Obstruction-free mechanism for atomic update of multiple non-contiguous locations in shared memory

7685365 Transactional memory execution utilizing virtual memory

7657500 Concurrent extensible cuckoo hashing

7395274 Space- and time-adaptive nonblocking algorithms

7389383 Selectively unmarking load-marked cache lines during transactional program execution

7328316 Software transactional memory for dynamically sizable shared data structures

7299242 Single-word lock-free reference counting

7254597 Lock-free implementation of dynamic-sized shared data structure

7206903 Method and apparatus for releasing memory locations during transactional execution

7194495 Non-blocking memory management mechanism for supporting dynamic-sized data structures

7089374 Selectively unmarking load-marked cache lines during transactional program execution

5553267 Method and apparatus for coordinating access to and modifying multiple element data objects in a shared memory

5428761 System for achieving atomic non-sequential multi-word operations in shared memory

Recent Funding

NSF 003991: SHF: Small: Collaborative Research: Concurrent Programming with Composable Transactional Objects \$249,997, 2014-2017.

Siemens contract: \$93K.

NSF 003432: SHF: Medium: Collaborative Research: Transactional Software Infrastructures: Making the Most of Hardware Transactions. \$390,939 2013-2017.

NSF 003605: BSF:2012171:Progress Guarantees for Hardware Transactional Memory \$44,996 2013-2017.

NSF, PI: Maurice Herlihy, 2009-2012, \$300,000. Combinatorial Topology and Concurrent Computation.

NSF, PI: Maurice Herlihy, 2008-2011, \$250,000. A Unified Open-Source Transactional-Memory Infrastructure.

Recent Teaching

CS1760 Introduction to Multiprocessor Synchronization.
Fall 1998-2018, except 2010.

CS2952A Blockchains and Cryptocurrencies Spring 2018.

CS2951S Distributed Computing through Combinatorial Topology.
Spring 2015.

CS004 Introduction to Scientific Computing and Problem Solving Fall 2012, 2013.

CS275 Topics in Distributed Computing (graduate seminar.)
Spring 1998-2009.

CS022 Discrete Mathematics.
Spring 2001.

CS031 Introduction to Computing Systems.
Fall 1999.

CS152 Introduction to Complexity Theory (undergraduate course). Spring 1998.

Ph.D. Students

Daniel Engel

Thomas Dickerson

Vikram Saraph

Irina Calciu (2015)
Hammurabi Mendes (2015)
Jamie Jablin 2013
Yossi Lev (2010)
Guy Eddon (2008)
Tali Moreshet (2007)
Ye Sun (2007)
Lucia Penso (2006)
Srikanta Tirthapura (2001)
Costas Busch (1999)

University and Department Service

Faculty search committee 2018
Curriculum committee 2018
Department executive committee, 2013-2015.
Curriculum committee, 2011-2012.
Industrial partners program 2008.
CS head of graduate program 2006.
CS graduate admissions committee 1994-2003.