
EDUCATION

- **Ph.D in Computer Science (1984)**: Massachusetts Institute of Technology, Cambridge, MA. Advisor: Barbara Liskov.
- **Sc.M in Computer Science (1980)**: Massachusetts Institute of Technology, Cambridge, MA. Advisor: Barbara Liskov.
- **A.B in Mathematics (1975)**: Harvard University, Cambridge, MA.

HONORS AND AWARDS

- **Honorary Doctorate (2025)**: Technion (Israel Institute of Technology).
- **Honorary Doctorate (2025)**: Università della Svizzera italiana.
- **CNRS Fellow-Ambassadeur (2023-2025)**:
- **Dijkstra Prize in Distributed Computing (2022, 2012, and 2003)** : In 2022: for *The Repeat Offender Problem: A Mechanism for Supporting Dynamic-Sized, Lock-Free Data Structures*. In 2012: for *Transactional Memory: architectural support for lock-free data structures..* In 2003: for *Wait-free synchronization*.
- **National Academy of Engineering (2013)**: “for concurrent computing techniques for linearizability, non-blocking data structures, and transactional memory.”
- **IEEE W. Wallace McDowell Award (2013)**: “for fundamental contributions to the theory and practice of multi-processor computation”.
- **Fulbright Distinguished Chair in the Natural Sciences and Engineering Lecturing Fellowship (2010).**:
- **ISCA Influential Paper award (2008)**: For *Transactional Memory: architectural support for lock-free data structures..*
- **Fellow of the Association for Computing Machinery (2005)**: For “contributions to distributed and parallel systems.”
- **Gödel Prize (2004)**: For *The Topological Structure of Asynchronous Computation*.

POSITIONS

- **An Wang Professor of Computer Science**: Brown University, Providence, RI (since 2016).
- **Professor**: Computer Science Dept., Brown University, Providence, RI (1998-2016).
- **Associate Professor**: Computer Science Dept., Brown University, Providence, RI (1994-1998).
- **Consulting Engineer**: Digital Equipment Corporation, Cambridge MA (1989 - 1994).
- **Assistant Professor**: Computer Science Dept., Carnegie Mellon University, Pittsburgh PA (1984 - 1989).
- **Research Intern**: Xerox Palo Alto Research Center, Palo Alto CA (Summer 1982).

VISITING POSITIONS

- **CNRS Fellow-Ambassadeur**: Laboratoire d’Informatique de Paris 6 (June 2023, June 2024, June 2025).
- **Visiting Scientist**: Algorand LLC (2019-2021).
- **Fulbright Fellow**: Computer Science Dept. Technion, Haifa, Israel (2010-2011).
- **Visiting Scholar**: Microsoft Research, Cambridge UK (2004-2005).

SELECTED PUBLICATIONS (LAST FIVE YEARS)

- Zareh Chahoki, A., Herlihy, M., and Roveri, M. (2025). Conthereum: Concurrent Ethereum Optimized Transaction Scheduling for Multi-Core Execution. *Proceedings of the 7th Conference on Blockchain Research and Applications for Innovative Networks and Services (BRAINS)*.
- Amoussou-Guenou, Y., Herlihy, M., Jayanti, S., Potop-Butucaru, M., and Rajsbaum, S. (2025). Asynchronous Byzantine Consensus with Trusted Monotonic Counters. *Proceedings of the 32nd International Colloquium on Structural Information and Communication Complexity (SIROCCO)*.
- Ganguly, R., Xue, Y., Jonckheere, A., Ljung, P., Schornstein, B., Bonakdarpour, B., and Herlihy, M. (2024). Distributed Runtime Verification of Metric Temporal Properties. *Journal of Parallel and Distributed Computing*, 185, 104801.

- Amoussou-Guenou, Y., Herlihy, M., Potop-Butucaru, M., and Rajsbaum, S. (2024). Byzantine Reliable Broadcast with One Trusted Monotonic Counter. *Proceedings of the 26th International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS)*.
- Herlihy, M., and Rajsbaum, S. (2024). Further Decentralizing Decentralized Finance: Loss vs Rebalancing Without a Shared Reference Market. *Proceedings of the 6th Conference on Blockchain Research and Applications for Innovative Networks and Services (BRAINS)* [Invited Paper].
- Xue, Y., Jin, D., and Herlihy, M. (2023). Fault-Tolerant and Expressive Cross-Chain Swaps. *Proceedings of the 24th International Conference on Distributed Computing and Networking (ICDCN)*.
- Busch, C., Chlebus, B. S., Herlihy, M., Popovic, M., Poudel, P., and Sharma, G. (2023). Flexible Scheduling of Transactional Memory on Trees. *Theoretical Computer Science*, 978, 114184.
- Cambou, B., Philabaum, C., Herlihy, M., and Hsiao, M. S. (2023). Methods to Encrypt and Authenticate Digital Files in Distributed Networks and Zero-Trust Environments. *Axioms*, 12(6), 531.
- Xue, Y., and Herlihy, M. (2022). Cross-Chain Deals and Adversarial Commerce. *The VLDB Journal*, 31(6), 1291–1309.
- Ganguly, R., Xue, Y., Jonckheere, A., Ljung, P., Schornstein, B., Bonakdarpour, B., and Herlihy, M. (2022). Distributed Runtime Verification of Metric Temporal Properties for Cross-Chain Protocols. *Proceedings of the 42nd IEEE International Conference on Distributed Computing Systems (ICDCS)*.
- Bazzi, R. A., and Herlihy, M. (2022). Clairvoyant State Machine Replication. *Information and Computation*, 285, 104701.
- Didona, D., Guerraoui, R., Herlihy, M., and Zwaenepoel, W. (2022). Dynamic Scheduling in Distributed Transactional Memory. *Distributed Computing*, 35(1), 19–36.
- Xue, Y., and Herlihy, M. (2021). Hedging Against Sore Loser Attacks in Cross-Chain Transactions. *Proceedings of the 2021 ACM Symposium on Principles of Distributed Computing (PODC)*.
- Engel, D., Herlihy, M., and Xue, Y. (2021). Failure is (Literally) an Option: Atomic Commitment vs. Optionality in Decentralized Finance. *Proceedings of the 23rd International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS)*.
- Herlihy, M. (2021). *Principles of Blockchain Systems*. Synthesis Lectures on Computer Science. Morgan and Claypool Publishers.

SELECTED PUBLICATIONS (WITH 100+ CITATIONS)

- Herlihy, M., & Shavit, N. (2020). *The Art of Multiprocessor Programming* (Revised Edition). Morgan Kaufmann. [≈ **2,600 citations**]
- Herlihy, M. (2018). Atomic Cross-Chain Swaps. *Proceedings of the 2018 ACM Symposium on Principles of Distributed Computing (PODC)*. [≈ **690 citations**]
- Dickerson, T., Gazzillo, P., Herlihy, M., & Koskinen, E. (2017). Adding Concurrency to Smart Contracts. *Proceedings of the 2017 ACM Symposium on Principles of Distributed Computing (PODC)*. [≈ **300 citations**]
- Herlihy, M., Kozlov, D., & Rajsbaum, S. (2013). *Distributed Computing Through Combinatorial Topology*. Morgan Kaufmann. [≈ **320 citations**]
- Herlihy, M., & Rajwar, R. (2010). Transactional Memory Execution Utilizing Virtual Memory. *Proceedings of the 15th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)*. [≈ **460 citations**]
- Herlihy, M., & Koskinen, E. (2008). Transactional Boosting: A Methodology for Highly-Concurrent Transactional Objects. *Proceedings of the 13th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)*. [≈ **380 citations**]
- Herlihy, M., Luchangco, V., & Moir, M. (2006). A Flexible Framework for Implementing Software Transactional Memory. *Proceedings of the 21st Annual ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA)*. [≈ **360 citations**]
- Harris, T., Marlow, S., Peyton-Jones, S., & Herlihy, M. (2005). Composable Memory Transactions. *Proceedings of the 10th ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP)*. [≈ **1,160 citations**]

- Rajwar, R., Herlihy, M., & Lai, K. (2005). Virtualizing Transactional Memory. *Proceedings of the 32nd International Symposium on Computer Architecture (ISCA)*. [≈ **590 citations**]
- Guerraoui, R., Herlihy, M., & Pochon, B. (2005). Towards a Theory of Transactional Contention Managers. *Proceedings of the 24th ACM Symposium on Principles of Distributed Computing (PODC)*. [≈ **310 citations**]
- Herlihy, M., Luchangco, V., Moir, M., & Scherer III, W. N. (2003). Software Transactional Memory for Dynamic-Sized Data Structures. *Proceedings of the 22nd ACM Symposium on Principles of Distributed Computing (PODC)*. [≈ **1,400 citations**]
- Herlihy, M., Luchangco, V., & Moir, M. (2003). Obstruction-Free Synchronization: Double-Ended Queues as an Example. *Proceedings of the 23rd International Conference on Distributed Computing Systems (ICDCS)*. [≈ **730 citations**]
- Herlihy, M., & Shavit, N. (1999). The Topological Structure of Asynchronous Computability. *Journal of the ACM (JACM)*, 46(6), 858–923. [≈ **630 citations**]
- Herlihy, M., & Moss, J. E. B. (1993). Transactional Memory: Architectural Support for Lock-Free Data Structures. *Proceedings of the 20th International Symposium on Computer Architecture (ISCA)*. [≈ **3,500 citations**]
- Herlihy, M. (1993). A Methodology for Implementing Highly Concurrent Data Objects. *ACM Transactions on Programming Languages and Systems (TOPLAS)*, 15(5), 745–770. [≈ **790 citations**]
- Herlihy, M. (1991). Wait-Free Synchronization. *ACM Transactions on Programming Languages and Systems (TOPLAS)*, 13(1), 124–149. [≈ **2,600 citations**]
- Herlihy, M., & Wing, J. M. (1990). Linearizability: A Correctness Condition for Concurrent Objects. *ACM Transactions on Programming Languages and Systems (TOPLAS)*, 12(3), 463–492. [≈ **4,470 citations**]
- Aspnes, J., & Herlihy, M. (1990). Fast Randomized Consensus Using Shared Memory. *Journal of Algorithms*, 11(3), 441–461. [≈ **310 citations**]
- Herlihy, M. (1988). Impossibility and Universality Results for Wait-Free Synchronization. *Proceedings of the 7th ACM Symposium on Principles of Distributed Computing (PODC)*. [≈ **300 citations**]
- Herlihy, M. (1986). A Quorum-Consensus Replication Method for Abstract Data Types. *ACM Transactions on Computer Systems (TOCS)*, 4(1), 32–53. [≈ **360 citations**]

PATENTS

-
- **Sharded Permissioned Distributed Ledgers:** *U.S. Patent 12,288,196* — Issued April 29, 2025 Inventors: Mark S. Moir, Harold Carr, Maurice P. Herlihy, Isaac Sheff
 - **Sharded Permissioned Distributed Ledgers:** *U.S. Patent 11,989,704* — Issued May 21, 2024 Inventors: Mark S. Moir, Harold Carr, Maurice P. Herlihy, Isaac Sheff
 - **Sharded Permissioned Distributed Ledgers:** *U.S. Patent 11,538,003* — Issued December 27, 2022 Inventors: Mark S. Moir, Harold Carr, Maurice P. Herlihy, Isaac Sheff
 - **Authenticated Key-Value Stores Supporting Partial State:** *U.S. Patent 11,269,839* — Issued March 8, 2022 Inventors: Victor Cacciari Miraldo, Harold Carr, Maurice P. Herlihy, Alex Kogan, Mark Sean Moir
 - **Sharded Permissioned Distributed Ledgers:** *U.S. Patent 10,740,733* — Issued August 11, 2020 Inventors: Mark S. Moir, Harold Carr, Maurice P. Herlihy, Isaac Sheff
 - **Techniques for Enhancing Progress for Hardware Transactional Memory:** *U.S. Patent 10,346,196* — Issued July 9, 2019 Inventors: Alex Kogan, David Dice, Maurice P. Herlihy
 - **Meta-Transactional Synchronization:** *U.S. Patent 10,049,127* — Issued August 14, 2018 Inventors: Nir N. Shavit, Maurice P. Herlihy
 - **Hardware Extensions for Memory Reclamation for Concurrent Data Structures:** *U.S. Patent 9,785,548* — Issued October 10, 2017 Inventors: Alex Kogan, David Dice, Maurice P. Herlihy
 - **Accountability and Trust in Distributed Ledger Systems:** *U.S. Patent Application 2017/0236120* — Published August 17, 2017 Inventors: Maurice P. Herlihy, Mark S. Moir
 - **Systems and Methods for Utilizing Futures for Constructing Scalable Shared Data Structures:** *U.S. Patent 9,424,080* — Issued August 23, 2016 Inventors: Alex Kogan, Maurice P. Herlihy
 - **Simple Optimistic Skiplist:** *U.S. Patent 8,375,062* — Issued February 12, 2013 Inventors: Maurice P. Herlihy, Yosef Lev, Victor Luchangco, Nir N. Shavit
 - **Viewing and Modifying Transactional Variables:** *U.S. Patent 8,181,158* — Issued May 15, 2012 Inventors: Yosef Lev, Mark S. Moir, Maurice P. Herlihy

- **Concurrent Lock-Free Skiplist with Wait-Free Contains Operator:** *U.S. Patent 7,937,378* — Issued May 3, 2011 Inventors: Nir N. Shavit, Yosef Lev, Maurice P. Herlihy
- **Method for Dynamically Refining Locks in Resizable Concurrent Hashing:** *U.S. Patent 7,809,916* — Issued October 5, 2010 Inventors: Nir N. Shavit, Maurice P. Herlihy
- **Code Preparation Technique Employing Lock-Free Pointer Operations:** *U.S. Patent 7,805,467* — Issued September 28, 2010 Inventors: Mark S. Moir, David L. Detlefs, Simon Doherty, Maurice P. Herlihy, Victor M. Luchangco, Paul A. Martin, Guy L. Steele, Jr.
- **Lightweight Reference Counting Using Single-Target Synchronization:** *U.S. Patent 7,769,791* — Issued August 3, 2010 Inventors: Simon Doherty, Maurice P. Herlihy, Victor M. Luchangco, Mark S. Moir
- **Transactional Memory Execution Utilizing Virtual Memory:** *U.S. Patent 7,685,365* — Issued March 23, 2010 Inventors: Ravi Rajwar, Maurice P. Herlihy
- **Practical Implementation of Arbitrary-Sized LL/SC Variables:** *U.S. Patent 7,680,986* — Issued March 16, 2010 Inventors: Mark S. Moir, Simon Doherty, Victor M. Luchangco, Maurice P. Herlihy
- **Concurrent Extensible Cuckoo Hashing:** *U.S. Patent 7,657,500* — Issued February 2, 2010 Inventors: Nir N. Shavit, Maurice P. Herlihy
- **Space-Adaptive Lock-Free Queue Using Pointer-Sized Single-Target Synchronization:** *U.S. Patent 7,577,798* — Issued August 18, 2009 Inventors: Mark S. Moir, Simon Doherty, Victor Luchangco, Maurice P. Herlihy
- **Space-Adaptive Lock-Free Free-List Using Pointer-Sized Single-Target Synchronization:** *U.S. Patent 7,533,221* — Issued May 12, 2009 Inventors: Simon Doherty, Mark S. Moir, Victor Luchangco, Maurice P. Herlihy
- **Selectively Unmarking Load-Marked Cache Lines During Transactional Program Execution:** *U.S. Patent 7,389,383* — Issued June 17, 2008 Inventors: Marc Tremblay, Quinn A. Jacobson, Shailender Chaudhry, Mark S. Moir, Maurice P. Herlihy
- **Method and Apparatus for Releasing Memory Locations During Transactional Execution:** *U.S. Patent 7,206,903* — Issued April 17, 2007 Inventors: Mark S. Moir, Maurice P. Herlihy, Quinn A. Jacobson, Shailender Chaudhry, Marc Tremblay
- **Selectively Unmarking Load-Marked Cache Lines During Transactional Program Execution:** *U.S. Patent 7,089,374* — Issued August 8, 2006 Inventors: Marc Tremblay, Quinn A. Jacobson, Shailender Chaudhry, Mark S. Moir, Maurice P. Herlihy
- **Method and Apparatus for Coordinating Access to and Modifying Multiple Element Data Objects in a Shared Memory:** *U.S. Patent 5,553,267* — Issued September 3, 1996 Inventor: Maurice P. Herlihy