



Keynote: Multicore Programming

Barbara Liskov

liskov@piano.csail.mit.edu

Massachusetts Institute of Technology
Cambridge, MA

Abstract

This talk describes a new approach to implementing efficient concurrent programs that run on multicore computers. The approach is inspired by work on software transactional memory, and like that work aims to make it easier to write correct concurrent programs through the use of atomic transactions. A conventional STM tracks reads and writes of memory words, which can lead to high overhead. Our approach, called STO (software transactional objects), is based on data abstraction instead. Implementations of transaction-aware datatypes can take advantage of datatype semantics to reduce bookkeeping, limit false conflicts, and implement efficient concurrency control. This way we can provide both good performance and correctness based on modularity and encapsulation.

ACM Reference Format:

Barbara Liskov. 2019. Keynote: Multicore Programming. In *2019 Architectural Support for Programming Languages and Operating Systems (ASPLOS '19), April 13–17, 2019, Providence, RI, USA*. ACM, New York, NY, USA, 1 page. <https://doi.org/10.1145/3297858.3304078>

Biography

Barbara Liskov is an Institute Professor at MIT. Her research interests include distributed and parallel systems, programming methodology, and programming languages. Liskov is a member of the National Academy of Engineering, the National Academy of Sciences, and the National Inventors Hall of Fame. She is a fellow of the American Academy of Arts and Sciences and the Association for Computing Machinery, and a charter fellow of the National Academy of Inventors. She received the 2008 ACM Turing Award, the ACM SIGPLAN Programming Language Achievement Award in 2008, the IEEE Von Neumann medal in 2004, a lifetime achievement award from the Society of Women Engineers in 1996, and in 2003 was named one of the 50 most important women in science by Discover Magazine. She was inducted into the National Inventors Hall of Fame in 2012.

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the owner/author(s).

ASPLOS '19, April 13–17, 2019, Providence, RI, USA

© 2019 Copyright held by the owner/author(s).

ACM ISBN 978-1-4503-6240-5/19/04.

<https://doi.org/10.1145/3297858.3304078>