Workshop on Recent Advances in Parallel and Concurrent Data Structures

Organizers
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Description
Dictionary data structures, such as B-trees [1970], binary trees (e.g., red-black trees [1978]), Packed Memory Arrays [1981], maintain a representation of a set of keys or key-value pairs. Such data structures are one of the fundamental topics in computer science and have been widely used and studied in the context of efficient storage systems, databases, graph processing, among many other applications.

There have been many interesting recent developments at the intersection of theory and practice on parallel and concurrent data structures including new settings, models, and applications. The goal of this workshop is to cover some of these topics, including batch-parallel data structures, multiversioning in concurrent data structures, and dynamic data structures on the GPU.

Goals
The primary goal of the workshop is to bring together researchers at the forefront of research in parallel and concurrent data structures and make the community (both theory and applications) aware of recent developments. This will help facilitate discussion of open research questions and interactions to tackle those questions.

Format
The workshop will be a series of talks on specific topics in the area: please see below for a potential list of speakers.

Example tentative schedule:

1:30-2p: Talk A
2-2:30p: Talk B
2:30-3p: Talk C
3-3:15p: coffee break
3:15-3:45p: Talk D
3:45-4:15p: Talk E
4:15-4:45p: Talk F
List of possible speakers and topics

Introduction - Laxman Dhulipala and Helen Xu

“CPMA: An Efficient Batch-Parallel Compressed Set Without Pointers” - Brian Wheatman

“Pac-trees: supporting parallel and compressed purely-functional collections” - Yan Gu / Yihan Sun

BP-Tree: Overcoming the Point-Range Operation Tradeoff for In-Memory B-Trees - Helen Xu

Multiversioned concurrent data structures - Hao Wei


ShockHash: Towards Optimal-Space Minimal Perfect Hashing Beyond Brute-Force or High Performance Construction of RecSplit Based Minimal Perfect Hash Functions – Dominik Bez, Hans-Peter Lehmann, Peter Sanders, Stefan Walzer

Dynamic data structures on the GPU - John Owens (or Rob Johnson)

Lock-Free Locks Revisited and the Flock library: Naama Ben-David, Guy Blelloch, Hao Wei