

PMAM 2019 Workshop Program

(17th February, 2019)

08:30 – 08:40: Opening Remarks

Quan Chen, Zhiyi Huang, Min Si

08:40 – 09:40: Keynote

Keynote Speaker: Prof. Jidong Zhai, Tsinghua University, China

Title: Programming Challenges on a Leading Supercomputer

Abstract: Programming on a large-scale supercomputer is a challenging task. In this talk, Dr. Zhai will share his experience on designing and implementing BFS algorithms on Sunway TaihuLight (the world's fastest supercomputer for two years, from June 2016 to June 2018), a leading heterogeneous supercomputer with 40,960 nodes and 10.6 million accelerator cores. To implement high-performance BFS, some novel techniques are proposed, such as pipelined module mapping, contention free data shuffling and group based message batching. Finally, the optimized BFS gets 23755.7 GTEPS on more than ten million cores, which is the 1st among heterogeneous machines and the 2nd overall in the latest Graph500's list.

Bio: Jidong Zhai is a Tenured Associate Professor in the Computer Science Department of Tsinghua University. He is a recipient of Siebel Scholar, CCF outstanding doctoral dissertation award, and NSFC Young Career Award. He was a Visiting Professor of Stanford University (2015-2016) and a Visiting Scholar of MSRA (Microsoft Research Asia) in 2013. He received the Ph.D. degree in Computer Science from Tsinghua University in 2010, with the Excellent Ph.D. Graduate Student Award of Tsinghua University. His research interests include high performance computing, parallel computing, and heterogeneous computing. He has published more than 40 papers in prestigious refereed conferences and top journals including IEEE TPDS, IEEE TC, SC, PPOPP, ASPLOS, ICS, ATC, and MICRO. His research received a Best Paper Finalist at SC'14. He is the advisor of Tsinghua Student Cluster Team. The team led by him has achieved 8 international champions in student supercomputing challenges at SC, ISC, and ASC. In 2015 and 2018, the team led by him swept all three champions at SC, ISC, and ASC. He was a program co-chair of NPC 2018 and a program co-chair of ICPP PASA 2015 workshop. He served or is now serving TPC member or reviewer of IEEE TPDS, IEEE TC, IEEE TCC, SC, ICS, PPOPP, ICPP, NAS, LCPC, and HPCC.

09:40- 10:00: Morning Break

10:00 – 11:40: Session 1: Concurrent Execution

Session Chair: TBD

Yu Xia, Xiangyao Yu, William Moses, Julian Shun and Srin Devadas. “LiTM: A Lightweight Deterministic Software Transactional Memory System”.

Herbert Jordan, Pavle Subotic, David Zhao and Bernhard Scholz. “Brie: A Specialized Trie for Concurrent Datalog”.

Pierre Laborde, Lance Lebanoff, Christina Peterson, Deli Zhang and Damian Dechev. “Wait-free Dynamic Transactions for Linked Containers”.

Masataka Nishi. “Process Barrier for Predictable and Repeatable Concurrent Execution”.

11:40 – 13:30: Lunch break

13:30-14:45 Session2: Consistency and Coherency

Session Chair: TBD

Millad Ghane, Sunita Chandrasekaran and Margaret Cheung. “Gecko: Hierarchical Distributed View of Shared Memory Architectures”.

Christina Peterson and Damian Dechev. “Formal Verification through Combinatorial Topology: the CAS-Extended Model”.

Robert Lysterly, Sang-Hoon Kim and Binoy Ravindran. “libMPNode: An OpenMP Runtime For Parallel Processing Across Incoherent Domains”.

14:45 – 15:05: Afternoon break

15:05-16:20 Session3: GPU and Heterogeneous Architectures

Session Chair: TBD

Jacob Nelson and Roberto Palmieri. “Don't Forget About Synchronization! A Case Study of K-Means on GPU”.

Andreas Prodromou, Dean Tullsen and Ashish Venkat. “Deciphering Predictive Schedulers for Heterogeneous-ISA Architectures”.

Biagio Peccerillo and Sandro Bartolini. “Task-DAG Support in Single-Source PHAST Library: Enabling Flexible Assignment of Tasks to CPUs and GPUs in Heterogeneous Architectures”.

16:20 – 16:30: Closing Remarks

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