



北京大学高能效计算与应用中心学术报告

Invited Talk, Center for Energy-Efficient Computing and Applications

MODERN LOCALITY THEORIES AND APPLICATIONS

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地点: 理科二号楼2736



ABSTRACT: In computing, there is a fundamental conflict between computing speed and data capacity. A signal cannot travel faster than the speed of light, so the faster the data access is, the smaller amount of data it can reach. The solution is to trade space for speed and store data in a memory hierarchy. Locality theory is concerned with the fundamental properties of data usage in applications and memory management in hardware, VM, OS, and other run-time systems.

I'll review multiple branches of the past research in different areas that culminate in our higher-order theory [ASPLOS'13] showing that the locality metrics for performance evaluation, system management, and program optimization --- hitherto separately developed and applied --- are essentially equivalent. Under this new light, I'll discuss the current advances in multicore/GPU cache management, collaborative caching, cache conscious algorithms, and some recent interests related to BigData.

BIOGRAPHY: Ding, Chen graduated from Beijing University in 1994 and is currently Professor of Computer Science at University of Rochester. His research received the young investigator awards from NSF and DOE. He co-founded the ACM SIGPLAN Workshop on Memory System Performance and Correctness (MSPC) and was a visiting researcher at Microsoft Research and a visiting associate professor at MIT. He is currently a visitor in Professors Luo, Yingwei and Wang, Xiaolin's group at Beijing University.