

Guide Data Placement in Heterogeneous Memory with Profiling

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Abstract

Nowadays, it has become common to see memories of different types integrated into the same system, known as heterogeneous memory. This encourages a new style of data processing and exposes developers with a new problem: given two memory types, how shall we redesign applications to benefit from this memory arrangement and decide on the efficient data placement? Existing methods perform detailed memory access pattern analysis to guide data placement. However, these methods are heavyweight and ignore the interactions between software and hardware. In this talk, we describe several profiling techniques to help developers determine better data placement policies.

Bio

Xu Liu is an assistant professor in the Department of Computer Science at NC State University. He obtained his Ph.D. from Rice University in 2014. Prof. Liu works on several open-source profiling tools, which are world-widely used at universities, DOE national laboratories, and industrial companies. Prof. Liu has published a number of papers in high-quality venues. His papers received Best Paper Award at SC'15, PPOPP'18, PPOPP'19, and ASPLOS'17 Highlights, and Distinguished Paper Award at ICSE'19. His recent ASPLOS'18 paper has been selected as ACM SIGPLAN Research Highlights in 2019. Prof Liu is the recipient of 2019 IEEE-CS TCHPC Early Career Researchers Award for Excellence in High Performance Computing.