Other

Distributed Garbage Collection for General Graphs

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Abstract:

Garbage Collection is well-studied and highly optimized for single nodes. This is less true for distributed systems. Typically, existing algorithms rely on some form of centralization or global barrier to get their work done. As these approaches do not scale, modern high performance distributed computations (e.g. codes written using HPX, Charm++, Uintah, etc.) rely on manual memory management. We describe a novel, decentralized, distributed garbage collection algorithm based on the Actor Model. It completes in order E time (where E is the number of edges) uses order Log(N) memory per node (where N is the number of nodes) and requires a reliable reordering queue. It is suitable for analysis using the CONGEST model.

Speaker's Bio:

Steven Brandt obtained his Ph.D. from the University of Illinois at Champaign-Urbana for his research in numerical simulations of rotating black holes. He currently serves as the Assistant Director for Computational science at the Center for Computation and Technology (CCT) and as an adjunct faulty member in the Division of Computer Science & Engineering and is involved in research into making parallel programming more effective. He works with the STEllAR team led by Dr. Hartmut Kaiser, and helps lead the Cactus Frameworks effort. He is PI on grants relating to Cactus Frameworks development and cyberinfrastructure for the Coastal Hazards Collaboratory.

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