革新的コンピューティング技術の開拓
2020 年度採択研究者

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ムーアの法則を超えた並列プログラミング

§1. 研究成果の概要

In this fiscal year we demonstrated a proof-of-concept of our autonomous execution model. We proposed a new method for writing programs for GPUs for iterative numerical solvers, that are widely used in HPC scientific simulations. Our method is generic, i.e., can apply to different iterative solves, and is also applicable to CPUs and other types of processors; not just limited to GPUs. By running iterative numerical solvers in a persistent way, we can reduce the data transfer to memory to minimum (the main bottleneck in single-node computations) and achieve speedups in software that are higher than speedups gained from using an entire new generation of hardware. Additionally, the achieved results make us well-positioned to enter the next fiscal year with the clear goal of expanding the autonomous execution environment to full supercomputer scale.

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