

Day 3 (Poster D)

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Title:Improvement in Convergence Speed of Fully-Parallel Annealing Algorithm with Spin-Update Restriction

Abstract:

Stochastic Cellular Automata Annealing (SCA) is one of the extension algorithms of Simulated Annealing (SA), which can update the state of an Ising spin system in a completely parallel manner and thus realizes faster spin update than SA. In SCA, the convergence to the ground-state is ensured by introducing the effect specified by a parameter, namely q , for restraining the flip of each spin. Though it is mathematically proven that q is required to be a sufficiently large value for ensuring the proper convergence, using a large q is not practical because its convergence speed becomes quite slow. In this presentation, we propose an improvement technique for SCA based on an enforced spin-update restriction scheme, which greatly improves the convergence speed and enables us to obtain better solutions than the original SCA. Our numerical simulation results demonstrate that the proposed scheme has a capability to bring the proper convergence even when using a small q .

The work was done in collaboration with Thiem Van Chu, Jaehoon Yu, and Masato Motomura.