Day 1 (Poster B)

Yosuke Mukasa, Waseda University

Title:Scalable Algorithm for Capacitated Vehicle Routing Problem Using Ising Machines

Abstract:
Ising machines are expected to obtain approximate solutions of combinatorial optimization problems at high speed. In many cases, the number of spins in current Ising machines is too small to solve real-world problems, caused by the hardware limitation. Moreover, even if the number of spins increases further in the future, there is no guarantee that the Ising machine will obtain a high-quality approximate solution. It may be more effective to partition the large problems into those dealt with into the Ising machine. In this study, we focus on the capacitated vehicle routing problem (CVRP) as an example of the problem where partitioning can be effectively applied, and we propose a two-step algorithm to solve CVRP; clustering by a conventional method and routing by Ising machines recursively. Our experimental results show that the proposed algorithm can obtain feasible solutions for large problems that cannot be dealt with to an actual Ising machine.

This work was done in collaboration with Yosuke Mukasa, Yoshiki Matsuda, Shu Tanaka, Nozomu Togawa.