

## Day 4

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Title: Traffic optimization by quantum annealing

Abstract:

Traffic congestion is one of the most desirable problems to be solved in our daily lives. A common solution is to build or expand roads, but it is difficult to respond appropriately to changes in vehicle flow. We have succeeded in solving the traffic congestion problem by combining the two different approaches. The first is to determine the route of vehicles, and the second is to control traffic signals. Both approaches can be formulated as combinatorial optimization problems. We solve them by quantum annealing by writing combined problems in terms of the quadratic unconstrained binary optimization (QUBO). In this presentation, in addition to introducing the methods of these two approaches, we will show that they are useful in solving the problem by comparing the number of times a car stops on a virtual crossroad in the program. As a result of the verification, it is confirmed that the traffic optimization using these two approaches dramatically reduces the number of times a car stops.