Day 3 (Poster E)

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Title:Reconstruction of Combinatorial Optimization Problems from Ising models

Abstract:
Ising computers，which are non-von Neumann computers that operate under principles different from those of legacy computers，have been gaining attention. An Ising computer is a hardware accelerator that obtains the ground state of the Ising model. It can obtain quasi-optimal solutions to heuristics by converting a combinatorial optimization problem into the Ising model and applying it as input. As Ising computers have high hardware costs，they have not been implemented in ordinary computers. These devices are positioned in remote areas and accessed via the Internet typically. Unreliable Ising computer providers can result in the original combinatorial optimization being reconstructed from the Ising model，and the confidential information can then be extracted. In this study，we investigate attacks in which an attacker obtains the Ising model generated from the combinatorial optimization problem and then reconstructs the original combinatorial optimization problem.

This work was done in collaboration with Masashi Tawada and Nozomu Togawa.