Joint CQSE and CASTS Seminar

Weekly Seminar
Oct. 20, 2017 (Friday)

TIME Oct. 20, 2017, 14:30 ~ 15:30
TITLE The quantum algorithm of implementing the bio-molecular solutions of the clique problem
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Abstract

One of the interesting opening questions is to ask when other NP-complete problems are reduced to one NP-Complete problem with its optimal quantum algorithm of a quadratic speed-up; those reduced problems can be solved with the same algorithm of a quadratic speed-up. Here we prove an optimal quantum algorithm of a quadratic speed-up to process the Boolean circuits originated from the bio-molecular algorithm, solving effectively the clique problem to any graph G with n vertices and θ edges. We also show that the processing of reduction among NP-complete problems not only cannot speed up the performance of quantum algorithms but also slows down their performance. To justify the feasibility of the proposed quantum algorithm, we have carried out a nuclear magnetic resonance (NMR) experiment involving *four* quantum bits to solve an exemplified clique problem for a graph G with *two* vertices and *one* edge.