Codes Updates

Richard Hua
University of Auckland, New Zealand

October 2021

Improved new QUBO formulations (requiring less number of logical qubits) for the graph/subgraph isomorphism problems have been developed in the paper [2].

The original Python scripts in the Appendices of the papers [1, 2] have been designed only for illustrations of the theories developed in these articles, so they have not optimized for large and complicated graphs.

A more efficient implementation of the QUBO formulation in [1] is now part of the gsgmorph library `https://pypi.org/project/gsgmorph/`.

The gsgmorph library is developed by John Long together with Iff Techonologies and has been bench-marked against the QUBO formulation scripts in paper [1]. See `https://www.linkedin.com/posts/ifftech_gsgmorph-activity-6846119281462181888-GGlc/` for more details.

References

[1] Cristian S. Calude, Michael J. Dinneen, and Richard Hua. QUBO formulations for the graph isomorphism problem and related problems. *Theoretical Computer Science*, 701:54–69, 2017.

[2] Richard Hua and Michael J. Dinneen. Improved qubo formulation of the graph isomorphism problem. *SN Computer Science*, 1(1):1–18, 2020.