

## **Quantum Persistent K-Cores for Community Detection and Ranking**

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The identification of communities and the strength of community ties within social networks is a key problem in network analysis and graph problems in general. Quantum persistent k-cores (QPKC) aims to identify k-core communities adjusted for link persistence, thus providing both a partitioning to k-core communities and an estimation of community strength through the graph filtration. QPKC is benchmarked on three toy network problems with known community structure and on an open-source social network. Results for simulated datasets and the open-source social network dataset are compared to hierarchical clustering, multilevel modularity-based clustering, walktrap random walk clustering, and spinglass statistical mechanics clustering.

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