

# HYBRID QUANTUM-CLASSICAL WALKS IN COMPLEX NETWORKS

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Complex networks are ubiquitous in nature, and their study remains one of the most exciting and active research areas today. However, due to their inherent complexity, we still lack general algorithms capable of fully capturing their topological properties. Quantum walks have emerged as a promising tool for this purpose, as they spread more rapidly than their classical counterparts. Nonetheless, their fully coherent nature complicates the analysis of their propagation paths. In this talk, we present a novel technique for the analysis of complex networks. Our method is based on a hybrid approach that combines quantum and classical dynamics, enabling efficient propagation through complex structures while simultaneously extracting meaningful information. Although inspired by quantum processes, the technique can be simulated efficiently on classical computers. We will also discuss potential applications of this approach.

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