

1139-05-546

Hanmeng Zhan* (h3zhan@uwaterloo.ca), Department of Combinatorics and Optimization,
University of Waterloo, Waterloo, Ontario N2L 3G1, Canada. *Recent Progress in Discrete
Quantum Walks.*

Discrete quantum walks are natural quantization of discrete random walks—we replace the doubly stochastic transition matrix, which updates the probabilities, by a unitary transition matrix U , which updates the amplitudes. With this unitarity requirement, however, U has to act on the arcs rather than the vertices. Thus, more inputs are required to build a discrete quantum walk, apart from the underlying graph. We will construct quantum walks from various combinatorial objects, and explore the connections between properties of these building blocks and properties of quantum walks. (Received February 19, 2018)