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Linking Quantum Search Algorithms to Ghost Imaging

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Ghost imaging is the process of reconstructing an image of an object using entangled photons. One of the entangled photons interacts with the object and is detected without spatial resolution while the other photon from the pair is detected with spatial resolution. When the two photons are detected in coincidence, an image of the object can be obtained with the help of projective masks. An analogy can be drawn between the Grovers algorithm (quantum search algorithm) and the detection of single photons to produce a ghost image of a given object. The Grover operator (consisting of the oracle and the diffuser) contains similarities to the operator which acts on the projective states in the ghost imaging procedure. This correlation presents a new method of performing ghost imaging. I will present our findings as to how Grover's algorithm is linked to bi-photon detection and how Grover's operator emerges.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

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