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Single-photon, single-pixel camera

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Abstract content
   (Max 300 words)
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Traditional imaging techniques require light to interact with the object of interest, however, quantum entanglement allows the formation of images without each photon interacting with the object, this is known as ghost imaging. The optical image is revealed in the coincidences between pairs of entangled photons, with only limited information available in counts from either one of the detectors alone. Ghost imaging offers multiple advantages in comparison to standard imaging; as it offers a non-destructive imaging system and imaging at the single photon level has enabled sub-diffraction limited imaging. Typically, quantum imaging is used to recover the amplitude of the object by implementing a scanning detector in one arm of the entanglement setup. We demonstrate that both the amplitude and phase of the object can be reconstructed using digital holography and single photon detectors. The latter reduces the complexity of the scanning device to single pixel.

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MSc

Main supervisor (name and email)
and his / her institution

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