

1106-81-1492

**Mingsheng Ying\*** ([mingsheng.ying@uts.edu.au](mailto:mingsheng.ying@uts.edu.au)), Centre for Quantum Computation and, Intelligent Systems, University of Technology, Sydney, Sydney, NSW 2121, Australia. *Quantum Recursion and Second Quantisation*.

This paper introduces a new notion of quantum recursion of which the control flow of the computation is quantum rather than classical as in the notions of recursion considered in the previous studies of quantum programming. A typical example is recursive quantum walks, which are obtained by slightly modifying the construction of the ordinary quantum walks. The operational and denotational semantics of quantum recursions are defined by employing the second quantisation method, and they are proved to be equivalent. (For full paper, see: <http://arxiv.org/pdf/1405.4443v2.pdf>) (Received September 13, 2014)