Course Project, Spring 2016

Cluster-State Quantum Computing

Mayra Amezcua, Dileep V. Reddy, Zach Schmidt

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CIS410/510 Introduction to Quantum Information Theory
Lecturer: Prof. Xiaodi Wu
Computer and Information Science, University of Oregon

Table of Contents (optional frame. Can delete.)

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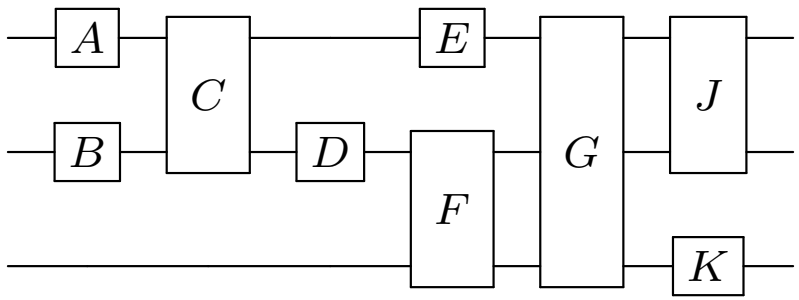
[1] Auth, DV, 123, 2001.



Arbitrary quantum circuit involving unitary operations on 3 qubits.

One-way quantum computing, measurement based quantum computing
As opposed to circuit based quantum computing

Basic teleporation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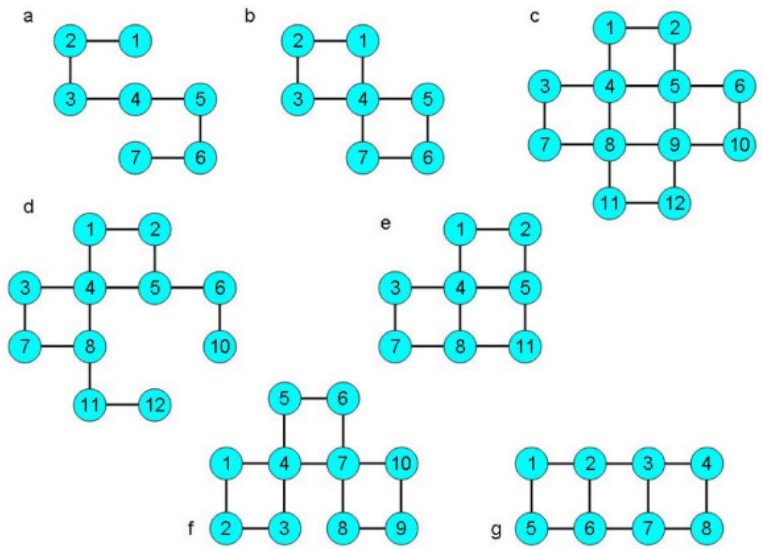

Figure: Figure showing representative 2-D cluster shapes. The vertices are qubits with integer indices, and the edges indicate entanglement connectivity between select neighbors.

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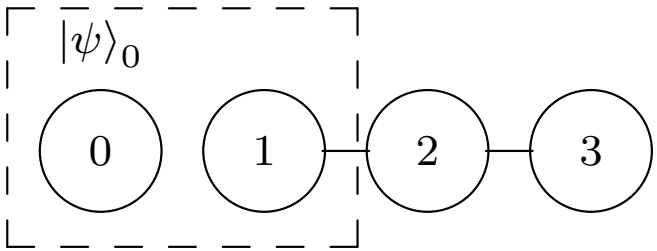
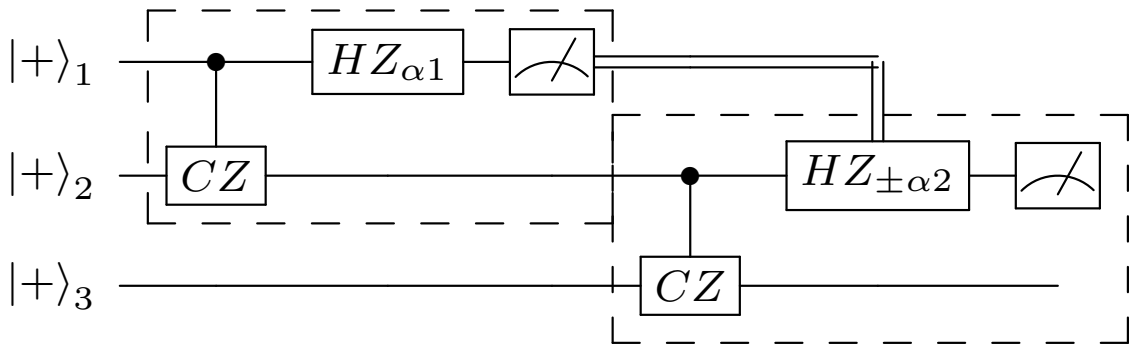
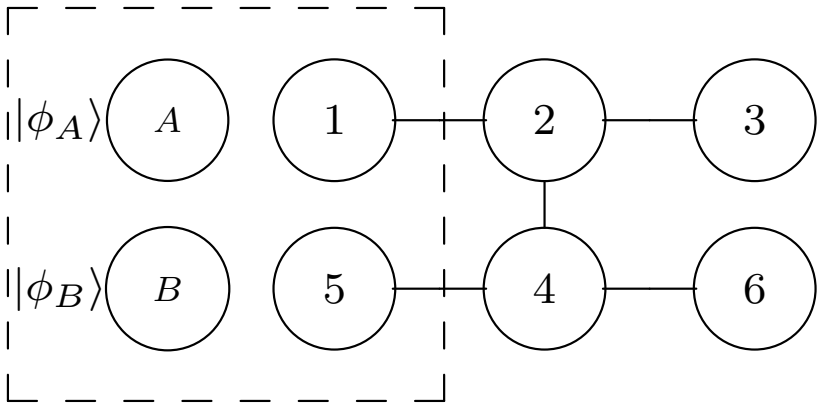


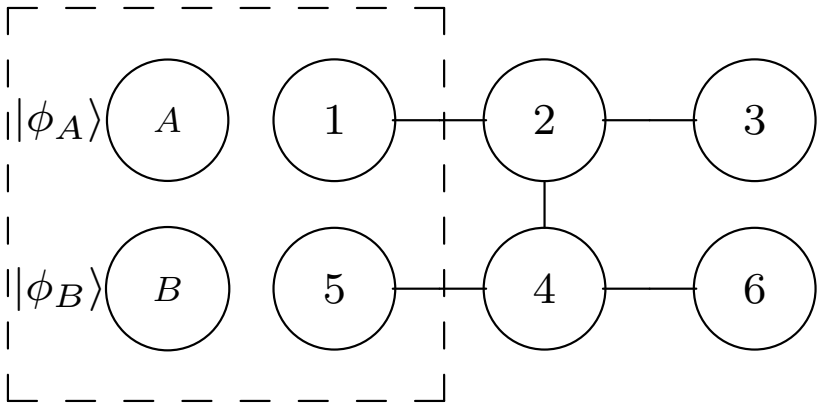
Gate $C_z^{(0,1)}$, followed by measurements $M_X^{(0)}$, $M_X^{(1)}$, & $M_X^{(2)}$.

Callback to teleportation discussion





Apply $C_z^{(A,1)}$ and $C_z^{(B,5)}$ to input quantum information into cluster state.



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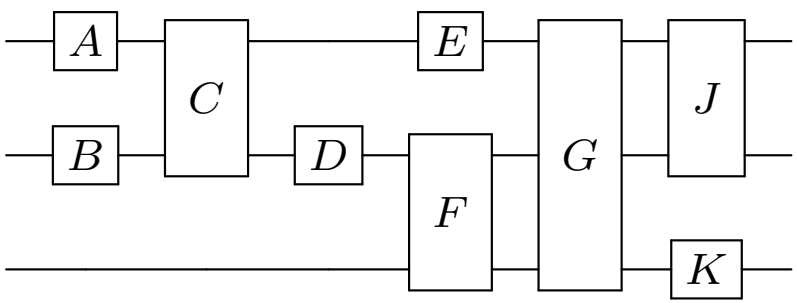

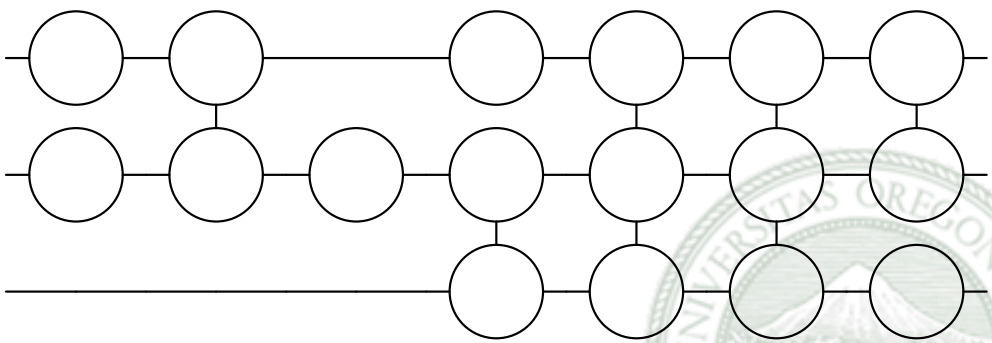


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