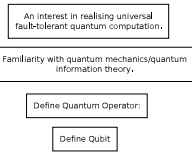
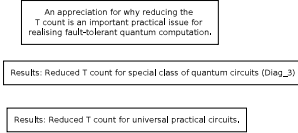


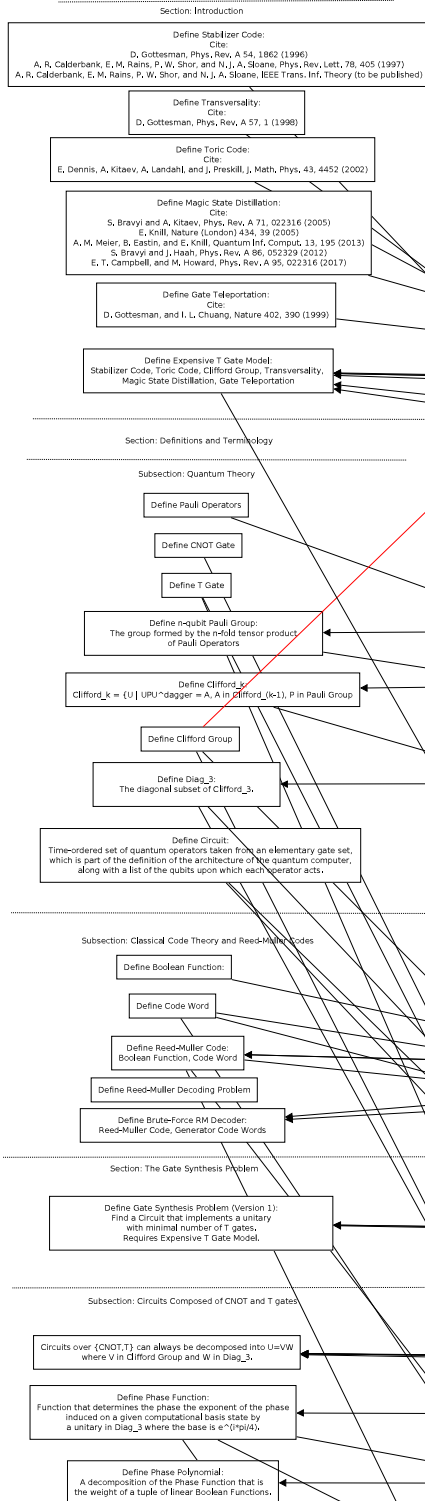
Input:



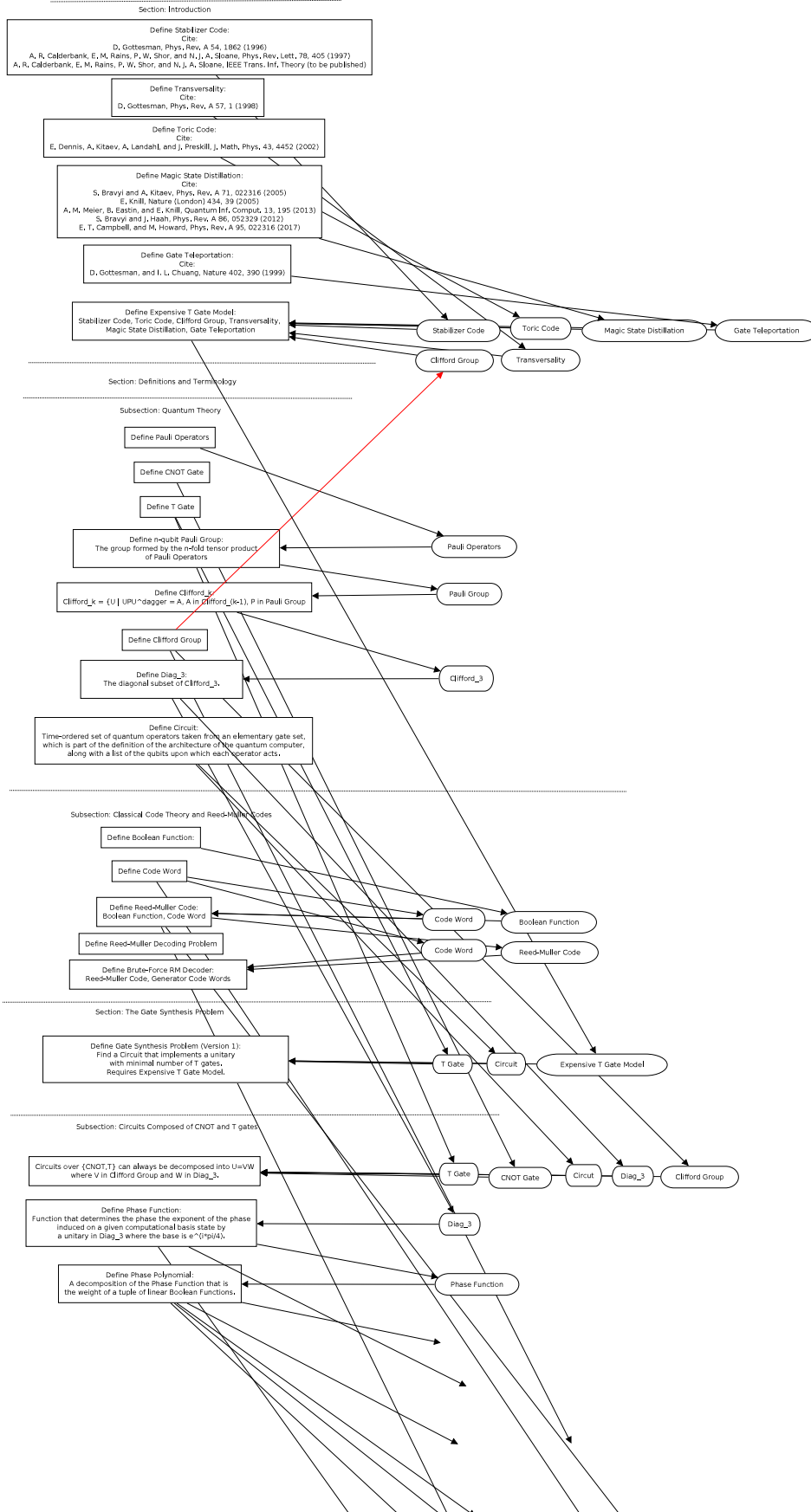
Output:

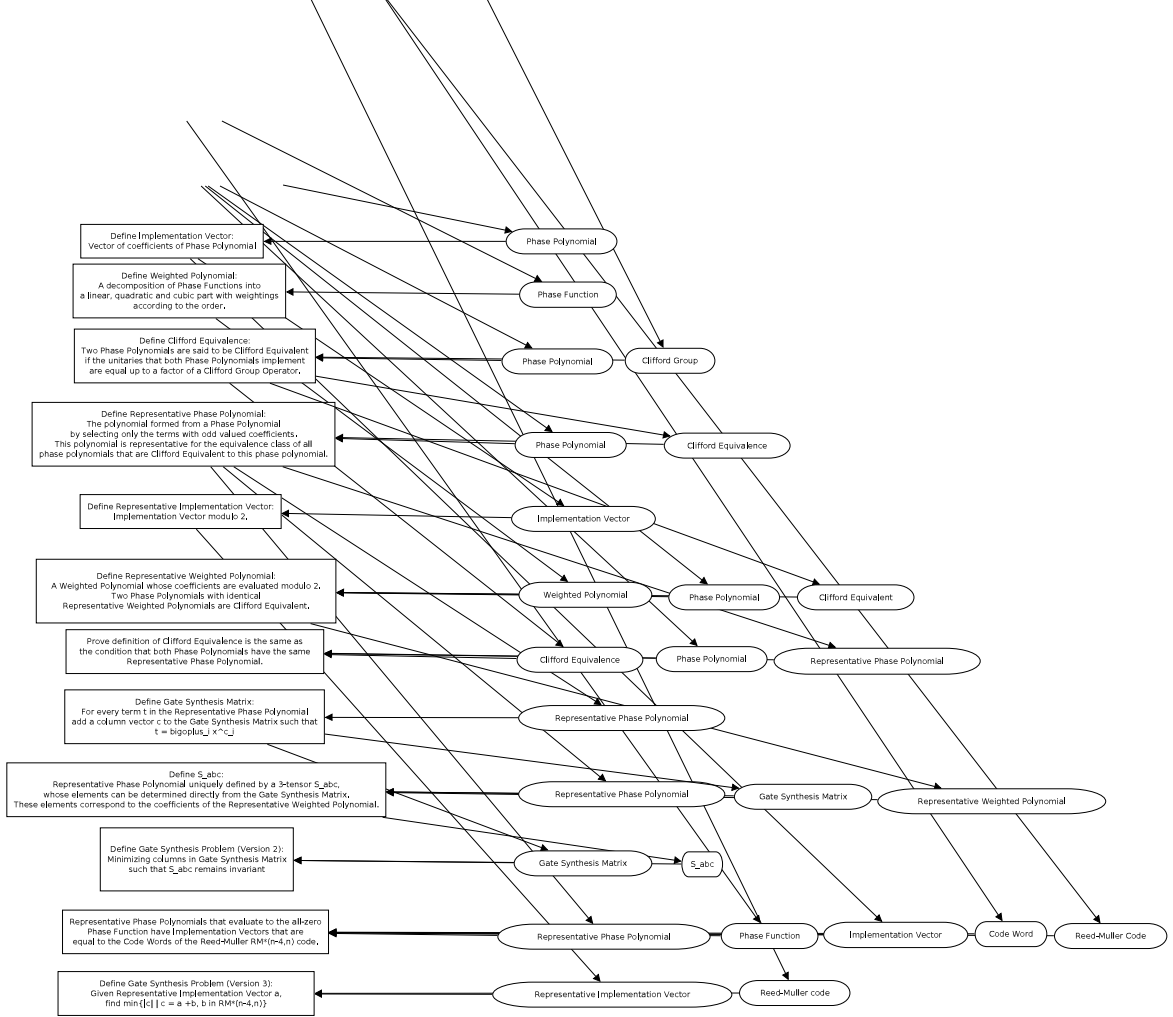


Content Boxes:



Concept Nodes:





Section: Solutions to the Gate Synthesis Problem

Subsection: The Lempel Algorithm

$A = BB^T$ problem where A is a symmetric matrix.

Describe algorithm.

Show applicability to Gate Synthesis Problem

Deconstruct input Circuit into series of control-unitaries.

Minimize number of T gates within target block.

Add the control qubit back on to target phase polynomial.

Quote analytical upper limit on T count

Subsection: The Extended Lempel Algorithm

$S_{abc} = \sum(B_{ka} B_{kb} B_{kc})$ problem where S_{abc} is a symmetric tensor.

Describe algorithm

Algorithm acts directly on the Gate Synthesis Matrix so no need for control-unitary decomposition.

Section: Experimental Results

Subsection: Random Circuits over CNOT and T

Subsection: Universal Practical Circuits

Generalised Toffoli-Standard method

Hadamard Path Variables

Cite:
- A. Montanaro, e-print arXiv:1607.08473
- M. Bremner, R. Jozsa, and D. Shepherd, Proc. Roy. Soc. Ser. A 467 (2126):459-472 (2011), e-print arXiv:1005.1407

Section: Discussion and Conclusions