Response to Ramesh & Vinay, (2003)

String Matching in $\tilde{O}(\sqrt{n}+\sqrt{m})$ Quantum Time

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1 Citation Example

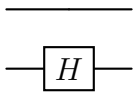
This is a dummy citation [1].

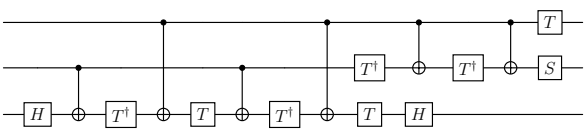
2 Matrix and Align Examples

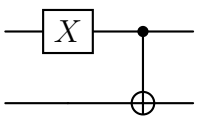
$$H = \frac{1}{\sqrt{2}}\begin{bmatrix}1 & 1\\ 1 & -1\end{bmatrix}$$
$$X = \begin{bmatrix}0 & 1\\ 1 & 0\end{bmatrix}$$
$$Y = \begin{bmatrix}0 & -i\\ i & 0\end{bmatrix}$$
$$Z = \begin{bmatrix}1 & 0\\ 0 & -1\end{bmatrix}$$

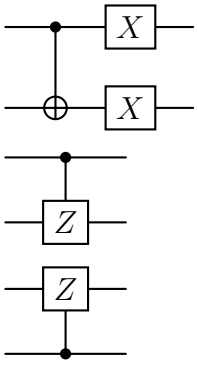
$$\begin{bmatrix}1 & 0 & 0 & 0\\ 0 & 1 & 0 & 0\\ 0 & 0 & 1 & 0\\ 0 & 0 & 0 & -1\end{bmatrix}$$

3 Quantikz examples









4 Bra-Ket examples

$$
\begin{aligned}
|\Psi\rangle &= \frac{1}{\sqrt{2}}\Big[H|0\rangle\left(\alpha|\phi_+\rangle + \beta|\phi_-\rangle\right) + H|1\rangle\left(\alpha|\phi_+\rangle - \beta|\phi_-\rangle\right)\Big] \\
&= \frac{1}{2}\Big\{|0\rangle\left[\left(\alpha|\phi_+\rangle + \beta|\phi_-\rangle\right) + \left(\alpha|\phi_+\rangle - \beta|\phi_-\rangle\right)\right] \\
&\qquad + |1\rangle\left[\left(\alpha|\phi_+\rangle + \beta|\phi_-\rangle\right) - \left(\alpha|\phi_+\rangle - \beta|\phi_-\rangle\right)\right]\Big\} \\
&= \alpha|0\rangle|\phi_+\rangle + \beta|1\rangle|\phi_-\rangle\,.
\end{aligned}
$$

$$
\begin{aligned}
|\psi_1\rangle = |0\rangle : |\psi_2\rangle &\to |\psi_2\rangle \\
|\psi_1\rangle = |1\rangle : |\psi_2\rangle &\to Z|\psi_2\rangle\,.
\end{aligned}
$$

References

[1] H Ramesh and V Vinay. String matching in $\tilde{O}(\sqrt{n}+\sqrt{m})$ quantum time. *Journal of discrete algorithms (Amsterdam, Netherlands)*, 1(1):103–110, 2003.