Quadratic optimization with quantum computing

Presentation 2

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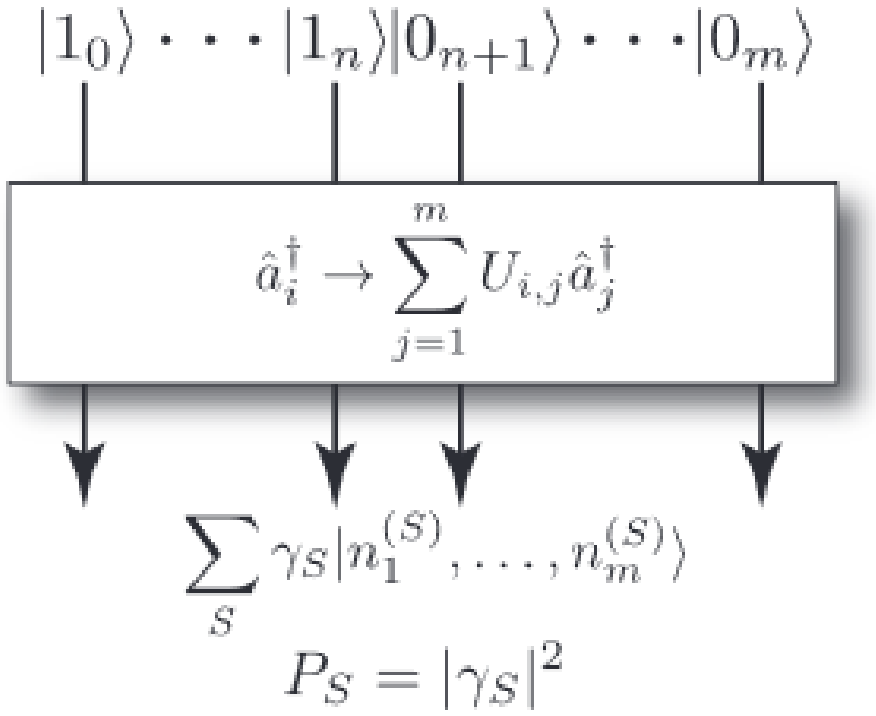
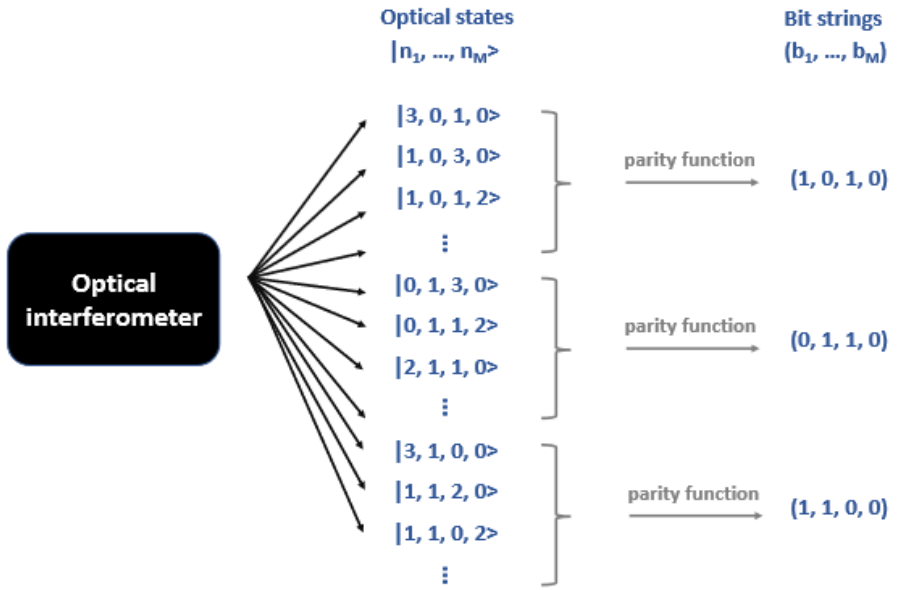
Overview: Boson sampling and parity mapping

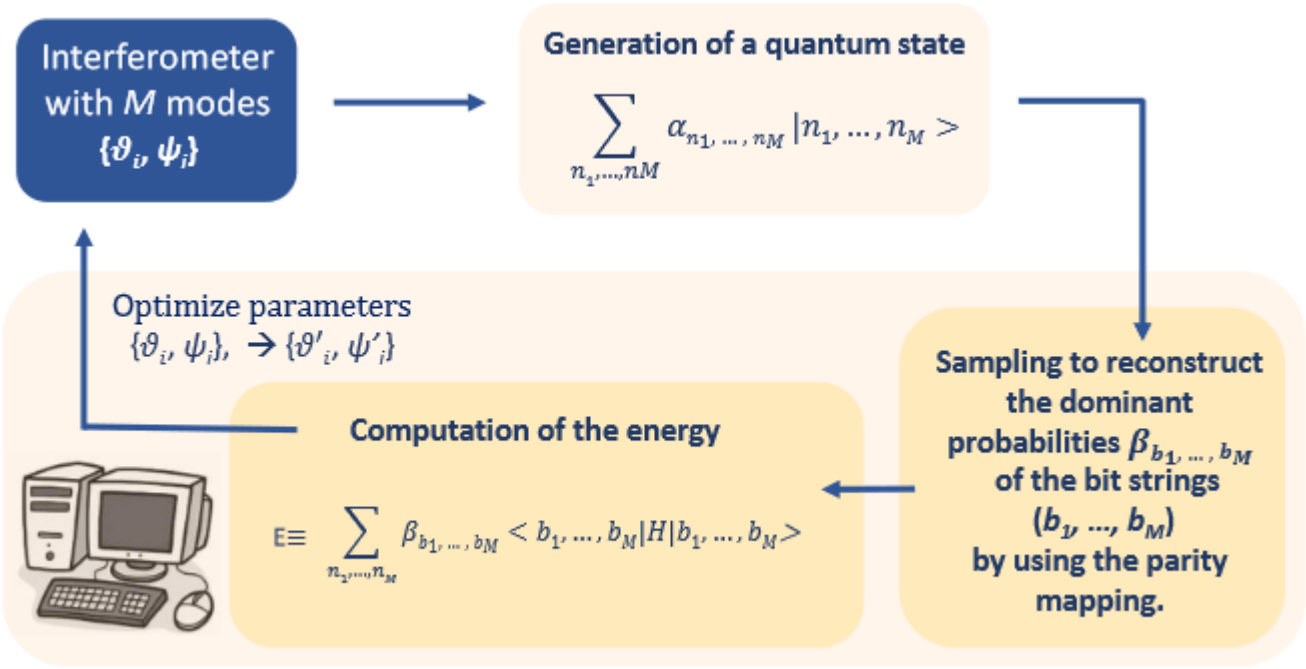


Gard, Bryan T., et al. "An introduction to boson-sampling.„ 2016



Bradler, Kamil, and Hugo Wallner.,
"Certain properties and applications of shallow bosonic circuits.„, 2021

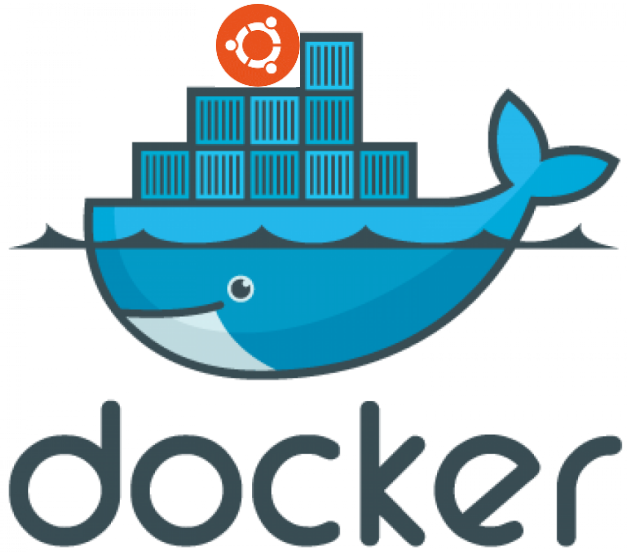
Model overview



Bradler, Kamil, and Hugo Wallner. "Certain properties and applications of shallow bosonic circuits.„ 2021

Setup

- Installed Ubuntu on Docker
- Installed necessary dependencies
- Built with Conda from Github source

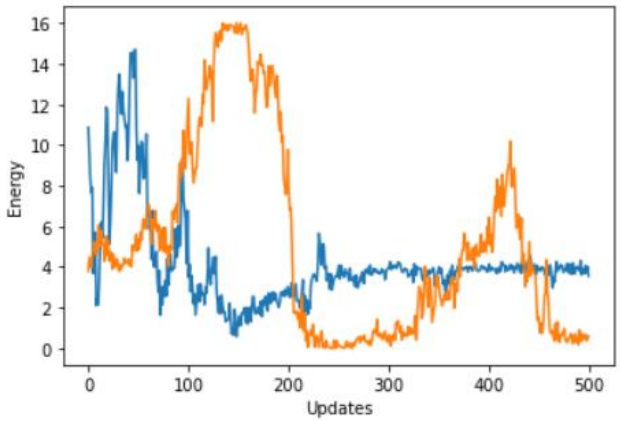


First steps

General symmetric matrix

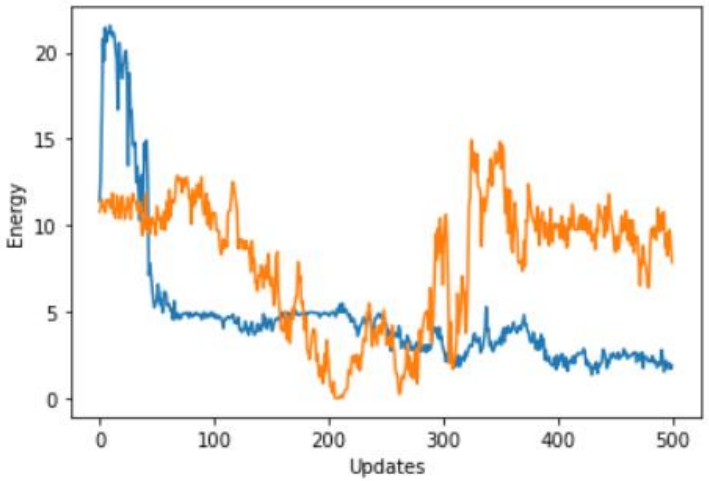
$$\mathbf{Q} = \begin{pmatrix} A & B & C \\ B & D & E \\ C & E & F \end{pmatrix}.$$

(1,0,0)	A
(1,1,0)	A + 2B + D
(1,1,1)	A + D + F + 2(B+ C + E)
(1,0,1)	A+2C+F
(0,1,1)	D+2E+F
(0,0,1)	F
(0,1,0)	D
(0,0,0)	0

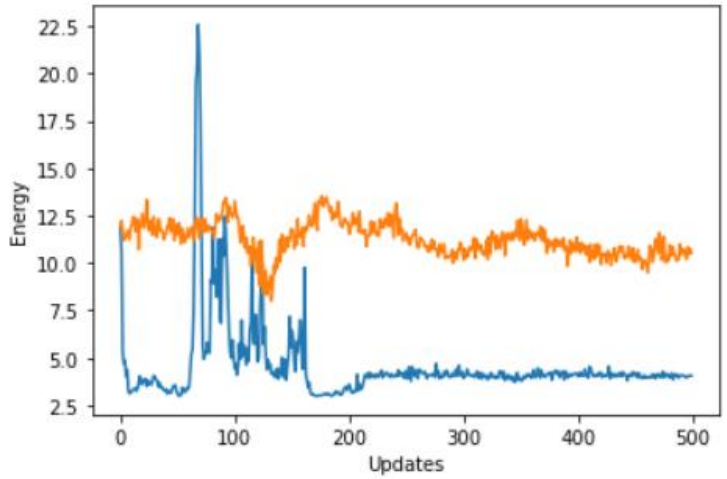


General case

Degenerate case



Trivial case



Thank you for your attention