Parameter estimation from quantum-jump data using neural networks

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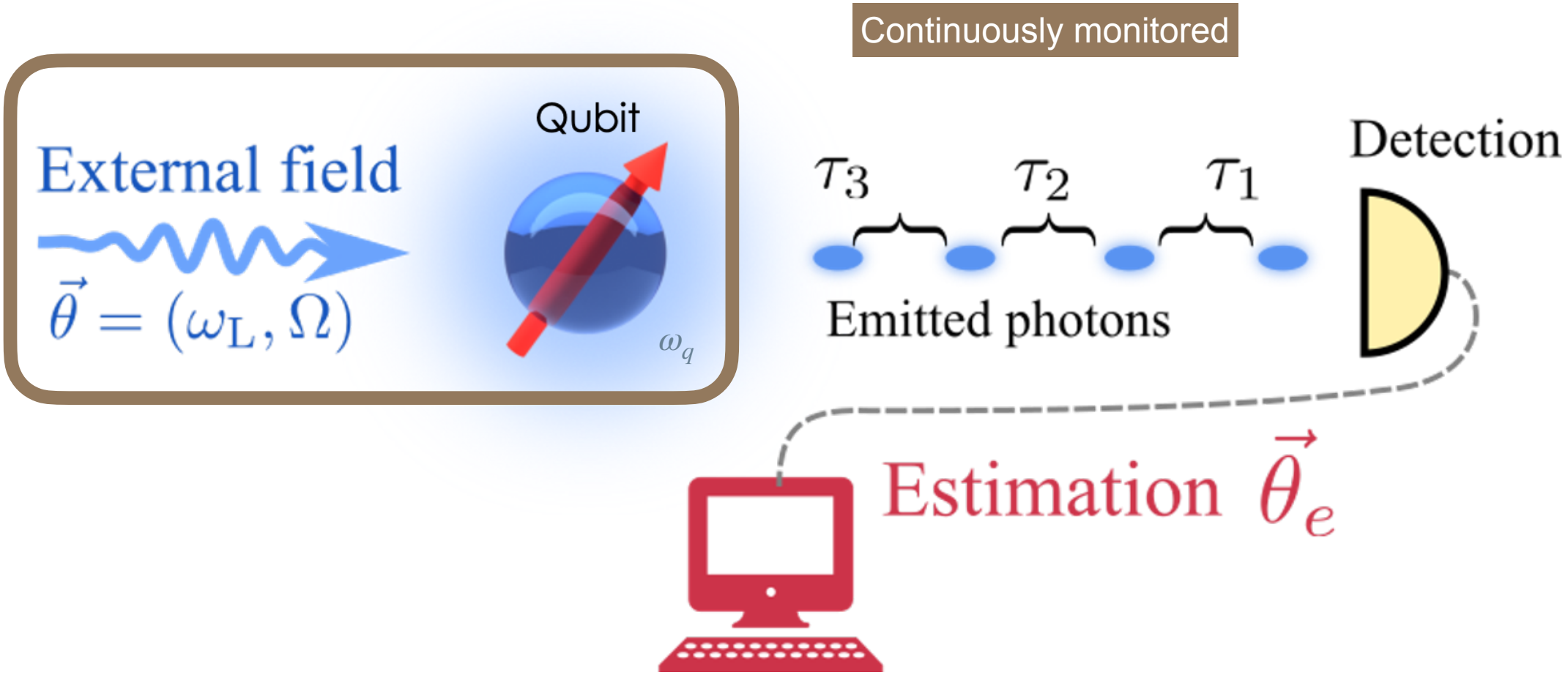
A simple model of an open quantum sensor



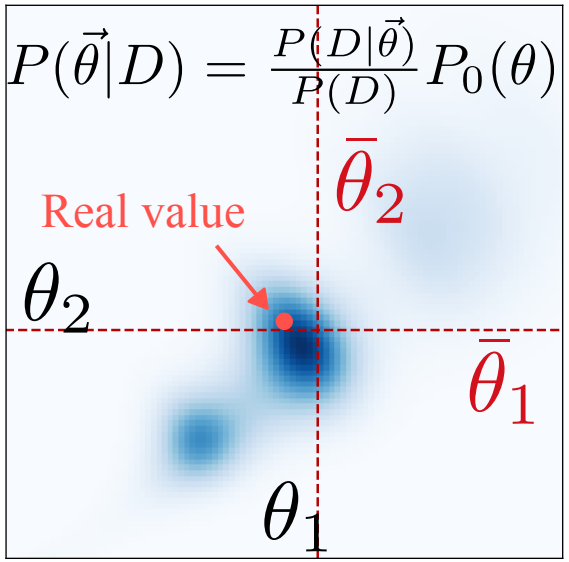
Can we precisely and robustly extract the value of the system's parameters?

$\vec{\theta}_e = \{\Delta = \omega_q - \omega_L \text{ and } \Omega\}$

Estimation $\vec{\theta}_e$

Bayesian Estimation

$D = [\tau_1, \tau_2, \ldots, \tau_m]$

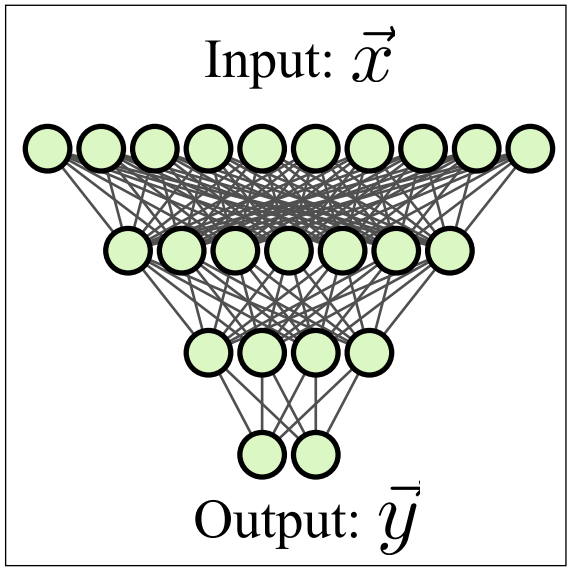


Estimation

$\vec{\theta}_e = [\bar{\theta}_1, \bar{\theta}_2]$

Machine Learning

$\vec{x} = [\tau_1, \tau_2, \ldots, \tau_m]$



Estimation

$\vec{\theta}_e = [y_1, y_2]$

Board 56

Benchmarked to be robust to noise and 10000x faster than Bayesian inference!