algo2qpu

(a)

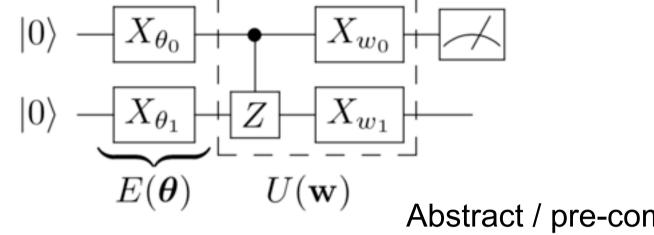**Algorithm: Quantum Classifier**

Training sets with label 0,1: S_0, S_1

Given encoding $E(\boldsymbol{\theta})$ of classical data $\boldsymbol{\theta}$ and a parametrized circuit $U(\mathbf{w})$

For data point i, Probability of measuring 0,1 in the top qubit: $p_0^{(i)}, p_1^{(i)}$
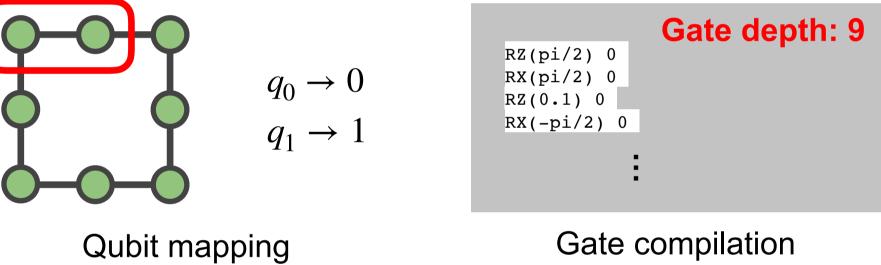
Objective function: $\min \sum_{i \in S_0} \log p_1^{(i)} - \sum_{i \in S_1} \log p_1^{(i)}$

(b)

Instance: 2-qubit circuit

Abstract / pre-compiled circuit

(c)

Circuit Compilation

$q_0 \rightarrow 0$
$q_1 \rightarrow 1$

Gate depth: 9

```
RZ(pi/2) 0
RX(pi/2) 0
RZ(0.1) 0
RX(-pi/2) 0
```

Qubit mapping   Gate compilation

(d)

Circuit Execution on QVM and/or QPU

(e)

Post-process & Storage

Decision boundaries of the classifier

Before training (from QVM)   After training (from QPU)