

Initialize population

a)

00011101010110110100

b) Decoding phase

Split 5 bits by gate

'00011','10101','01101','10100'

First 3 Bits	Quantum Gates	Last 2 Bits	Angles
000	Hadamard	00	$\pi$
001	CNOT	01	$\pi/2$
011	$R_x$	10	$\pi/4$
111	$R_y$	11	$\pi/8$
100	$R_z$		

d)

Mutation

Crossover

Selection

N

Early stopping  
Conditions

Y

Return Best  
Individual

Select N  
Individuals

Evaluation  
Function (Fitness)

- Calculating number of gates
- Fitting QSVM and Accuracy on test

c)

$\mathcal{U}(x; \theta)$

$$K(\vec{x}, \vec{z}) = |\langle \Phi(\vec{x}) | \Phi(\vec{z}) \rangle|^2$$