EMOTIONAL SIMULATOR USING QUANTUM AI

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OVERVIEW

- The quantum-ai emotion simulator blends artificial intelligence and quantum computing to understand and express a users emotional state .

- This program uses logistic regression as well

- The AI determines what your emotional probabilities are

- The quantum system expresses how those emotions feel

- These create a scientific and poetic model of human emotion

AI ROLE

- Collects training examples where each sample has 5 yes/no questions

- Uses logistic regression

- Learns patterns from the examples dataset

- Feeds the users answers to model

- Produces probability

- Provides a friendly emotional interpretation

QUANTUM ROLE

- Encoding Emotion as a Qubit - The ML probabilities for Happy and Sad are mapped to a single-qubit quantum state using two angles (θ, φ).

- Quantum State Preparation - Quantum rotation gates RY(θ) and RZ(φ) create the emotional state on the Bloch sphere.

- Quantum Measurement - The circuit is simulated with multiple shots to obtain Happy/Sad frequencies.

- Visualization & Interpretation - The qubit's Bloch sphere position shows the emotional direction.

1. BLOCH SPHERE

A Bloch sphere visualizes the relationship between a quantum state and two important angles, θ and ϕ.

θ is the polar angle which measures the rotation from the positive z axis.

Φ is the angle which measures the rotation of the projection of the qubit on the xy-plane from the positive x axis.

$$|\psi\rangle = cos\frac{\theta}{2}|0\rangle + e^{i\varphi}sin\frac{\theta}{2}|1\rangle$$
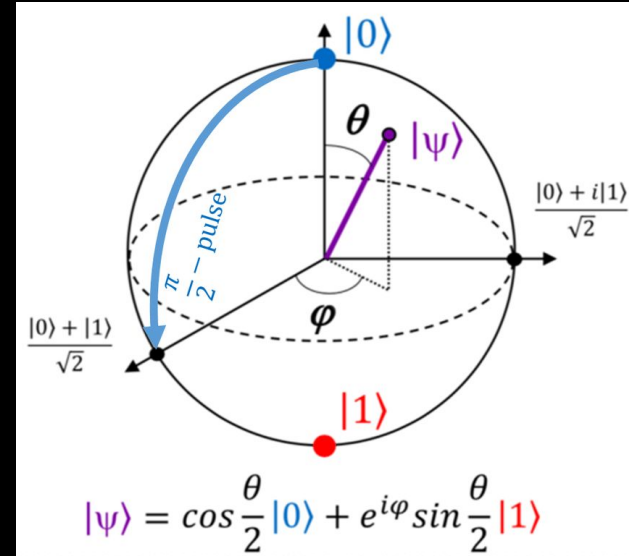
RY GATE

- The Ry(θ) gate rotates the qubit around the Y-axis of the Bloch sphere by an angle θ.
- There is a change in a and β, hence the probabilities also change.
- A phase change can occur sometimes.

$$R_y(\theta) = \begin{pmatrix} \cos(\theta/2) & -\sin(\theta/2) \\ \sin(\theta/2) & \cos(\theta/2) \end{pmatrix}$$

RZ GATE

- The Rz(φ) gate rotates a qubit around the Z-axis of the Bloch sphere by an angle φ.
- There is no change in a and β, hence the probabilities remain same.
- A phase change always occurs.

$$R_z(\phi) = \begin{pmatrix} e^{-i\phi/2} & 0 \\ 0 & e^{i\phi/2} \end{pmatrix}$$