Simulator for Qubit Measurement Using Augmented Reality

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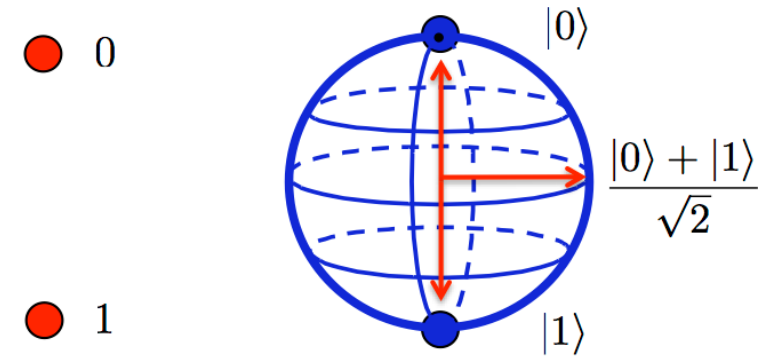- Future Enhancements
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Qubits

- Qubits(Quantum Bits) are the basic units of Quantum computing.

- Generally representation of the Qubits will be done using Ket notation.
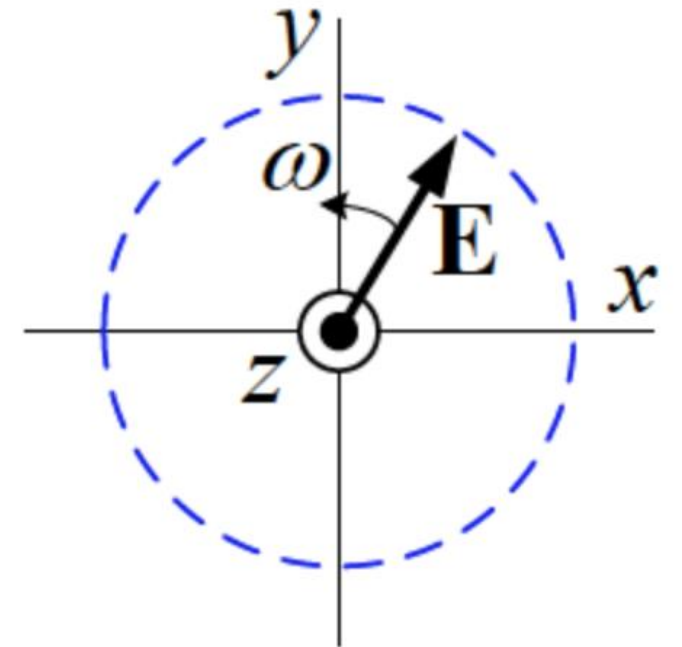
Qubit : $|\psi\rangle = \cos\theta\,|0\rangle + \sin\theta\,|1\rangle$

- Here θ is the resultant angles from Base and Polarization of the Photon. These angles form the fundamentals for quantum computing and cryptography.

Classical Bit

0

1

Qubit

$|0\rangle$

$\dfrac{|0\rangle + |1\rangle}{\sqrt{2}}$

$|1\rangle$

Augmented Reality

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- An enhanced version of reality created by the use of technology to overlay digital information on an image of something being viewed through a device (such as a smartphone camera).

Ex : Games like Pokemon GO

- We used Augmented reality for capturing the rotation of the objects and take them as a input for base and Polarization angles.

Project Idea

This research proposes a new way of visualizing the phenomenon of creation of a qubit (quantum bit) using tools of augmented reality.

The main focus is on concept of polarization, basis and measurement outcomes with respect to different bases.

The augmented reality application will provide a simulator for the measurement of the qubit based on the input angles of bases and polarization.

What is Achieved in the Project

Users can provide inputs for Base and Polarization angles using the interactable augmented Reality Objects.

User can create the Qubits with those values.

The users can give different values of bases and polarization and can observe the variation in qubit values with respect to those bases.

Future Enhancements

Block Sphere Simulation for the Qubit.

Future developments will include topics like superposition and entanglement.

DEMO

Made with

unity

Thank you for listening any question?