Simulator for Qubit Measurement Using Augmented Reality

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This research proposes a new way of visualizing the phenomenon of measurement 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. These form the fundamentals for quantum computing and cryptography. The augmented reality application will provide a simulator for the measurement of the qubit based on the input angles of bases and polarization. The users can give different values of bases and polarization and can observe the variation in qubit values with respect to those bases. Various simple props will be used that a student can hold in their hands, but their interactions with them will be enhanced using augmented reality. Future developments will include topics like superposition and entanglement. Our hypothesis is that given the lack of quantum equipment, augmented reality will provide a means for intuitive understanding of complex counter-intuitive phenomenon. Research has shown that hands-on exercises increase comprehension and retention of theoretical concepts.