Instituto Tecnológico y de Estudios Superiores de Monterrey

Quantum Computing

Reading 10

It from qubit

Ariel Arturo Goubiah Gamboa Vázquez
A01749802
a01749802@itesm.mx

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Abstract

In this text, that is based on the paper: "It From Qubit" by David Deutsch, two ideas are extracted arbitrarily and discussed, according to the interest of the author.

1 Idea 1

Observables
I relate the idea of the continuum observables as if we dropped a ball from a roof, and we wanted to know its position at a certain time. Classically we can know where it is by using some visual technique, for example, let us suppose that there is an artificial vision system that analyses a video of the roof and identifies the position of a certain object (let us suppose that the conditions are right and that the system is robust enough to achieve this accurately). This system can theoretically provide us with a precise measurement of the ball at any given moment of time, then, in the bottom, there are two baskets big enough to cover all the possible places in which this ball can possibly fall down to. If we only had the baskets as measurement instruments, we would have only two observables, but we have built a system that can tell us its actual position at a given time.... Or have we? Of course not! We can not build a digital system that tell us with perfect precision the position of something. In this case, the artificial vision system would return, in the best case scenario, a floating point value that will tell us which place, out of all the physical places that the ball can be, is the ball closest to. This is just like having smaller and smaller baskets!

2 Idea 2

Tools of physics

I believe that physics can not be fully understood from a mathematical point of view, or at least, not yet. I think of quantum mechanics as a good approximation that numbers the states a given system can be, and then assign probabilities to each of these scenarios, these theory is very accurate, and it gives us the most accurate description of a natural event we can find. I hope that new mathematical tools (built from physical understanding) provide us with the right framework to keep on the process of creating more and more accurate models. Will these models ever lead us to a "Perfect " accuracy? Or will the theories that create these models always bring an ultimate truth?