Instituto Tecnológico y de Estudios Superiores de Monterrey

Quantum Computing

Reading 11

A single quantum cannot be cloned

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Abstract

In this text, that is based on the paper: "A single quantum cannot be cloned" by W. K. Wootters, two ideas are extracted arbitrarily and discussed, according to the interest of the author.

1 Idea 1

Our universe is not as cool as it could be
I did not understand the set of papers provided as reading, maybe because I am nor familiar with the the concepts on them. Also, because unfortunately I do not have the formation as a physicist, so some procedures shown in the papers are beyond my understanding at this point, so the ideas I will give today may not be directly dealing with technical topics from the paper, but more with more abstract, epistemological concepts, since those are the ones I can present and I also find them interesting.

Even when it has been proved that arbitrary photons can not be cloned, faster than light communications are possible using entangled states, such as the quantum teleportation protocol. In this universe, the cloning may not be possible due to some thing that we can not understand, nevertheless, we figured out ways in which we can transmit information faster than light. From this point of view, we would never be able to perfectly replicate a human being, because we will never be able to perfectly copy each one of the particles this human being is constituted of. This fact could be a turn down for many sci fi enthusiasts, but maybe we will be able to do something interesting with the limited resources that reality provides.

2 Idea 2

On the feedback

The set of papers that are provided as this week's reading, consist of three. In the first one, the no cloning theorem is postulated, then in a second paper, P. J. Bussey points out that the conservation of the angular momentum is violated in the approach the first paper shows abut a theoretical device that is designed to duplicate a photon. Then , in a third paper, the original authors of the first paper reply specifically to Bussey, and analyse this violation of angular momentum, and then they conclude that the original argument is still valid. I believe that both arguments are valid, but that the observation Bussey made to the work of Wootters was not meant in a mean or offensive way. I believe that this observation, far from being mean, nourished the original paper by letting the authors expand on their ideas.