



THE TREE AND THE UNCERTAINTY

AYUSH GUPTA

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--Ayush Gupta (28-05-2025)

One day on a random morning I was in my balcony and was looking at a tree that was at a distance of like 20 to 30 meters, the wind was subtle so the branches and leaves were moving that was observable from my balcony. I was brushing teeth at that time; I have a habit of moving my head back and forth subtly while brushing so I observed that tree was completely still when I was moving my head but when I stopped my head at one point then I was able to see the tree leaves and branches moving subtly due to the wind. it led me to some weird thinking patterns.

When I introduce uncertainty in my head's position or give it certain momentum then I can see the average position of tree and no momentum but when I introduce a certainty in my heads position or give it a certain position then I can see the momentum precisely of the tree but not average position. It's strikingly similar to the Heisenberg Uncertainty Principle. So just like the tree we observed, in the same way we also observe the quantum particles and get confused many times about the position and momentum and also even Heisenberg uncertainty is also proved by the maths supporting the quantum mechanics that says the Heisenberg uncertainty is a inherit trait of quantum particles and not just because of observer (I guess so, I am making this word "inherent trait" by myself so I am not sure), so what if it's about the observer and not the particle just like the tree experiment, even though it was a classical experiment but still different set of observations(rest and moving head) got different results just like also in different wave particle duality experiments. By thinking all this, it just justifies this sentence "quantum mechanics is like saying a person that a human face is hidden inside a cubical solid block of wood, anyone will say it's absurd and how can a face be inside that, but an artist carves it and shows the face and everyone just gets amazed", this sentence was present inside one book I read in the past and has left me in awe since then.

It led me into more weird thinking patterns that because for photons(in perspective of photons) time can't exist because a photon coming from far away space can "experience" the big bang till the present world all at same time, so time doesn't exist also we have seen in the Feynman diagrams that the graphs will also work if the photons travel back so we don't use any arrows for photons. So what if our detectors don't absorb photons but we can also perceive them like they are emitting the photons from them that are hitting an electron in the ground state and make them in higher state which we can observe(I know this sounds and is ridiculous and can't be happening because logically there's no mechanism for any photon detectors like eyes or mechanical things for emitting photons, but it's just a thought I am discussing here), so what if that tree that I observed also get affected by my photons coming from my eyes? but still that's not possible because in classical experiments like this, we can observe a clock without interfering with it but in quantum world we are also are the part of the experiment so any act of observation will likely change the quantum clock.

“What if it's about the observer and not the particle, just like the tree experiment?”

This is not just a normal question, this is the question at the heart of the deepest debates in quantum foundations. In early interpretations, Uncertainty was sometimes misinterpreted as a disturbance from measurement but now as we know in modern quantum mechanics that Heisenberg Uncertainty is not a technical limitation but it's an intrinsic feature of reality as described by quantum theory.

While the tree is classical and totally unaffected by quantum uncertainty, my perception of it changes based on my motion, I think it mimics how different quantum observations yield different “realities or results”

These thoughts of mine are really similar to Relational Quantum Mechanics or QBism Interpretations of quantum mechanics, at the end this all points to one thing “Quantum weirdness isn't because of some weird particles but rather it's because we misunderstand the nature of observation.”