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Creative Project Proposal

I would love to work with the Qiskit SDK from IBM if possible. I think a really cool idea could be modeling the qbit gates to simulate some small, real-life example of atoms interacting. I know scientists hope to use these gates to simulate larger-scale interactions like how cancers could potentially react to the chemotherapy in someone's body. This would be much smaller-scale.

My most thought-out idea is simulating particle/wave interference over time to prove the particle/wave duality. Using a properly-randomized algorithm for the particles, I would essentially be coding the graphics to animate the interference pattern gained from a double-slit experiment. One graph would be stagnant, showing the "waves" where we would see a bird's eye view of the pattern and its intensity graphed with respect to its position along the width of the middle of the screen. In another model, I could show the animation of dots being added to the screen as the particles hit it, where the light's intensity is shown through the density of the light particles on the screen.

The last idea I have is implementing a machine learning algorithm to find the most common mistakes that physics students make when solving certain problems by hand. Another one could be to do a simple model of climate-induced migrations throughout the world, and get the computer to predict the next major wave based on information throughout history. We could check this against a model of differential equations, similarly to how we modeled covid infection rates.