Progress Report

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1 Work Completed To Date

To date, I have read through a variety of studies of topics, difference between quantum and classical walks, quantum-inspired algorithms for multivariate analysis, quantum-inspired algorithms for non-conservative systems. In regards to coding, I progressed through a few code book modules supplied by PennyLane. Learning about different operations of a quantum algorithm including, setting up a quantum algorithm, setting up devices, creating quantum nodes. A variety of gates supplied by PennyLane library have also been learned including, PauliX operation, CNOT gate and the Hadamard gate. The biggest issues that has appeared during my research is starting the process of coding my quantum algorithms, like the finite differences, spectral-split and LCHS. To tackle this problem, I am using content I have learned from PennyLane to break my algorithms into pieces and work on one at a time.

2 Upcoming Work

I will continue working through PennyLane code book to strengthen my knowledge of PennyLane to allow me to utilize their library at a greater magnitude. I will also begin creating my quantum algorithms with applying my coding experience from PennyLane to the studies I have read. A weekly meeting is done with my supervisor Dr. Butler and fellow student Rob each week, and will continue for the semester. The meetings with my supervisor will help ensure I am staying on track, as well as answer questions that I am unable to figure out alone. The meeting with Rob will allow us to bounce ideas off each other and prevent possible obstacles the other may have solutions for.

3 Updated Timeline

February 5th: Project report submitted to supervisor.

February 20th: Code for simulating quantum space, including, the finite differences,the LCHS, and the spectral split-step methods completed.

February 24th: Collect data and begin error analysis of different approaches.

March 13th: Pre-rough draft of thesis submitted to supervisor.

March 20th: Rough draft thesis submitted to supervisor.

April 4th: Final thesis draft submitted to professor