Why Quantum Machine Learning Matters | DL-2 Red

CS 4850 – Section 03 – Fall 2023

Date: September 10, 2023

Project Team

Roles	Name	Major responsibilities	Contact (Cell Phone)
Project owner	Dan Lo	Give requirements for project; assist on research	470-578-5487
Team leader	Patricia Solano Reimao	Schedule meetings; turn in group documents	404-398-2449
Team members	Christopher Dargan	Development; website management	912-996-7396
	Hyunmo Kim	Analyze documents	770-815-7918
Advisor / Instructor	Sharon Perry	Facilitate project progress; advise on project planning and management.	Sperry46 in D2L is preferred


Patricia Solano Reimao


Christopher Dargan

Hyunmo Kim

Project Overview

In the field of Quantum Machine Learning, there have been many approaches to achieve the task of classification. One prominent avenue is Quantum Neural Networks (QNN). This project will focus on exploring the significance of Grover's Algorithm within the context of Quantum Neural Networks. Research will be conducted on Grover's Algorithm

to investigate potential enhancements to the capabilities of QNNs. In addition, practical experimentation and further analysis will be done through the use of IBM's Quantum Composer.

Project website

https://christopherdargan.github.io/

Final Deliverables

1. Quantum Program
2. Result Analysis Report
3. Conference Draft Paper

Milestone Events

#1 - Research on quantum programs and quantum machine learning

By 09/30/23

#2 - Development of a quantum program

By 10/28/23

#3 - Result analysis and conference paper draft

By 11/25/23

#4 – Final Report

By 12/02/23

Meeting Schedule Date/Time

Tuesdays at 3:30 pm

Resources and Materials

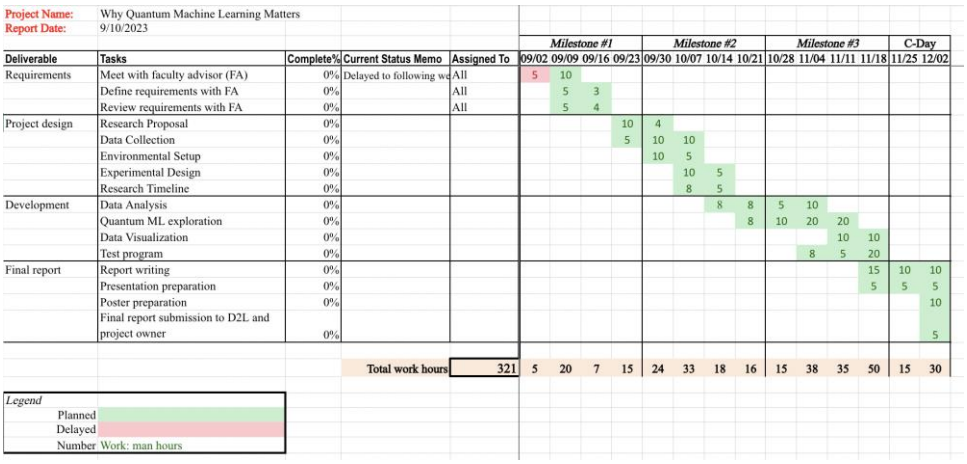
1. Yuxuan Du et al 2021 New J. Phys. 23 023020, A Grover-search based quantum learning scheme for classification, 2021.
2. IBM Quantum, https://quantum-computing.ibm.com/

Collaboration and Communication Plan

Meetings will be conducted on Microsoft Teams and communication will be through text messaging.

Collaborative files will be worked on through Microsoft Word.

Project Schedule and Task Planning



Project Name: Why Quantum Machine Learning Matters
Report Date: 9/10/2023

					Milestone #1				Milestone #2				Milestone #3				C-Day	
Deliverable	Tasks	Complete%	Current Status Memo	Assigned To	09/02	09/09	09/16	09/23	09/30	10/07	10/14	10/21	10/28	11/04	11/11	11/18	11/25	12/02
Requirements	Meet with faculty advisor (FA)	0%	Delayed to following we	All	5	10												
	Define requirements with FA	0%		All		5	3											
	Review requirements with FA	0%		All		5	4											
Project design	Research Proposal	0%						10	4									
	Data Collection	0%						5	10	10								
	Environmental Setup	0%							10	5								
	Experimental Design	0%								10	5							
	Research Timeline	0%								8	5							
Development	Data Analysis	0%									8	8	5	10				
	Quantum ML exploration	0%										8	10	20	20			
	Data Visualization	0%													10	10		
	Test program	0%												8	5	20		
Final report	Report writing	0%														15	10	10
	Presentation preparation	0%														5	5	5
	Poster preparation	0%																10
	Final report submission to D2L and project owner	0%																5
			Total work hours	321	5	20	7	15	24	33	18	16	15	38	35	50	15	30

Legend
Planned
Delayed
Number Work: man hours

Version Control Plan

Faculty advisor will most likely have a place for version control. If not, we will create a GitHub repository with all team members as collaborators.