

MATH 395 QUANTUM COMPUTING

OCTOBER PROJECT ABSTRACTS

Title: Bloch Sphere

Speaker(s): Chris Goode & Gustavo Guzman

Abstract: Our project on Geometry of the Bloch Sphere will begin with a short introduction/review of the basics of the Bloch Sphere. Then we will be discussing the use of the Bloch sphere as a geometric representation of probabilities and lastly, the rotational isometries.

Title: Classical Factoring Algorithms

Speakers: Jon Alvarado, Teng Hu, Rubin Traylor

Abstract: In our talk, we will examine three classical factoring algorithms: Pollard's Rho Algorithm, Fermat's Algorithm, and Dixon's Algorithm. For each algorithm, we will discuss a brief background, explain the algorithm, and provide pseudocode/code for the algorithm.

Title: Landauer's Principle

Speaker(s): Carlos Andina, Harold Frank, Ben Garcia

Abstract: Landauer's principle is a physical law connecting the thermodynamics of physical systems to the information bearing operations of logical systems embedded within those physical systems. We will discuss elementary thermodynamics, logical and physical systems, logical and physical reversibility, the Maxwell's demon thought experiment, and the unification of logical and physical law to construct the equation for the Landauer limit.

Title: Simulation of Grover's Algorithm

Writer(s): Derek Dang, DK Lee

Abstract: This is a classical program written in Java to simulate Grover's Algorithm. It takes in the number of qubits in the string and the special value and returns the probability of obtaining that value. Using phase inversion and inversion about the mean $\sqrt{n}$ times, the algorithm can find a value in $O(\sqrt{n})$ time; which is quadratic speedup.

Title: Implementation of Teleportation

Speaker(s): Alexa Becker & Hui Jiang

Abstract: We give an in depth definition of what quantum teleportation is, as well giving its history and past implementations. We will also discuss the EPR Paradox, Bell State, and Quantum Entanglement in order to better understand how quantum teleportation is possible and give examples of real world applications.

Title: Classical Search Algorithms

Speaker(s): Ahmana Tarin, Amanda, India

Abstract:

Title: Big- O notation

Speaker(s): Jiawei, Feiyi Shi

Abstract(s):