Course Project - [Quantum Mechanics Research](https://learning.rasmussen.edu/webapps/assignment/uploadAssignment?content_id=_7098824_1&course_id=_77026_1&group_id=&mode=view)

Shaun Pritchard

Rasmussen College

PHY4060

Arunava Roy

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Quantum technology is a class of technology that works by using the principles of quantum mechanics (the physics of sub-atomic particles), including quantum entanglement and quantum superposition, and many other principles and factors. Quantum mechanics describes the wave-particle concept of quantum mechanics that every particle or Quantum energy but that is smaller than an atom can be described as either a particle or a wave. As opposed to the classical physics interpretation which states that something must behave like either a particle or wave not at the same time. In quantum mechanics, we experience the effects of elements acting as both a wave and a particle in this nature *(Scientific American, 2010).*

Quantum Mechanics has been the underlying topic of our modern age which is found in many of the technologies we use and are on the brink of creating. Three technologies I would like to present are

* Light Emitting Diodes (LEDs)
* GPS
* Quantum Computers

Light Emitting Diodes are a light source that is based on two layers of semiconductors which contain electrons and holes. Semiconductors work on the principle of quantum physics. Electrons in semiconducting solids behave like a wave. When an LED is connected to a battery, the two layers of semiconductor meet and releases energy in the form of bright light. Thus, we are using the quantum technique in the form of light bulbs that you have probably seen on your smartphone and other devices *(Foundation, 2001).*

GPS or Global Positioning System is a network of satellites that have made finding locations and directions possible with networks of computer systems including our smart mobile devices. The application of GPS is dependent on quantum physics. Each satellite in the GPS constellation includes an ensemble of atomic clocks and these atomic clocks use the principles of quantum theory to measure time *(Nadine Schuessler, 2009).*

My favorite technology which is the entire reason I selected Computer Science as a major is Quantum Computers. Quantum computing is the use of quantum phenomena such as superposition and entanglement to perform computation. Quantum Computers theoretically will allow us to store and retrieve more data than the classical bit 2^n. Today quantum computers do exist and are at the stage comparatively to where Steve Jobs and Steve Wozniak where after creating the first Apple computer in the mid-1970’s.

Given the need today to extract information from the three-dimensional world (data), the

storage, processing, and retrieval of visual information are first-order tasks for

research of image processing and related areas, such as pattern recognition and

artificial intelligence. However, the restricted architecture of classical computers

and the often-overwhelming computational complexity of state-of-the-art classical

algorithms make it necessary to find better (i.e., more efficient) ways to manipulate

visual information *(Yan, 2017).*

With the rapid development of quantum computation and information, notably

Feynman’s quantum computation model , Deutsch’s quantum parallelism assertion [14], Shor’s integer factoring algorithm , and Grover’s database searching

algorithm *(Grover, 1996)*, the analysis of previously mentioned problems through the lens of

quantum computation and information may result in new ways of understanding the

nature of visual information *(Feynman, 1982).*

Quantum mechanics by the way of extraction on to the technology that way you have already been using an incorporated for past Century. Today we are on the precipice Ernestine quantum mechanics principles to advance our technology hopefully for the better of mankind.

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