Quantum Computing and Cryptography - 01: Basics of Complex Numbers

Length	Nanomodule
Collection	NSA NCCP
Updated	March 14, 2019
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Academic Levels	Undergraduate, Graduate
Topics	Quantum Computing
Link	https://clark.center/details/aparakh/638e9c5b-7333-423c-81a9-1af2cdb345d5

Description

This nanomodule reviews the basics of complex numbers needed to understand quantum computing/cryptography. It covers operations such as multiplication and addition of complex numbers and writing programs to handle complex numbers.

Email Dr. Abhishek Parakh at aparakh@unomaha.edu for solutions to the problems.

Note: To get started with Jupyter notebooks please follow the userguide available at: https://sites.google.com/unomaha.edu/userguideqcl/

Outcomes

- Practice basic additive and multiplicative operations on complex numbers.
- Demonstrate complex number representations.
- Implement Python programs that perform basic operations of addition and multiplication on complex

Alignment

The standards and guidelines this learning object is mapped to

- CAE Cyber Ops (2014) - Discrete Math: Given an algorithm determine the complexity of the algorithm and cases in which the algorithm would/would not provide a reasonable approach for solving a problem

- NICE Workforce Knowledge (2017) - K0052: Knowledge of mathematics (e.g. logarithms, trigonometry, linear algebra, calculus, statistics, and operational analysis).
- CAE Cyber Defense (2014) - Programming: Students will be able to demonstrate proficiency in the use of a programming language to solve complex problems in a secure and robust manner.

Links

External links that are associated with this learning object

- User guide for our material