Quantum Computing and Cryptography - 05: Complex Vector Spaces: Linear Combination, Independence, Basis and Dimensions

Length	Micromodule
Collection	NSA NCCP
Updated	March 14, 2019
Contributors	Abhishek Parakh
Academic Levels	Undergraduate, Graduate
Topics	Quantum Computing
Link	https://clark.center/details/aparakh/aefdefd0-b13e-4c7d-80e5-d198009bcc0e

Description

This module teaches the concepts of linear independence and dimensions of complex vector spaces needed for quantum computing and cryptography. Students will also learn about basis and dimensions of a complex vector space.

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/

Notes

For solutions for Final Quizzes please contact Dr. Abhishek Parakh at aparakh@unomaha.edu.

Outcomes

- Apply the concept of basis and dimension of a complex vector space.
- Apply the concept of linear independence.

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).

Links

External links that are associated with this learning object

- User guide