Overblik og Introduktion til valgfaget Quantum Computing Fall 2020

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27. August 2020

Quantum Computing $|\psi\rangle =$

Agenda på "intro-dagen"

- Recap – Questions according to L1
- Recap – Hilbert –Phytagoras og Matricer
- Recap – Double slit experiment
- 5 pages report
- Stop training at Qubits, Geometrical reprsentation and the Uncertainty Principle
- Coderanch Qiskit installation – EP2
- Coderanch Qiskit Hello-World – EP3

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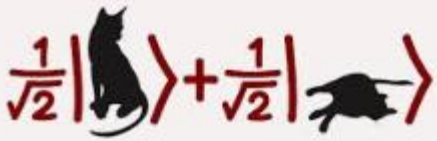


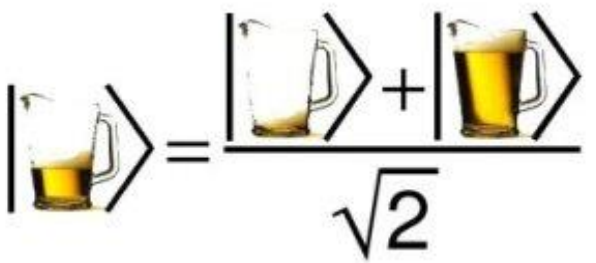
RECAP Math

- En Qubit i et koordinatsystem som vektor
- En Qubit som en matrice
- En Qubit koordinatsystemet "Hilbert space"
- Operatorer – Metoder på en Qubit
- Operatorer som matricer "Pauli Gates"

Quantum Computing

RECAP

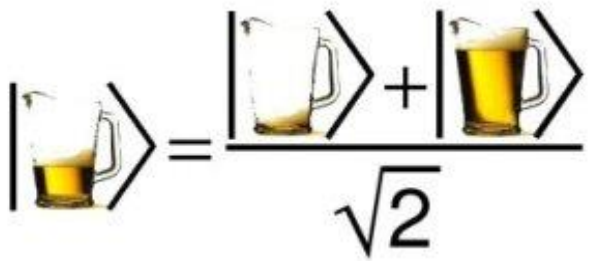
Double slit experiment

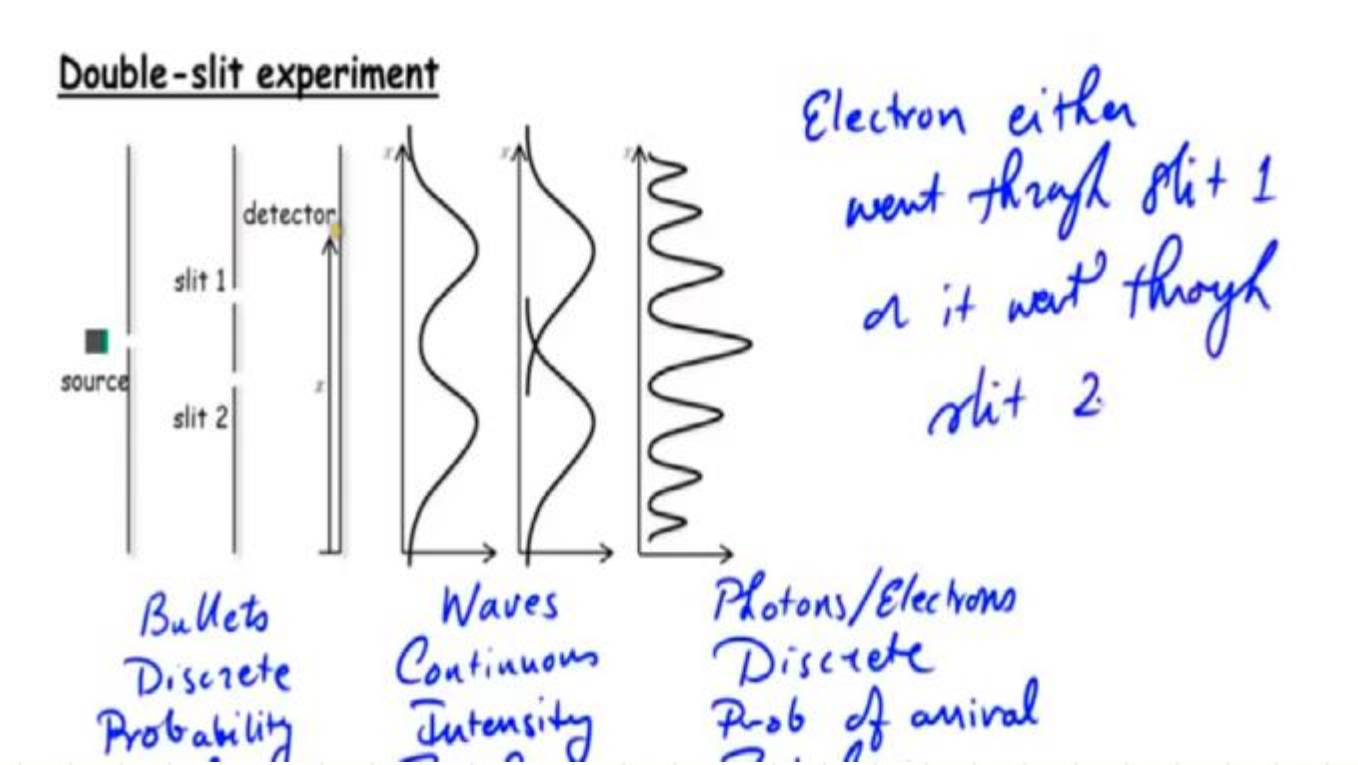


1. Start video Lecture 1 part 1 og 2 vist nedenfor
2. https://www.youtube.com/watch?v=scBJ-o2JJ08&list=PLnhoxwUZN7-6hB2iWNhLrakuODLaxPTOG&index=3
3. https://www.youtube.com/watch?v=S3sCL8rIhN4&list=PLnhoxwUZN7-6hB2iWNhLrakuODLaxPTOG&index=4

Quantum Computing

RECAP





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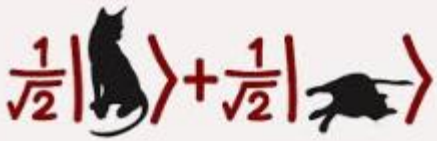
RECAP Factoring and simple Explanation - Period finding QFT



- Example of factorising
- $N = P_1^{e1} \times P_2^{e2} \ldots P_n^{en}$
- $60 = 2^3 \times 3 \times 5$
- You are shurely still wondering why QC is that strong compared to a classical computers power

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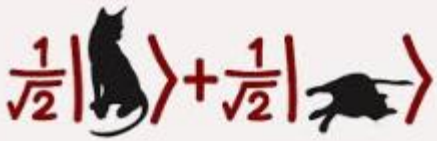

5 Pages report

- Which kind of considerations do You have about the report
- Exaples like a Quantum Computing algorithm Q-Mechanical phenomena, Q-Programming, Quantum-Sensing Quantum-Bio-Posner Molcule, Q-Logistics etc...

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CodeLab – Install + Hello Wor

- Start QisKit videoen med Abraham Asfaw
- Installation af Qiskit EP2
- https://www.youtube.com/watch?v=M4EkW4VwhcI&t=10s
- Create Hello-World program
- https://www.youtube.com/watch?v=RrUTwq5jKM4

- Please create this program and deliver it as an exercise for L2