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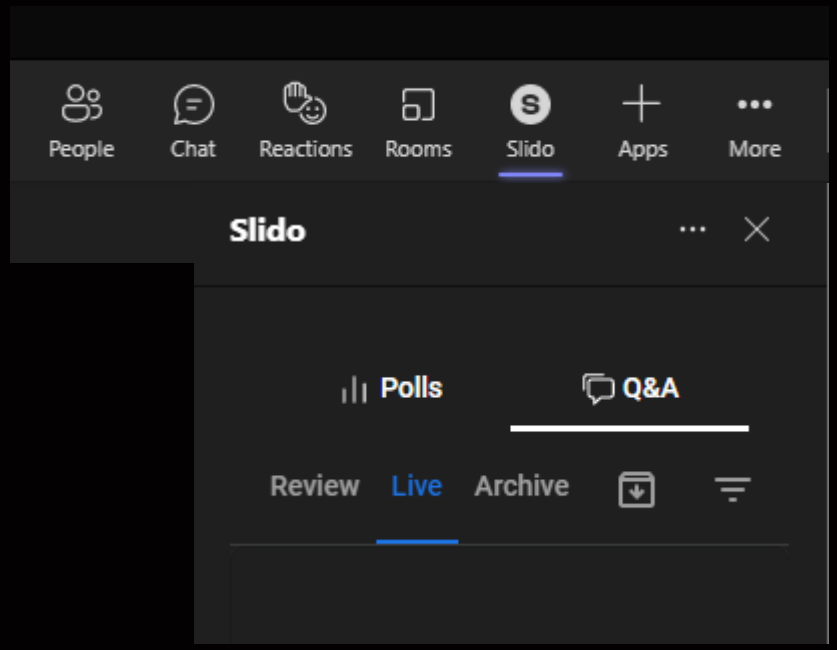
AI&DATA LAB

by ASESOFTWARE

QnA

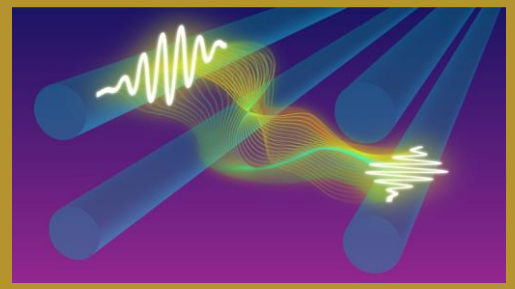
- We use Slido for Q&As and polls
- Teams app users can see Slido at the bottom of the meeting
- Web users can go to slido.com and enter the number **# 1117329**



Technical Course Structure

Multiple Qubits

Thursday 15th September

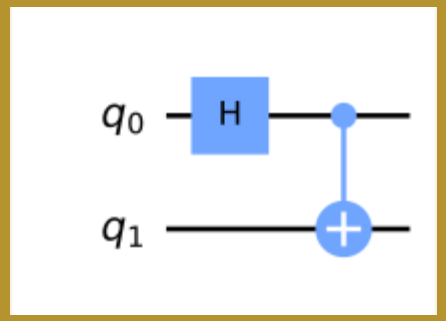


Multi-qubit states
Entanglement revisited
Multi-qubit gates

Assignment 2 Due Tomorrow

Quantum Circuits

Thursday 22nd September

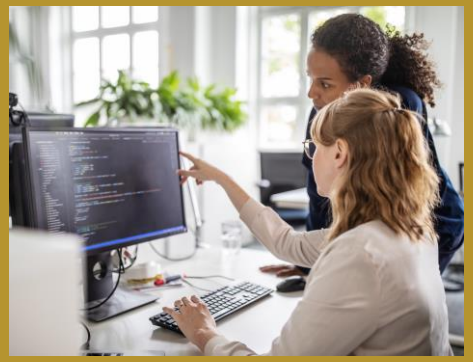


How to program a QC
IBM Quantum Experience

Assignment 3 Due

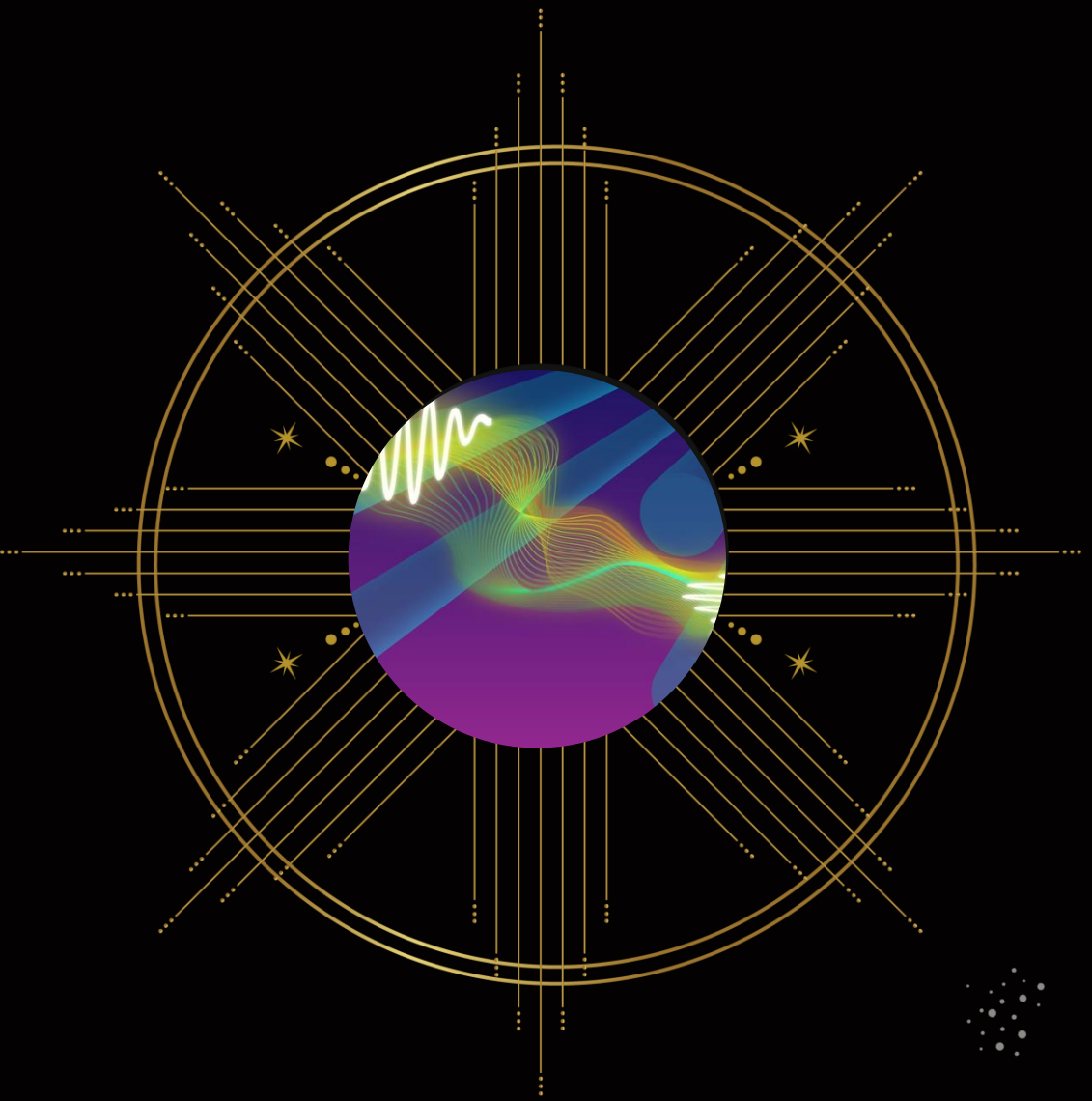
Quantum Algorithms

Thursday 29th September



Shor's Algorithm, Grover's algorithm
Practical considerations

Assignment 4 Due



Multiple Qubits

Putting qubits together

Course materials

https://github.com/EquinoxAI/YAItQC/tree/main/Chapters

EquinoxAI / YAItQC Public

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main | YAItQC / Chapters / | Go to file | Add file | ...

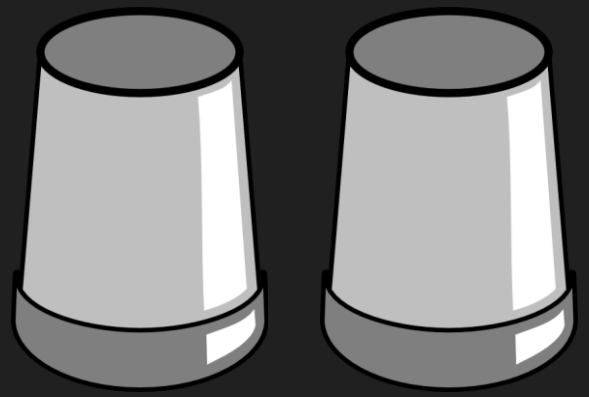
tclarke21 Moved ket to linear algebra section #3 — 54ef3de 15 minutes ago — History

..		
Images	#4 added quantum algorithms diagram	3 days ago
0_Acknowledgements.ipynb	#6, #9 Thank you Giulio Malinverno, Andres Felipe	28 minutes ago
10_Grover.ipynb	I renamed 1 folder and everyone loses their minds!	13 days ago
11_Shor.ipynb	Added references, another image #4 #7	9 days ago
12_QML.ipynb	I renamed 1 folder and everyone loses their minds!	13 days ago
1_What_is_quantum.ipynb	#8 Fixed	3 days ago
2_What_is_quantum_computing.ipynb	#4 added quantum algorithms diagram	3 days ago
3.1_Complex_numbers.ipynb	#8 Fixed	3 days ago
3.2_Linear_algebra.ipynb	Moved ket to linear algebra section #3	15 minutes ago
4_Dirac_Notation.ipynb	Moved ket to linear algebra section #3	15 minutes ago
5_Single_Qubits_&_Bloch_Sphere.ipynb	#8 Fixed	3 days ago
6_Multiple_Qubits.ipynb	#8 Fixed	3 days ago
7_Quantum_circuits.ipynb	I renamed 1 folder and everyone loses their minds!	13 days ago
8_Quantum_algorithms.ipynb	I renamed 1 folder and everyone loses their minds!	13 days ago

This week's content

How is quantum?

$$= \frac{1}{\sqrt{2}} \left(\quad + \quad \right)$$



Entanglement

The state of one qubit can't be described independently of the other qubit

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Order the following steps to produce the Bell state |Φ+>

ⓘ Start presenting to display the poll results on this slide.

Assignment 3

- 6 regular questions
- 2 optional challenge questions
- Due Friday 23rd September
- Link to the assignment

Thomas Clarke
Quantum Computing Technical Foundations
September 15, 2022

Assignment 3: Multiple Qubits

Assignment Due: Friday 23rd September

Solutions can be handwritten on a separate sheet of paper, typed or done on a tablet. You can print this, write the solutions on it, and then scan and upload it.
Send the completed assignment to tclarke@ascsoftware.com If you have any questions or difficulties, please do reach out to the same email.
Challenge Questions are optional.

Question 1. Basic binary

Represent the following numbers in binary

1) 4
2) 7
3) 12

Question 2. Back to basics

Represent the following numbers in decimal (or a base of your choice)

1) 00101
2) 1010
3) 110

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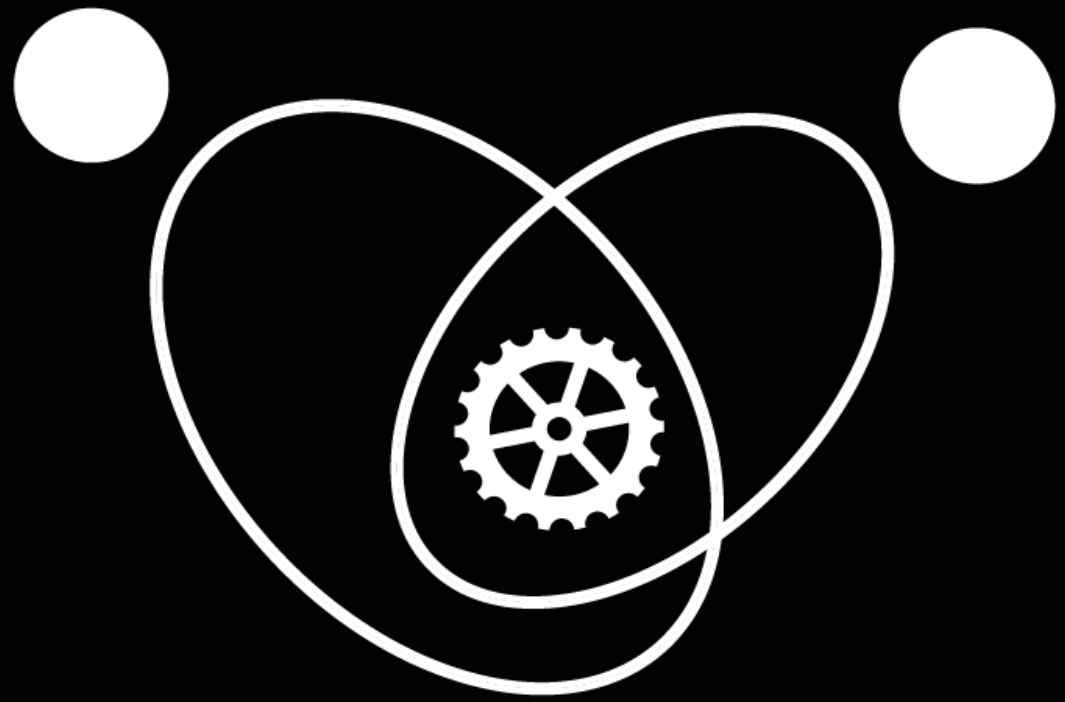
Audience Q&A Session

ⓘ Start presenting to display the audience questions on this slide.

G R A C I A S



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