

## SESSION 2

### Quantum algorithms

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Sam Pallister

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Quantum Engineering Centre for Doctoral Training, University of Bristol

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Here's are the algorithms that we're going to cover in this session:

- Deutsch's algorithm (David Deutsch, 1992)
- Grover's algorithm (Lov Grover, 1996)
- The Quantum Fourier Transform (Peter Shor, 1994 / Scott Aaronson & Andris Ambainis, 2015)

## A QUICK NOTE ON MAKING ALGORITHMS

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# QUANTUM ALGORITHMS

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- It's not obvious how you go from the description of the problem, to writing down a quantum circuit that can solve the problem for you.

Upshot: we only have a short list of problems that we think quantum computers are helpful for. But this isn't bad news!

# DEUTSCH'S ALGORITHM

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# GROVER'S ALGORITHM

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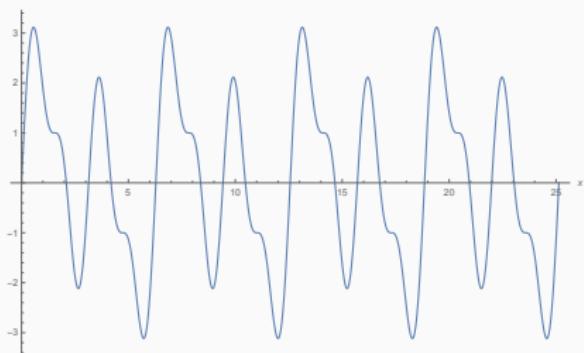


# THE QUANTUM FOURIER TRANSFORM

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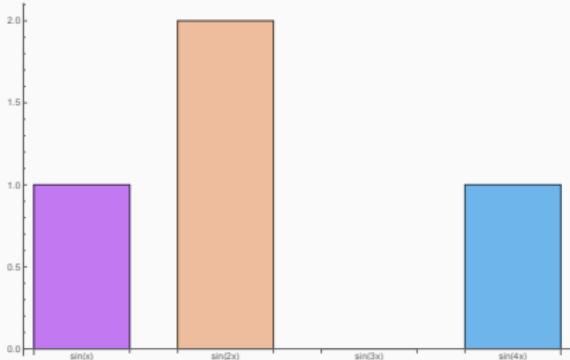
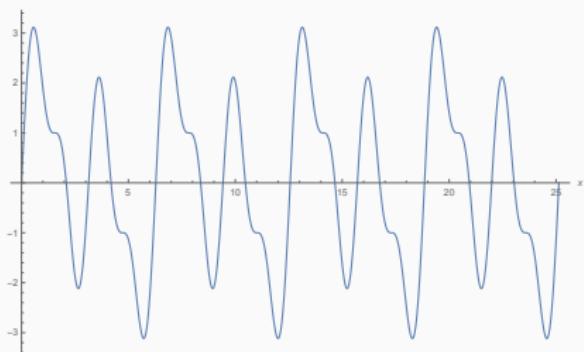
# THE FOURIER TRANSFORM

An operation that extracts the period from a periodic function.



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