# *Lunch and Learn: Getting to grips with AI Jargon*

**Date:** 22 October 2024
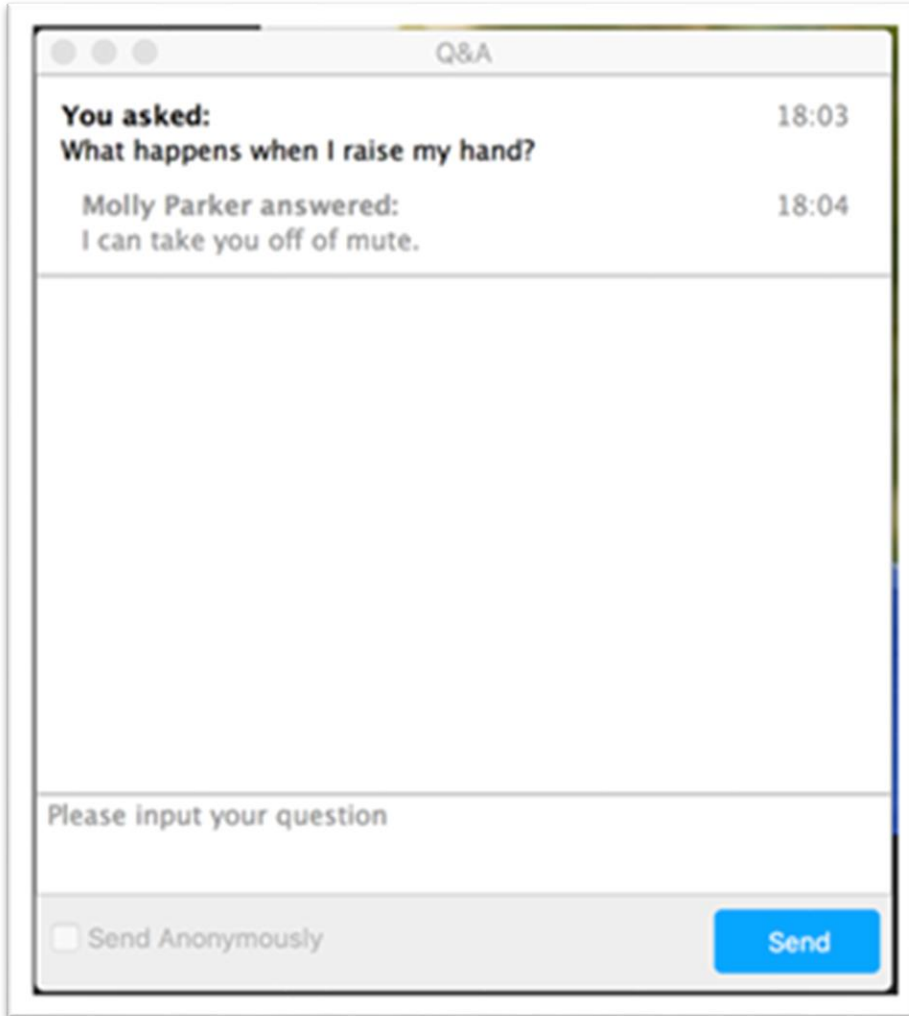**Speaker:** Oliver Nelson-Smith, Tech Policy Manager, ICAEW

# Did you know?

ICAEW's Continuing Professional Development (CPD) Regulations have changed. Members are now required to do a minimum number of CPD hours per year.

This webinar could contribute to up to 1 hour of verifiable CPD, so long as you can demonstrate that the content is relevant to your role.
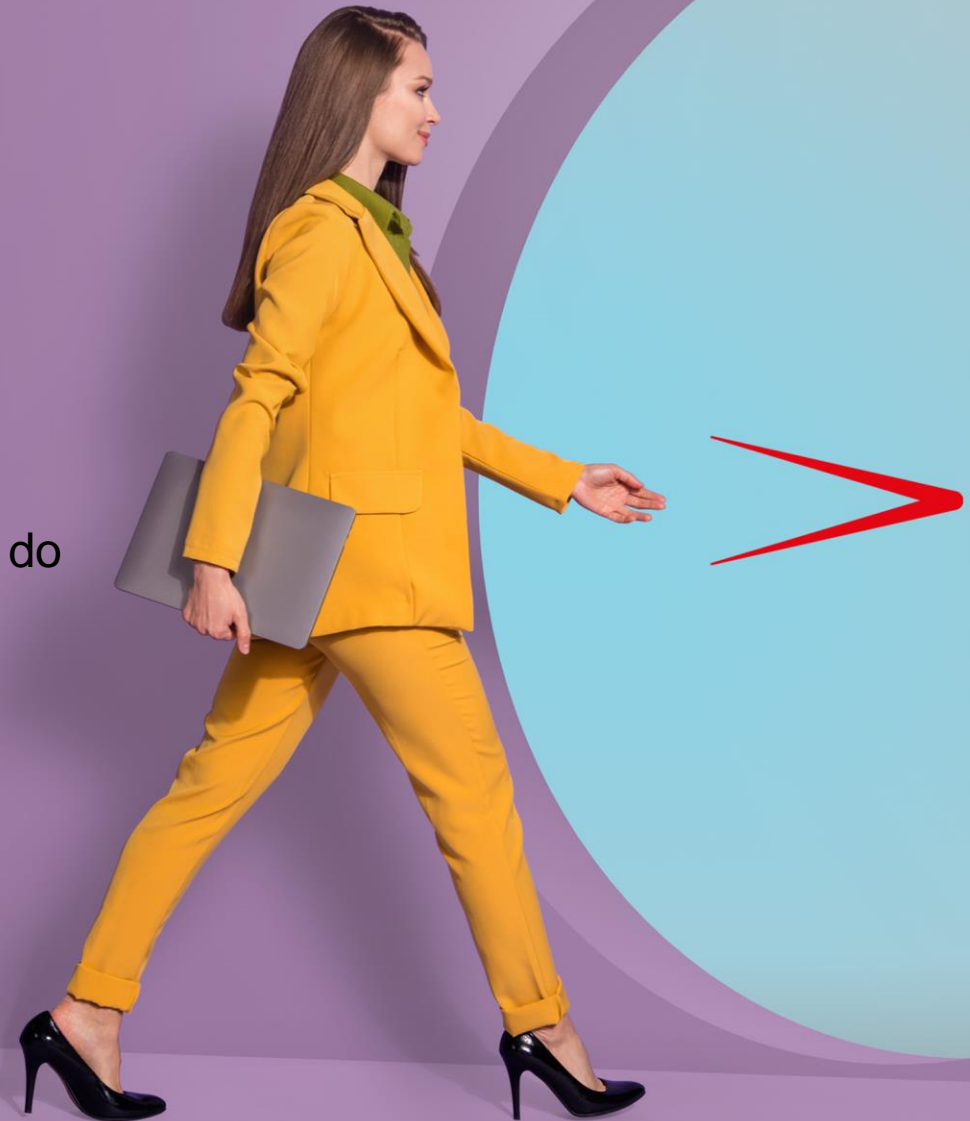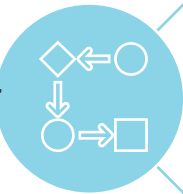
# *Ask a question*



Click on the Q&A button in the bottom toolbar to open the submit question prompt.

Type in your question and click send.

Note. If you wish to ask anonymously tick the send anonymously box shown on the illustration to the left.

# Algorithms, data and AI

**Algorithm**
- A sequence of instructions used to transform inputs into expected outputs

- Recipes
- Excel functions
- AI models

**Big data**
- Data sets that have become too large for traditional data processing methods

- NHS data
- Payment's data
- Travel data

**Automation**
- A system or process which has been made to be self-operating

- OOO emails
- Contract management & renewals
- APIs

**Artificial Intelligence**
- A system capable of performing tasks which normally require a person

- Search engines
- Digital assistants (e.g. Siri)
- Copilots

# Types of algorithm

## Brute force

This is the most basic and simplest type of algorithm. A Brute Force Algorithm is the straightforward approach to a problem
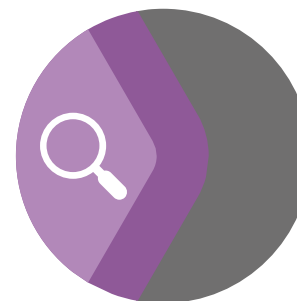
## Recursive

A problem is solved by breaking it into subproblems of the same type and then using itself again and again until the problem is solved with the help of a base condition.

## Randomised

Uses a random number to decide the expected outcome. The decision to choose the random number so it gives the immediate benefit

## Sorting

Used to sort data in maybe ascending or descending order. It's also used for arranging data in an efficient and useful manner.

## Searching

Searches for a specific key in sorted or unsorted data to return the expected output.

## Encryption

Transforms data according to specified actions to protect it. The intended devices that can access it have the right 'key' to transform the data back to its original form.

# *There is not just one type of AI...*

**ICAEW**

**MACHINE LEARNING**

Subset of AI that enables machines to learn from existing data and improve upon that data to make decisions or predictions

**DEEP LEARNING**

A machine learning technique in which layers of neural networks are used to process data and make decisions

**ARTIFICIAL INTELLIGENCE**

A system which seeks to create intelligent machines that can replicate or exceed human intelligence

**GENERATIVE AI**

Creates NEW written, visual, and auditory content given prompts or existing data.

This includes Large Language Models (LLM).

Artificial Intelligence

Machine Learning

Deep Learning

Generative AI
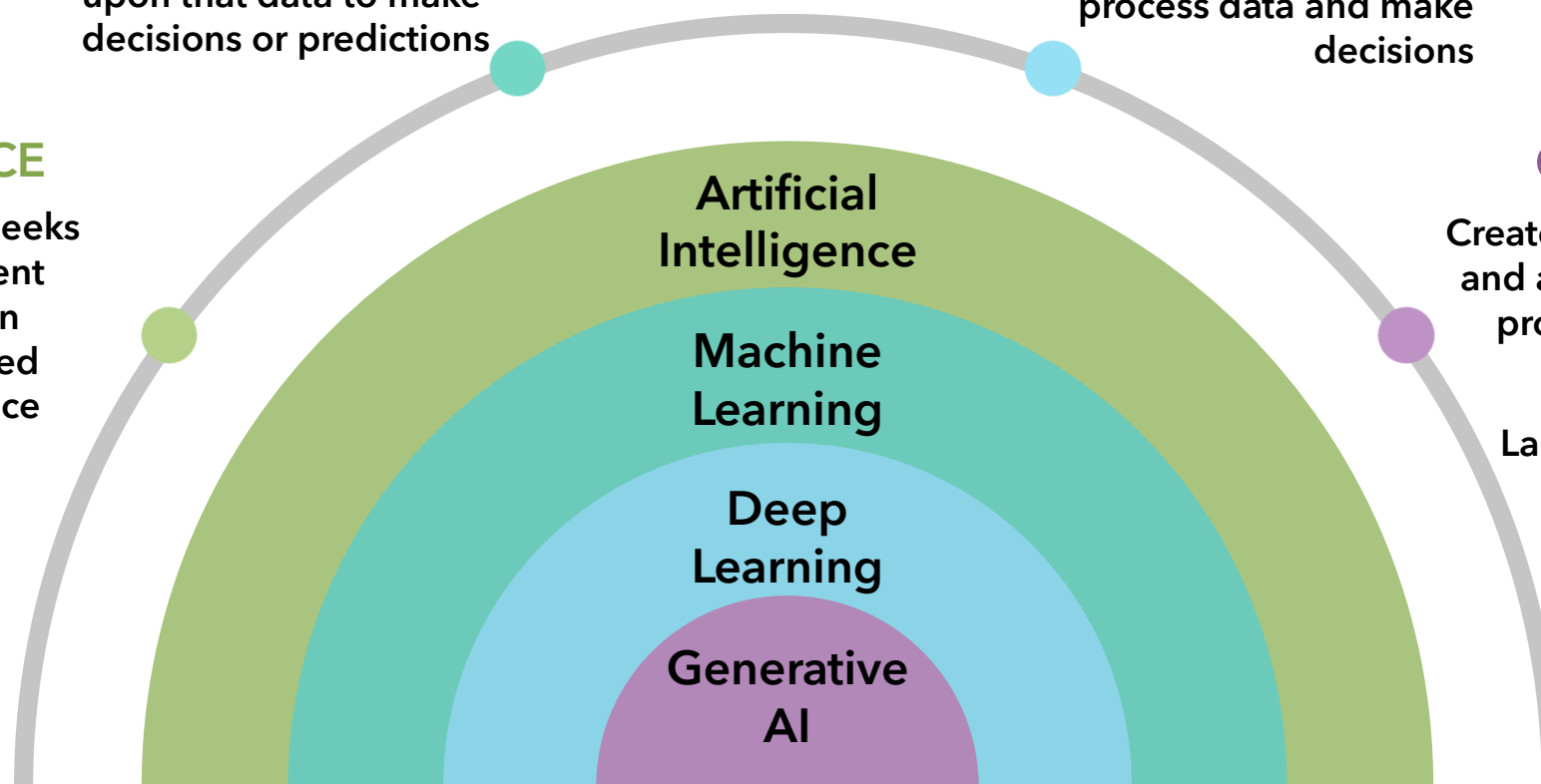
# Interpretation to generation

**Natural Language Processing**

Ability of machines to interpret human-readable text or speech.

**Natural Language Generation**

Creation of human-readable text from structured data

**Computer Vision**

Ability of machines to extract visual information from digital images and videos.

**Image generation**

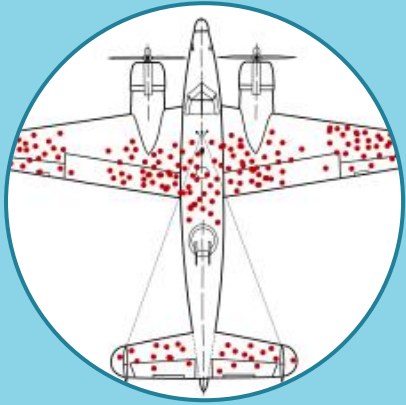Ability to generate images and videos from prompts which can be indexed to tagged images.

**Audio signal processing**

Ability of machines to interpret and respond to human speech.

**Voice generation**

Ability to generate a human like voice from text.

# *Common risks*



## Bias
When a system produces outputs which reflect and perpetuate societal biases.



## Hallucination
When a model produces outputs which are wrong.

## Pattern recognition

People develop their biases due to pattern recognition. Our brains are designed to this, and throughout our lives, biases develop based on prior experience. Hallucinations occur for the same reason; our brains interpret a pattern (e.g. a face) on something where it should not be (e.g. a cloud).

AI models are designed to mimic human intelligence, using either or both historic information and, trial and error to improve the model's efficacy. But historical data can have human biases represented and trial and error works as a method for the most common inputs.

# *What is it doing?*

## The complexity challenge

**TRANSPARENCY**

Openness in design, development, and deployment of a tool.
Includes data sources, decision making processes and source code.

The more complex the model, even with transparency of the code, training and verification data, etc. it is difficult to 'know' the logic of these algorithms. But it will allow for robust testing.

**EXPLAINABILITY**

Ability to understandably describe the logic as to how a model reaches its output.
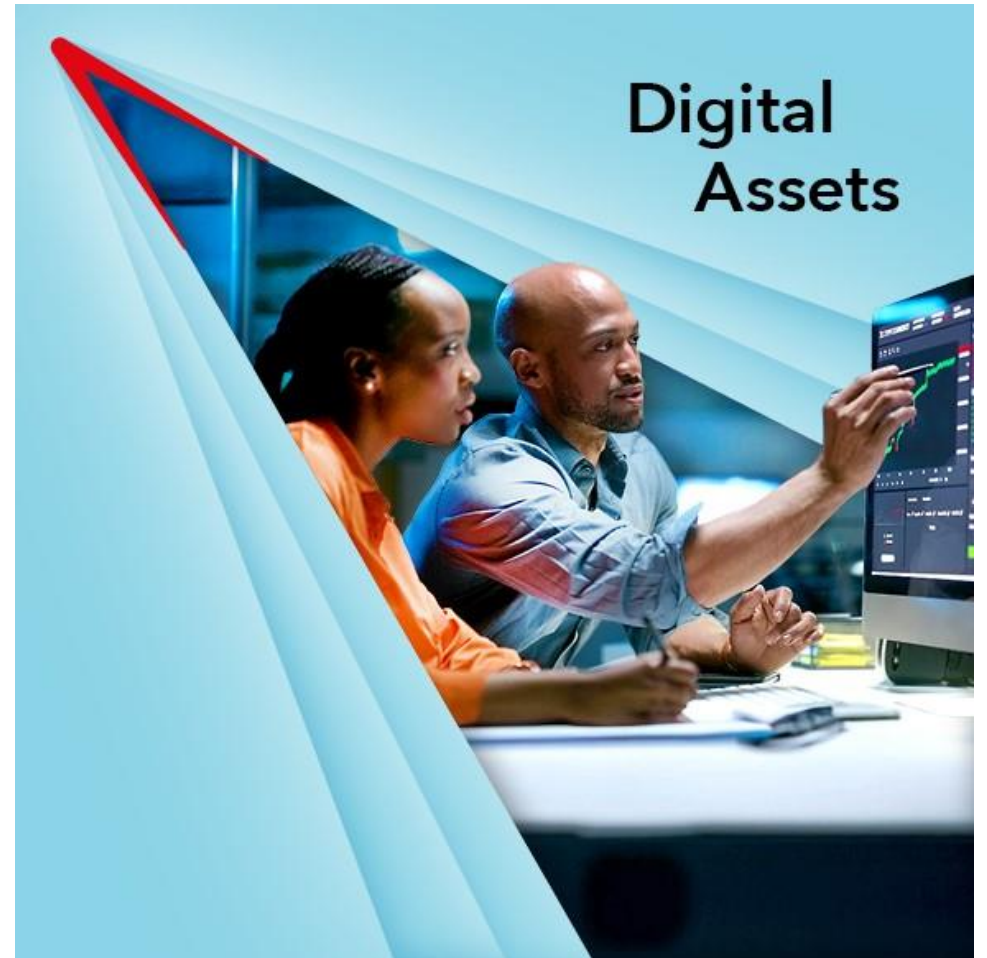This does not require the model to be transparent.

A lot of advances have been made in making complex models explainable, but some of these solutions are relying on another algorithm to interpret the original one.
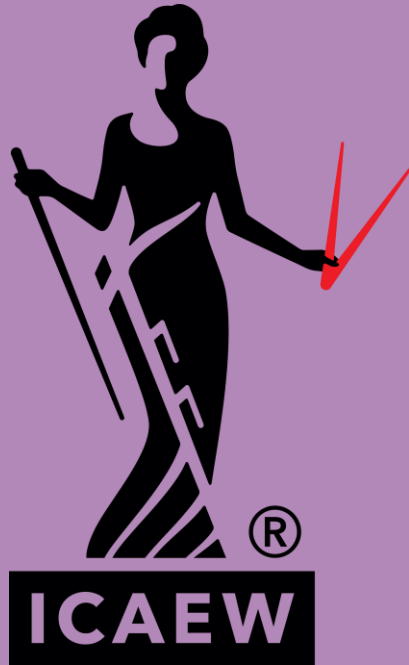
**INTERPRETABILITY**

Ability to interrogate the inner working of the algorithm, tracing what each step in the algorithm does to the input to reach an output.

The more complex the algorithm, the less interpretable. A decision tree is easy to follow the logic of, a generative model is not.

# *Digital Assets Conference 2024*



**Scan the QR Code to find out more!**

icaew.com