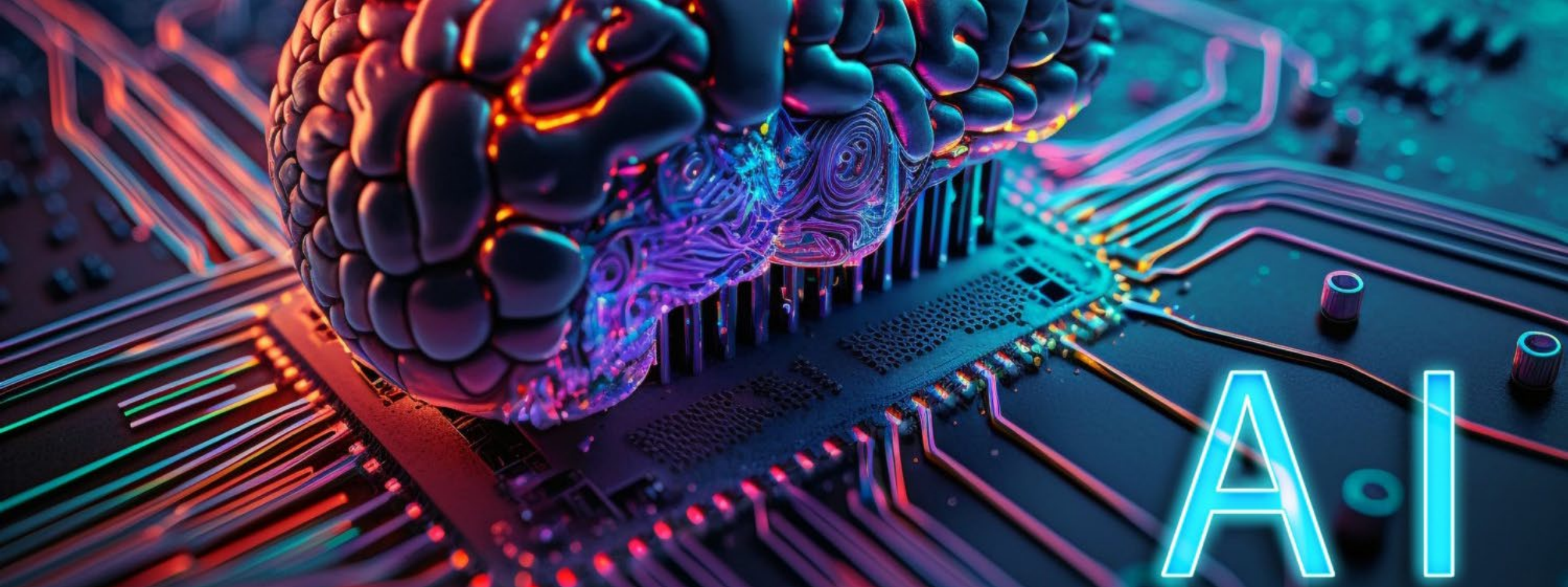




HISTORY OF ARTIFICIAL INTELLIGENCE

Lecturer: Mark Gillan

MYTH TO MACHINE

Evolution of AI

The origins

- Origins, the history, the purpose
- A journey from ancient concepts of mechanical life to modern digital era

Ancient myths to modern machine



WHAT IS THE PURPOSE?

Why do humans create intelligent machines?

Definition

- AI is the development of computer systems to perform tasks that typically require human intelligence.

The Purpose

- **Automation:** Handling repetitive or dangerous tasks.
- Processing vast amounts of data far quicker than a human.
- Assisting humans in complex decision-making, from medical diagnosis to climate modelling.

ANCIENT GREECE AND THE FIRST 'ROBOT'

Talos: In Greek mythology, Talos was a giant bronze automaton built by Hephaestus (the god of invention) to protect the island of Crete.

The Concept: Talos wasn't born; he was "made." He had "ichor" (the blood of gods) flowing through a single vein.

Significance: This shows that the human desire to create autonomous, life-like machines is thousands of years old.



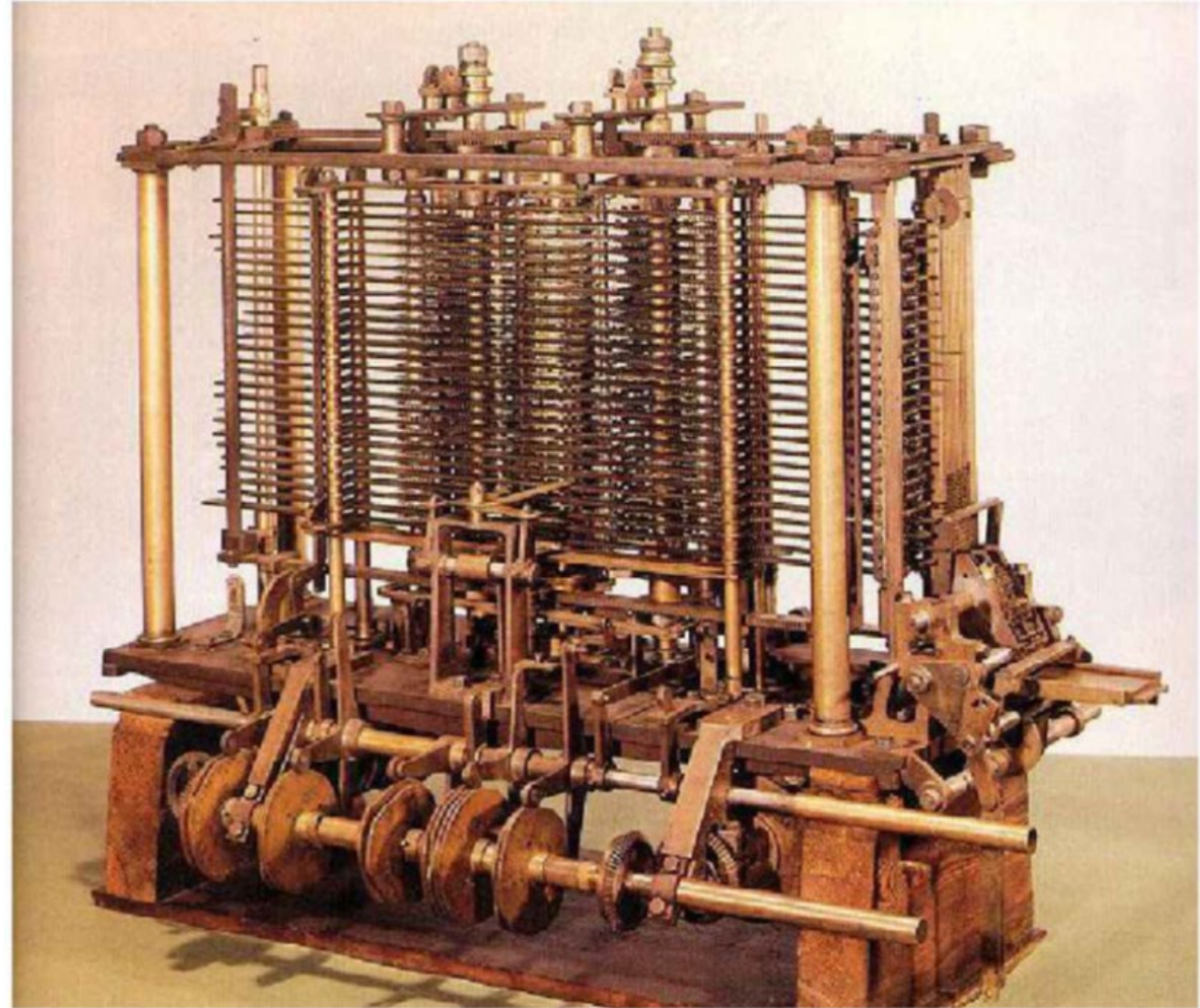
CHARLES BABBAGE

Charles Babbage is regarded as the Godfather of Computing

The Machine: In the 1830s, Babbage designed the **Analytical Engine**. It was a mechanical, steam-powered computer.

Key Features: It had a "Mill" (the processor) and a "Store" (the memory). It was designed to be programmed using punched cards.

Legacy: Although never finished in his lifetime, it was the first blueprint for a general-purpose computer.



ADA LOVELACE — THE SPARK

- **The Person:** 1815 – 1852 Mathematician and visionary.
- **The Visionary:** Lovelace was the first to see that Babbage's machine could do more than just maths.
- **The Spark:** She realised that if a machine could manipulate symbols, it could potentially create music or art.
- **Key Fact:** She is widely considered the world's first computer programmer. She provided the "spark" for the idea that machines could follow instructions to perform "intellectual" tasks.



1950 — ALAN TURING

Alan Turing publishes his academic paper "Computing Machinery and Intelligence," in which he proposes the Turing Test, to measure machine intelligence.



1955/6 — BIRTH OF AI

- In 1955, Marvin Minsky, John McCarthy, Claude Shannon, and other researchers hold the Dartmouth Summer Research Project on Artificial Intelligence
- Considered the birth of the field of AI as we know it today.
- **Optimism:** They believed that a significant part of the AI problem could be solved in just one summer.
- They were wrong!
- In 1956, John McCarthy coins the term 'Artificial Intelligence'.



1957 – CHECKERS

Arthur Samuel develops a checkers-playing program that learns from experience, marking a significant advance in machine learning.



BIRTH OF AI

1950

Turing Test

Academic paper published

1956

The term 'Artificial Intelligence'

John McCarthy coins the term at the Dartmouth Summer Research Project

1957

Development

Arthur Samuel develops checkers playing program that learns from experience

EARLY DEVELOPMENTS



1957

Arthur Samuel
Checkers
playing game

The Checkers playing game learns from experience. A significant advance in Machine Learning



1961

John McCarthy
Lisp
Programming
Language

Lisp Programming Language is developed and designed specifically for AI research



1965

Joseph
Weizenbaum
ELIZA created

ELIZA, a program that simulates a psychotherapist, demonstrating AI potential



1966

Shakey the
Robot

First truly mobile robot, developed at SRI International.

FIRST AI WINTER 1974 TO 1980

- The Lighthill Report
- Commissioned by the UK Government
- Criticises the state of AI research
- **The Problem:** Computers of this era were incredibly slow and had very little memory. They couldn't handle the "complexity" of the real world.
- Leads to decline in funding and interest in Artificial Intelligence
- Governments and investors lost interest, leading to a "Winter" where funding for AI research almost disappeared.
- **Lesson:** Progress in AI is always limited by the power of the hardware available.



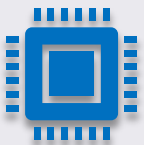
BOOM TIMES OF THE 1980'S



1980 ... Expert systems, uses rules to solve specific problems, become popular



1982 ... First LISP machine, by Xerox



1985 ... Geoffrey Hinton publishes a paper on backpropagation, a key algorithm for training artificial neural networks

SECOND AI WINTER 1987 TO 1993

The AI boom comes to an end as expert systems fail to live up to expectations.



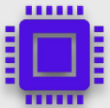
BOOM TIMES ONCE AGAIN



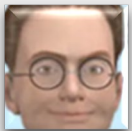
1997 ... Deep Blue, an IBM chess playing computer, defeats world champion, providing positive media coverage and a significant milestone in AI development.



2001 ... Roomba, the first commercially successful robotic vacuum cleaner



2006 ... AlexNet, a deep learning network, wins the ImageNet competition, marking a turning point in deep learning research



2014 ... Eugene Goostman, a chatbot developed by a Russian team, wins the Loebner Prize. Demonstrating AI can convincingly simulate human conversation. Passes the Turing Test at the Royal Society in London

IMPORTANT MILESTONE 1997

- 1997 Man versus Machine
- **The Event:** IBM's supercomputer, Deep Blue, defeated the reigning World Chess Champion, Garry Kasparov.
- **Why it mattered:** Chess was long considered the ultimate test of human logic.
- **The Method:** Deep Blue used "Brute Force"—calculating 200 million possible moves per second.



INTEREST IN AI INCREASING



2014 ... Eugene Goostman, passes the Turing Test at the Royal Society in London posing as a 13-year-old boy without English as first language, debate as to the passing of the Turing Test



2022 ... LaMDA, a factual language model from Google AI is released. Demonstrating ability to generate human-quality text and participate in conversations across a wide range of topics

THE MODERN ENGINE – THE GPU

- A hardware revolution: The GPU – Graphics Processing Unit
- Originally built for rendering video game graphics, GPUs are designed to do thousands of tiny calculations simultaneously (parallel processing).
- **AI Connection:** Modern AI (Machine Learning) requires massive parallel processing. Without the "heavy lifting" of the GPU, today's AI wouldn't exist.



THE NEW FRONTIER

- **Generative AI** from 2022 to Today:
Artificial Intelligence that creates!
- **The Difference:** Instead of just *sorting* data, these
AIs *generate* new data based on what they have
learned.
- **Impact:** AI is now a tool for writers, artists, and
programmers to speed up their work.



SUMMARY



Artificial Intelligence has its origins and use of the term, its birth, back in the 1950's



Booms led to interest and investment, providing research and more interest



Artificial Intelligence 'winters' caused a lack of research and reduced interest, meaning development suffered

THANK YOU

Mark Gillan

www.ExtendedClassroom.com

Class material, video, exercises