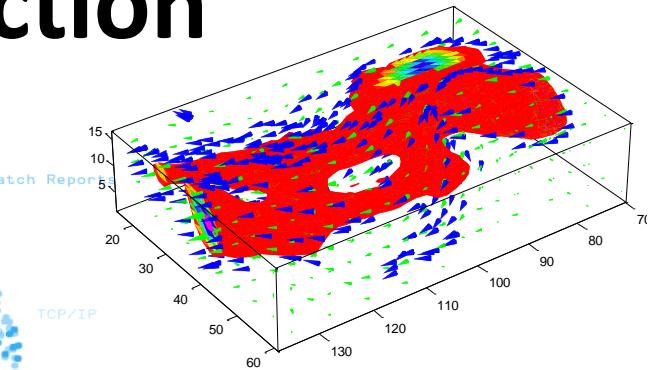




# Introduction to Artificial Intelligence

## - 01-01 An Introduction



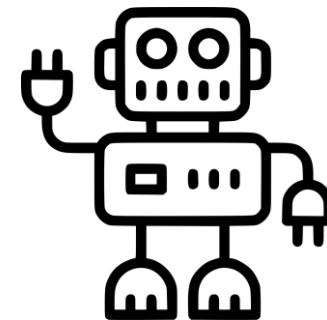
**Dr Leo Chen**

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26/Feb/2024 1

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- 1. Introduction**
- 2. Evolutionary Computation**
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# Chapter Contents

## 1. Definition of Artificial Intelligence

## 2. History of artificial intelligence

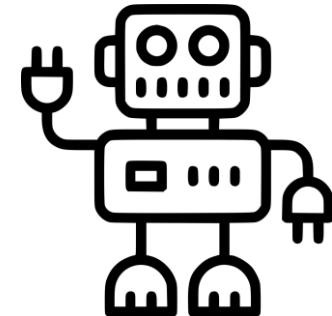
## 3. Key Drivers and Enablers

## 4. Related Concepts

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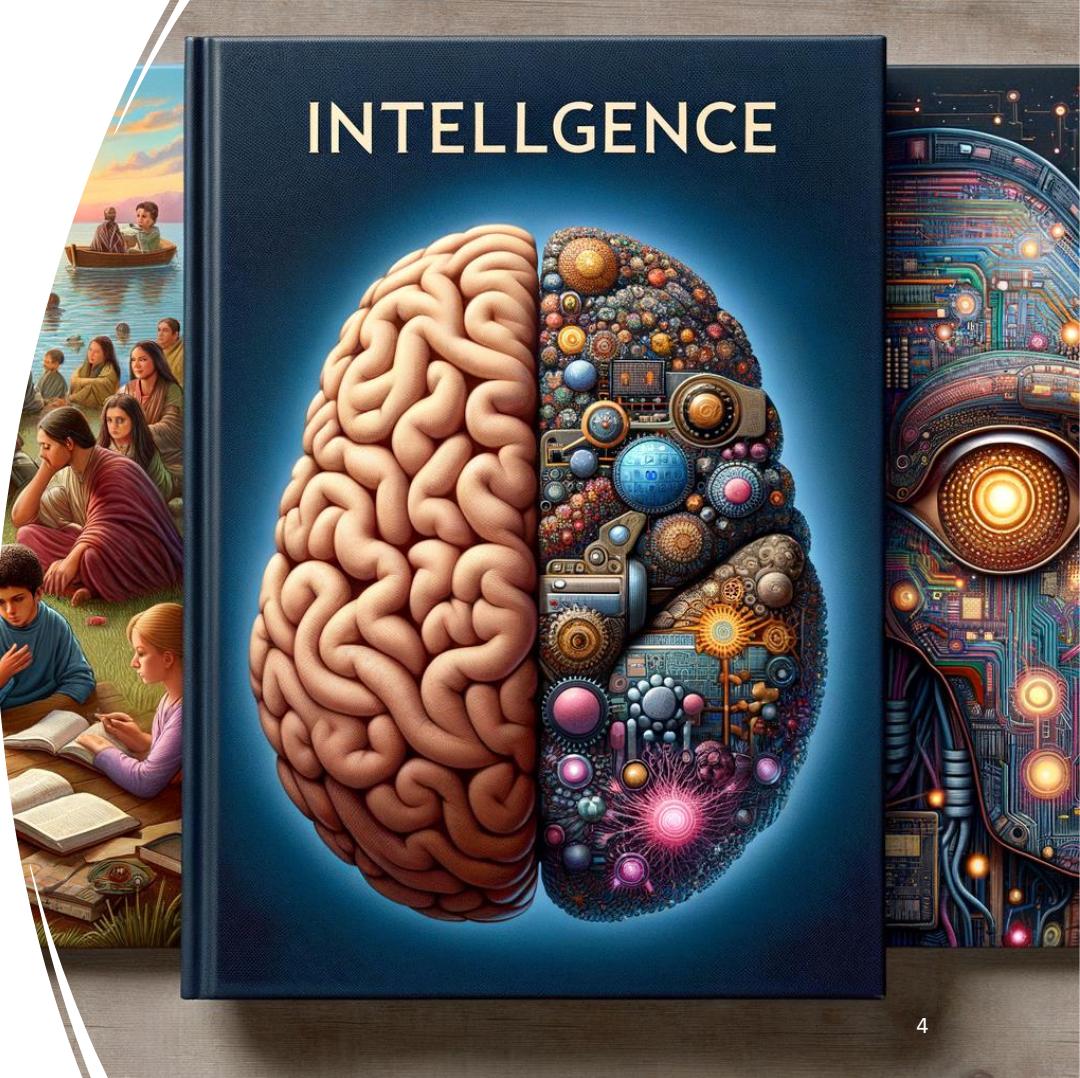


- Class Discussions
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## A few Basic Concepts:

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- **Intelligence**
- **Natural Intelligence**
- **Artificial Intelligence**



# What is “Intelligence”? (the *definition*)



Intelligence can be broadly defined as the capacity or ability of

- an **individual** or a **system** to **acquire**, **understand**, **process**, and **apply knowledge** or information in a way that enables problem-solving, learning, decision-making, and adaptation to new situations.
- It encompasses various **cognitive abilities** and **skills** that contribute to effective **reasoning**, **problem-solving**, and **learning processes**.

# What is “Intelligence”? (the *features*)



- a) Problem-solving
- b) Utilising knowledge to develop innovative solutions
- c) Learning and enhancing skills
- d) Decision-making
- e) Demonstrating reasoning and adaptability
- f) Memory and recollection
- g) Proficiency in language and communication
- h) Emotional intelligence
- i) Creativity
- j) Social intelligence
- k) Sensory and perceptual capabilities



## What is “Natural Intelligence” ?

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- Natural intelligence is the **inborn cognitive ability** found in humans and animals.
- It includes the **mental** processes that allow for **perception, understanding, reasoning, learning, and environmental adaptation**.

# What is “Artificial Intelligence” ?

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- **Artificial intelligence** (AI) is intelligence demonstrated by machines, in contrast to the **natural intelligence** (NI) displayed by humans and other animals.<sup>[1]</sup>
- At its simplest form, artificial intelligence is a **field**, which **combines** computer science and robust datasets, to enable problem-solving. <sup>[2]</sup>
- The science and engineering of making **intelligent machines**<sup>[3]</sup>
- What is AI? [BBC](#)<sup>(1:57)</sup>, [Future of AI](#)<sup>(4:35)</sup> , [Coldfusion](#)<sup>(9:21)</sup>,

A PROPOSAL FOR THE  
DARTMOUTH SUMMER RESEARCH PROJECT  
ON ARTIFICIAL INTELLIGENCE

J. McCarthy, Dartmouth College

M. L. Minsky, Harvard University

N. Rochester, I.B.M. Corporation

C.E. Shannon, Bell Telephone Laboratories

August 31, 1955

We propose that a 2 month, 10 man study of artificial intelligence be carried out during the summer of 1956 at Dartmouth College in Hanover, New Hampshire. The study is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it. An attempt will be made to find how to make machines use language, form abstractions and concepts, solve kinds of problems now reserved for humans, and improve themselves. We think that a significant advance can be made in one or more of these problems if a carefully selected group of scientists work on it together for a summer.

# What is “Artificial Intelligence” ?

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- Dartmouth Proposal [**Dartmouth1955**]: “The study is to proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it.”
- John McCarthy [**McCarthy2007basic**] “It is the science and engineering of making intelligent machines, especially intelligent computer programs.” “The ultimate effort is to make computer programs that can solve problems and achieve goals in the world as well as humans.”
- Wallace Marshall (1987): “Artificial stupidity (AS) may be defined as the attempt by computer scientists to create computer programs capable of causing problems of a type normally associated with human thought.”

# IEEE Computational Intelligence Society

## What is Computational Intelligence? [4]

- Computational Intelligence (**CI**) is the theory, design, application and development of biologically and linguistically motivated computational paradigms. Traditionally the **three** main pillars of CI have been **Neural Networks**, **Fuzzy Systems** and **Evolutionary Computation**.
- In this module, **Computational Intelligence (CI) == Artificial intelligence (AI)**





Christopher Manning @chrmmanning · 7小时

Artificial Intelligence Definitions: This (northern) summer time than I'd like to admit coming up with a handout de AI in 1 page, trying to be informative and suitable for n me know if you like them! [hai.stanford.edu/sites/default](http://hai.stanford.edu/sites/default)

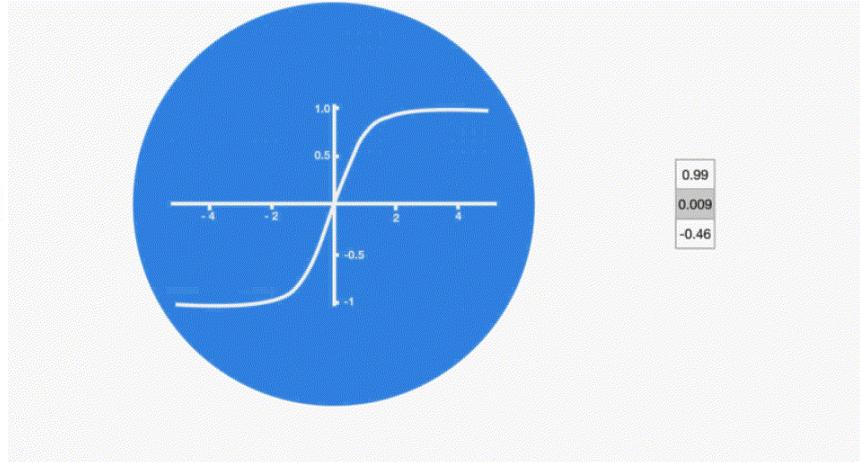
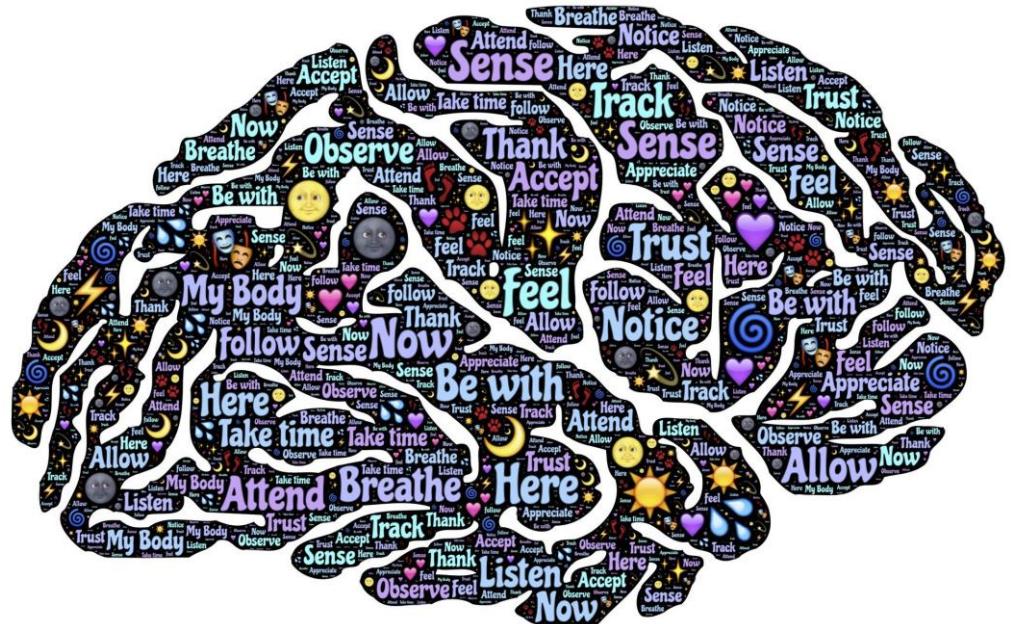


Artificial  
Intelligence  
Definitions

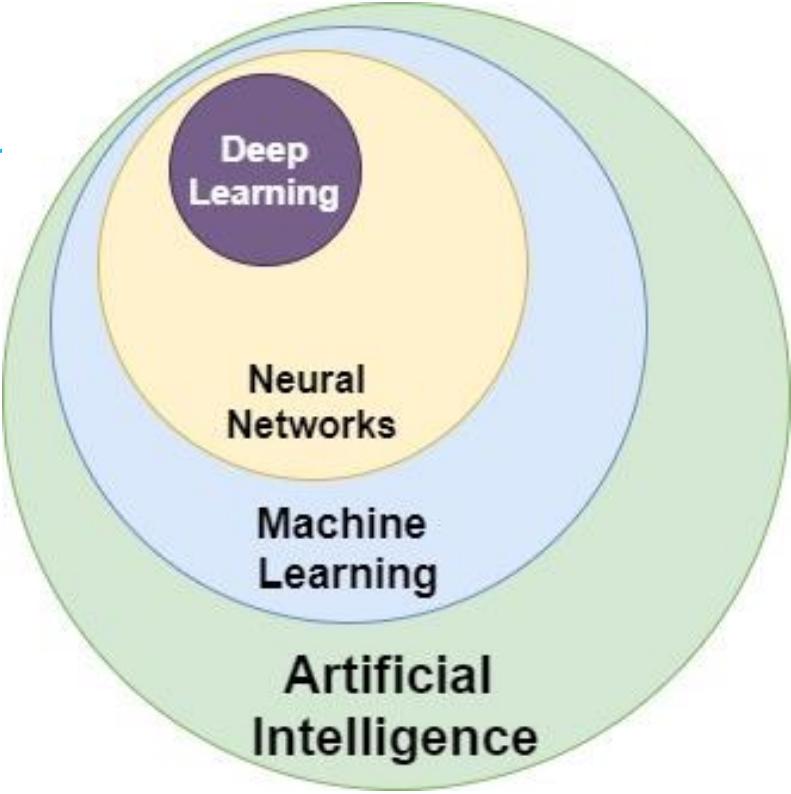
**Artificial Intelligence (AI)**, a term coined by emeritus Stanford Professor John McCarthy in 1955, was defined by him as “the science and engineering of making intelligent machines”. Much research has humans program machines to behave in a clever way, like playing chess, but, today, we emphasize machines that can learn, at least somewhat like human beings do. [5]

# Class Discussion 01

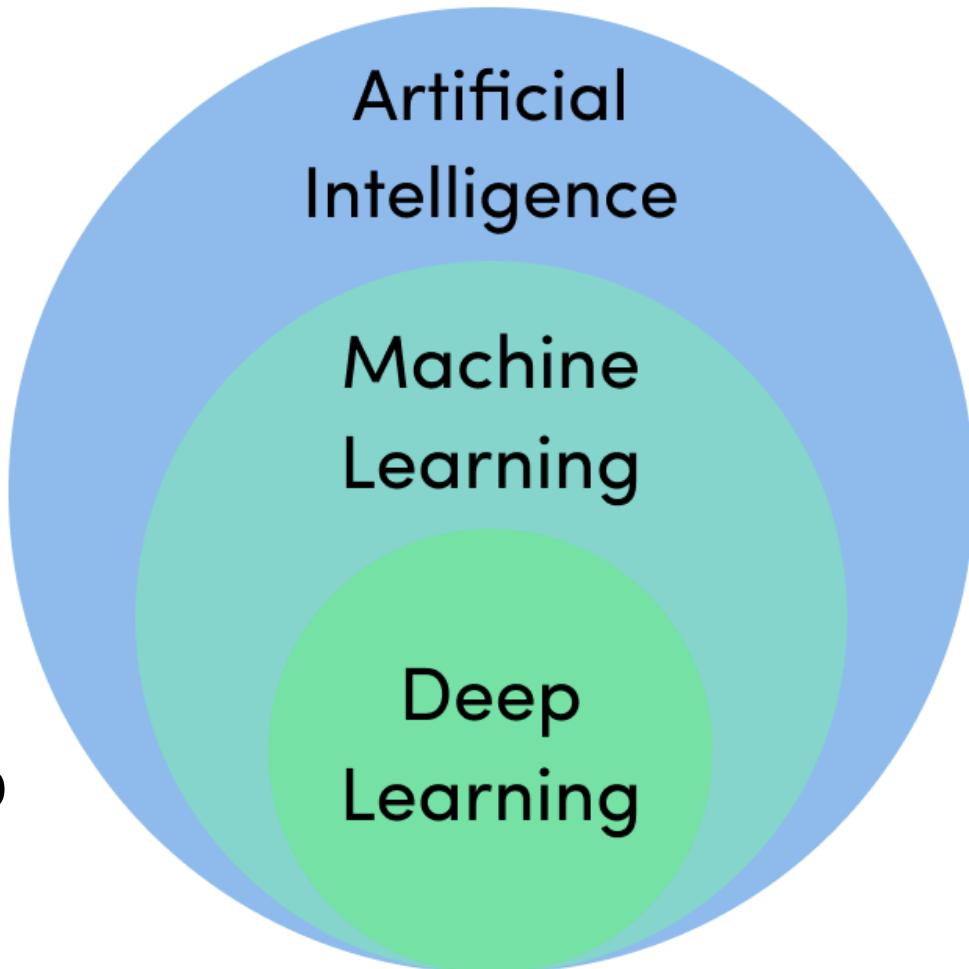
# What is AI in your mind?



## What is Artificial Intelligence (6:14)



**AI, Machine Learning, Deep  
Learning, Data Science in  
Venn Diagrams**

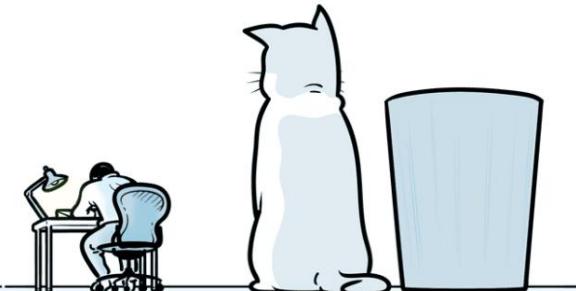


# Reference

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- \bibitem{Dartmouth1955} J. McCarthy, M. L. Minsky, N. Rochester, and C. E. Shannon, "A Proposal for the Dartmouth Summer Research Project on Artificial Intelligence," 1955.
- \bibitem{McCarthy2007basic} J. McCarthy, "Basic questions," 2007,  
\url{https://www-formal.stanford.edu/jmc/whatisai.pdf}

# Thanks and Questions





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**Thanks and Questions**  
This is the Last Page

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