# A Media Look at

# The Learning Process

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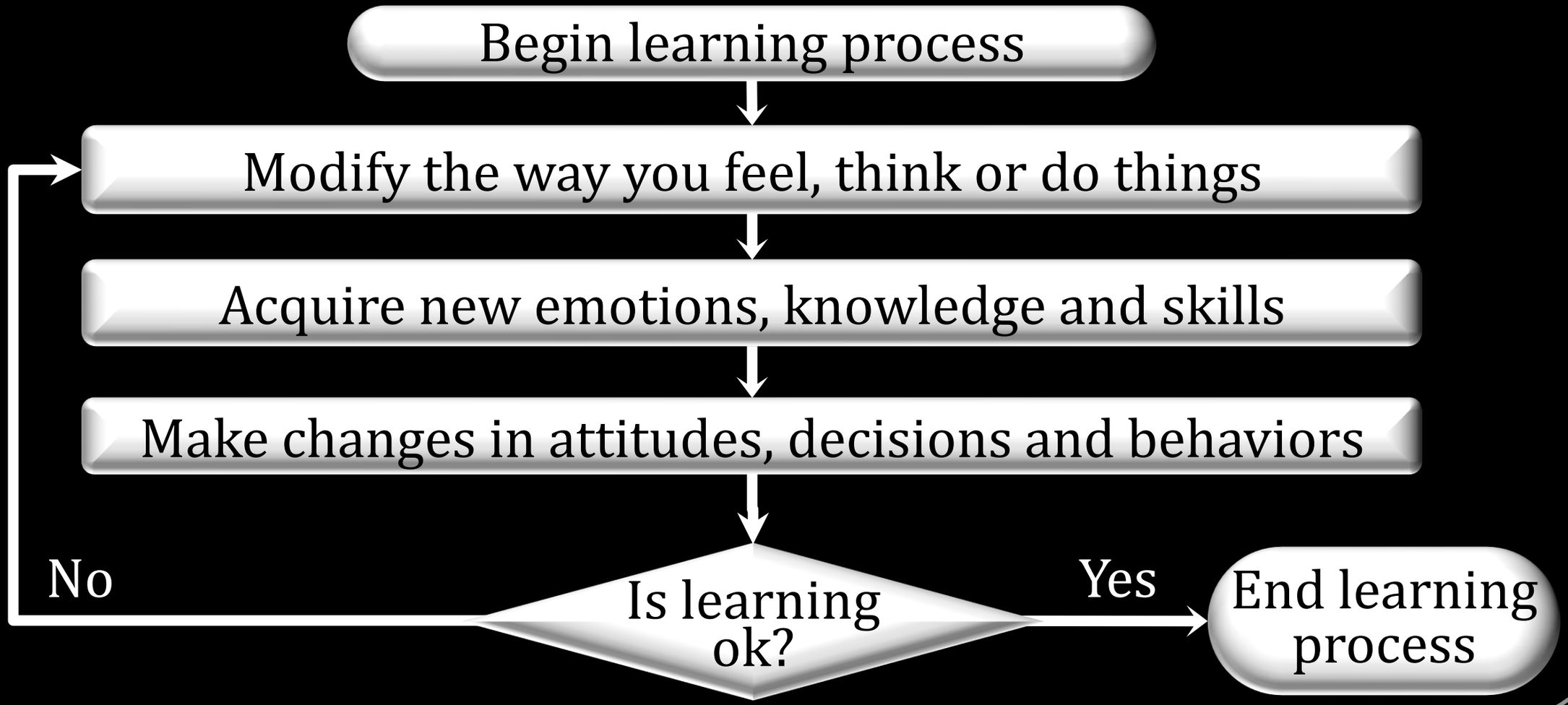
# Agenda

- What is Learning?
- Types of Learning
- The Steps of the Learning Process
- Theories of Learning
- Brain Based Learning
  - Biological Neural Networks (BNN)
- Computer Simulated Learning
  - Artificial Neural Networks (ANN)
- The Machines Learning Process
- Artificial Intelligence

# Learning...

## is an intellectual, emotional and physical process



# The Steps in the Learning Process

**assess readiness, set goals, modify params, learn, assess, modify params**

Air pressure from lungs, shape of teeth, mouth, tongue and lips

Learning Intention → Assess Readiness to Learn → Set Learning Goals → ⊕ → Modify the Learning Parameters → Engage in the Learning Process → Learned Behavior (Talking)

Call 'mum' to guarantee food and security forever

Just screaming is no use!

Evaluate Learning Results

Is 'mum' here yet?

Case Study: A new-born baby intends to talk and the trials and the learning process continuous forever…

# Types of Learning

**Psychomotor Learning**

**Involves acquiring skills required in integration of mental and muscular activities**

**Skill**

**Cognitive Learning**

**Deals with intellectual behavior and requires thinking**

**Knowledge**

**Affective Learning**

**Deals with feelings, attitudes, opinions or values**

**Attitude**

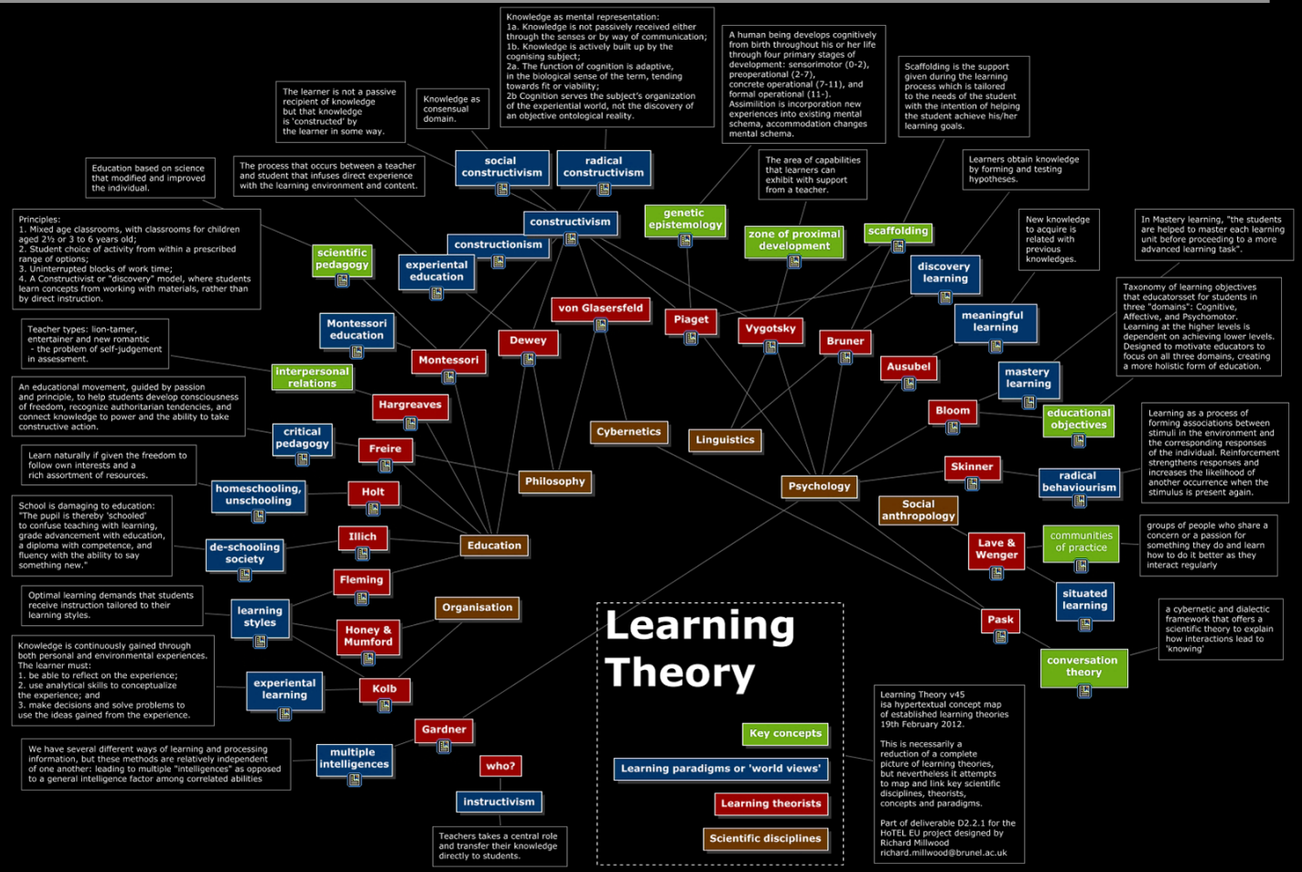


https://www.fiddleheads.ca/articles/post/q-and-a--is-upper-arm-movement-during-bowing-okay

# Theories of Learning

## There are just too many of them!

- Behaviorism
- Cognitivism
- Social Learning Theory
- Social Constructivism
- Multiple Intelligences
- **Brain Based Learning**

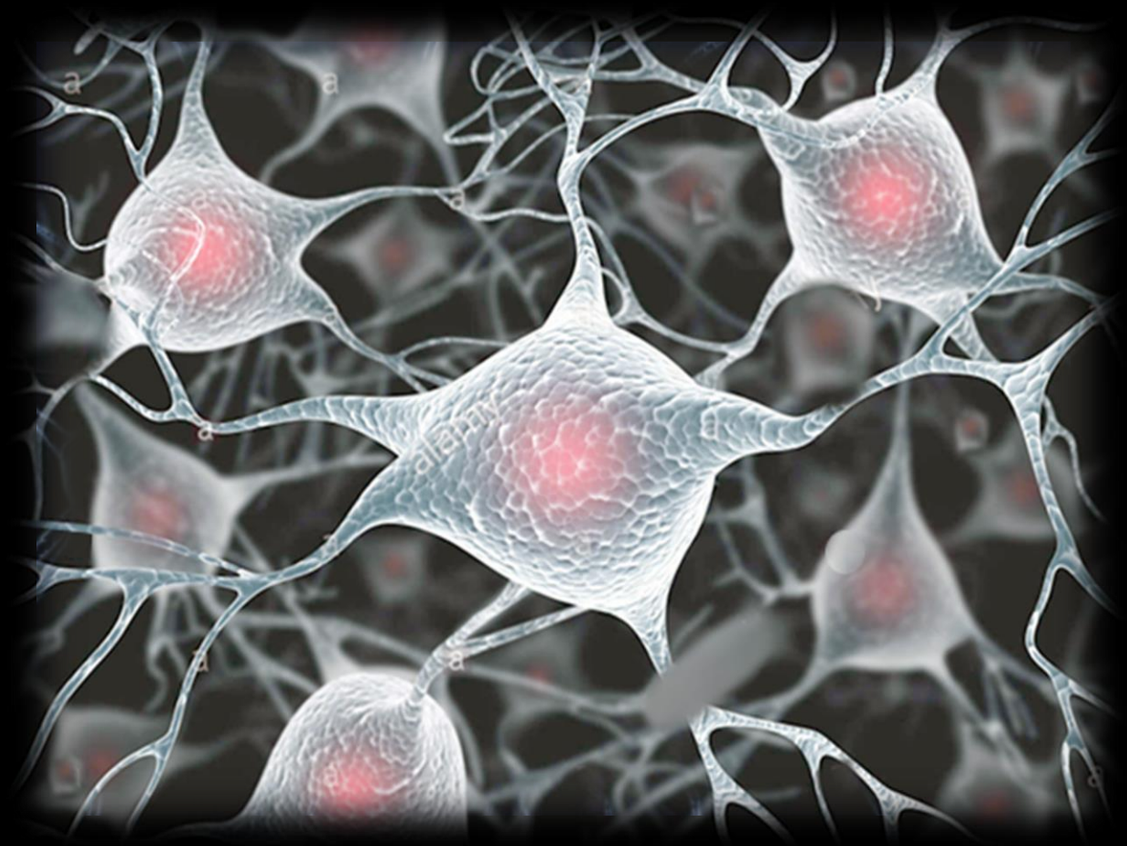



- **Let's have a look at the "Brain Based Learning"**

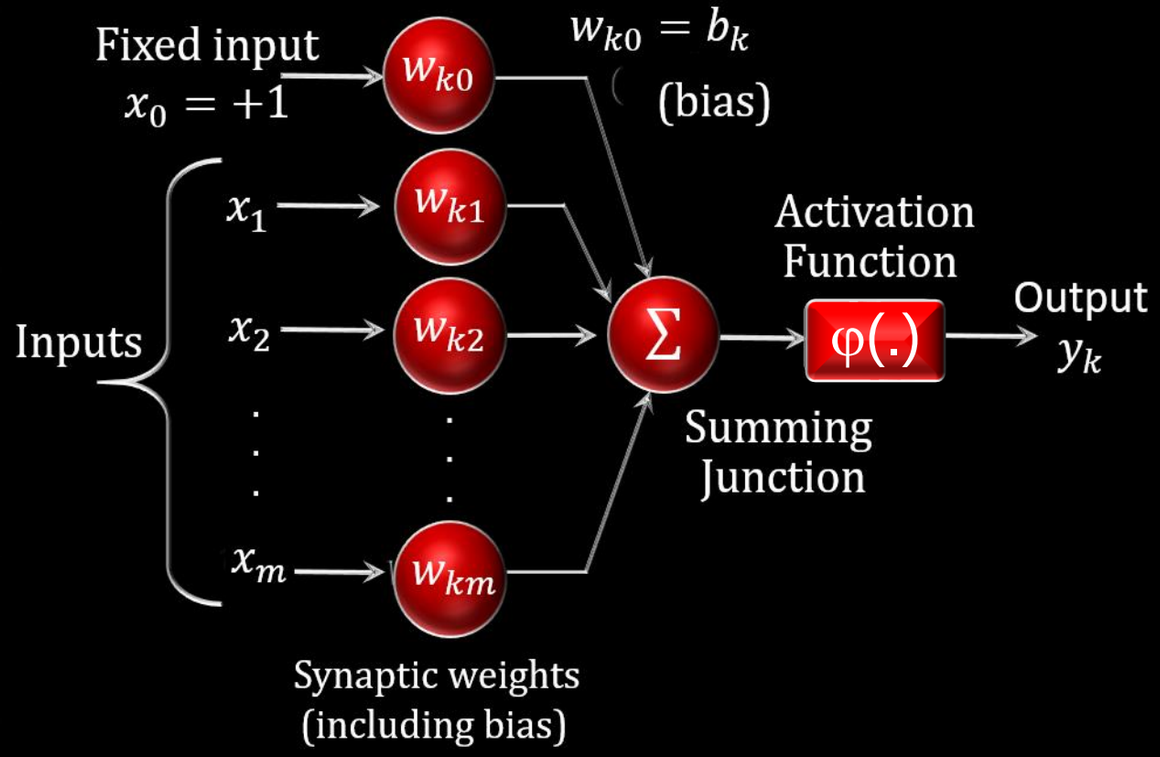


https://www.teachthought.com/learning/a-visual-summary-the-most-important-learning-theories/

# Brain Based Learning
## Biological Neural Network (BNN)



Actual Picture of Human **Neurons**




Model Representing Human **Neurons**



https://www.alamy.com/stock-photo-image-concept-of-a-network-of-neurons-in-the-human-brain-144400787.html

# Neurons
## The Fundamental Units of BNNs

- Neurons are responsible for carrying the signals to perform certain activities such as pattern recognition, perception, and motor control

**Pattern Recognition**

VectorStock.com/26631293

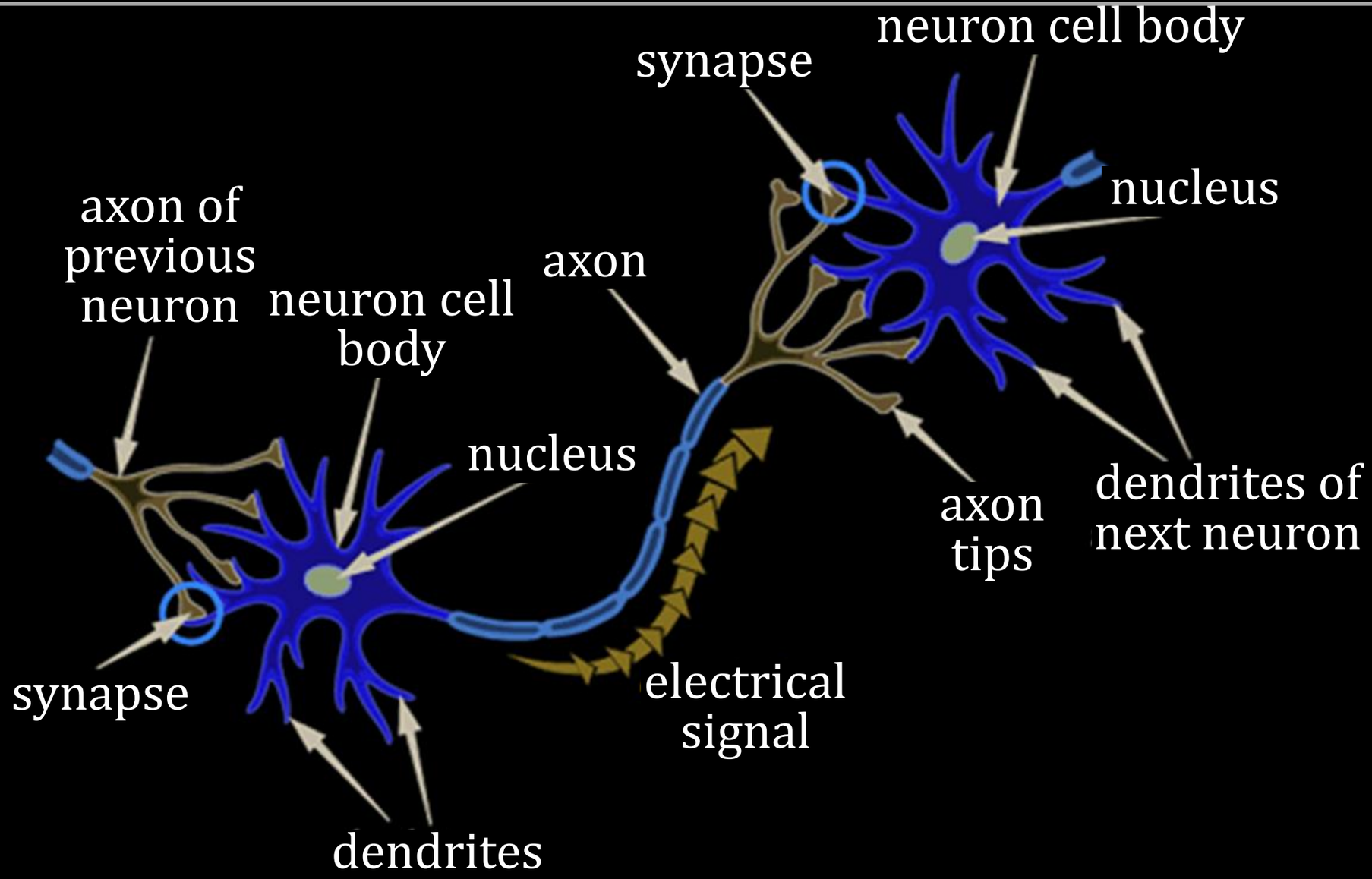
**Perception**

https://www.goconqr.com/quiz/3448871/six-blind-men-and-an-elephant-


**Motor Control**

https://www.purdue.edu/hhs/hk/Biomechanics-MotorBehavior/research/motor-control/

# Human Neuron





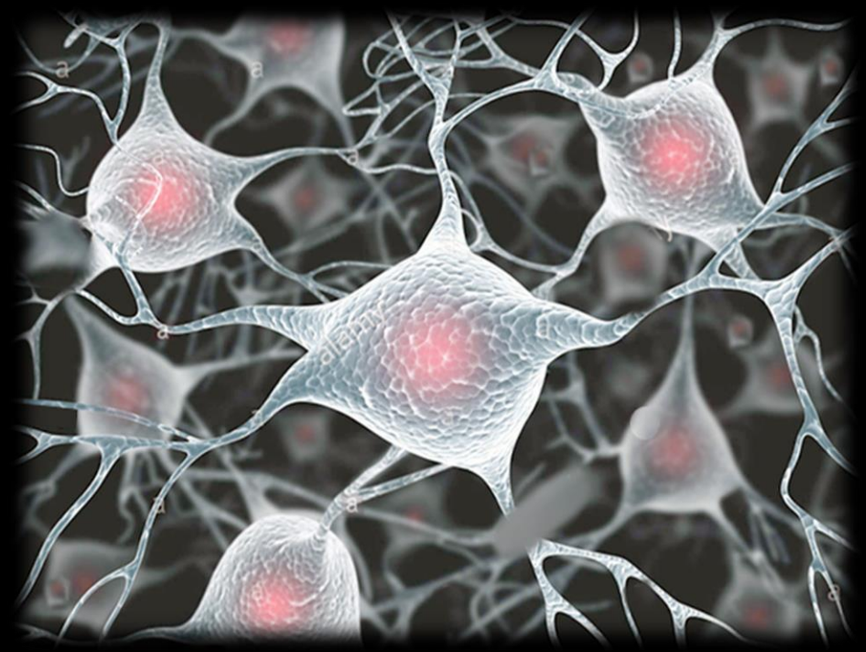

https://thriveglobal.com/stories/touched-by-light-a-conjecture-on-how-gravity-and-human-thought-maybe-related/

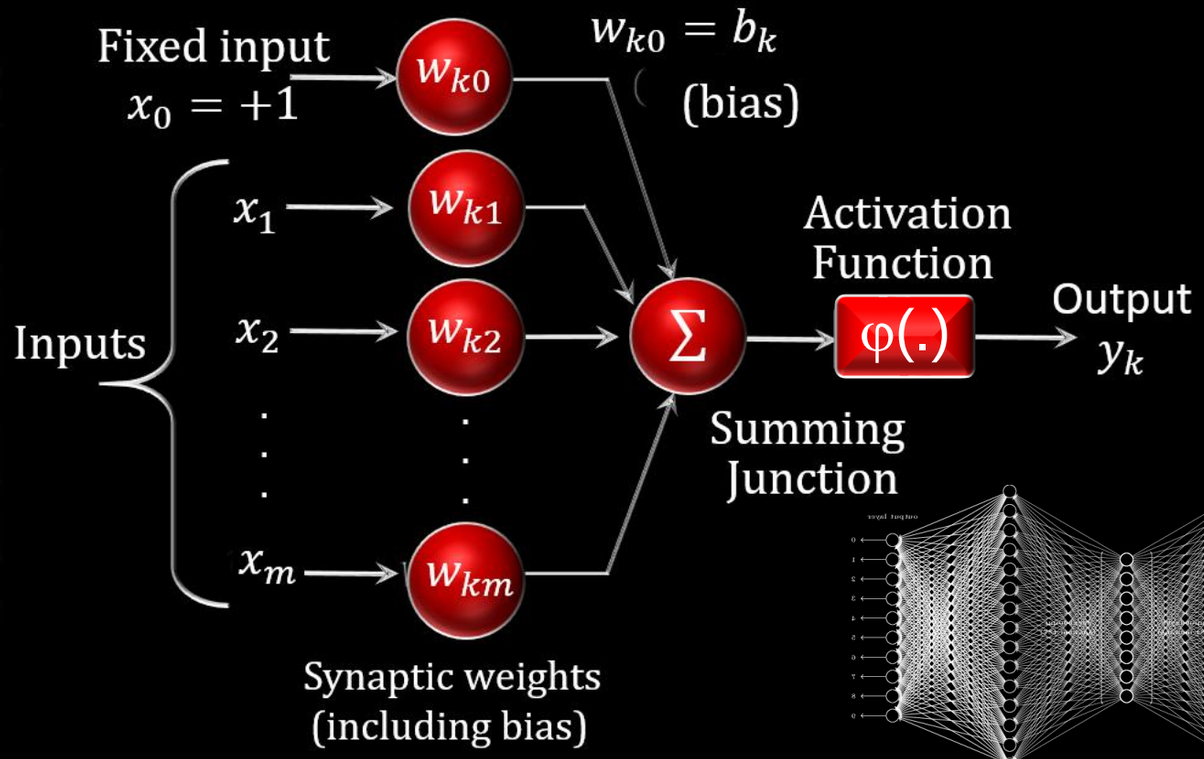
# Artificial Neural Network

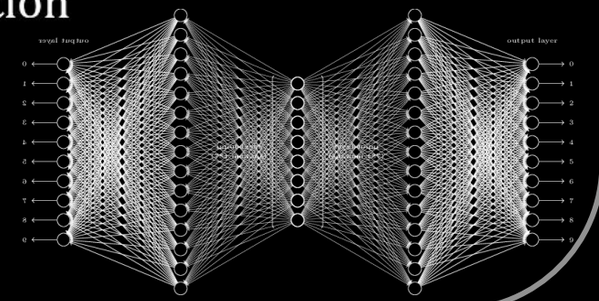
## Model to Simulate the Brain Activities

- The total **contributions of the neurons** are combined together along with a bias $b$, forming the sum

$$y_i = b + \sum_i w_i x_i$$

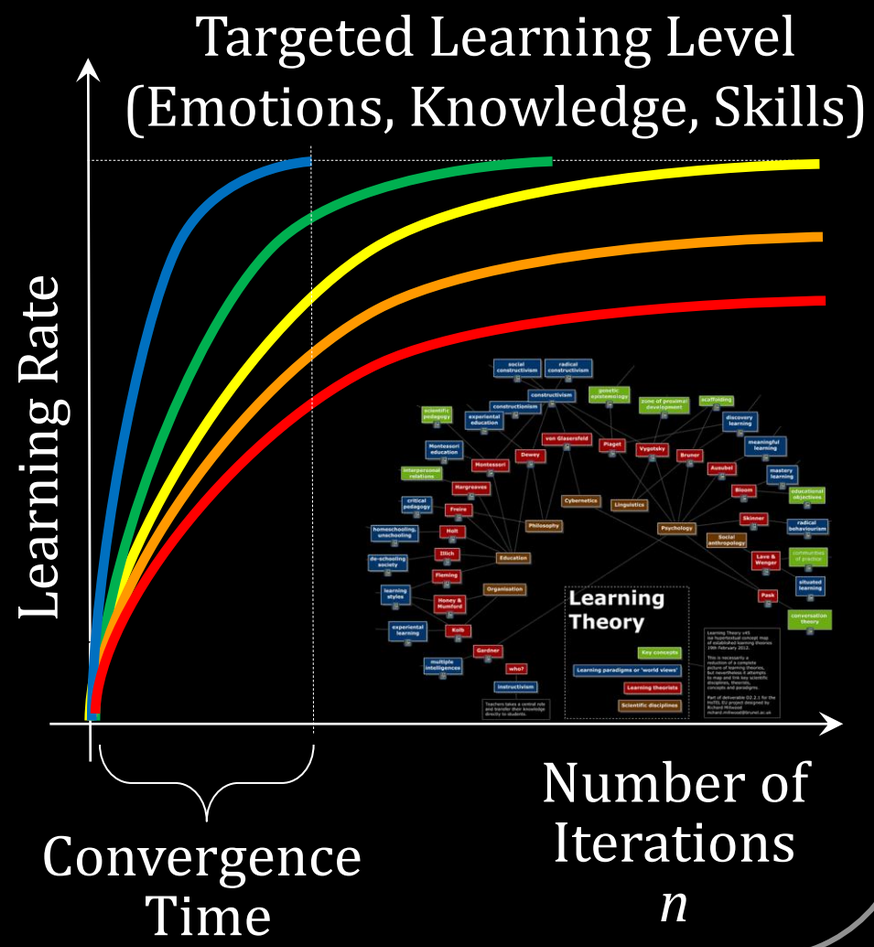




# Learning Algorithms
## The Learning Curves

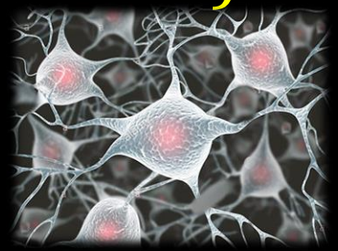
- The convergence behavior of a **learning algorithm** under varying environmental conditions is shown by the **learning curve**

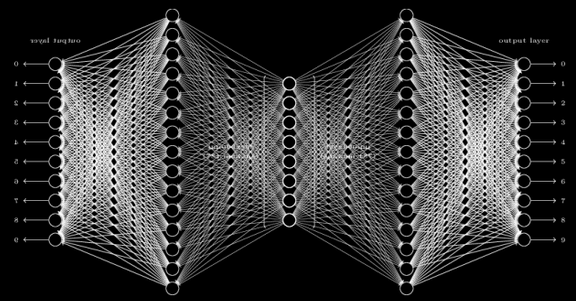


# The Machine Learning Process

## Machines Can Learn…

- Machines can learn from data,
  - ✓ identify patterns and make decisions
  - ✓ with minimal human intervention.
- To achieve good performance,
  - ✓ neural networks employ massive interconnection of computing cells (neurons).





# 4 Categories of Artificial Intelligence

## 1. Reactive Machines

- This type of AI has **no ability to form memories** or use past experiences to form current decisions
- Example: **IBM Deep Blue** chess-playing supercomputer, which beat grandmaster Garry Kasparov in late 1990s.

## 2. Limited Memory

- Machines which can **look into the past**
- Self-driving cars can observe other cars' speed and direction
- which **requires identifying specific objects** and monitoring them in time.

## 3. Theory of Mind

- Machines form **representations about the world and other entities** in world
- In **psychology**, understanding of people and creatures in the world can have **thoughts & emotions** that affect their behavior

## 4. Self-Awareness

- Top level of AI development can build systems that **can form representation about themselves**.
- Leads to understanding **consciousness** and build **self-conscious** machines.



https://www.govtech.com/computing/understanding-the-four-types-of-artificial-intelligence.html

# Natural Interaction
# Philosophy of Mind

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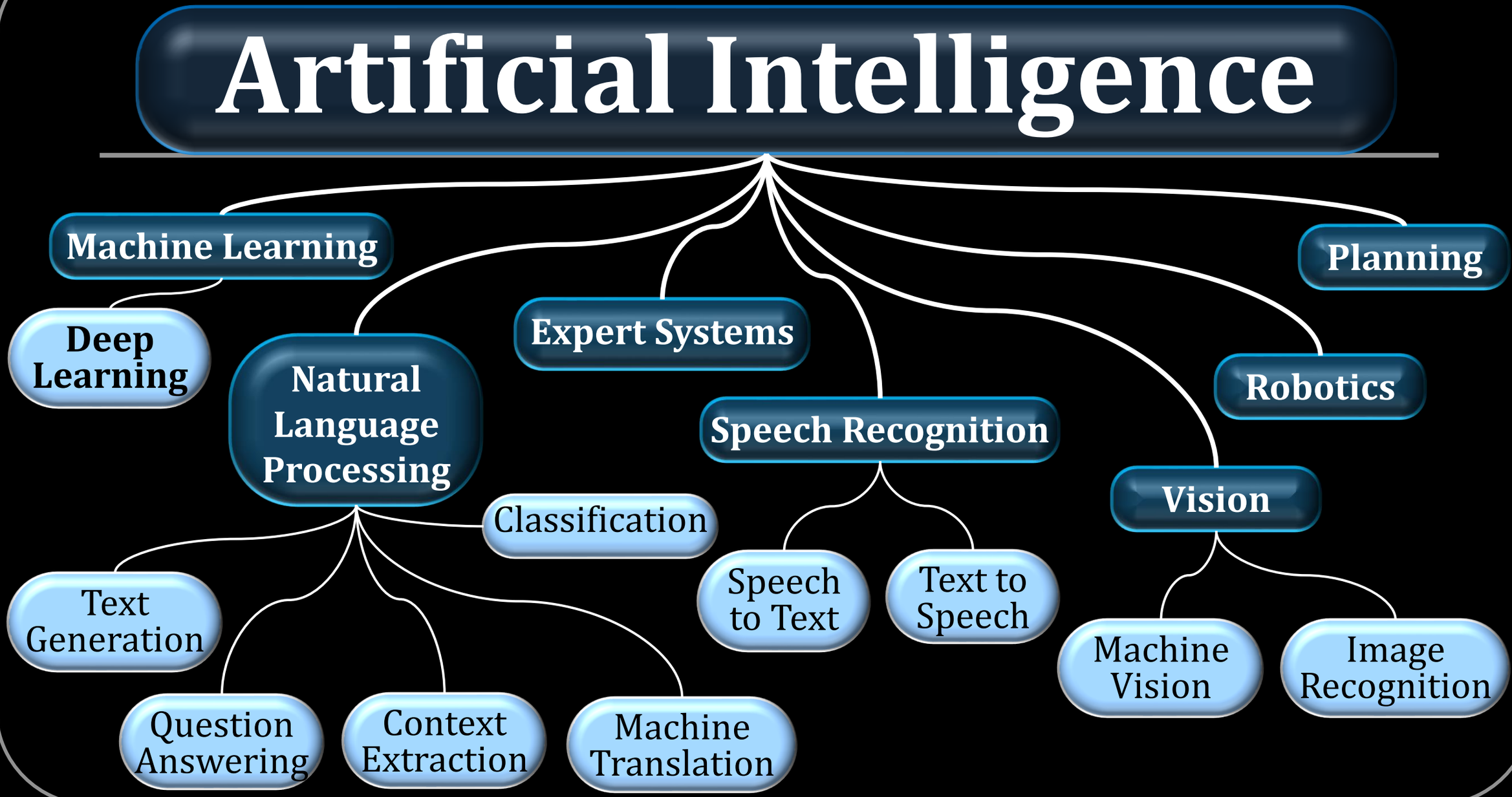
# Artificial Intelligence
## Definition

- Artificial intelligence is
  - ✓ the **simulation of human intelligence** processes by computing machines
  - ✓ to perform the tasks normally requiring human

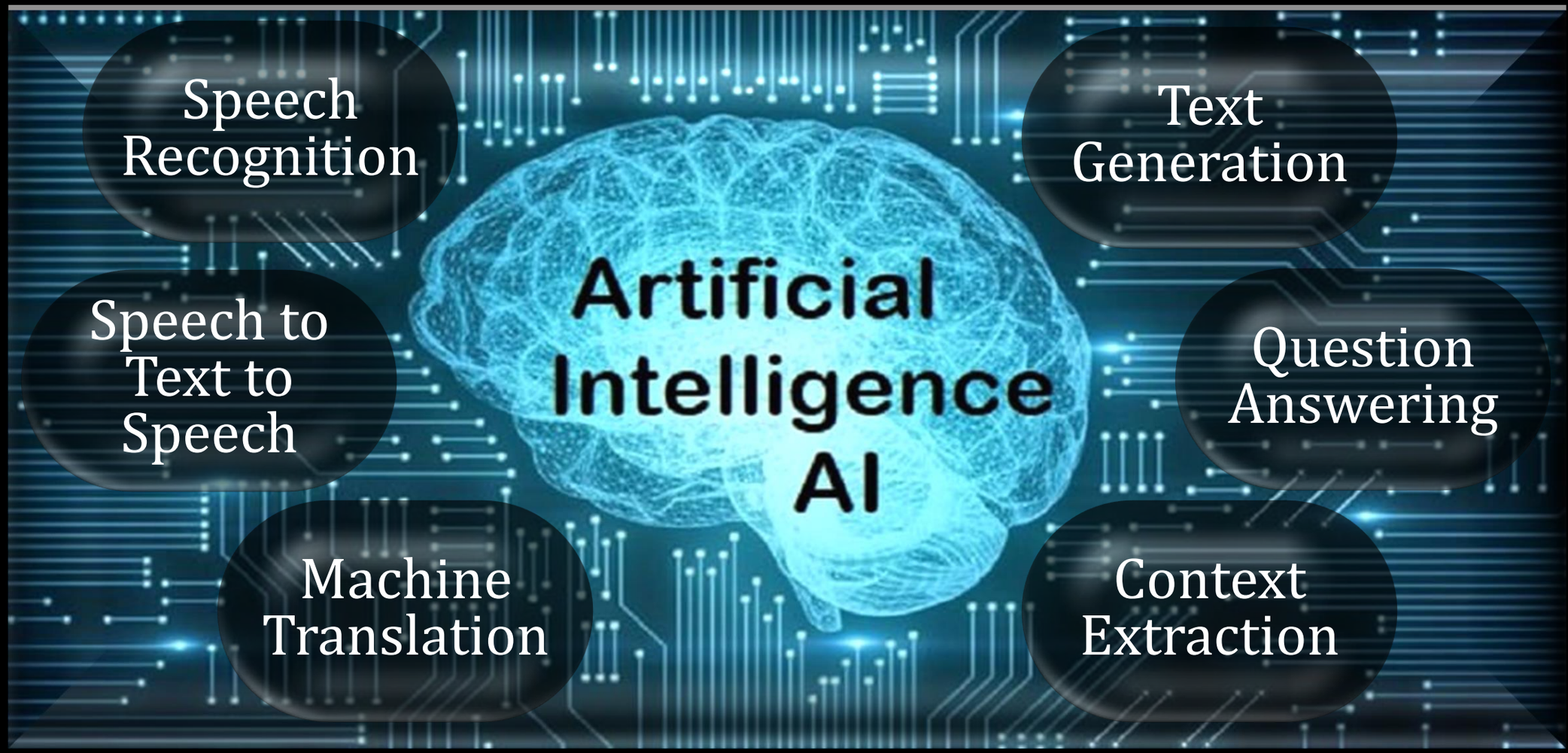

The robot, identifies itself as Chloe, (in **Detroit Become Human**) talks to the interviewer about its abilities, giving credit to the humans who have developed it...

Watch YouTube video: https://www.youtube.com/watch?v=AjOiYIjxoCE

The **Mind Map** Revealing the Specific Applications of Artificial Intelligence



# Artificial Intelligence
## in Social Sciences

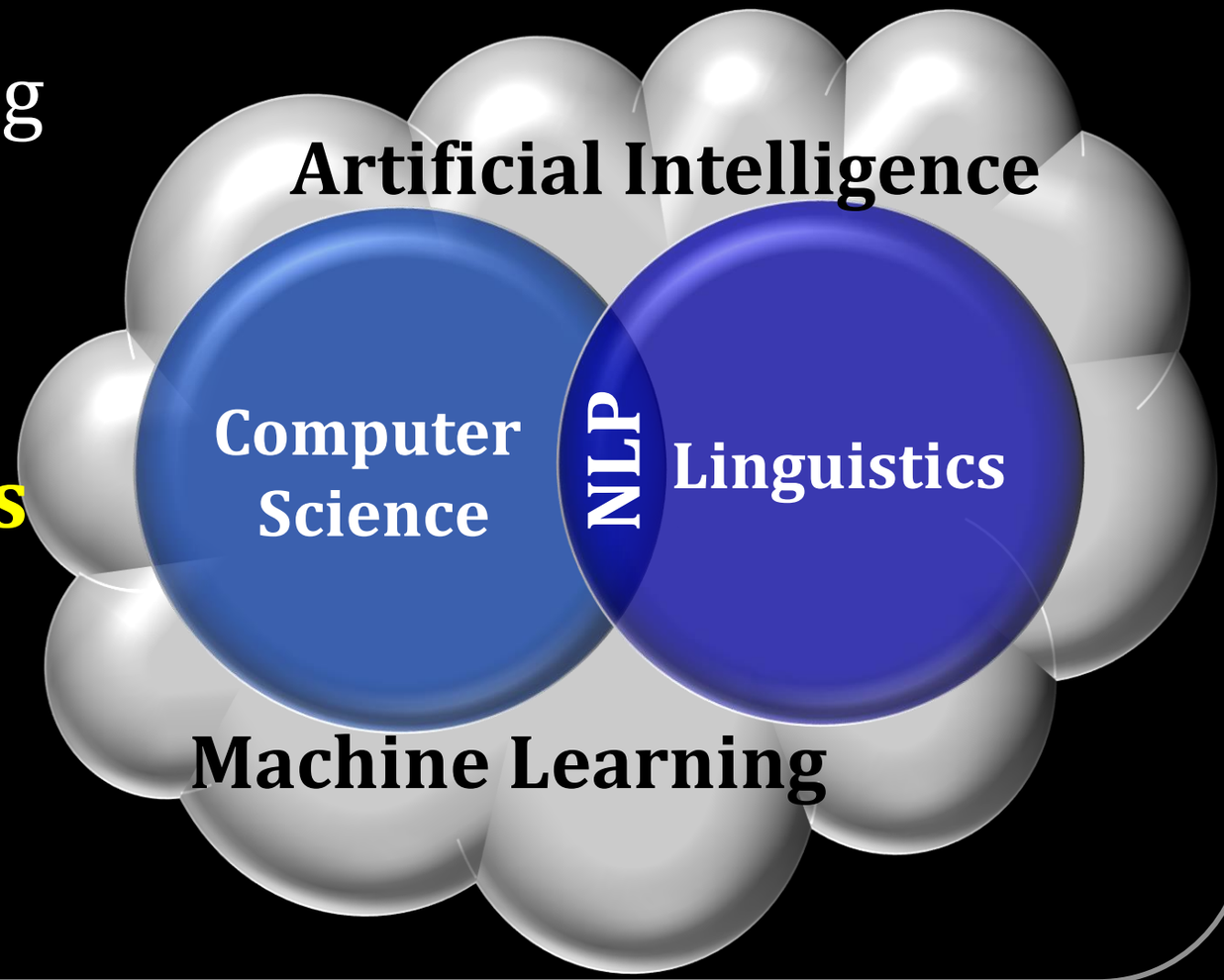





https://medium.com/@teztecch/artificial-intelligence-is-the-simulation-of-human-intelligence-processes-by-machines-especially-5ca1b0c828ec

# AI - Application Areas
## Natural Language Processing

- Natural Language Processing (NLP) refers to
  - ✓ the branch of Artificial Intelligence
  - ✓ concerned with **machines ability to understand text and spoken words**
  - ✓ same way as human beings

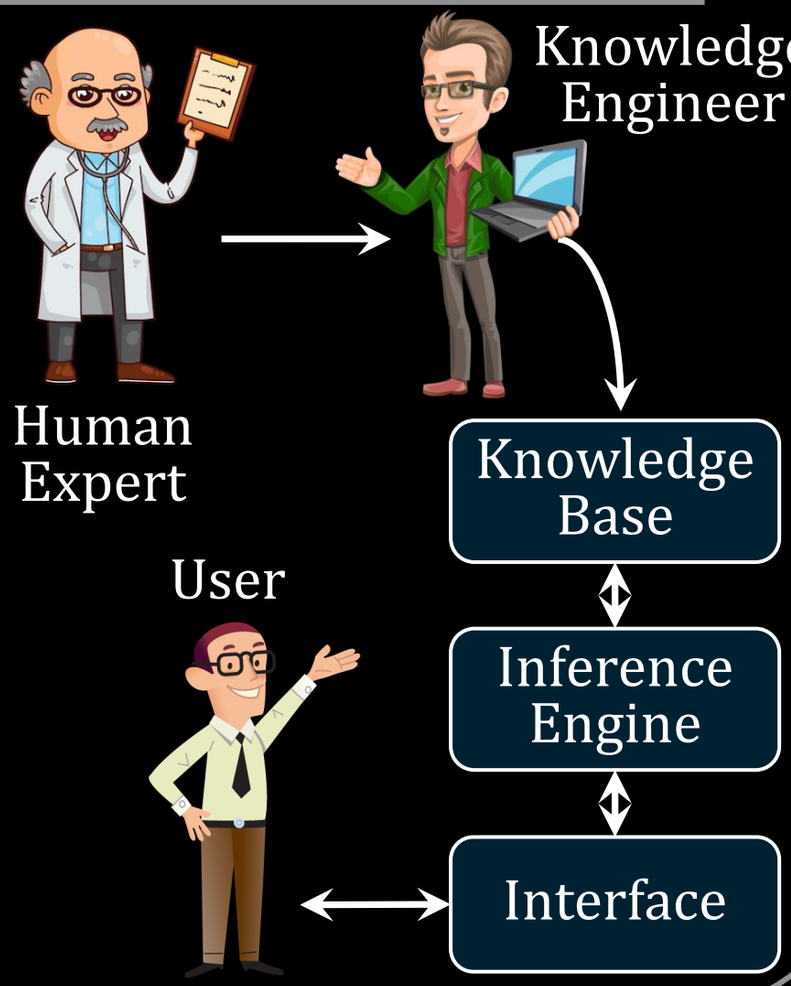





https://clevertap.com/blog/natural-language-processing/

# AI - Application Areas
## Expert Systems

- Specific applications of AI include
  - ✓ **expert systems,**
    - Decision Support System for diagnosing diseases
    - Google Search, Google Translate
  - ✓ natural language processing,
  - ✓ machine vision,
  - ✓ visual perception,
  - ✓ speech recognition,
  - ✓ decision-making.



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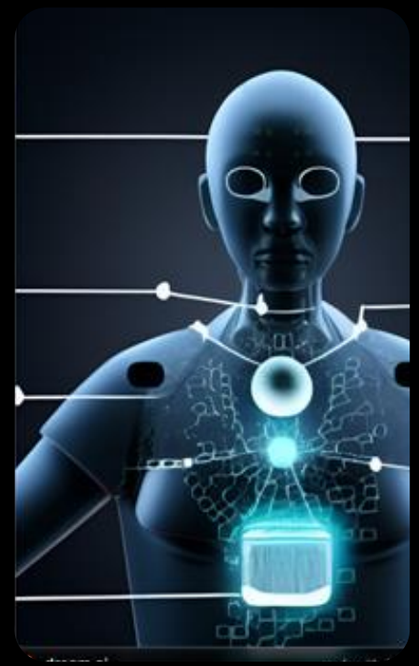
# High Quality Artwork
## AI Generated!!!

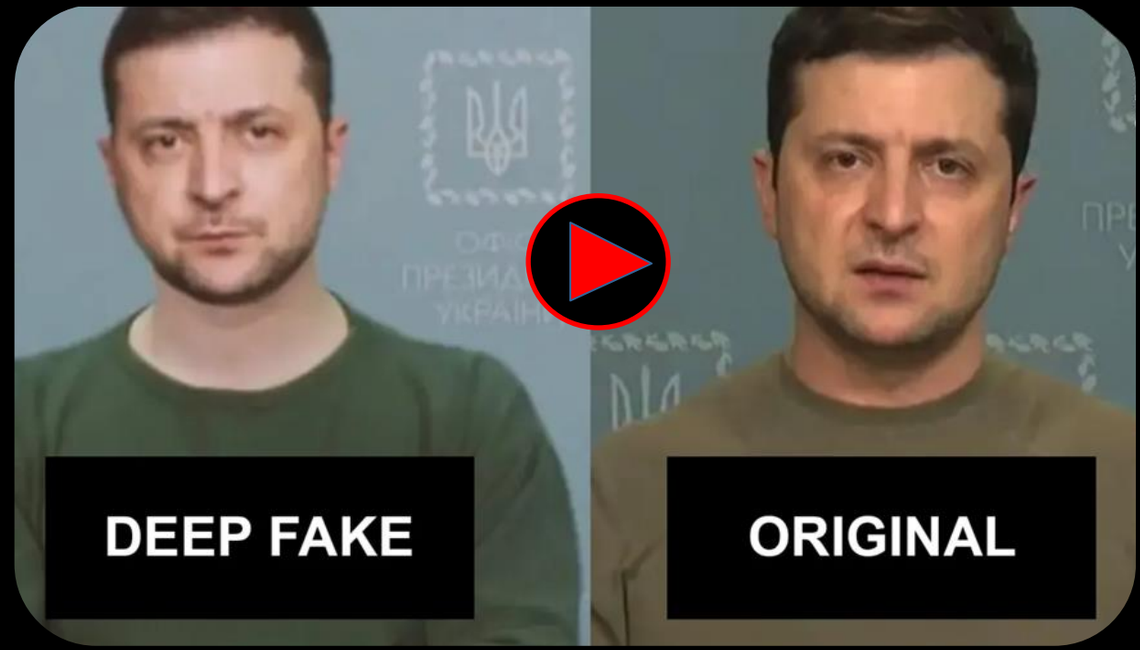
- **AI generated high quality artwork** in seconds conform to the description given (human versus AI in year 2030) by www.wombo.com
- AI used as a military weapon and create unfair circumstances
- A "small cat" chasing a "large dog" with big ears and long tail

https://www.wombo.art/create

# Big Idea 5.5 - Societal Impact
# AI Faking and Misleading People!

- A **deepfake** of Ukrainian President Zelensky calling on his soldiers to lay down their weapons was uploaded to a hacked Ukrainian news website.
- Such deepfakes could cause severe consequences on human being.




https://katzlberger.ai/2022/03/25/propagandakrieg-mit-deepfake-video/

# Big Idea 5.5 - Societal Impact
# How Will Metaverse Impact Society?

- **What is Metaverse and what does it have to do with AI?**
- Metaverse is the emerging 3D enabled digital space,
  - ✓ that uses virtual reality, augmented reality,
  - ✓ and other advanced technologies,
  - ✓ **to enable people to have lifelike experience online**.


Video:https://www.mckinsey.com/Videos/video?vid=6310398117112&plyrid=HkOJqCPWdb&aid=909E4487-FCCF-4364-B77A-03706DCE5CFA

https://www.mckinsey.com/capabilities/growth-marketing-and-sales/our-insights/building-the-next-big-experiences

# The Learning Process

## Thank You

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