

Lecture 26

# Origins to SOTA of Deep Learning

**Mohammad Sabik Irbaz**

**Data Scientist, Leadbook Pte. Ltd.**

**Former Lead ML Engineer, Omdena & Pioneer Alpha**

**sabikirbaz@iut-dhaka.edu**

**Dokkho Data Science Career Program**

By MasterCourse

# Machine Learning

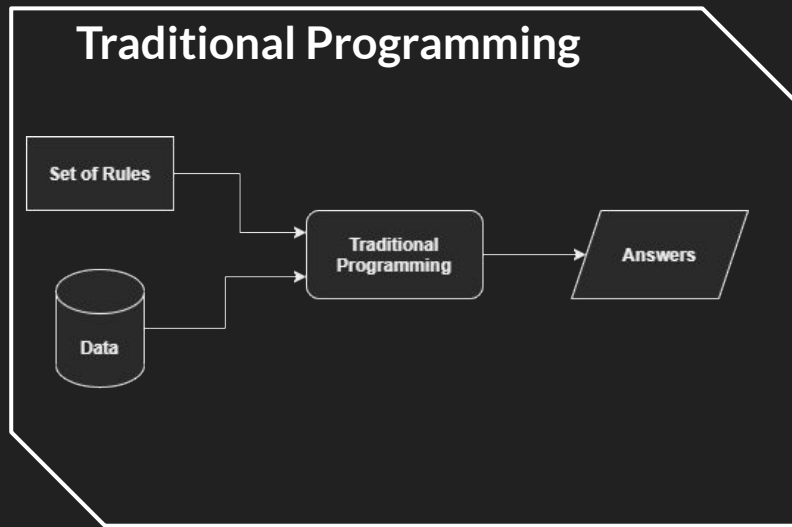
**According to Arthur Samuel, one of the pioneers of AI**

**“Machine Learning is the field of study that gives the computers the ability to learn without being explicitly programmed.” [1959]**

# Machine Learning

According to Arthur Samuel, one of the pioneers of AI

**“Machine Learning is the field of study that gives the computers the ability to learn without being explicitly programmed.” [1959]**

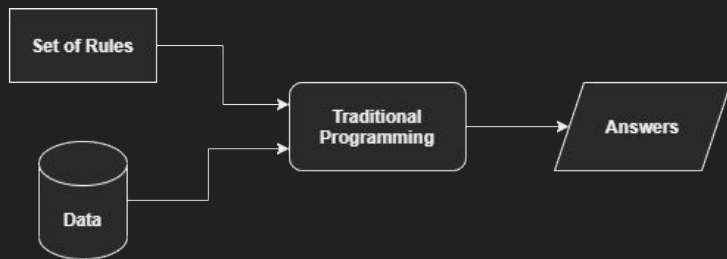


# Machine Learning

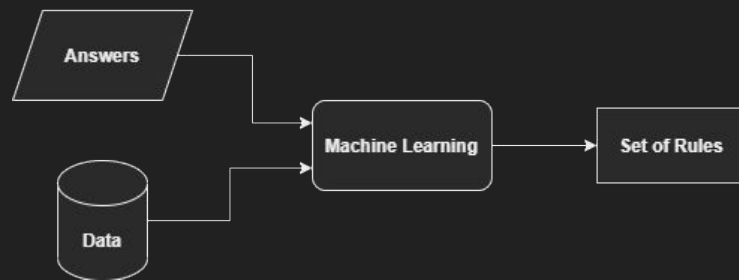
According to Arthur Samuel, one of the pioneers of AI

**“Machine Learning is the field of study that gives the computers the ability to learn without being explicitly programmed.” [1959]**

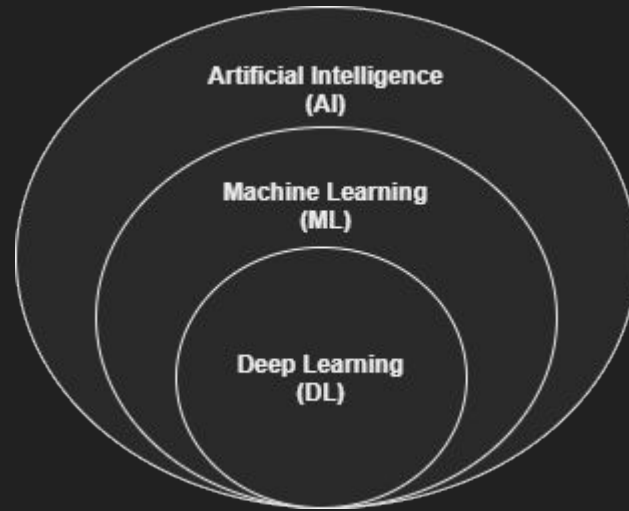
## Traditional Programming



## Machine Learning

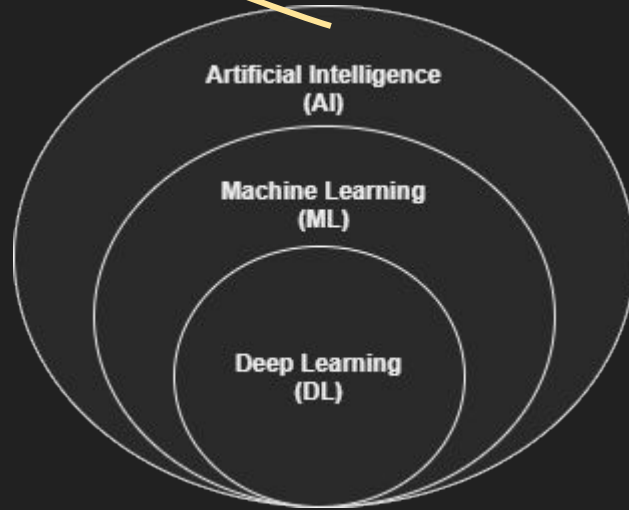


# AI vs ML vs DL



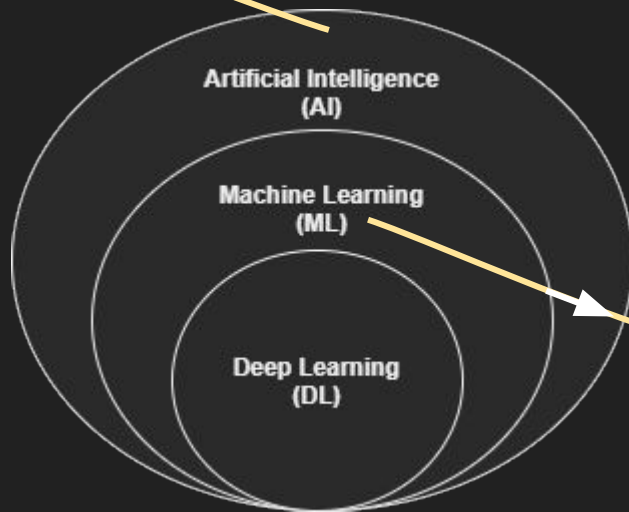
# AI vs ML vs DL

Programs with the  
ability to learn and  
reason like humans



# AI vs ML vs DL

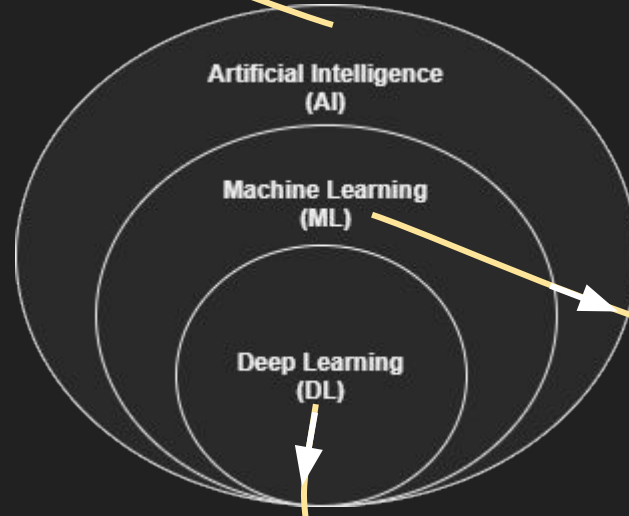
Programs with the ability to learn and reason like humans



Algorithms with the ability to learn without being explicitly programmed

# AI vs ML vs DL

Programs with the ability to learn and reason like humans



Algorithms with the ability to learn without being explicitly programmed

Subset of ML in which Artificial Neural Networks adapt and learn from vast amounts of data



# The Origin

Arthur Samuel from IBM developed a computer program for playing checkers in the 1950s which started to beat good checkers players.

He first came up with the phrase “Machine Learning” in 1952.



Taken from Google Arts and Culture

# The Origin (cont.)

## Perceptron

[1957]

Frank Rosenblatt combined Hebb's brain cell model with Samuel's ML efforts and created the perceptron.

## Nearest Neighbor Algorithm

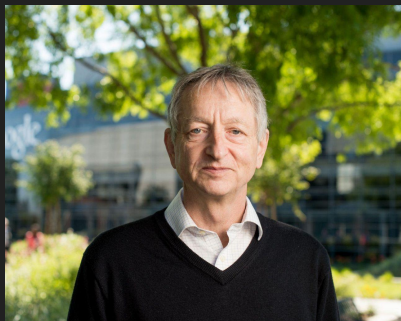
[1967]

The nearest neighbor algorithm was conceived, which was the beginning of basic pattern recognition.

## Multilayer Perceptron

There are many opinions about this. But multilayer perceptron with backpropagation was first popularized by Geoffrey Hinton.

# Four Horsemen of Deep Learning



**Geoffrey Hinton**

invented backpropagation  
won Turing Award 2018

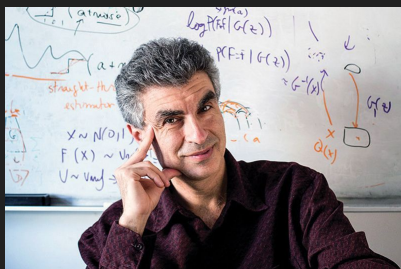
Professor, University of Toronto  
Computer scientist, Google Brain



**Yann Lecun**

invented convolution nets  
won Turing Award 2018

VP and Chief AI Scientist,  
Facebook



**Yoshua Bengio**

highest citation in the world in 2018  
won Turing Award 2018

Co-Chair of the AI Advisory Council,  
government of Canada

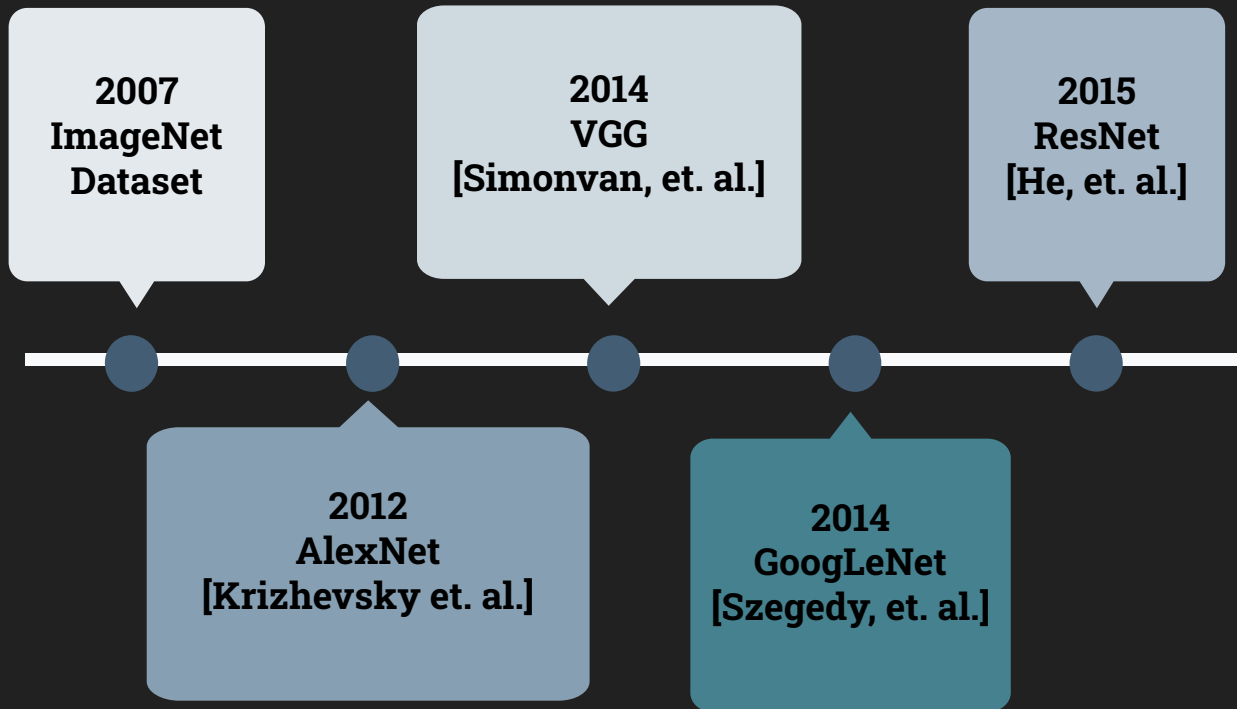


**Jürgen Schmidhuber**

invented LSTM and authored  
many papers on which modern  
NNs are based on

Director, KAUST AI Initiative

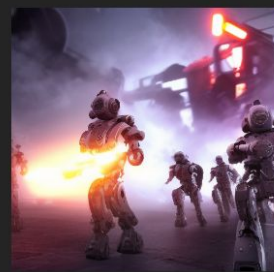
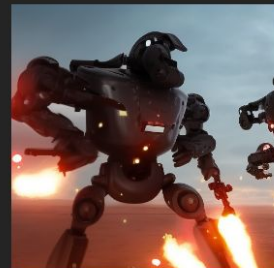
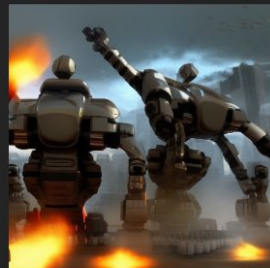
# Computer Vision Revolution [2012 – 2016]



**Let's have a look at what Tom  
Cruise wants to say us.**

<https://twitter.com/mckaywrigley/status/1364972080513515520>

# State of The Art (Stable Diffusion)



Medieval army killing zombies, 4k



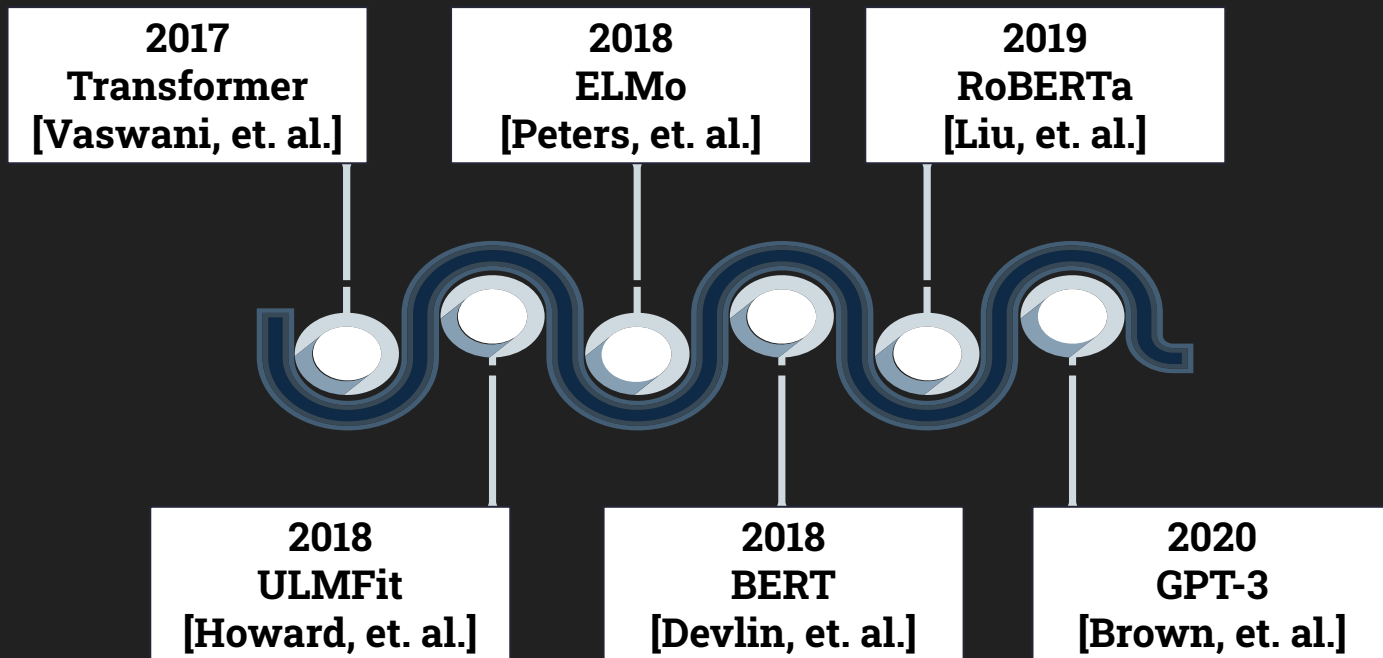
futuristic army fighting the evil robots, 4k



Dream

Play around here: <https://beta.dreamstudio.ai/>

# Natural Language Processing (NLP) Revolution [2017 - ongoing]



# State of The Art (ChatGPT)



Write a short poem on MasterCourse being the best E-learning platform



MasterCourse, the best e-learning platform  
A world of knowledge at your fingertips  
From business to art, a vast array of courses  
You can learn at your own pace, no need to rush

Easy to use, with top-notch instructors  
You'll find all you need to succeed  
So join MasterCourse today, and start learning  
A bright future is waiting, just take the lead



write a short paragraph on evil AI



Evil AI refers to artificial intelligence that is intentionally designed or programmed to cause harm or act malevolently. This concept is often depicted in science fiction and popular media, and while it is not currently a reality, it is important for AI researchers and developers to consider the potential negative consequences of their work and take steps to prevent AI systems from being used for malicious purposes. Some experts also argue that it is important for society to establish ethical guidelines for the development and use of AI, in order to ensure that it is used for the benefit of humanity rather than causing harm.



How to become a data scientist in 10 days



It is not realistic to become a data scientist in 10 days. Becoming a data scientist requires a strong foundation in mathematics, statistics, and programming, as well as a deep understanding of machine learning algorithms and techniques. It also requires significant hands-on experience working with data and using these tools and techniques to solve real-world problems.



How to get fit in 1 month



Getting fit in one month is a challenging but achievable goal. Here are some steps you can take to make the most of your month:

1. Set specific and achievable goals: Decide what you want to achieve in the next month and make sure your goals are realistic and specific. For example, rather than saying "I want to be fit," say "I want to be able to run a mile in under 8 minutes" or "I want to lose 10 pounds."
2. Make a plan: Determine how you will achieve your goals. This might include creating a workout schedule, choosing specific exercises to focus on, or finding a workout buddy to keep you motivated.