

[Overview]

Artificial Intelligence

정상근

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인공지능에 대한 인식

왜 지금 인공지능인가?

인공지능에 접근하는 방법

인공지능의 주요 기술

인공지능 : 표현, 해결, 적용

인공지능에 대한 인식

[Question]

Artificial Intelligence?

AI related images from Web (Google Image Search)



How artificial intelligence is changing development...
surveycto.com



Why We Need to Fine-Tune Our Def...
singularityhub.com



Artificial Intelligence - Telenor Group
telenor.com



The Proliferation of Artificial Intellige...
vlab.org



Is Artificial Intelligence real or is it just an hype of this decade??
towardsdatascience.com

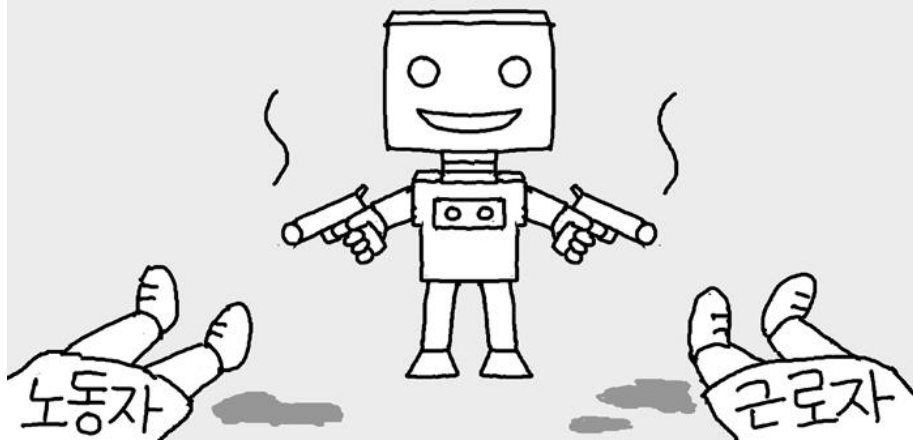


Benefits & Risks of Artificial Intelligence - Futu...
futureoflife.org



Why 'Fail Fast' Is a Disaster When It Comes to Artificial Intelli...
entrepreneur.com

AI from News



“인간이 AI 보다 잘하는 것”, 2019.02.28, 조선일보

http://news.chosun.com/site/data/html_dir/2019/02/28/2019022800180.html



“인공지능 진화...인간 일자리 사라지나?”, 2016.03.10, YTN

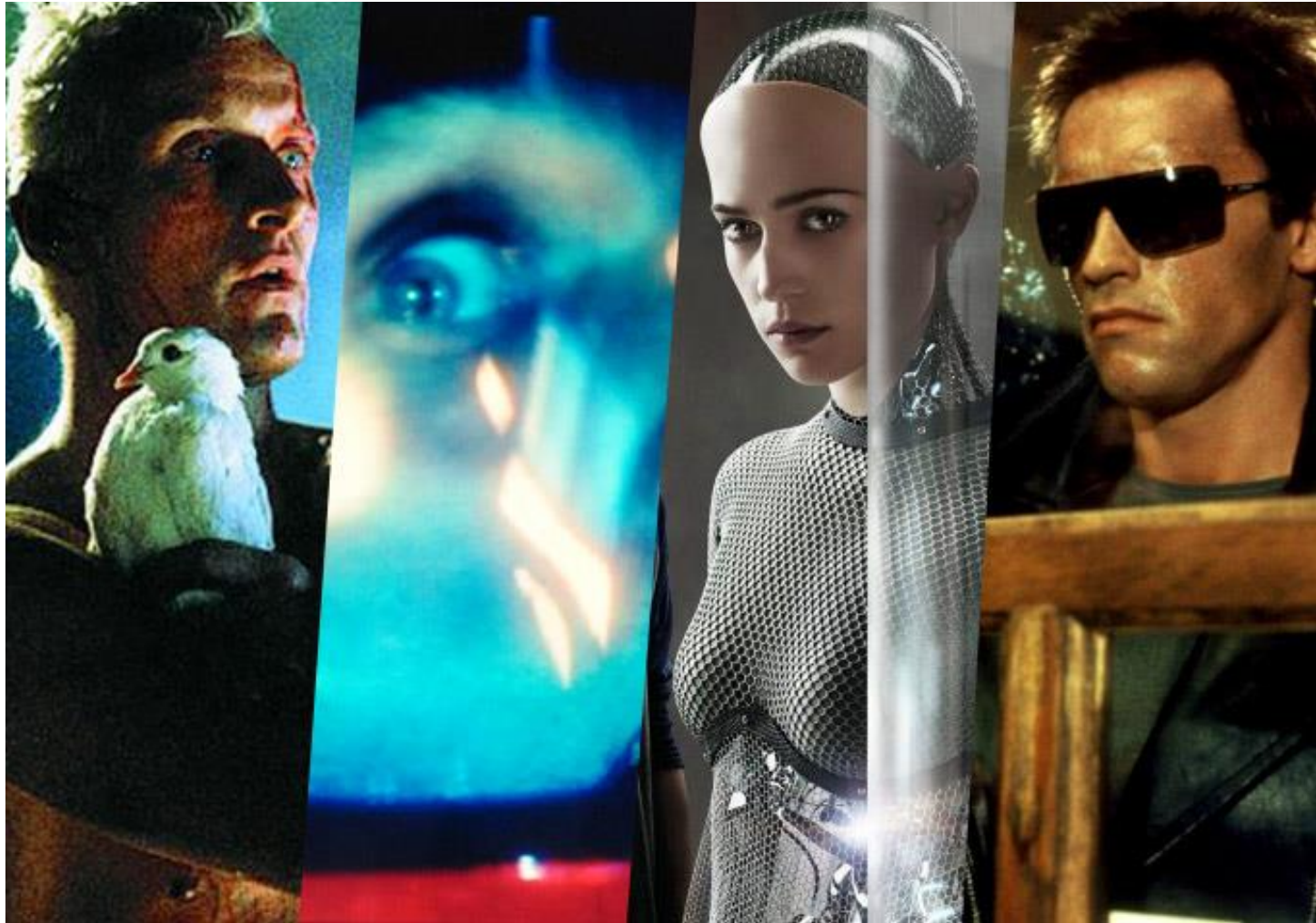
<https://www.youtube.com/watch?v=YCt-9VHDOqA>



“인간 vs AI, 이번엔 스타크래프트 ”, 2017.11.10, etnews

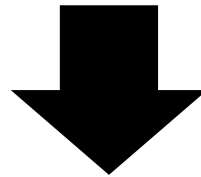
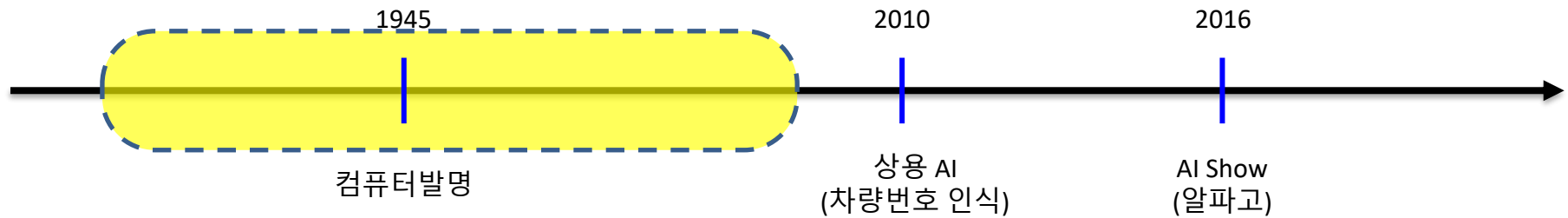
<http://ciobiz.co.kr/news/article.html?id=201□1108120030>

AI from movies



<https://theplaylist.net/10-essential-movies-about-artificial-intelligence-20150409/>

너무 오랫동안 (실체 없는) AI 에 대해 들어옴



AI Fantasy & Stereotype

사람보다 똑똑함

사람 대체

그냥 알아서 잘함

4차 산업혁명

신기술

왜 지금 인공지능인가?

[Let's take a break]

우리는 어디쯤 서 있을까?

2 Stories

Data Explosion

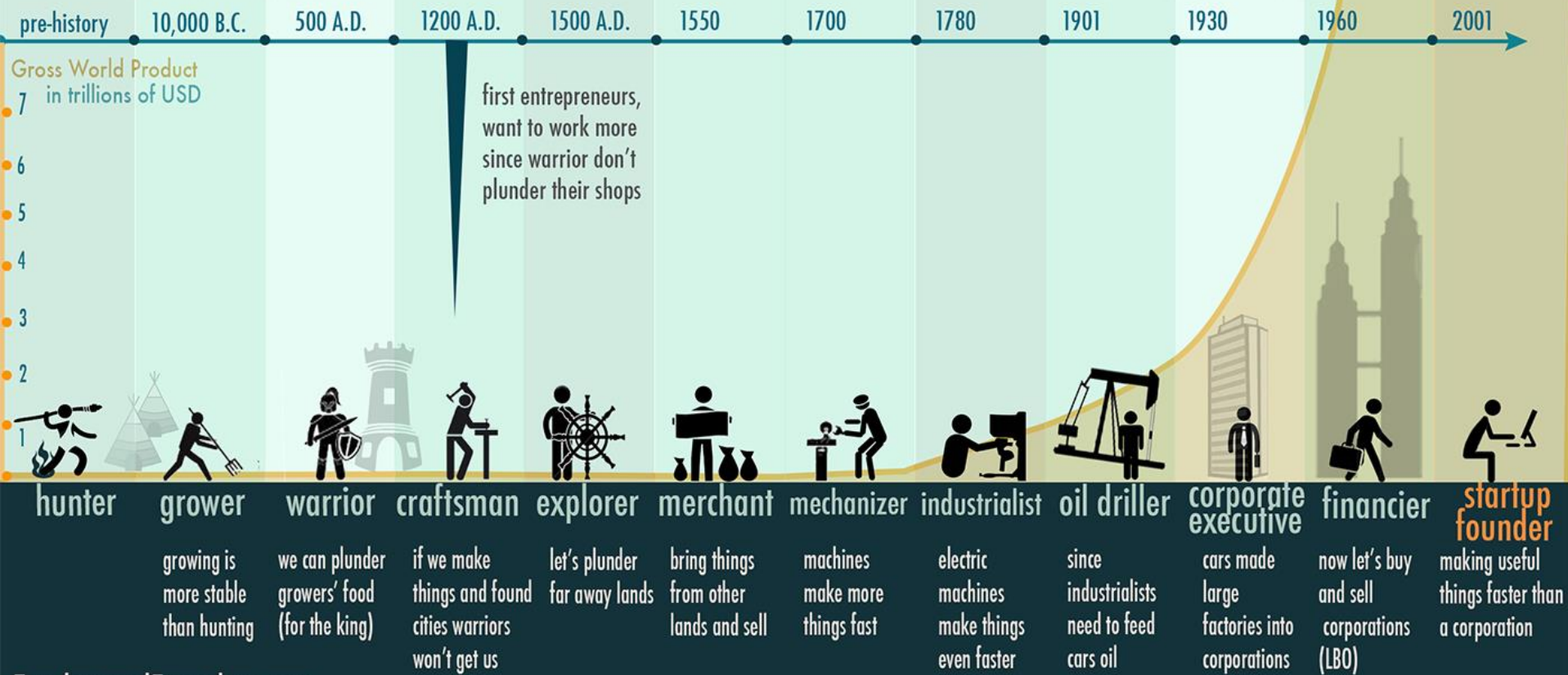
Representation Shift

THE HISTORY OF OPPORTUNITY

by Anna Vital

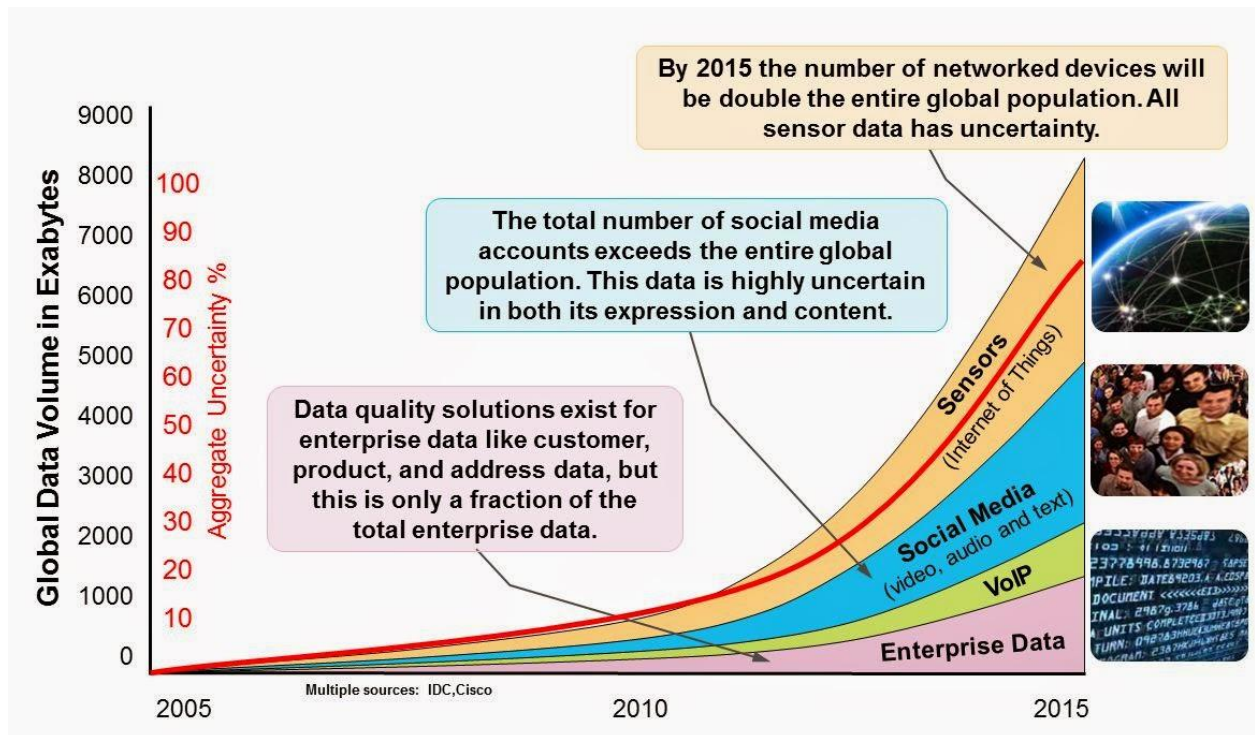
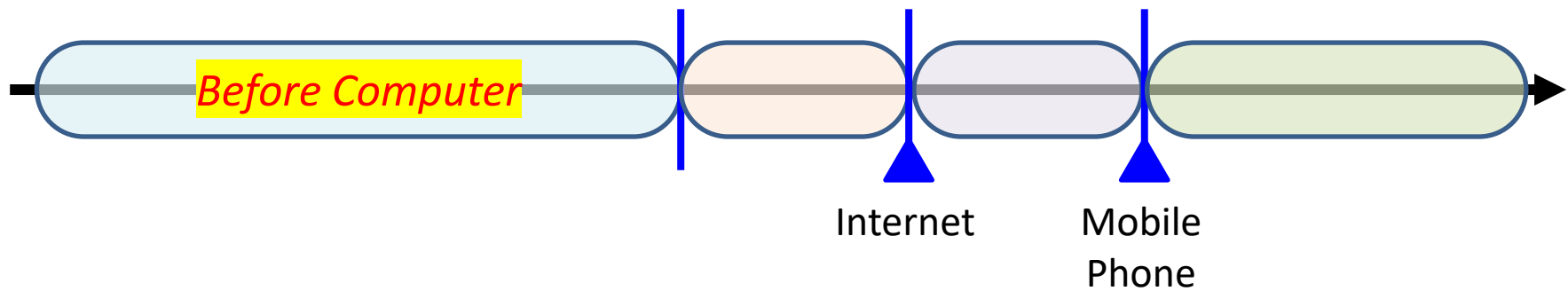
How Humans Created Value and Made Money

in 2012
Gross World Product
\$71 trillion



FundersandFounders.com

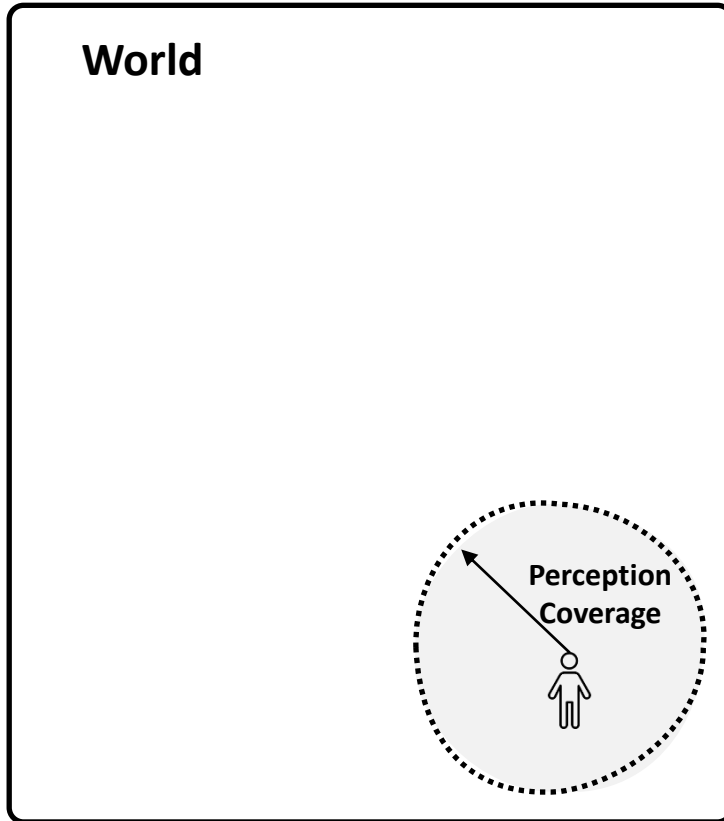
Data Explosion (1)



Source: IBM Global Data Growth

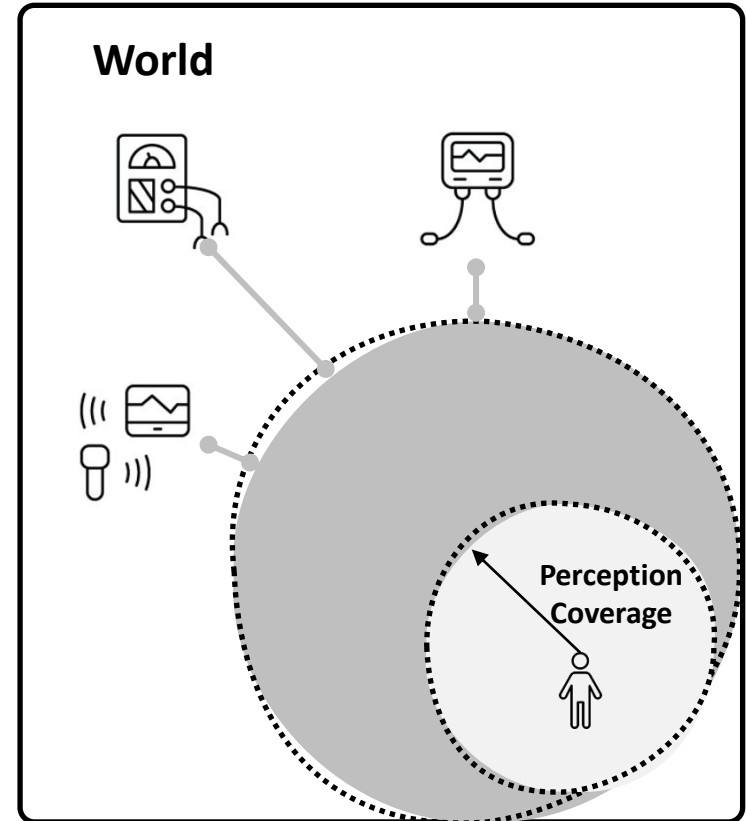
Data Explosion (2)

Past



- Sense very limited time and space

Modern



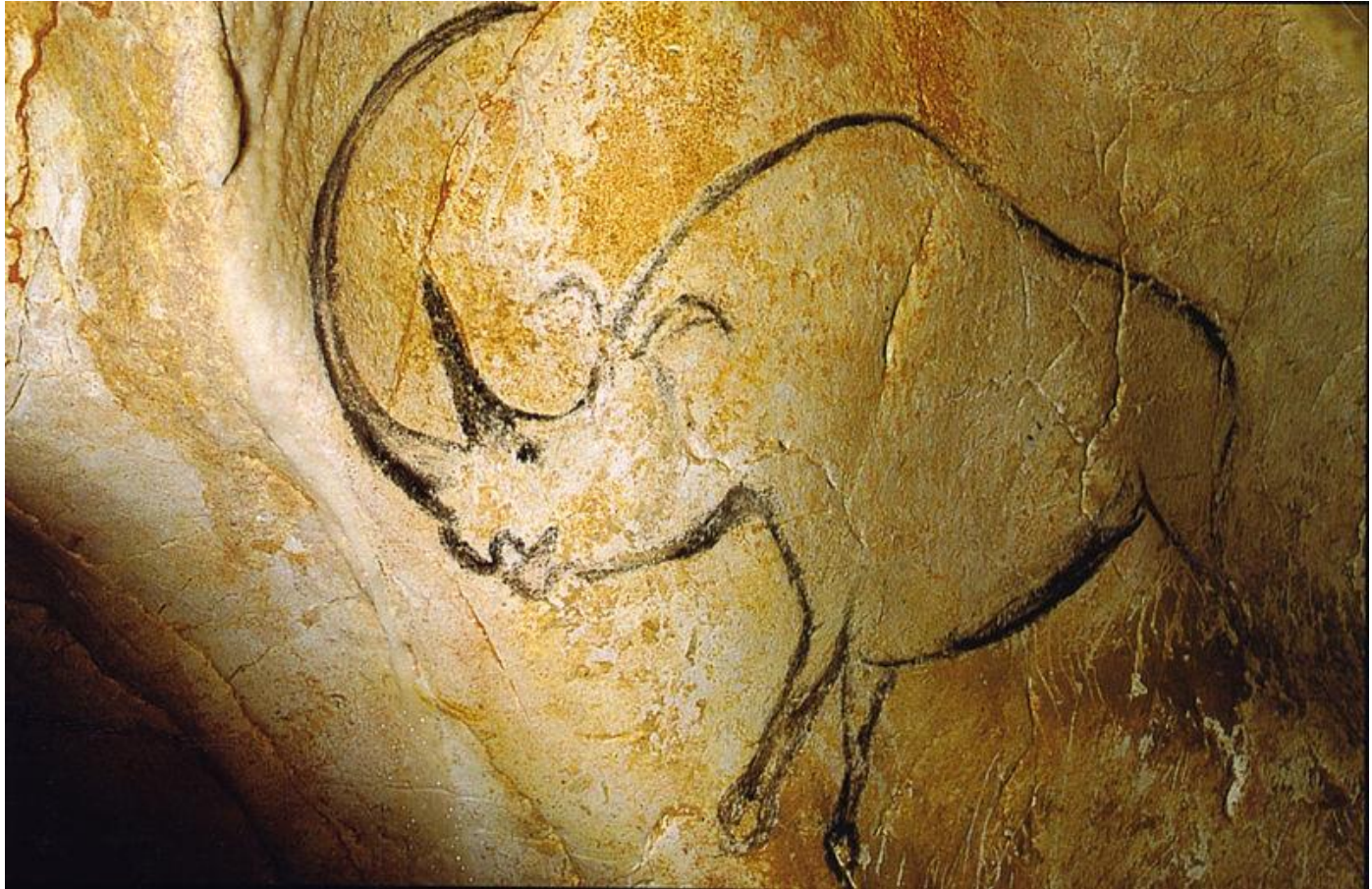
- (Indirectly) Sense large space and time

Image : <https://creativemarket.com/adnen.kadri/2413448-15-Sensor-Icons>

Human Evolution History



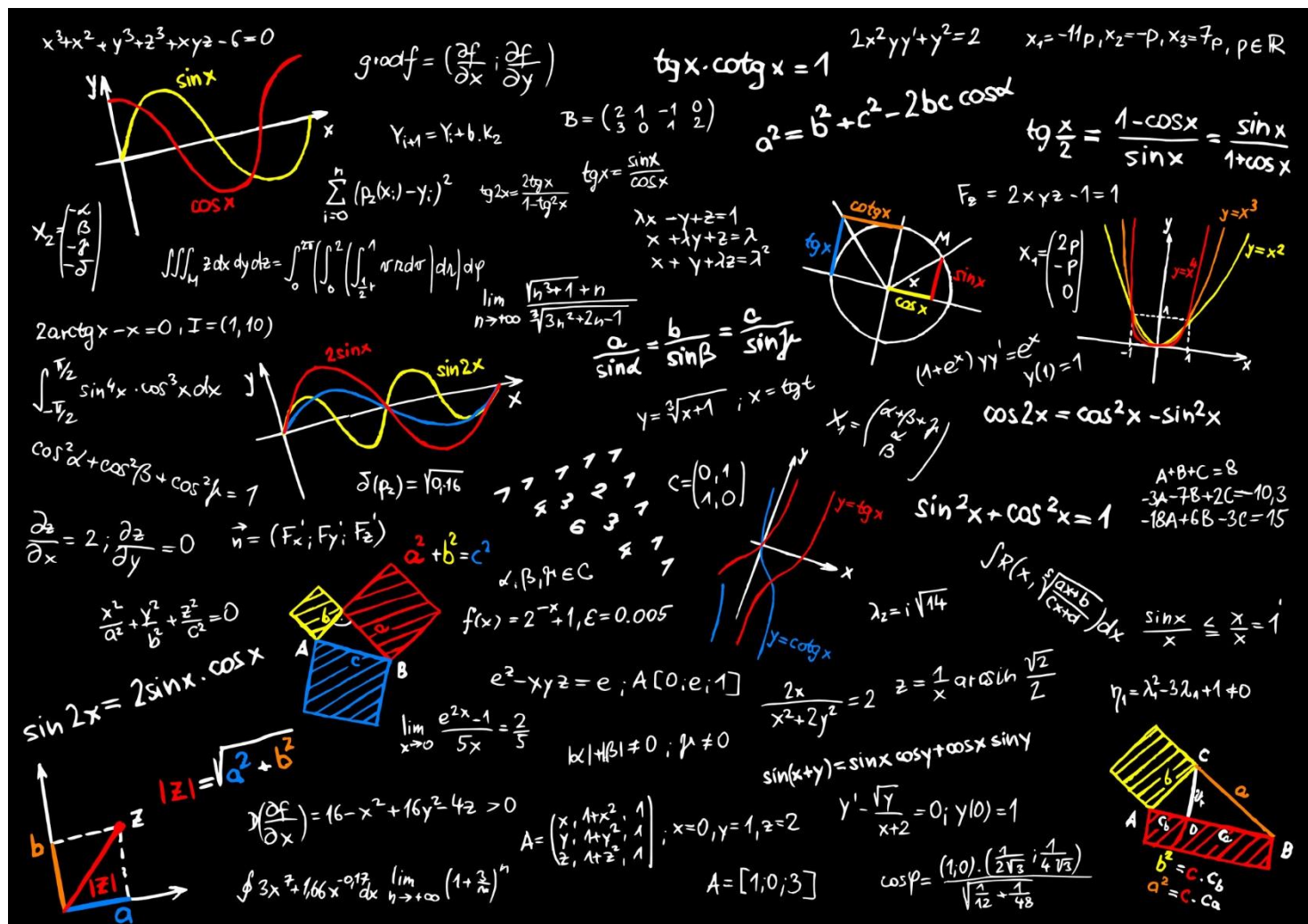
Symbol Evolution History

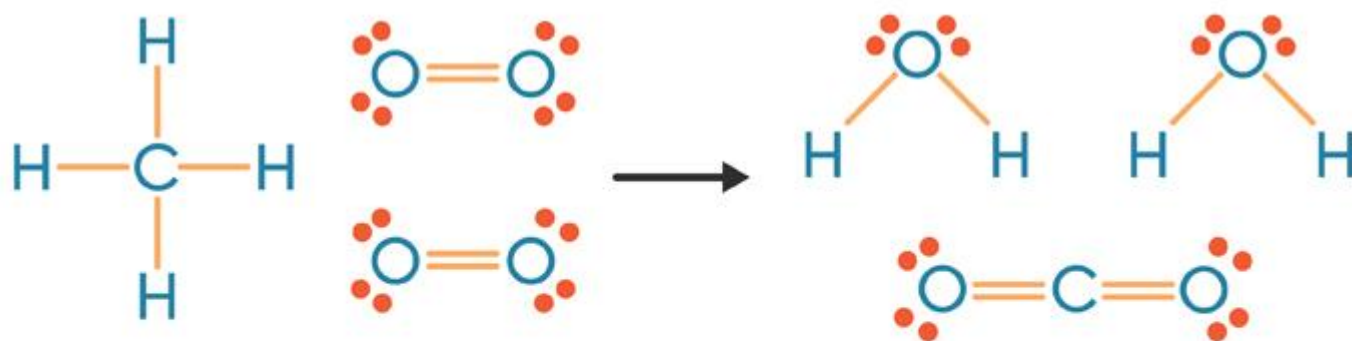


Cave art evolved in Europe 40,000 years ago. Archaeologists reasoned the art was a sign that humans could use symbols to represent their world and themselves.
(Courtesy of [Wikimedia Commons](#))



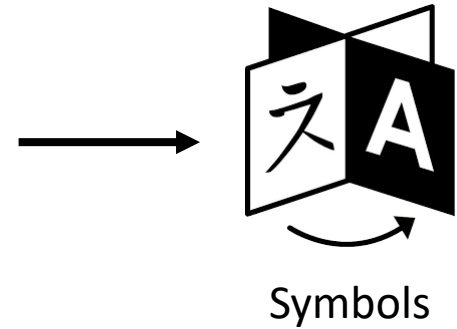








Representation
the Real World



Human cannot manage data anymore.

Why?

- ① Old data representation is for human to read
→ **Impossible**
- ② Old data representation is for managing data separately. → **need to integrate**

데이터 기반

- 상황 파악
- 의사결정

인공지능에의 접근

We are not ready to realize the AI fantasy

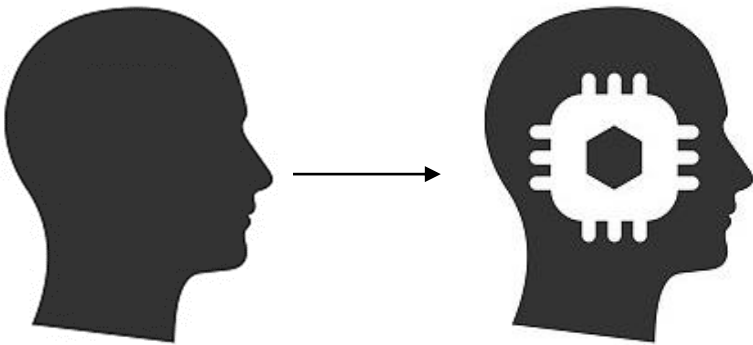


- **Problem Definition**
: We cannot even define what human can do
- **Data Definition and Collection**
: Data is the fuel of AI
- **Understanding AI**
: without fantasy

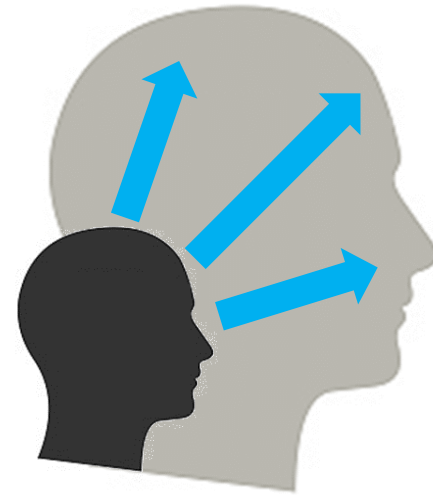
Big Picture

Artificial Intelligence

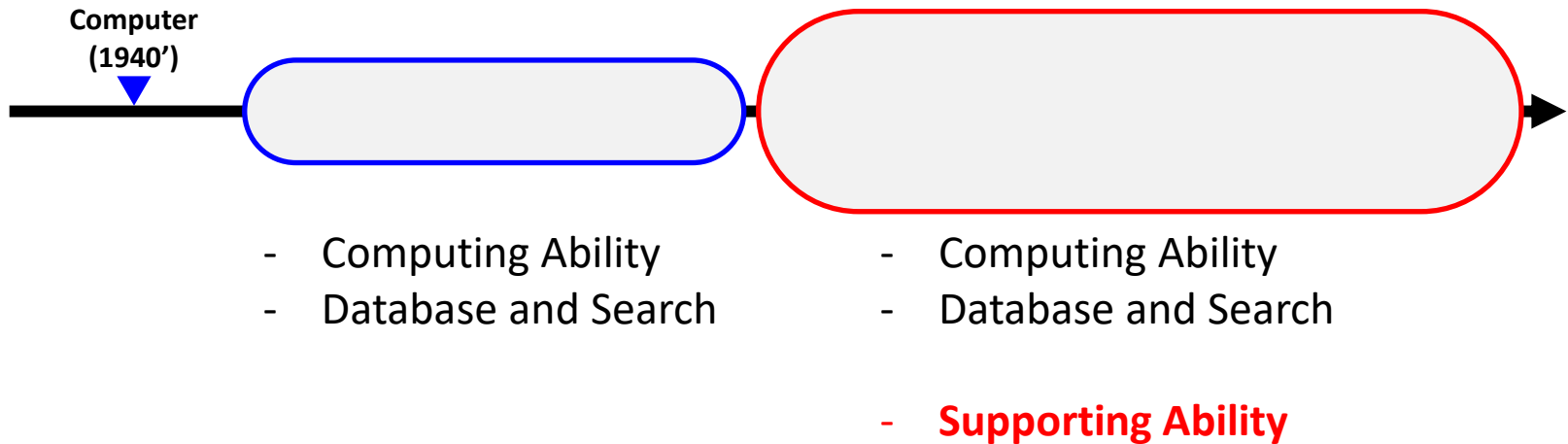
Implement Human Intelligence



Computing Assistant



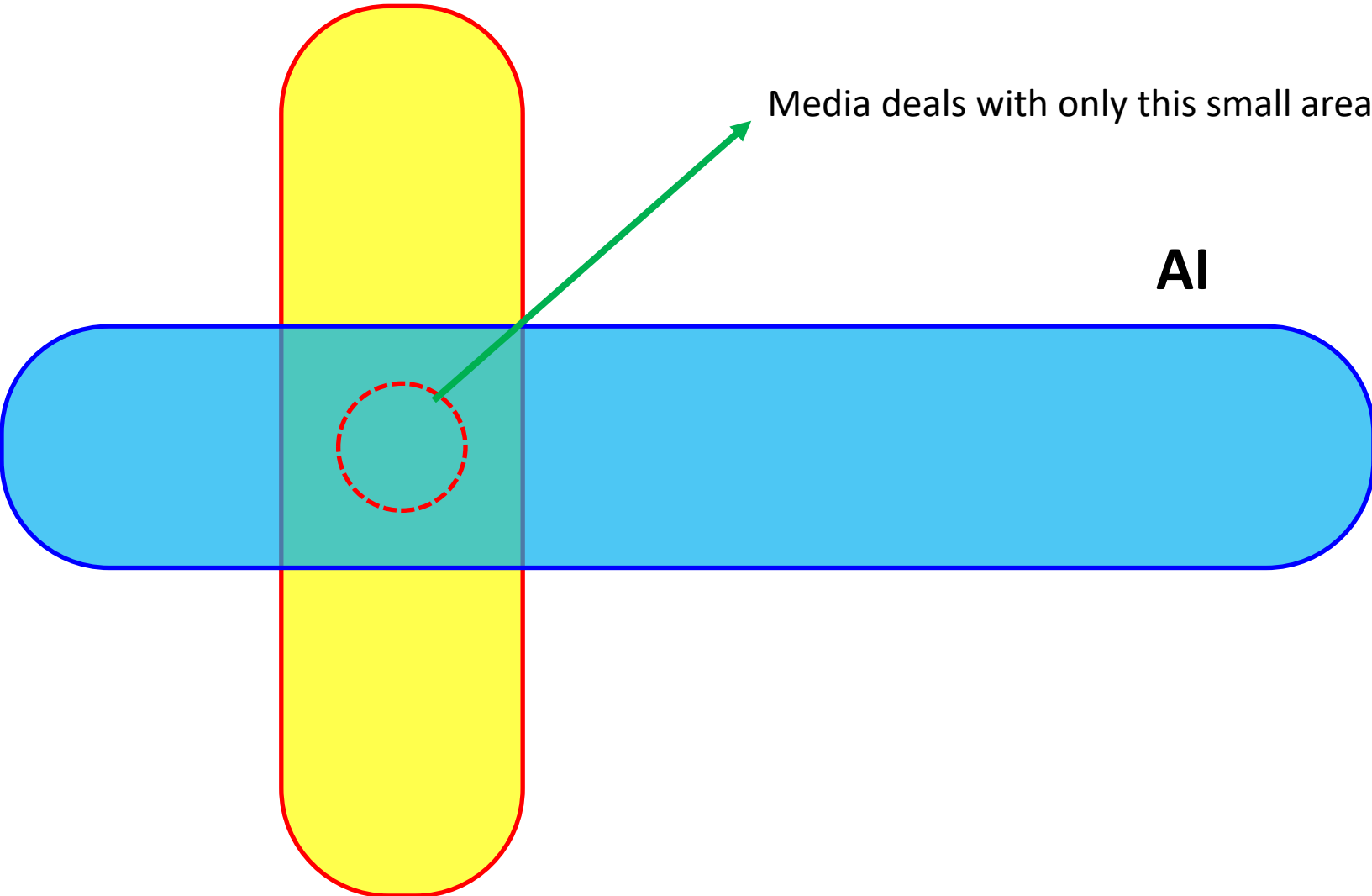
Human and Computer



:: 과거에는 컴퓨터의 고속 연산 및 저장/검색 기능을 주로 활용했다면,
:: 미래에는 인간을 지원해주는 기능으로 더 많은 역할을 할 것이다.

AI Scope

Human



Media deals with only this small area

AI

AI = Problem Solver

AI = Tool

Artificial Intelligence



Coffee Distillation

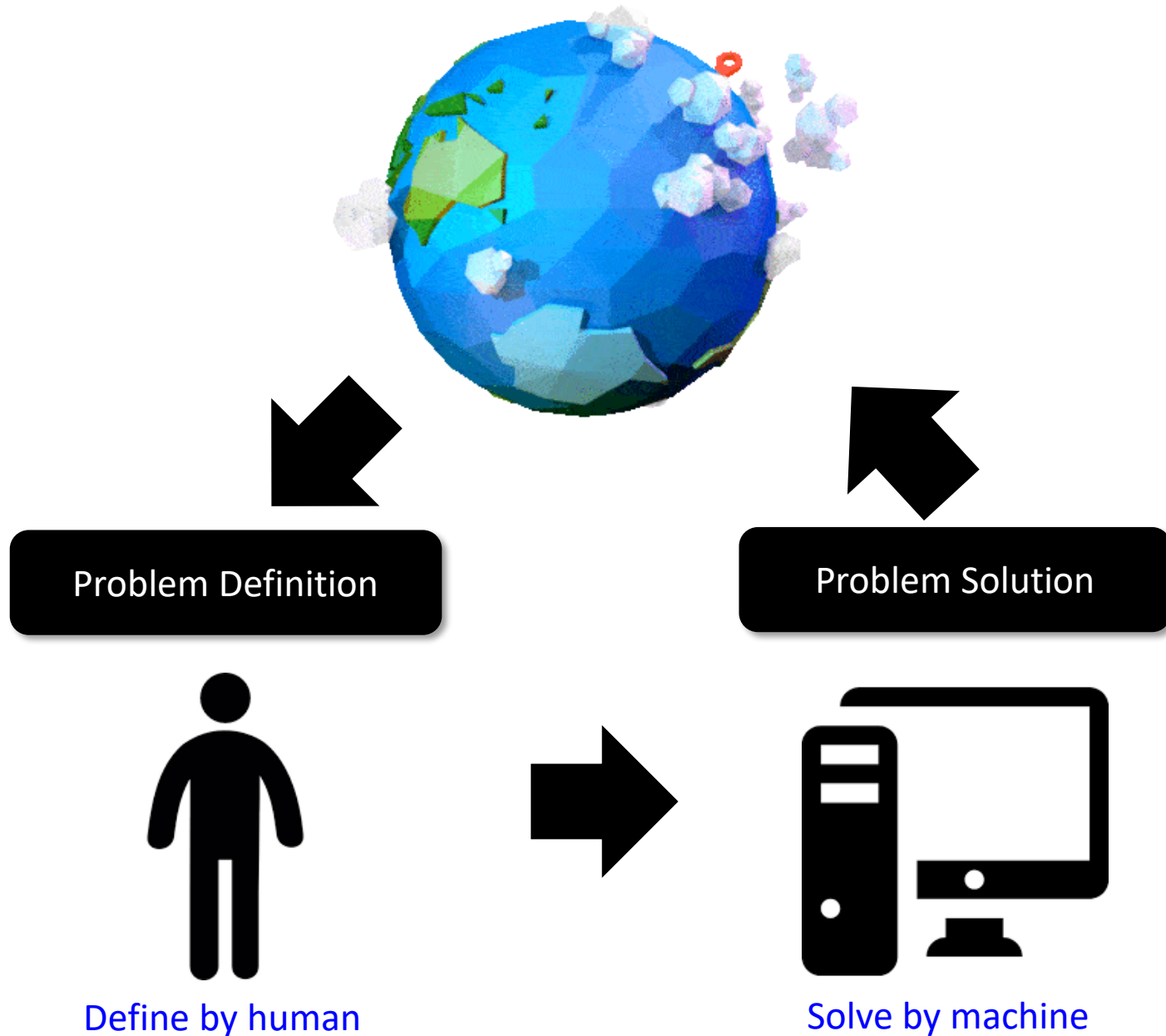
https://ae01.alicdn.com/kf/H2a31e46dbbdc4211b1d5987e21cb40f8C/Gold-Royal-Coffee-Machine-Drip-Type-Manual-Coffee-Maker-Machine-Siphon-Distillation-Coffee-Pot-Make-Coffee.jpg_350x350.jpg



Cooking

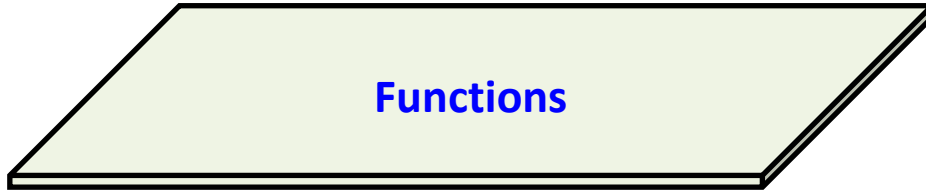
https://prod-olivewellness.s3.amazonaws.com/uploads/2017/11/shutterstock_479481286.png

Problem Definition & Solution



인공지능기술의 종류

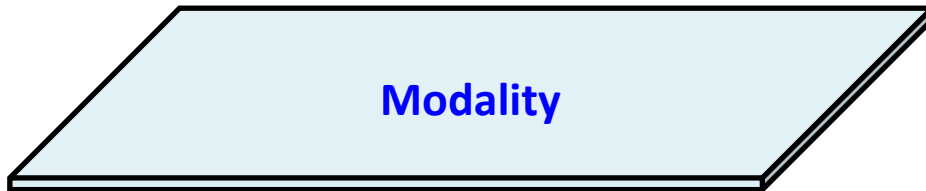
Artificial Intelligence Perspectives



실세계에서의 기능



구현을 위한 접근방법



다루는 데이터 형태

Functions in the Real World

인과관계분석

분류

계획하기

탐색하기

가까운 것 찾기

세상을 표현하기

Intelligence Functions and corresponding techniques

인과관계분석

- Bayesian Network
- Logic
- Probabilistic Approach

분류

- Linear Regression
- Support Vector Machine

계획하기

- Markov Decision Process
- Reinforcement Learning

탐색하기

- Tree Search
- Dynamic Programming
- Uniform cost search
- Beam Search
- A* Search

가까운 것 찾기

- Distance Metric
- Nearest Neighbors
- Clustering

세상을 표현하기

- Logic
- Neural Network
- Representation Learning

Big Picture



Perception

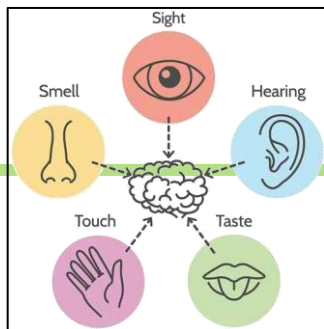
지능 + 행동

Application

Intelligence - Process



[Real World]



[Senses]



[Brain]



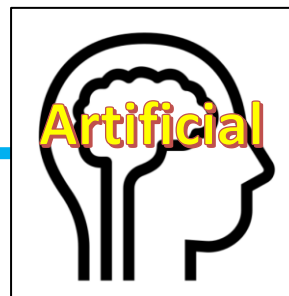
[Intelligence]



[Real World]



[Sensors]



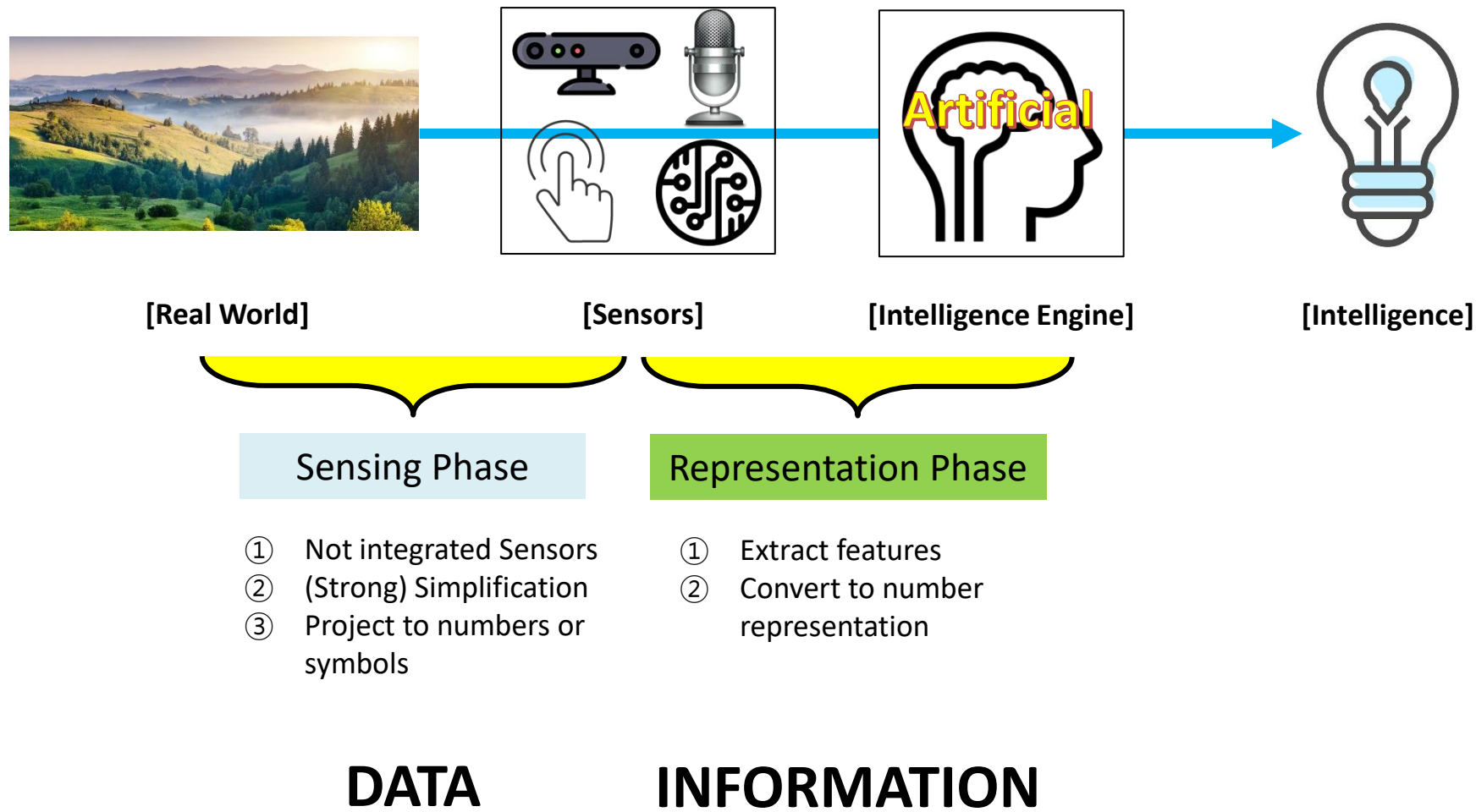
[Intelligence Engine]



[Intelligence]

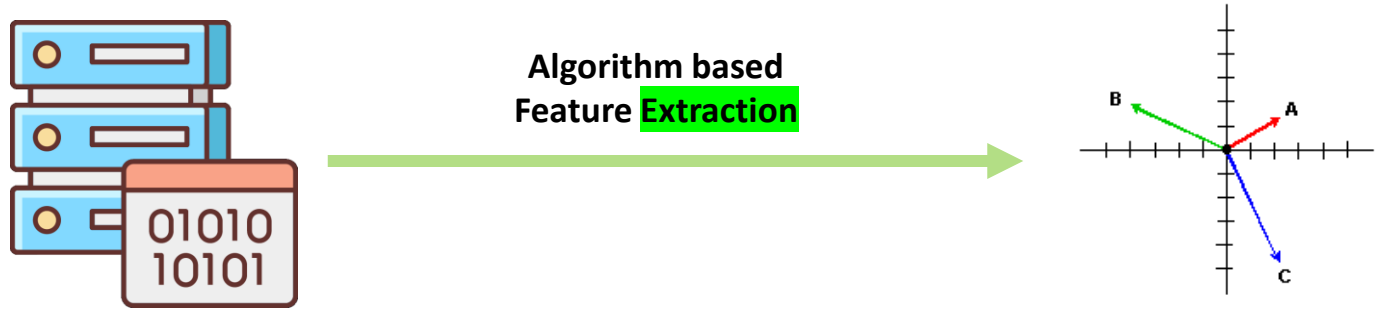
Image : <https://marcus-jackson.com/2018/07/31/the-five-senses-and-the-first-day-of-school/>
Image : <https://icons8.com/icon/uxYsijalErJ/head-with-brain>
Image : https://www.flaticon.com/free-icon/motion-sensor_327804
Image : <https://docs.unity3d.com/Manual/class-Microphone.html>
Image : <https://www.ti.com/ko-kr/microcontrollers/msp430-ultra-low-power-mcus/capacitive-sensing-mcus-overview.html>
Image : https://www.flaticon.com/free-icon/bio-sensor_1452233

In detail,



Data to Information Process

Human Insight Driven



Data & Task Driven

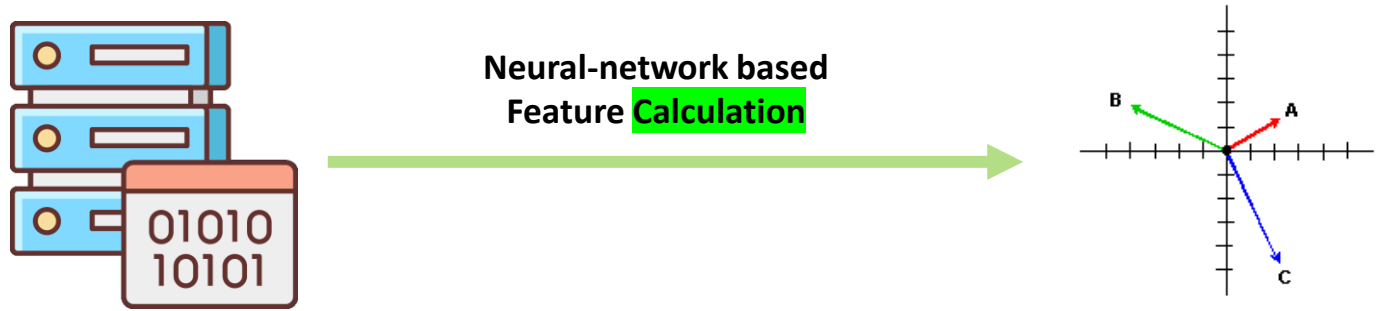


Image : https://www.flaticon.com/free-icon/master-data_1493691
Image : <https://whatis.techtarget.com/definition/vector>

인공지능 : 표현, 해결, 적용

[Real World]

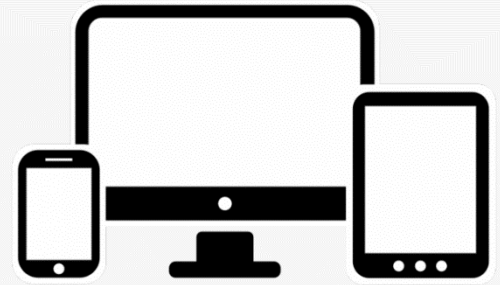


Representation
(표현)



Application
(적용)

[Computing World]



Problem Solving
(해결)

[Real World]



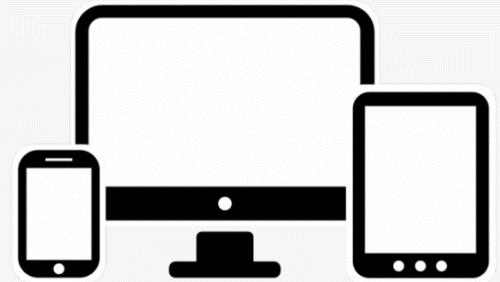
Representation
(표현)



Application
(적용)

TOOL = AI

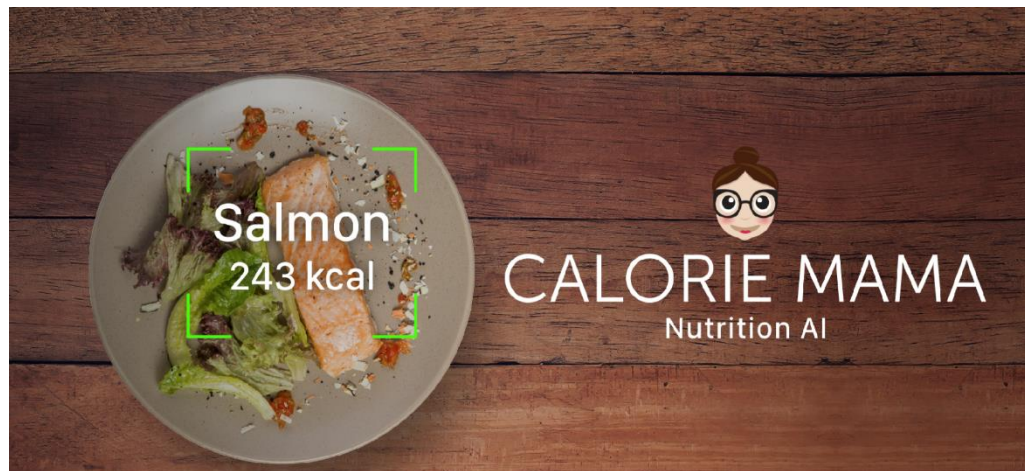
[Computing World]



Problem Solving
(해결)

TOOL = AI

예) 음식 칼로리 계산 인공지능



Data Collection

Representation

Problem Solving

Application

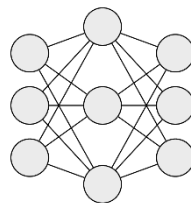
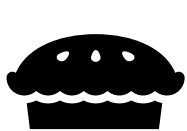


Image source : <https://thespoon.tech/samsung-adds-food-image-recognition-to-bixby-through-calorie-mama-api/>

Image source : https://www.math.purdue.edu/~nwinovic/deep_learning_optimization.html