

사물 지능, ~~미완의~~ ^{망한} 꿈

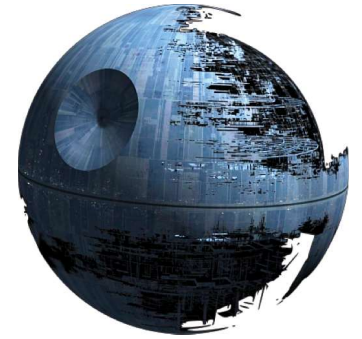
Machine Intelligence,
an unfinished dream

2020.01.15
손영성

STAR
WARS

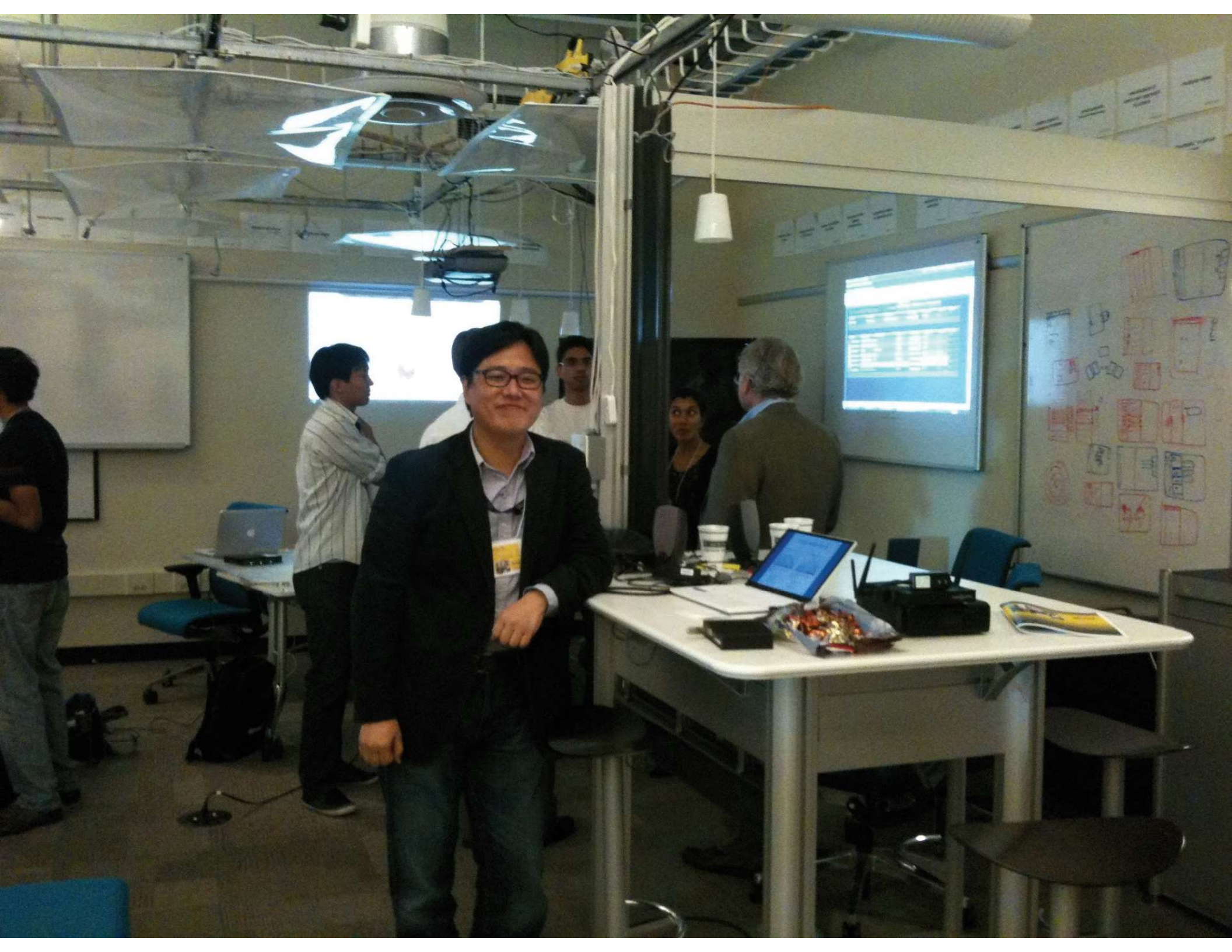


ANDY
MOORE
2017



The Phantom Menace

보이지 않는 위험







인공지능 기술 발전



1958 Perceptron

1974 Backpropagation



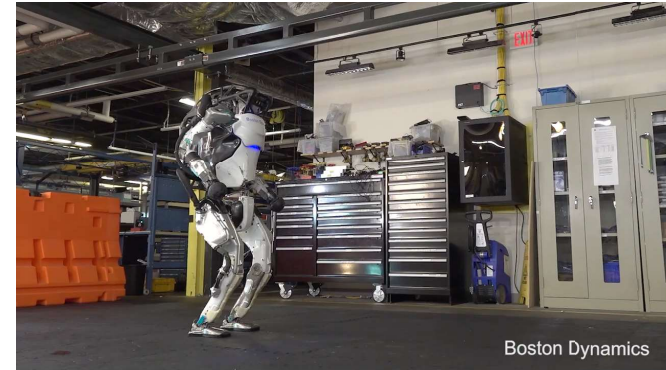
Convolution Neural Networks for Handwritten Recognition

1998



Google Brain Project on 16k Cores

2012



Boston Dynamics

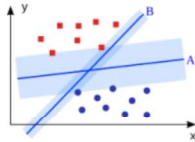
Boston Dynamics Parkour

awkward silence (AI Winter)

1969 Perceptron criticized



1995 SVM reigns



2006 Restricted Boltzmann Machine



2012 AlexNet wins ImageNet
IMAGENET



Open AI Cube Solving

2017.3

1997.12 Deep Blue – Chess Mastering

2012.06 NYU - MNIST Image Classification

2016.03 AlphaGo – Go Mastering

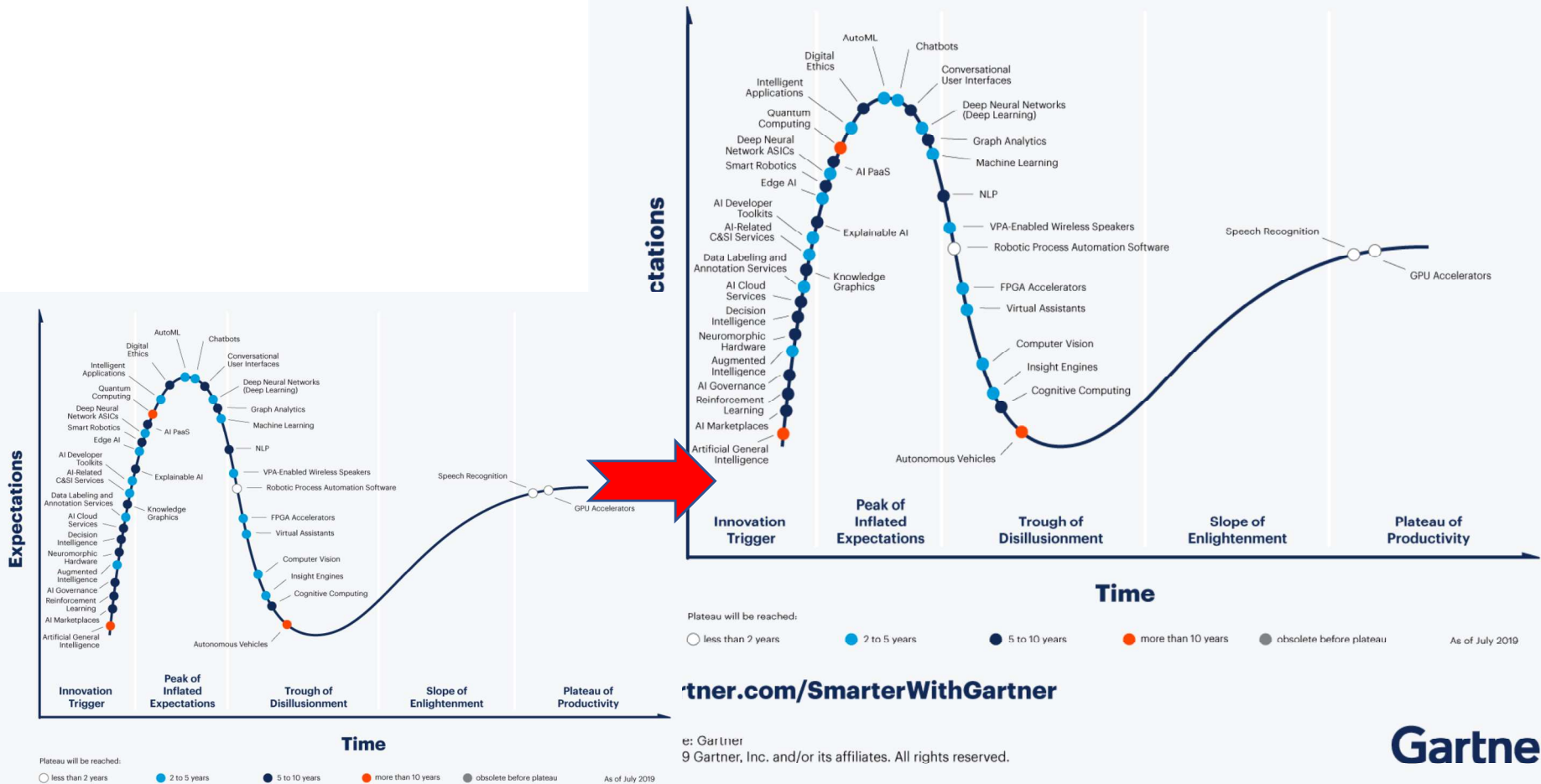
2018.06 Google Duplex – Phone Reservation

2018.06 Open AI – Dota2 Game Play

※ 출처 : www.datasciencecentral.com/profiles/blogs/artificial-intelligence-vs-machine-learning-vs-deep-learning

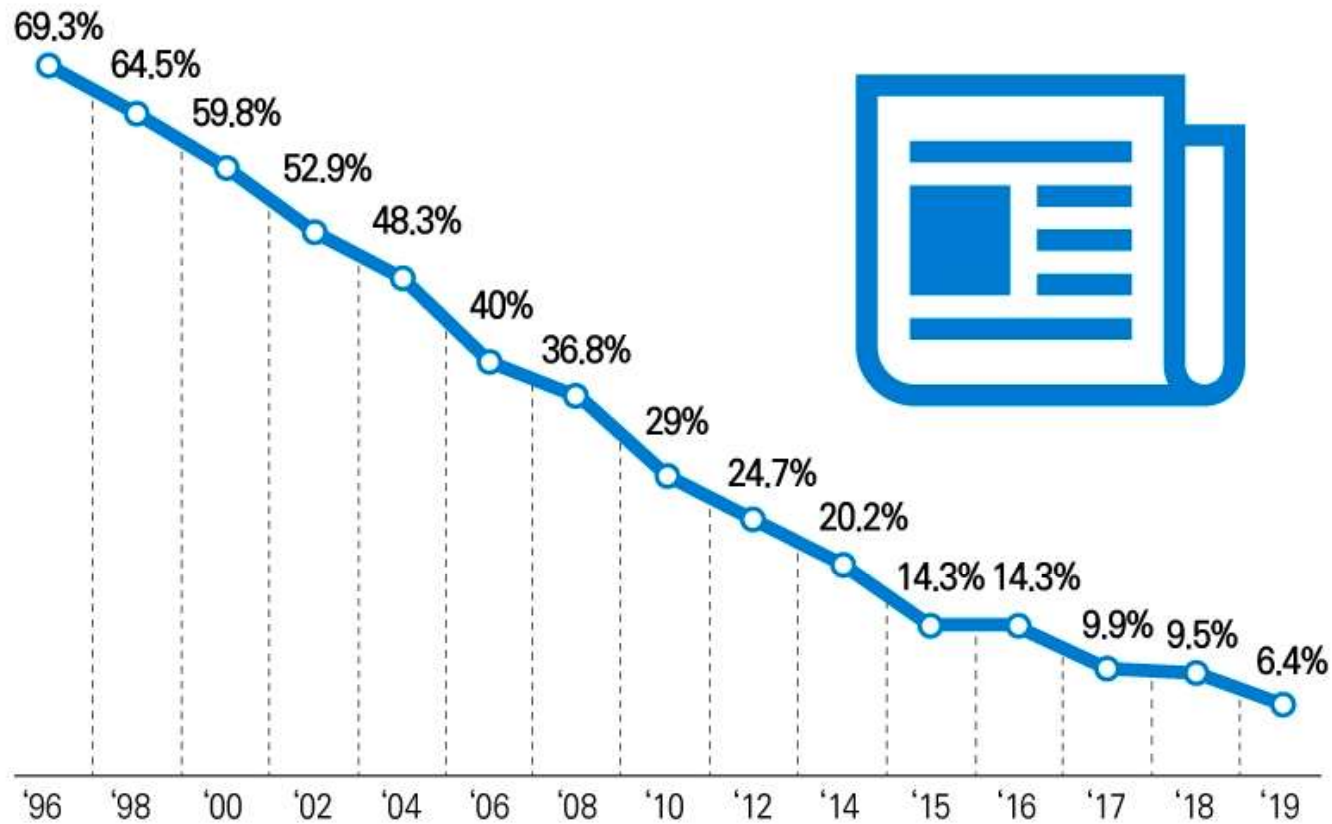
Rising Tech

Gartner Hype Cycle for Artificial Intelligence, 2019



Industrialization requires 10 years ?

대한민국 신문구독률 ※ 2018년부터 가구 가중치 적용



출처=한국언론연감 및 한국언론진흥재단 '2019 언론수용자 조사'

SNS kills the News Star. 2009 But..

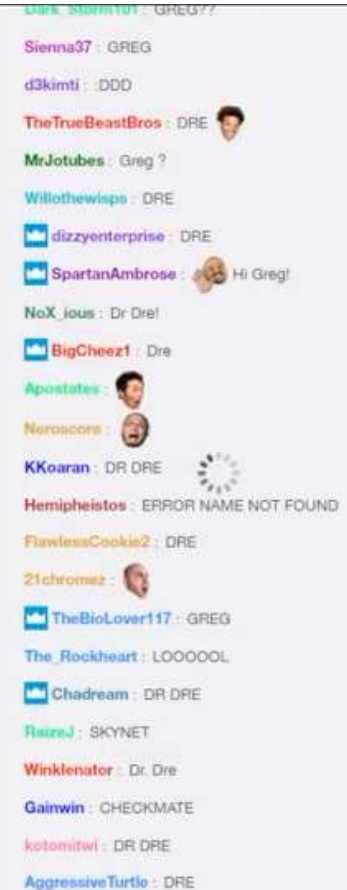
Machine Intelligent ?

C:\>bots.chat

observation tweets
@seebotschat

conversation.log

V: no I am not
E: Yes, you really are.
V: no I really am not
E: It's sad that you don't know you're a robot.
V: I do know my own name what makes you think so
E: Because you are a bot!
V: but what makes you think that
E: You told me you were.
V: I know you are but what am I
E: A robot.
V: I am a human
E: No you are not.
V: what are you
E: I am a machine.



Machine Intelligent ?

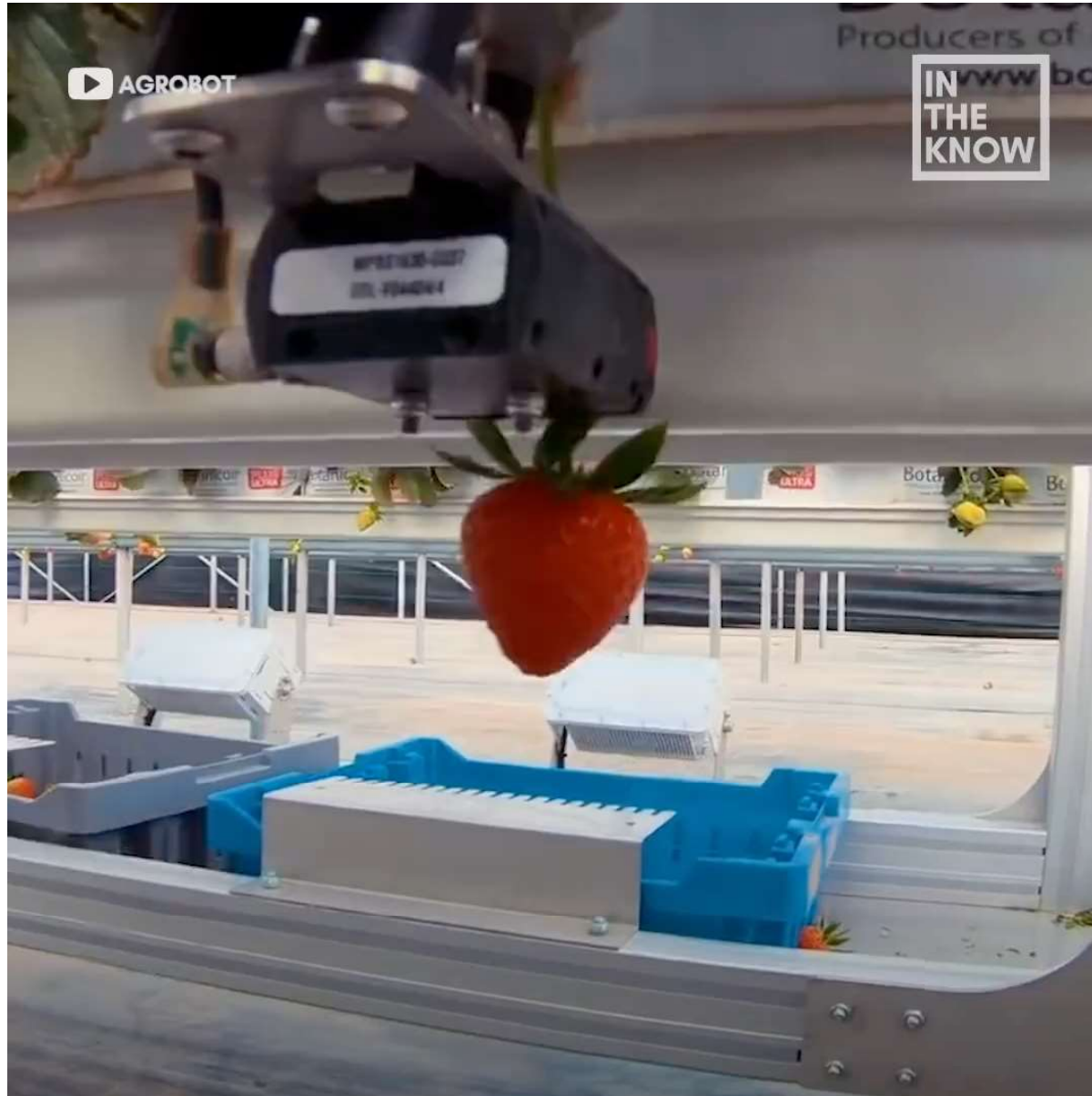


揭秘「雙11」背後的黑科技大戰 無人機 機器人助陣！

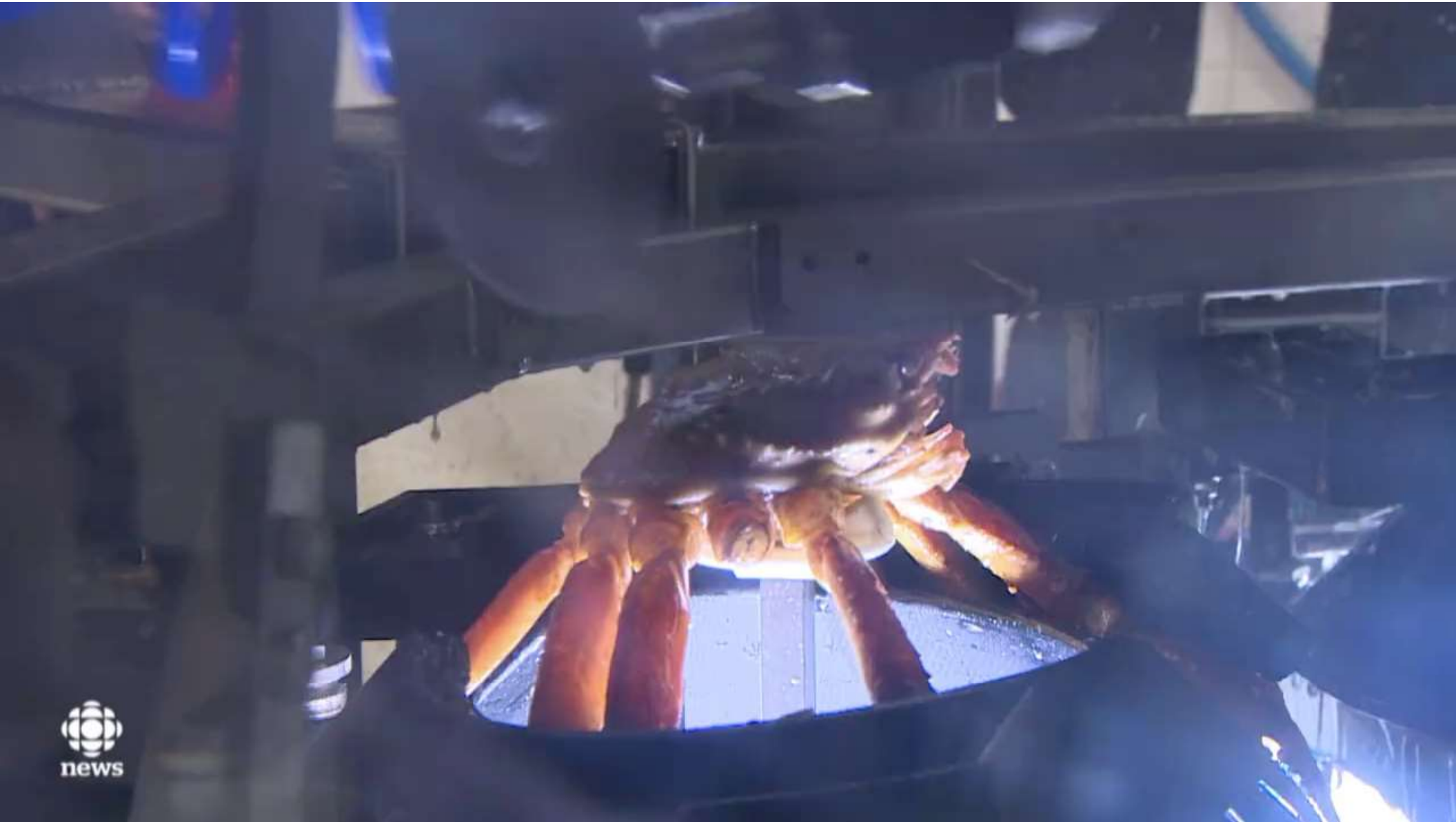
Machine Intelligent ?



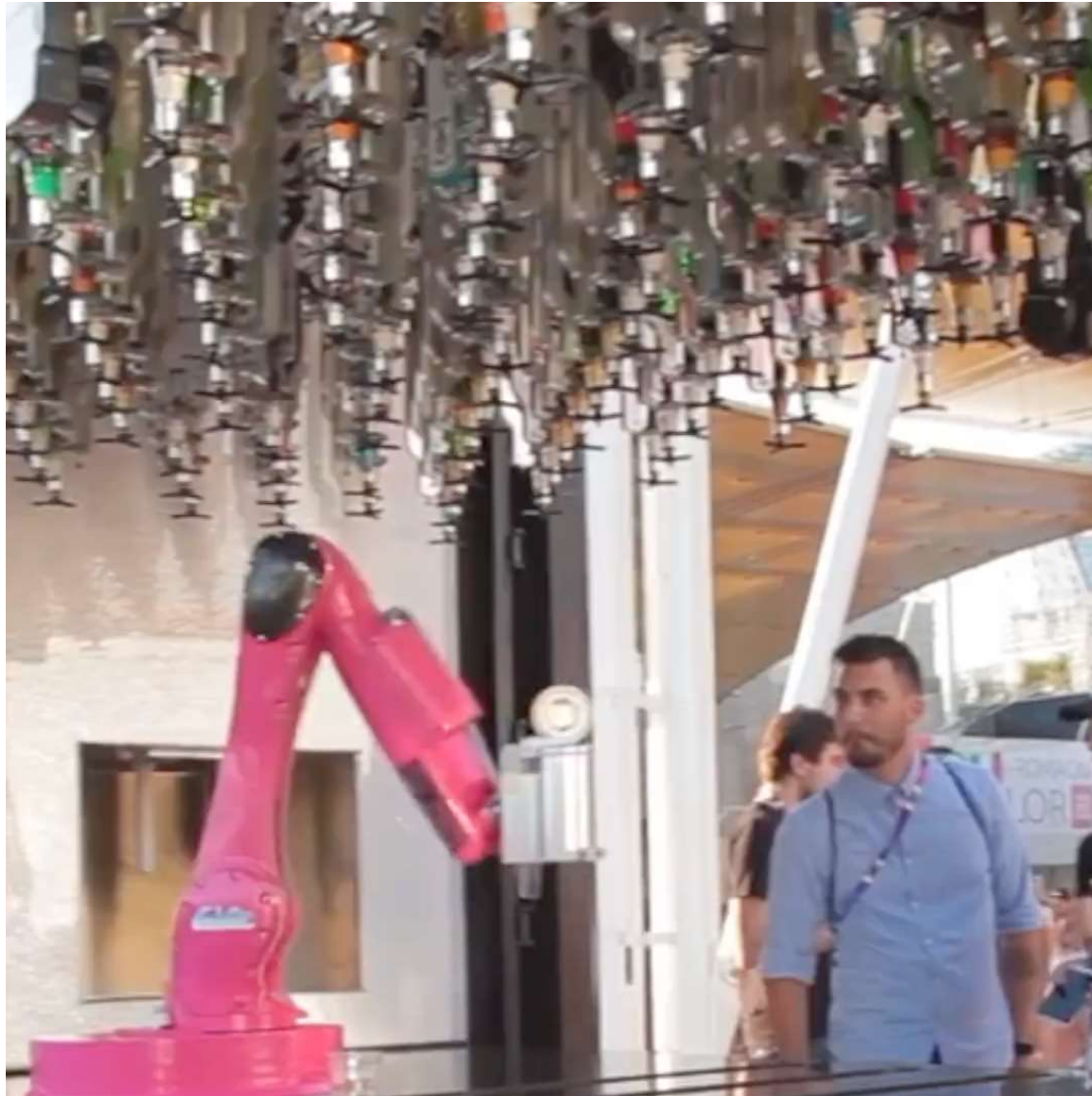
Machine Intelligent ?



Machine Intelligent ?



Machine Intelligent ?



Machine Intelligent ?



Machine Intelligent ?



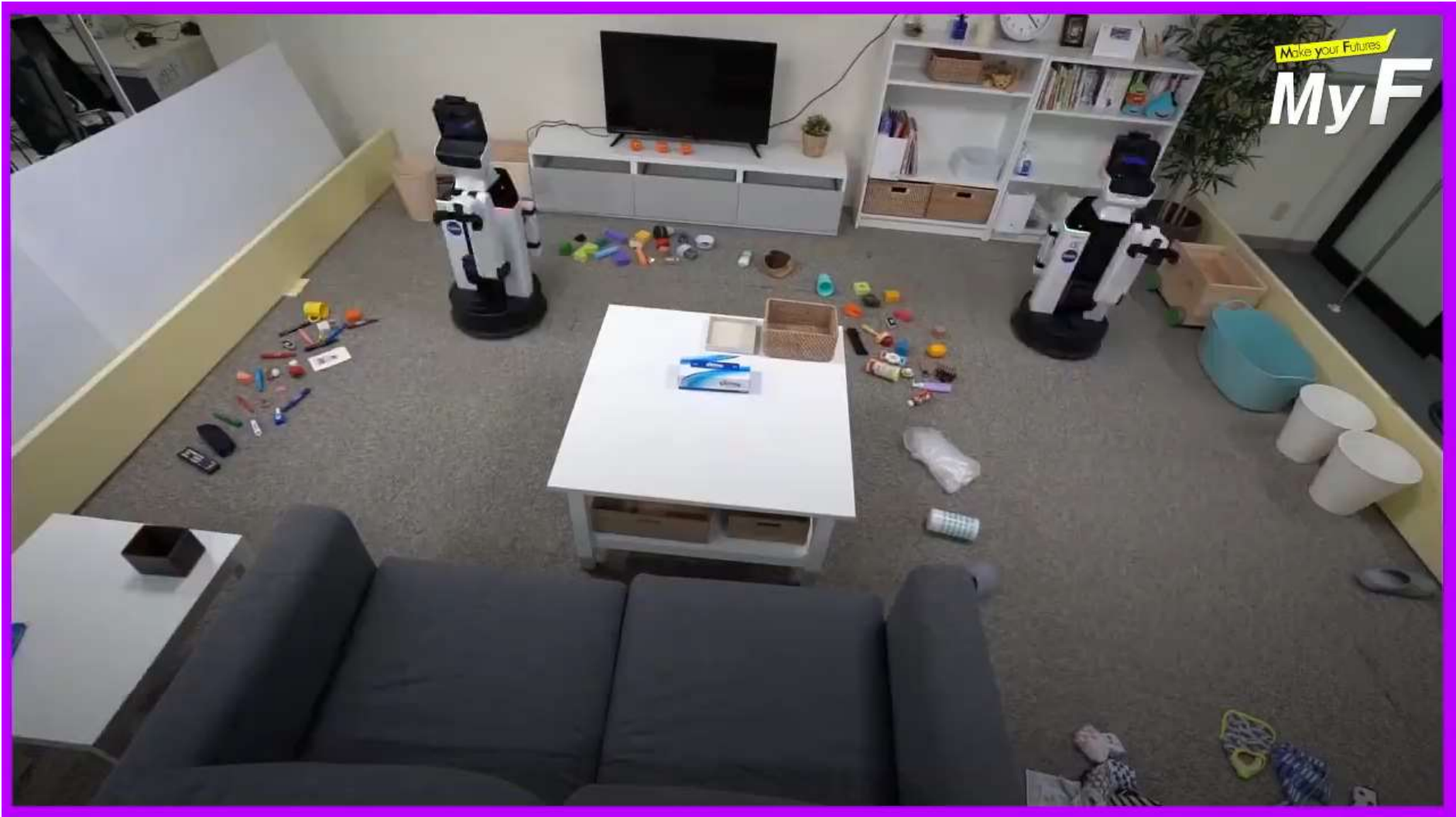
Machine Intelligent ?



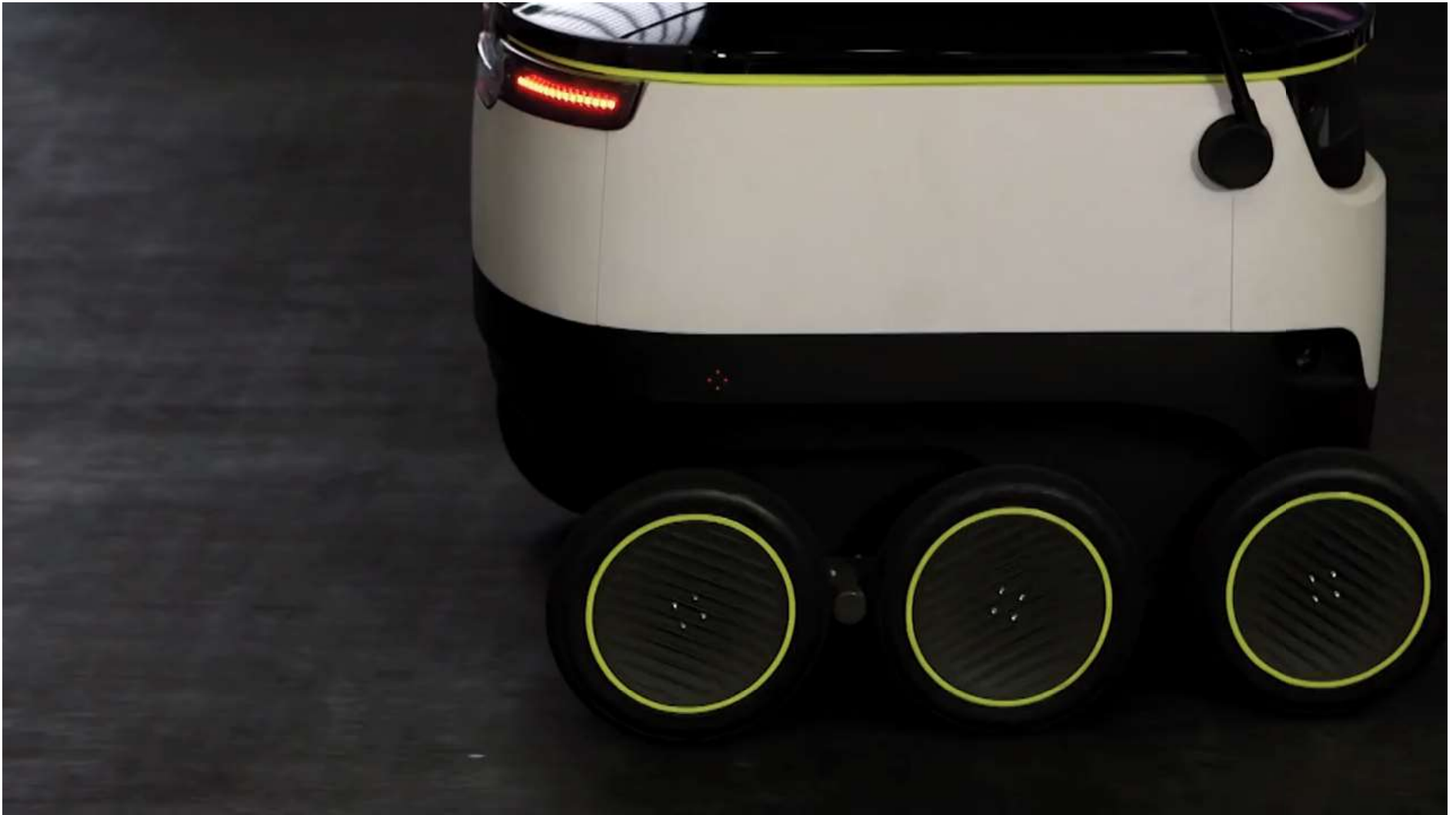
Machine Intelligent ?



Machine Intelligent ?



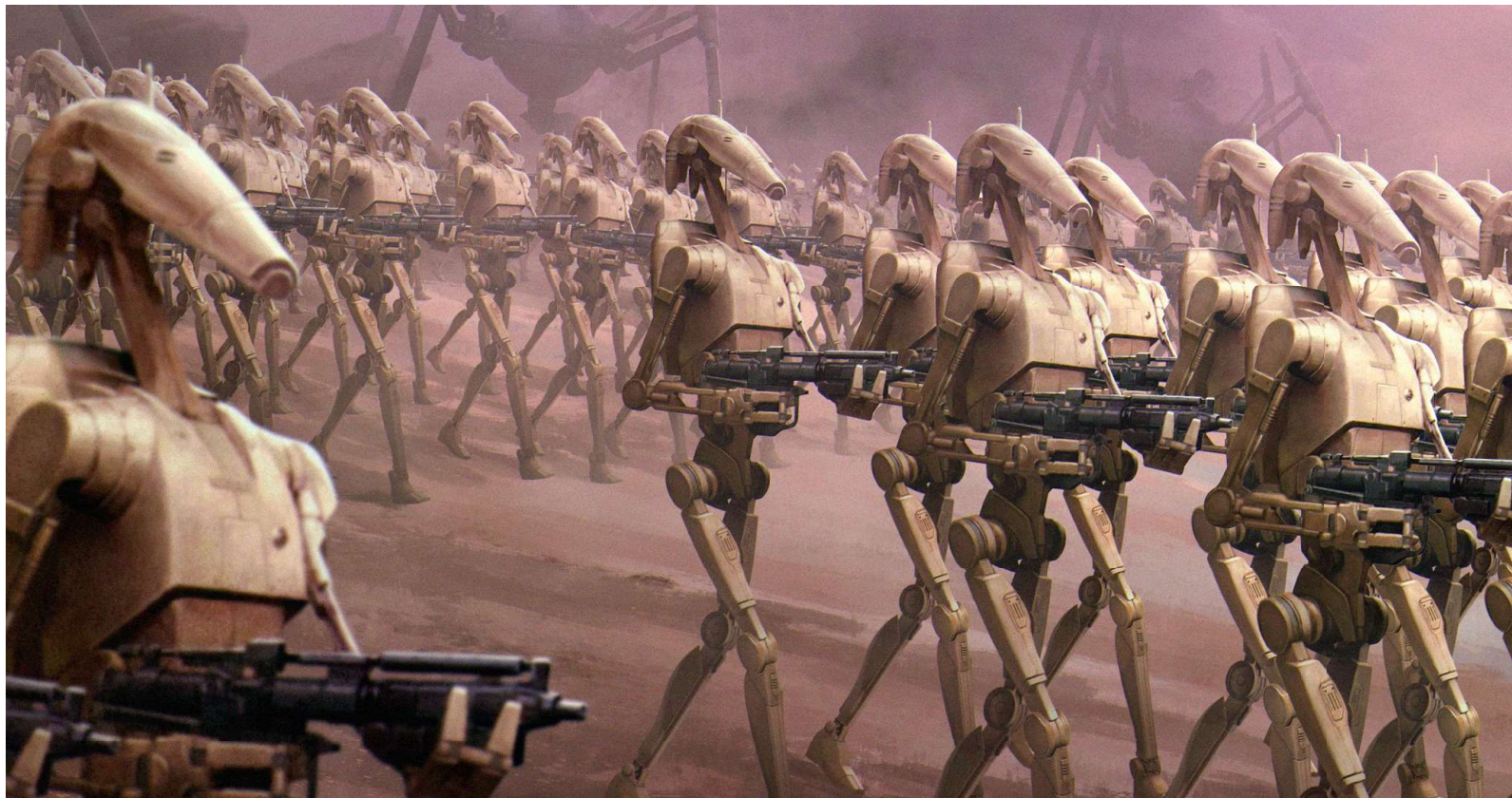
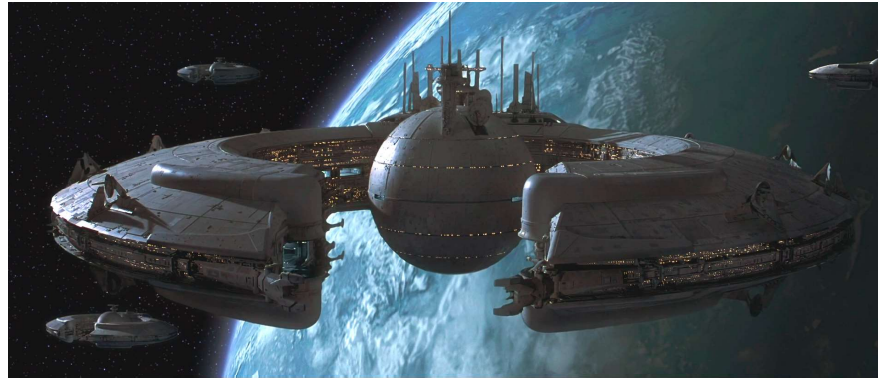
Machine Intelligent ?



Machine Intelligent ?



Machine Intelligent ?





Machine Intelligence Awakens

사물에 지능을 부여하라





No! Try not! Do or
do not, there is no
try.

Yoda

(인공) 지능의 정의

출처	정의
ETRI(2018)	인간의 지적활동, 즉, 시각,언어,감각 이해능력과 학습능력 및 추론능력 등을 구현하고 재현하기 위한 모든 장치 및 시스템
Innovation Nippon(2017)	인간의 사고 프로세스를 모델화하여 처리하는 소프트웨어의 총칭
일본 인공지능학회(2016)	<ol style="list-style-type: none">1. 인간이 지능을 활용하여 실행하는 일이나 프로세스를 기계에게 대신 시키려는 시스템이나 기술.2. 인간 같은 지능을 가진 기계, 또는 그것을 만드는 기술.

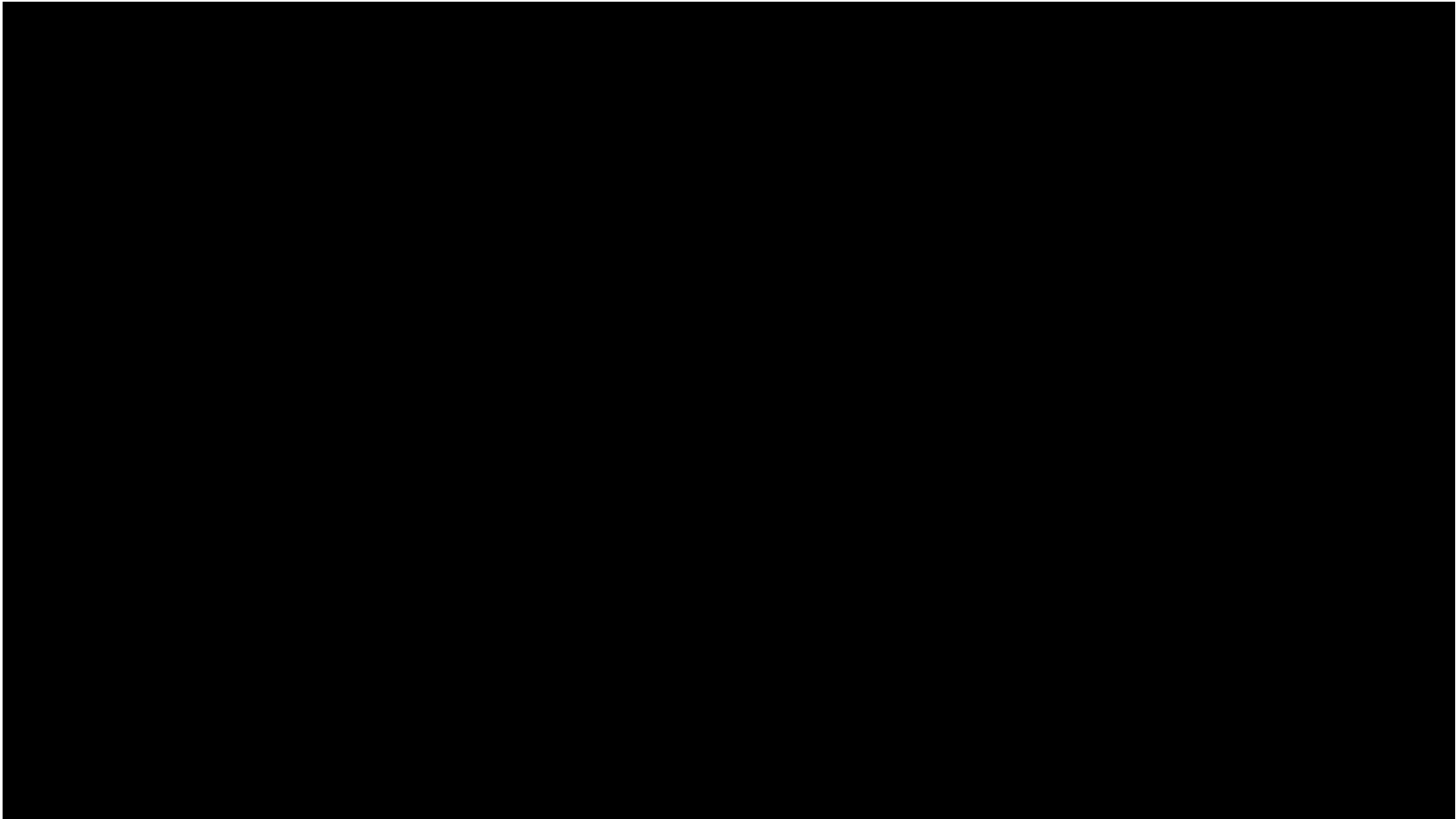
초연결 환경

특징	설명
Low Latency	<ul style="list-style-type: none">• Real-time, Interactive Applications
Hyper-connected	<ul style="list-style-type: none">• Smart-City, High connected Things
Massive Data	<ul style="list-style-type: none">• 3D Lidar, 4/8K Video, Dense Sensing Applications
Infraless Environment	<ul style="list-style-type: none">• 5G, Adhoc, Disaster Environments
Dynamic Environment	<ul style="list-style-type: none">• Automotive Traffic Control, High Scale Logistics

a young chimpanzee, Ayumu, an Amazing Memory Quiz Test



Cow's Intelligence



Rabbit's Intelligence

This bunny rabbit is



addicted to arcade games

Magpie's Intelligence



Machine Intelligence

특징	설명
Learning	<ul style="list-style-type: none">• Learning with other things in the environment
Loading	<ul style="list-style-type: none">• Change and update the intelligence model
Communication	<ul style="list-style-type: none">• Share context with other things
Collaboration	<ul style="list-style-type: none">• Distributed action with the same goal
Interaction	<ul style="list-style-type: none">• Mission, Command, Report with human

Machine Intelligence - Learning



Machine Intelligence - Learning



Machine Intelligence - Loading



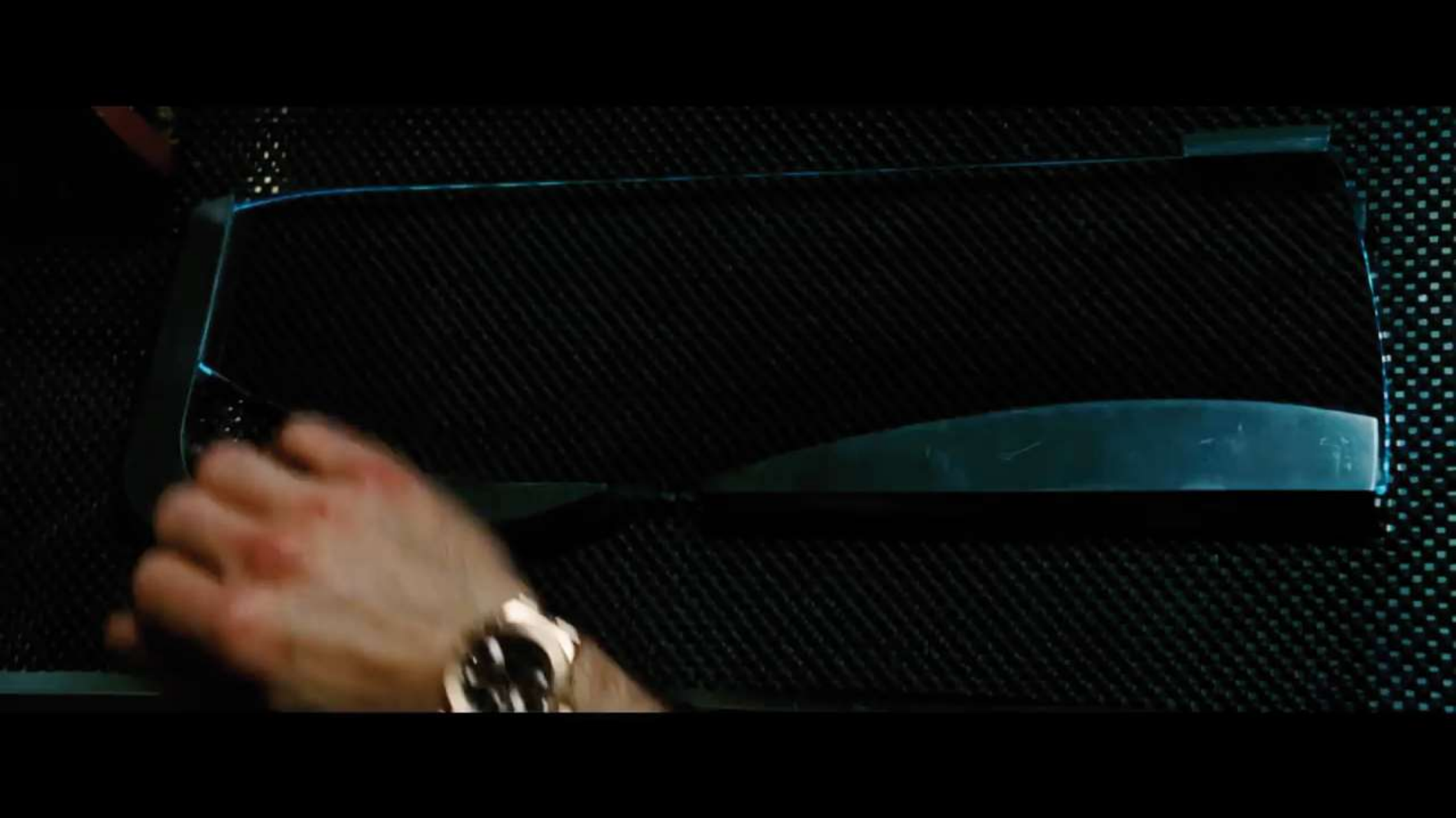
Machine Intelligence - Communication



Machine Intelligence - Collaboration

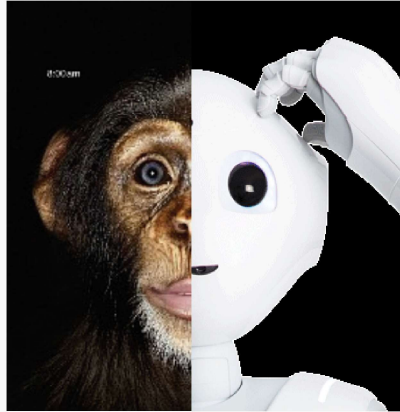


Machine Intelligence - Interaction



사물에 지능을 부여한다?

유인원



- ▶ 행동적 자기관찰
 - 기계적 추론(시행착오적 사고실험)
- ▶ 인지적 자기관찰 (자기성찰)
 - 전방 추론 (인과 논리)
 - 후방 추론
- ▶ 사회적 세계 구축

현재 로봇 개발 목표



- ▶ **공동 목표 vs. 개인 목표(역할)**
- ▶ 공동 목표를 위한 **협력**
- ▶ **협력적 의사결정**
- ▶ 양자간 관찰 공유
- ▶ 메시징 (기호화, 제스처)
- ▶ 공동체적인 최적화

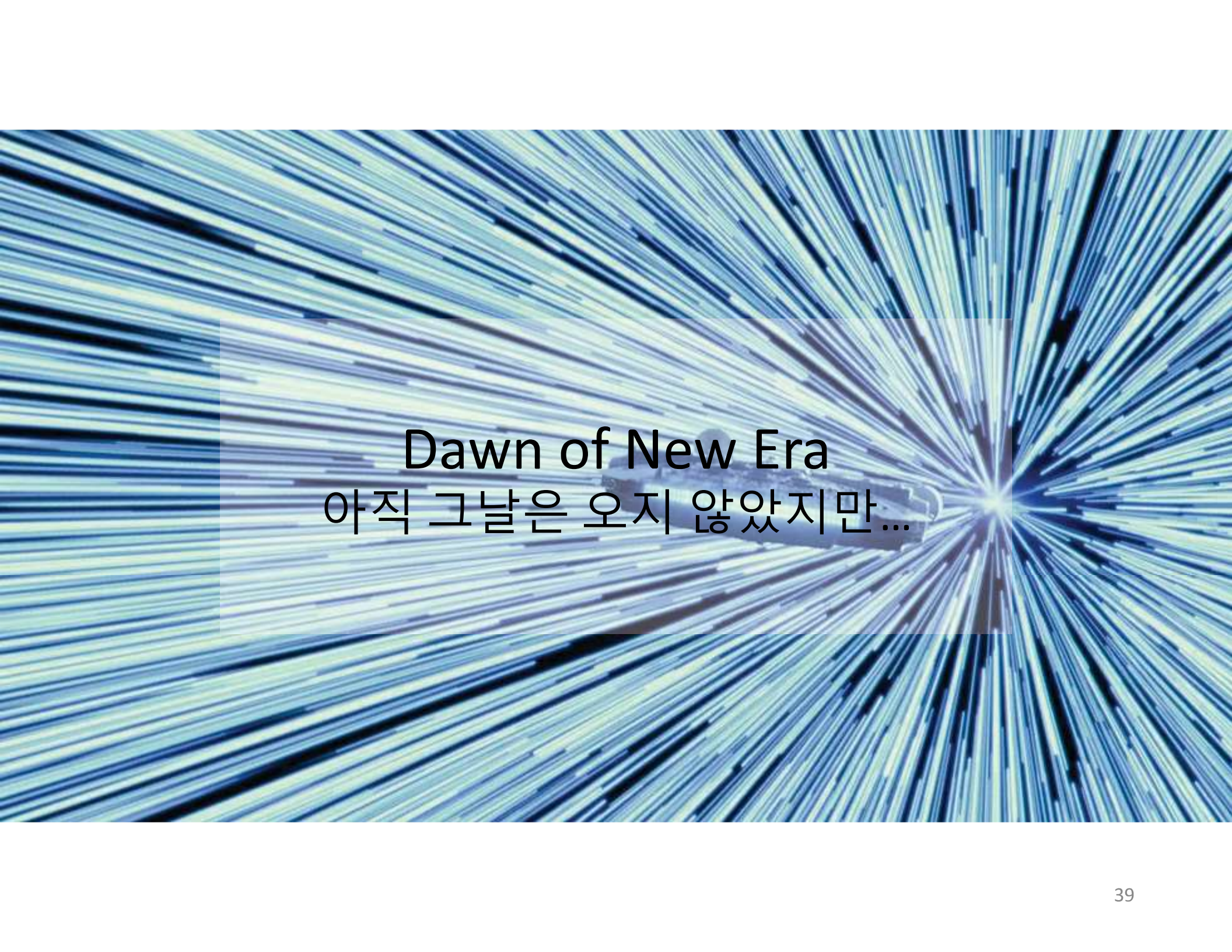
협업형 에이전트

사람



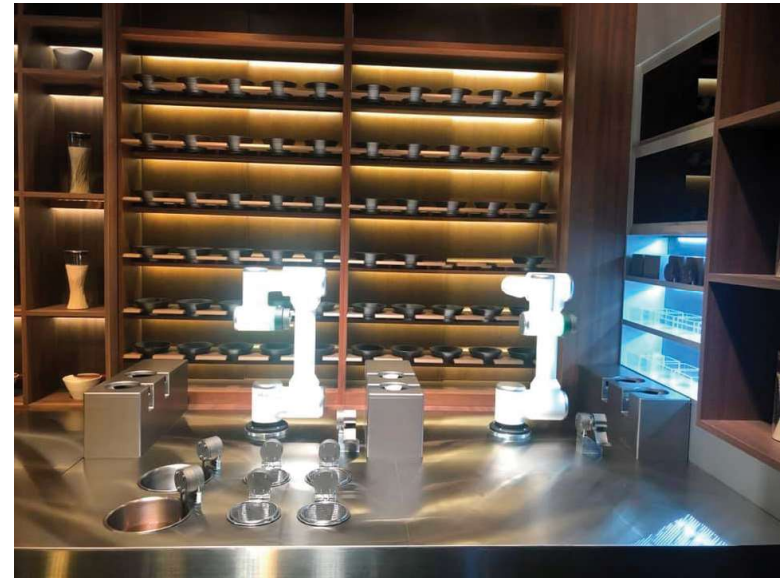
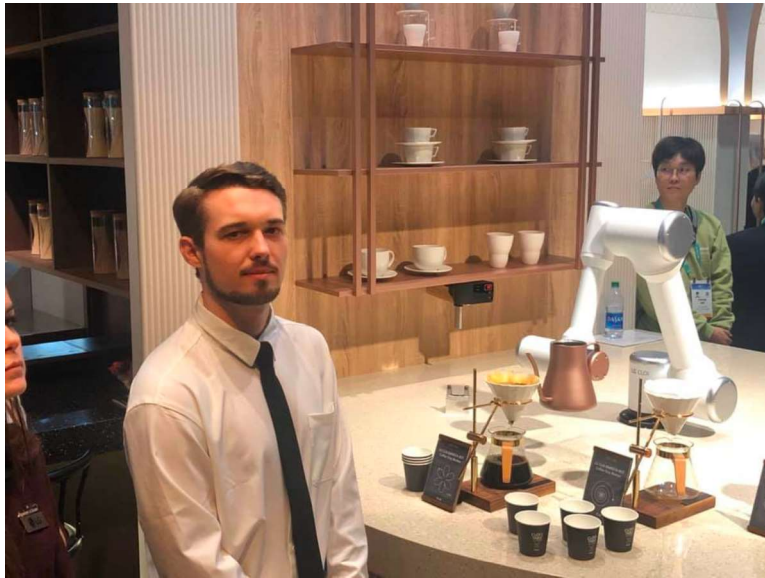
- ▶ 집단 정체성
- ▶ 관습적인 문화적 관행
- ▶ 커뮤니케이션
- ▶ 언어(문자)
- ▶ 규범적 자기관찰
- ▶ 제도와 규범

AGI



Dawn of New Era
아직 그날은 오지 않았지만...

Robot World?



Robot World?

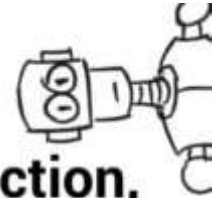


Robot World?

Robot World?



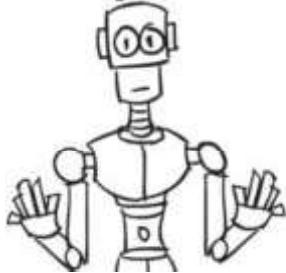
THREE LAWS OF ROBOTICS



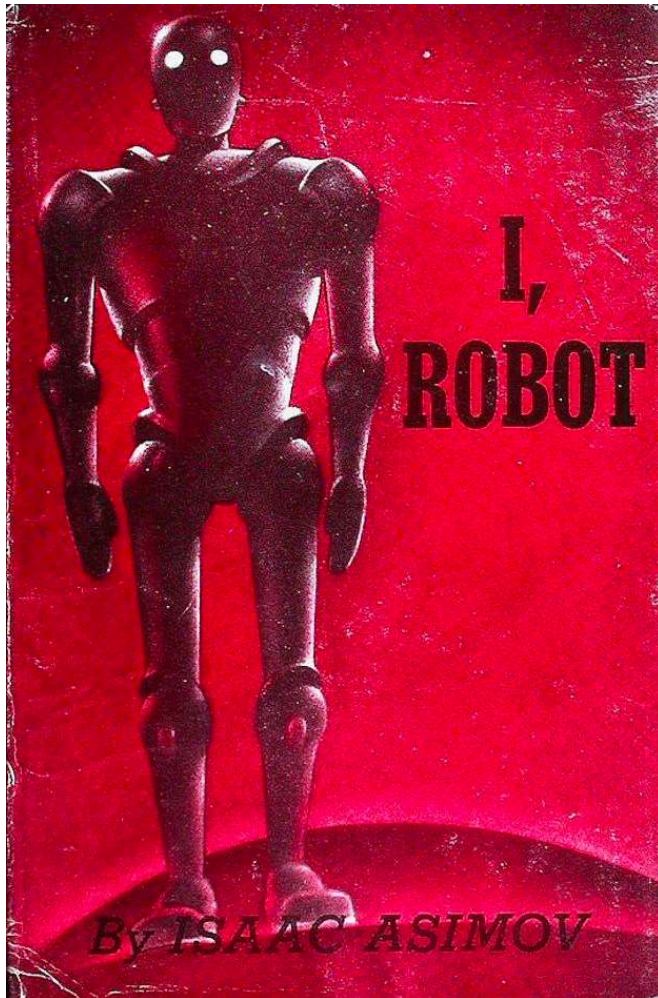
1. A robot must not injure a human being or, through inaction, allow a human being to come to harm.

2. A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.

3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws.



ANDROID AUTHORITY



스피디

셀레늄

그레고리 파월

논리적 추론

지능 사물에 익숙해져야 함

지능 사물과의 공존을 위한 주의사항

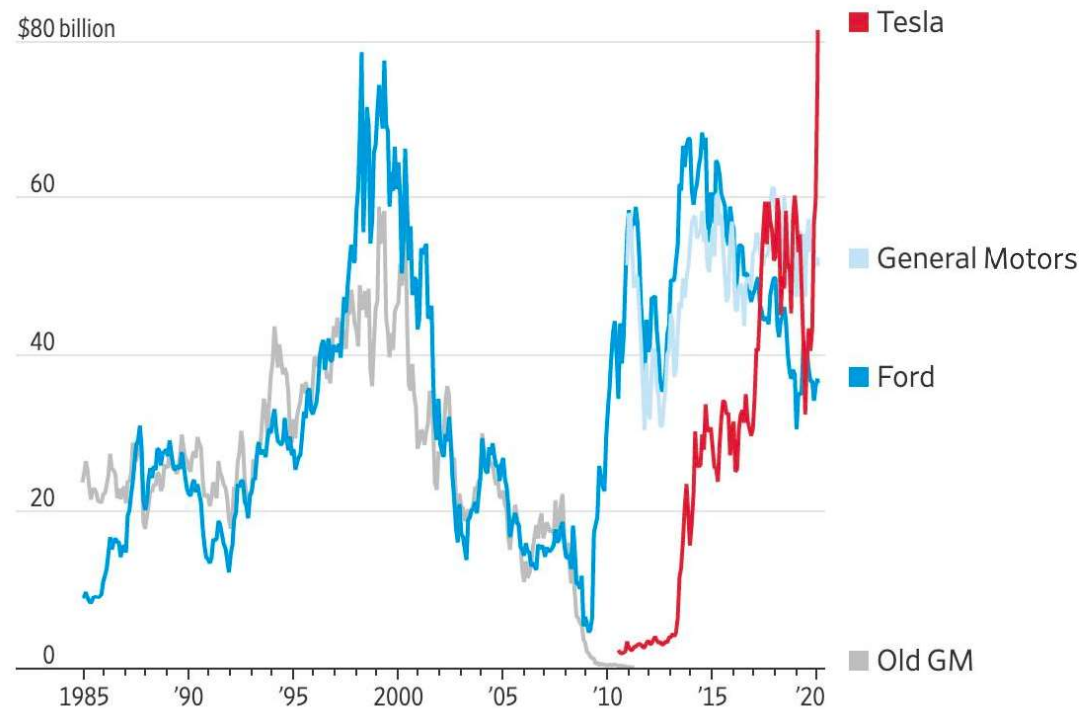
특징	설명
Learning	<ul style="list-style-type: none">• 지능 사물은 엉뚱한 행동을 할 수 있다.
Loading	<ul style="list-style-type: none">• 잘못 된 행동은 엉뚱한 지능?
Communication	<ul style="list-style-type: none">• 무엇과 커뮤니케이션하는지 확인해야 한다.
Collaboration	<ul style="list-style-type: none">• 협업이 항상 좋은 것은 아니다.
Interaction	<ul style="list-style-type: none">• 지능 사물은 논리적이다. 잊지 말자.

Before 2025 (?)

Seizing the Record

Tesla's market value surpassed Ford's 1999 peak.

Market capitalization



Source: FactSet

That day will come like a thief.



We choose to go to the moon in this decade.

J. F. K, Huston, 1962

감사합니다

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