

Ten Unsolved Problems in AI

Chair, National Research Council of Science & Technology, Korea
Visiting Professor, CNAM (National Conservatory of Arts & Industries), France
Professor Emeritus, KAIST, Korea

Kwangyun Wohn



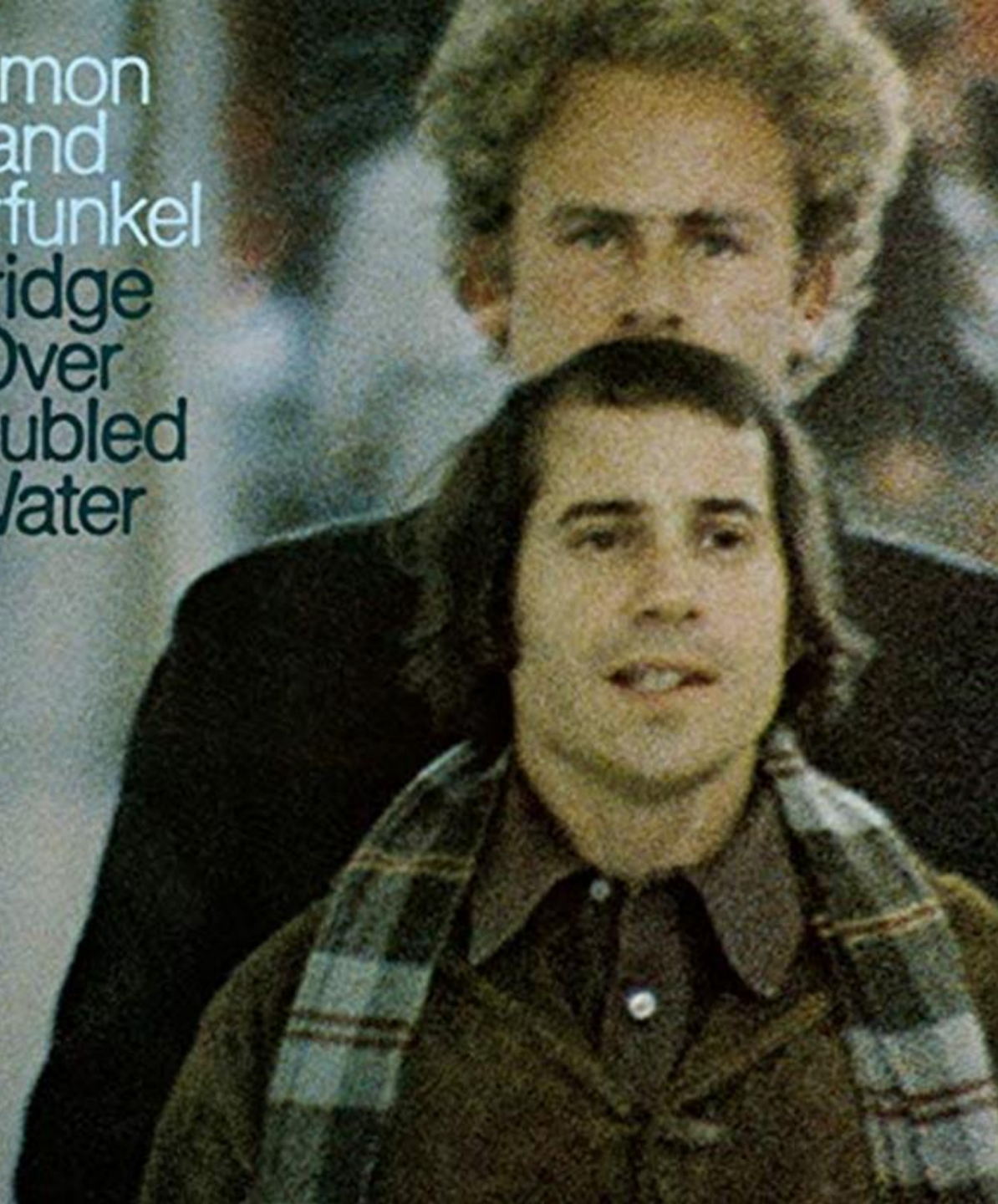
e-Bridge over Troubled Water

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Kwangyun Wohn



Simon
and
Garfunkel
Bridge
Over
Troubled
Water



LINDA
HAMILTON

ARNOLD
SCHWARZENEGGER

MACKENZIE
DAVIS

NATALIA
REYES



PRODUCER JAMES CAMERON RETURNS
FROM TIM MILLER THE DIRECTOR OF DEADPOOL

TERMINATOR

D A R K F A T E

STORY BY JAMES CAMERON & CHARLES EGGLE &
JOSH FRIEDMAN & DAVID GOYER & JUSTIN RHODES
SCREENPLAY BY DAVID GOYER & JUSTIN RHODES AND BILLY RAY
DIRECTED BY TIM MILLER

COMING SOON



The 4'th industrial revolution, is it for real?



Klaus Schwab @ Dabos Forum, 2016



The Essence of 4IR?

3D Printing

Robotics

Internet of Things

Artificial Intelligence

Autonomous Vehicles

Cyber-Physical System

Big Data

Smart Factories

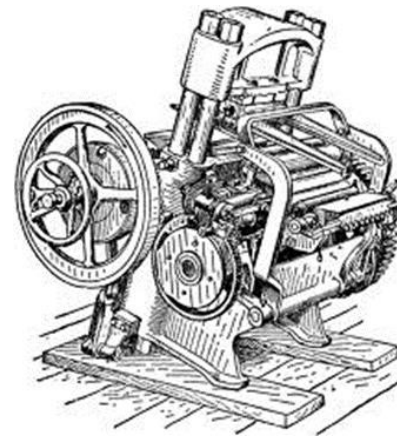
Smart City

Smart-X



Human-Artifact Interaction:

A Framework for Understanding the Industrial Revolutions

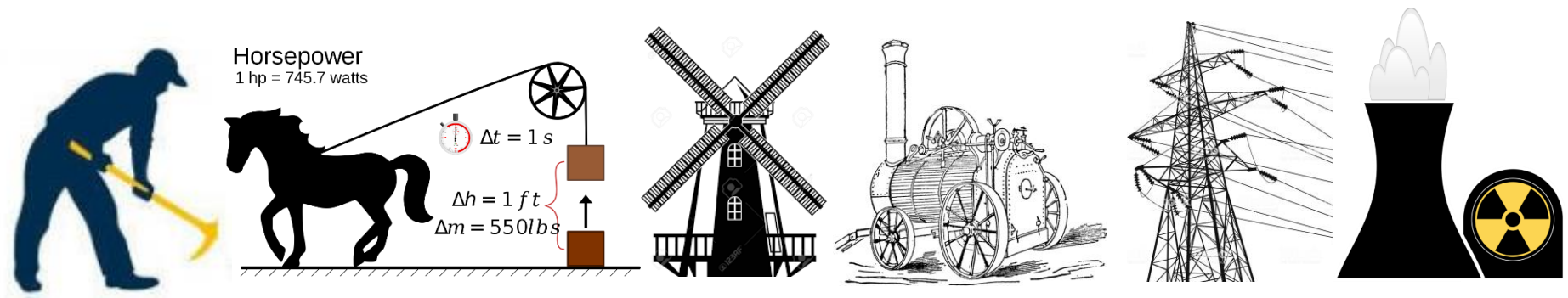


Tools → Machines → System ... → ... Cybernetics ... → ... Symbiosis



Energy Sources/Media

A Framework for Understanding the Industrial Revolutions



Animals $\cdots \rightarrow$ Fossil $\cdots \rightarrow \cdots$ Electricity $\cdots \rightarrow \cdots$ Nuclear $\rightarrow$ Re-usable $\rightarrow$ Fusion



Public Media

A Framework for Understanding the Industrial Revolutions

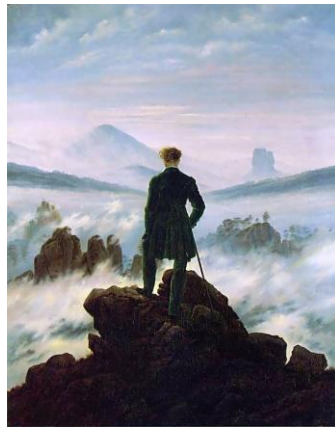


Scripts ... → Printed Matter ... → Electric Media ... → Digital Media → ?



Social and Cultural Spirits:

A Framework for Understanding the Industrial Revolutions



Classicism → Romanticism → ... Modernism ... → Post-Modernism → ?



Iconography

A Framework for Understanding the Industrial Revolutions

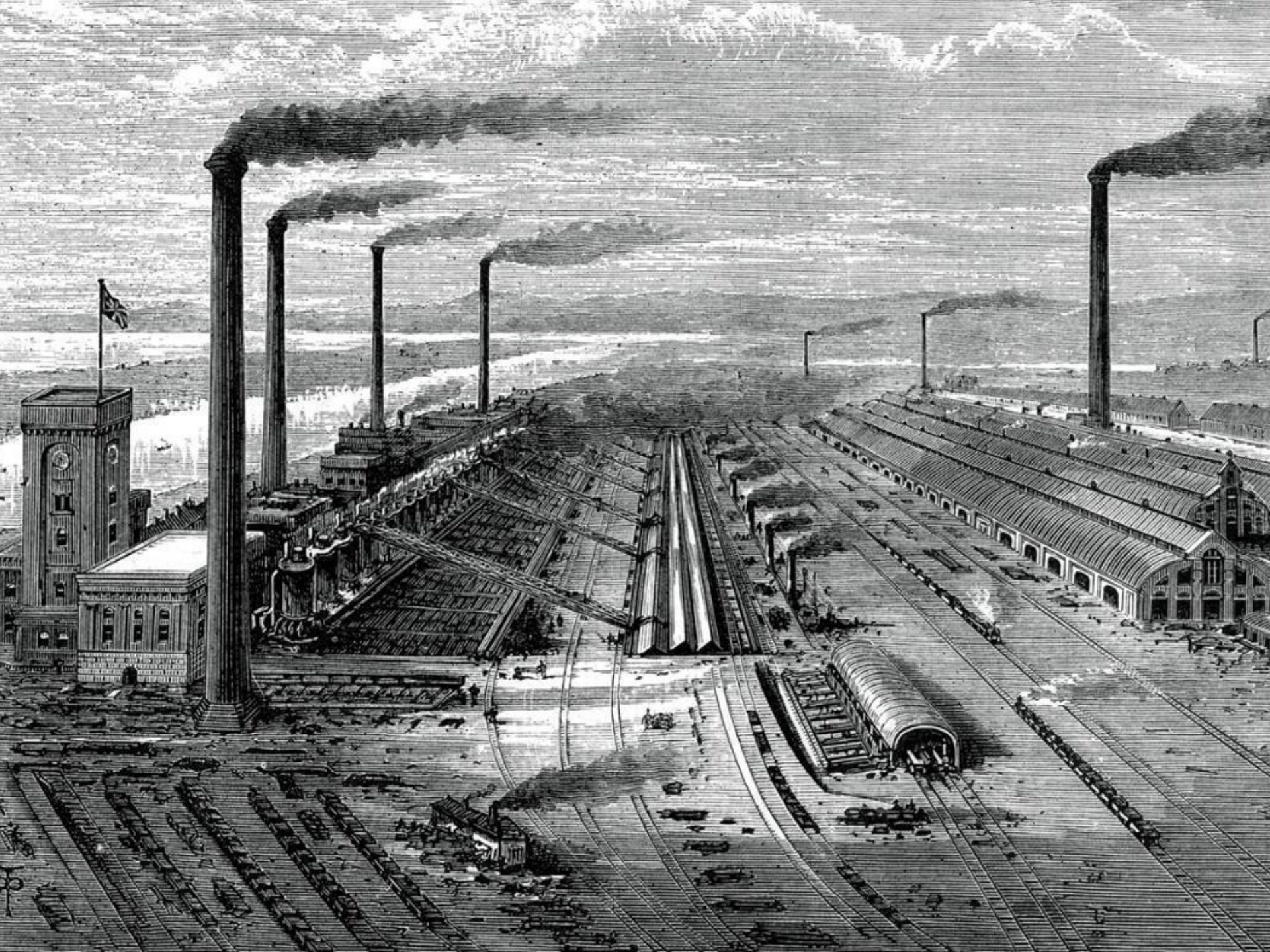


Keyword 1 → Keyword 2 → ... Keyword 3 ... → Keyword 4 = Hybrid



The 1'st IR ?







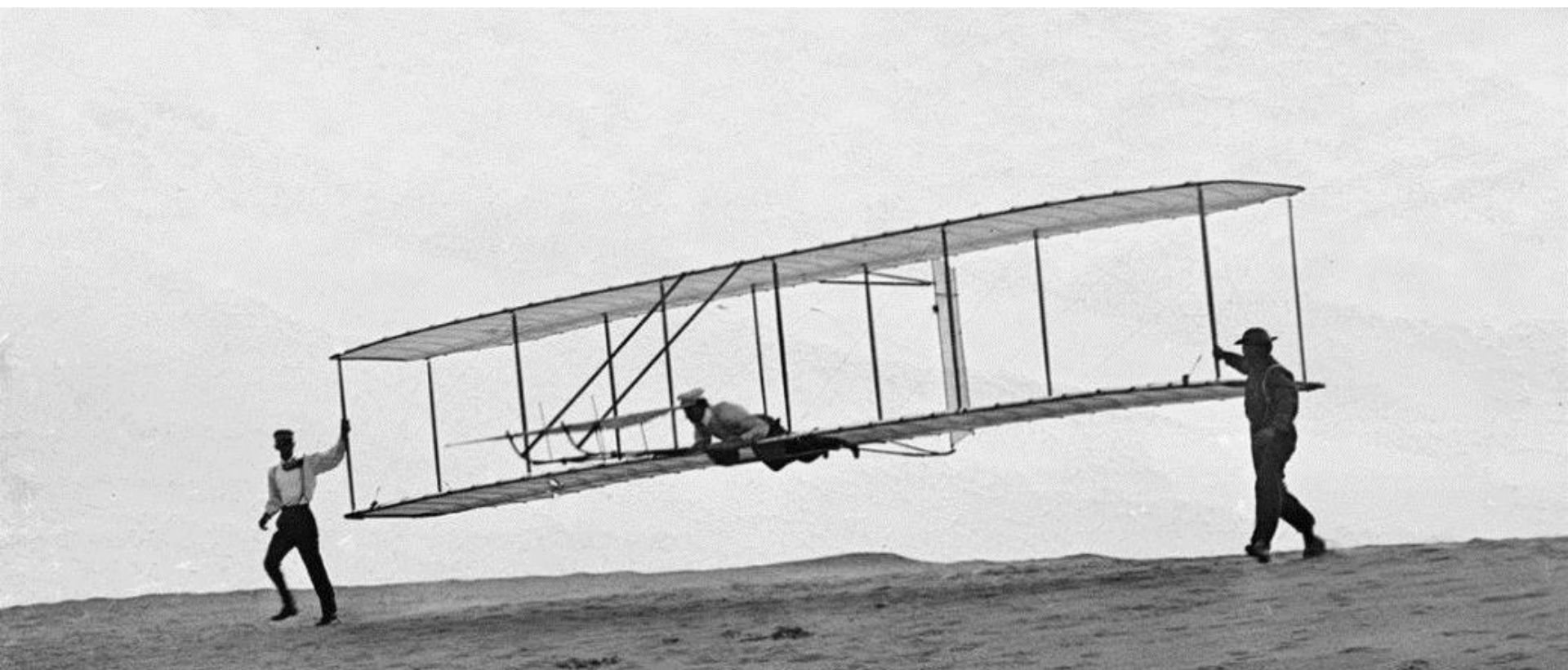
William Turner (1839)



The 2'nd IR ?









JUN. 26 30



JUL. 7 30



JUL. 24 30



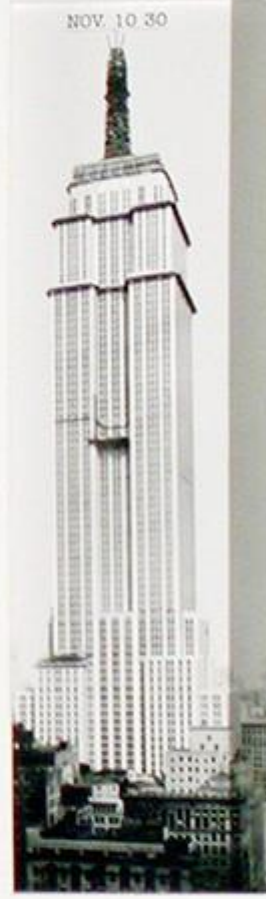
AUG. 18 30



SEPT. 8 30



NOV. 10 30



Futurism





Italian Futurism (1911~1940's) to Metropolis (1927) to Blade Runner (1982)





<Unique Forms of Continuity in Space>, Umberto Boccioni (1913)

<The Electricity Fairy>, Raoul Dufy, for Pavillon of Light & Electricity, World Expo (1937)





Edison

Marie Curie

Pierre Curie

Roseley

Mendeleeff

Hertz

Geissler

Baudot

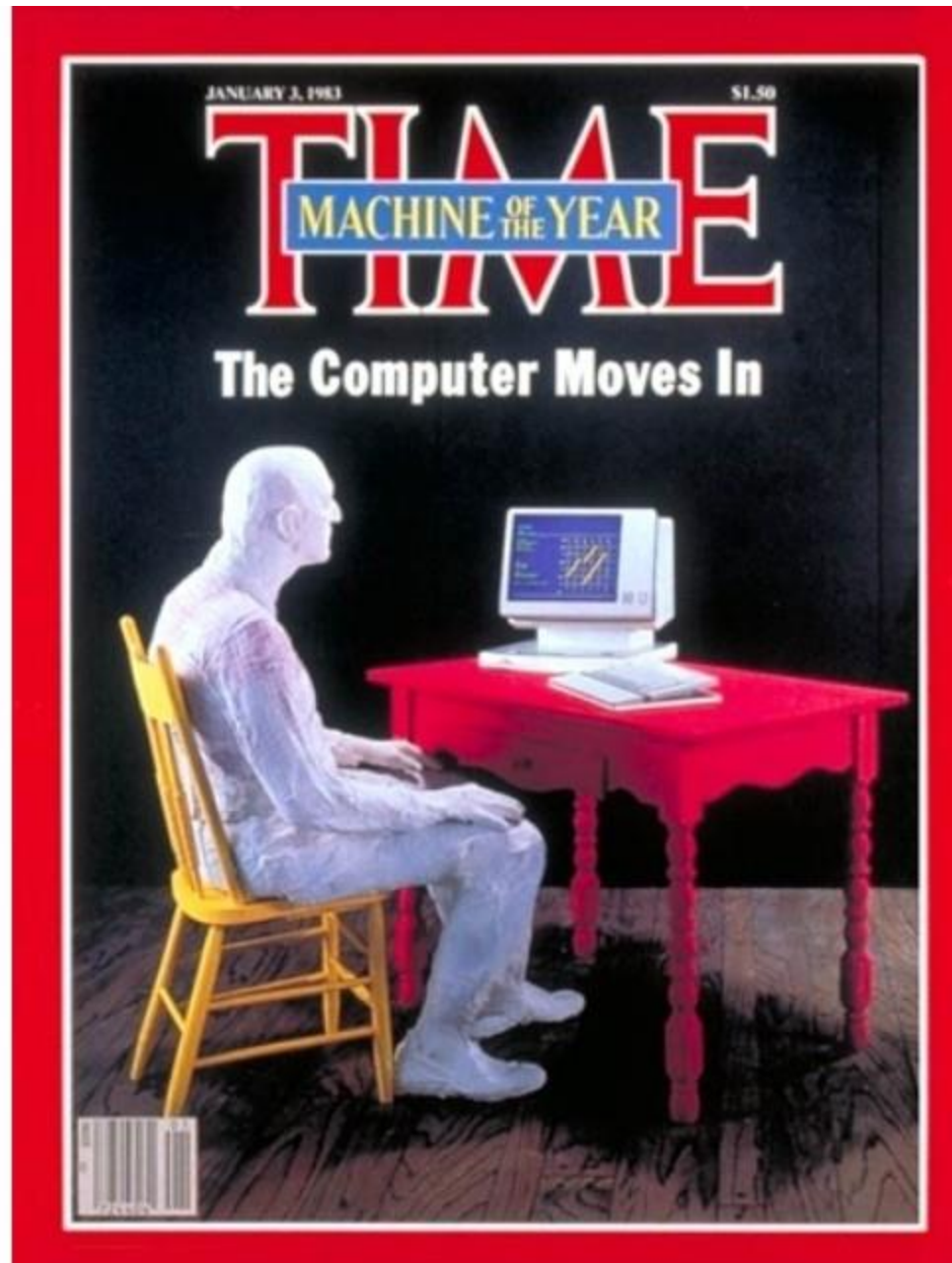
Hertz

Poincaré

Röntgen

The 3rd IR



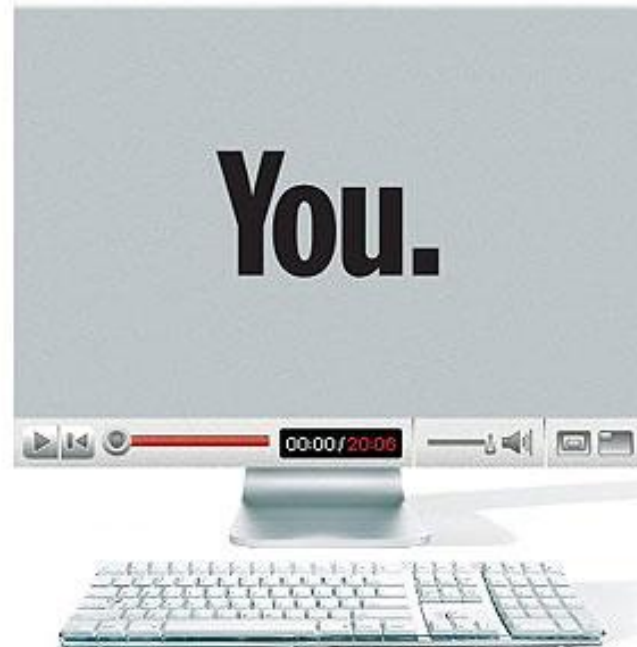


DECEMBER 25, 2006 / JANUARY 1, 2007

www.time.com

TIME

PERSON OF THE YEAR



Yes, you.
You control the Information Age.
Welcome to your world.





December 2027 January 2028

www.time.com

TIME

PERSON OF THE YEAR

?



Technological Essence of the 4'th Industrial Revolution

1. Computing power

→ Data power

AI, Big Data, Analytics, Nano, Bio, ...

2. Digitalization

→ Physicalization

3D Printers, Robots, Drones, Autonomous Vehicles, ...

3. Networks of computers

→ Networks of (almost) everything

Human, Life forms, Things, Abstract concepts(?)



Industrial Revolutions

- 1'st. Mechanical
- 2'nd. Electrical
- 3'rd. Computing
- 4'th. {Data + AI + Network} + Physical Embodiment



Industrial Revolutions

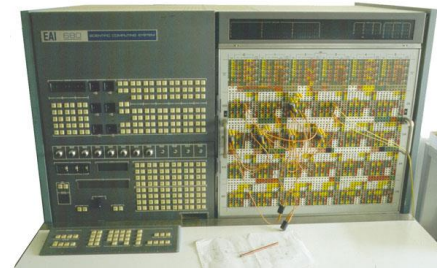
- 1'st. Mechanical
- 2'nd. Electrical
- 3'rd. Computing
- 4'th. Hybrid !



"Hybrid"



Hybrid Car

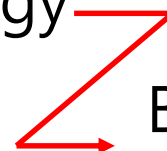


Hybrid Computer

Divergent,
Complementary



Symbiosis. Synergy



Best solutions,
Best experiences



Hybrid Approaches, Hybrid Phenomenon

1. Analog + Digital
2. Hardware + Software
3. Algorithm + Data



Hybrid Approaches, Hybrid Phenomenon

1. Analog + Digital
2. Hardware + Software
3. Algorithm + Data
4. Real + Virtual



Hybrid Approaches, Hybrid Phenomenon

1. Analog + Digital
2. Hardware + Software
3. Algorithm + Data
4. Real + Virtual
5. Culture + Technology



Hybrid Approaches, Hybrid Phenomenon

1. Analog + Digital
2. Hardware + Software
3. Algorithm + Data
4. Real + Virtual
5. Culture + Technology
6. Human + Machine



Hybrid of {Human + Machine} ≠ Cyborg



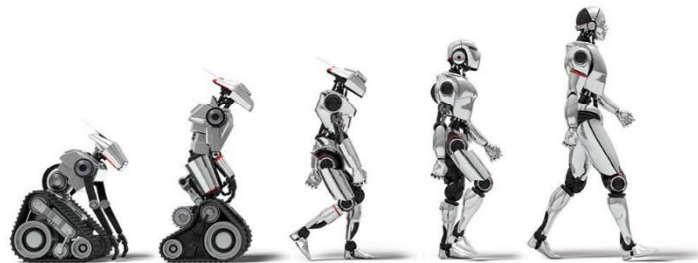
December 2026 January 2027

www.time.com

TIME

PERSON OF THE YEAR

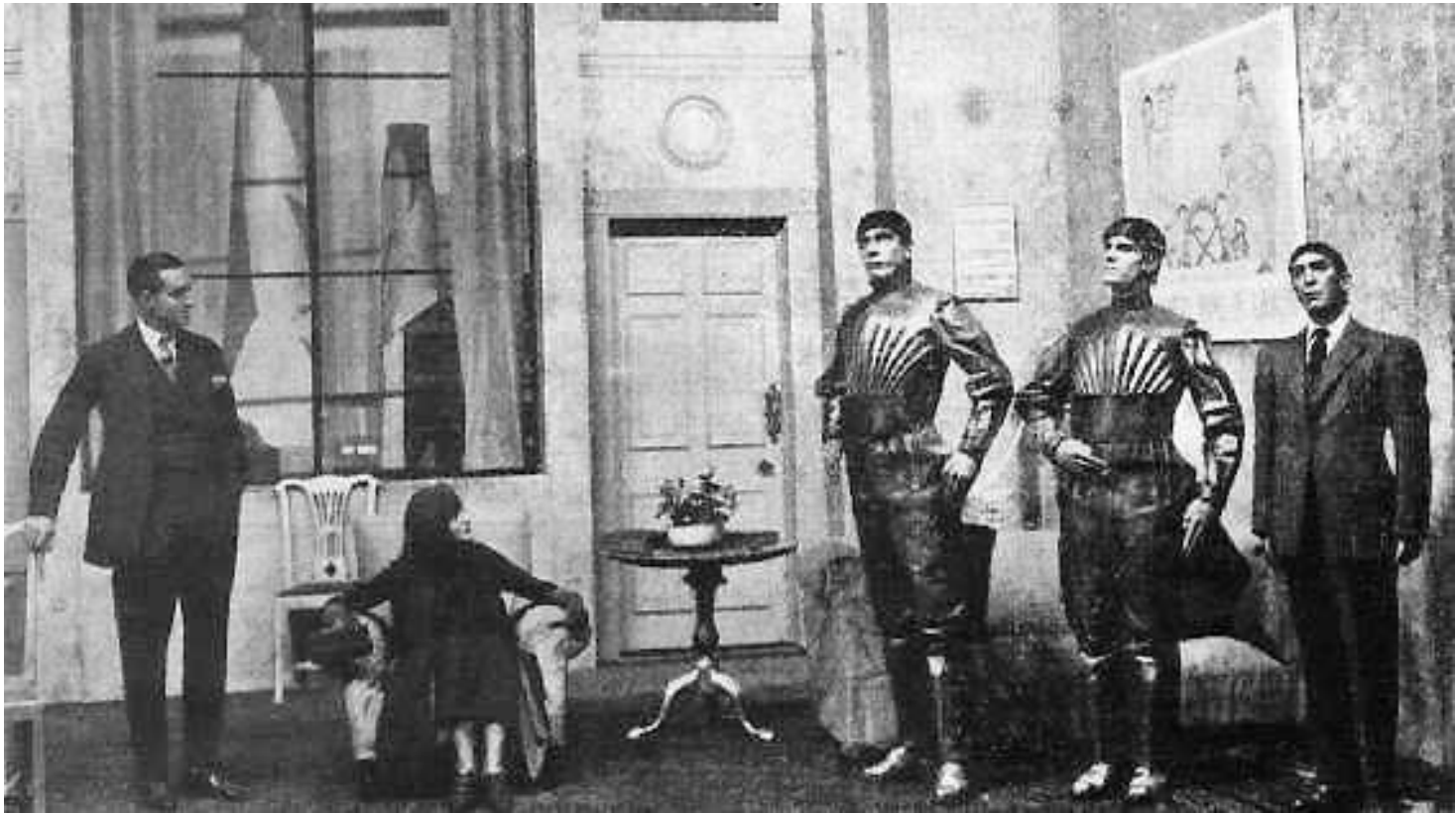
They.



Yes, They.
They control the knowledge age.
Welcome to their world.



연극 R.U.R. (1921)



Karel Capek (1890~1938)



인조 인간

인조 인간

劇団俳優座公演NO.247

中野 誠也 松野 健一
河原崎 次郎 中寛三
村上 博 加藤 佳男
武正 忠明 河内 浩
塩山 誠司 渡辺 聡
田中 壮太郎 松島 正芳
片山 万由美 鷗野 樹理
花村 明 四本 あや
ほか

5月14日(金)~23日(日)

俳優座劇場(六本木)

前売開始・4月8日(木)より

料金/一般5,250円・学生3,675円(各税込)

お問合せ・お申込み/劇団俳優座
チケット専用

TEL.03-3405-4743

平日・土10:30am~6:30pm

〒106-0032 東京都港区六本木4-9-2

ロボット

RUR/R/ロッスム・ユニバーサル・ロボット

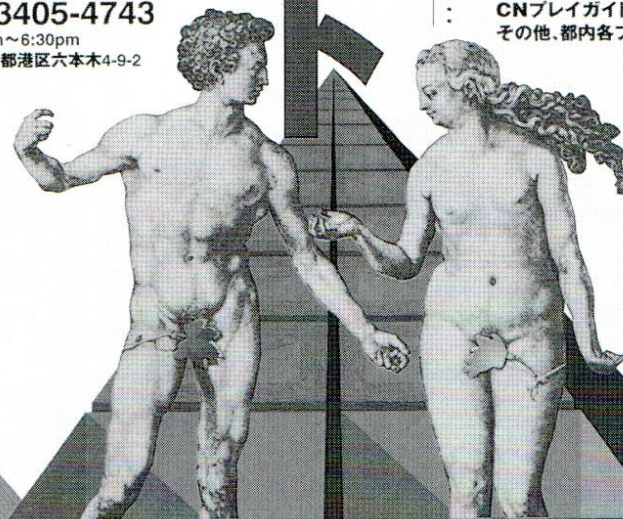
人類を滅ぼしたロボットたちにも絶滅の危機が迫ってきた。
果たして人類の遺産を受け継ぐロボットのアダムとイブは生まれるのか...

劇団俳優座創立55周年記念公演
文化庁芸術創造特別支援事業
後援/チェコ共和国大使館

作/カレル・チャペック
訳/千野栄一
上演台本・演出/栗山民也
美術/堀尾 幸男
照明/井口 眞
効果/果 小山田 昭
衣裳/若生 昌
演出助手/高岸 未朝
舞台監督/川口 浩三
制作/古賀 伸雄
下 哲也

前売りチケット

劇団俳優座 03-3405-4743
チケットぴあ 03-5237-9988
チケットセゾン 03-3250-9999
ローソンチケット 03-3569-9900
Lコード35611(24時間受付)
CNプレイガイド 03-5802-9999
その他、都内各プレイガイド

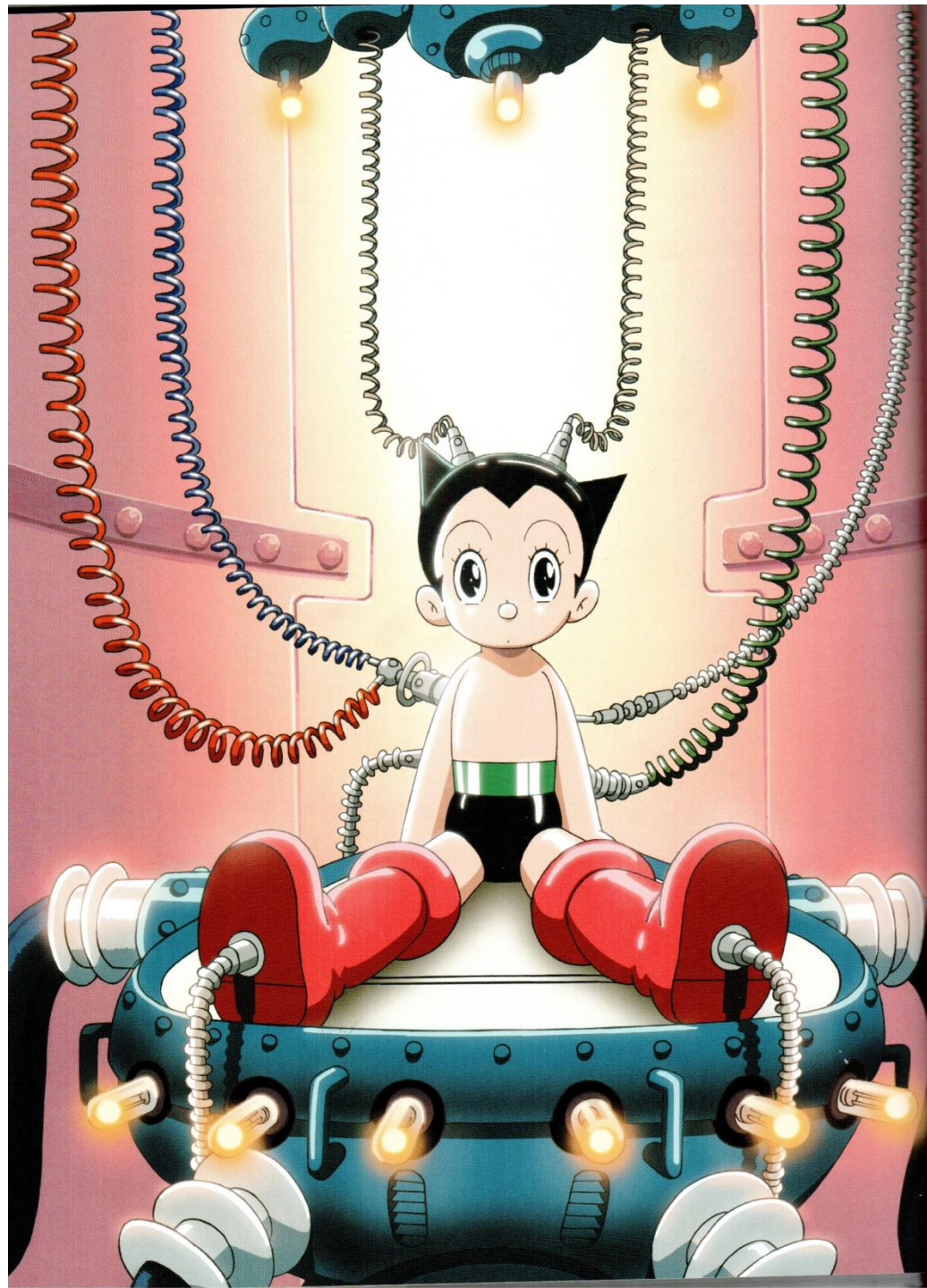


RUR

RUR







$$\textit{Science Fiction} = \lim_{IR \rightarrow \infty} \{\textit{Reality}\}$$



Kinds of Mankind

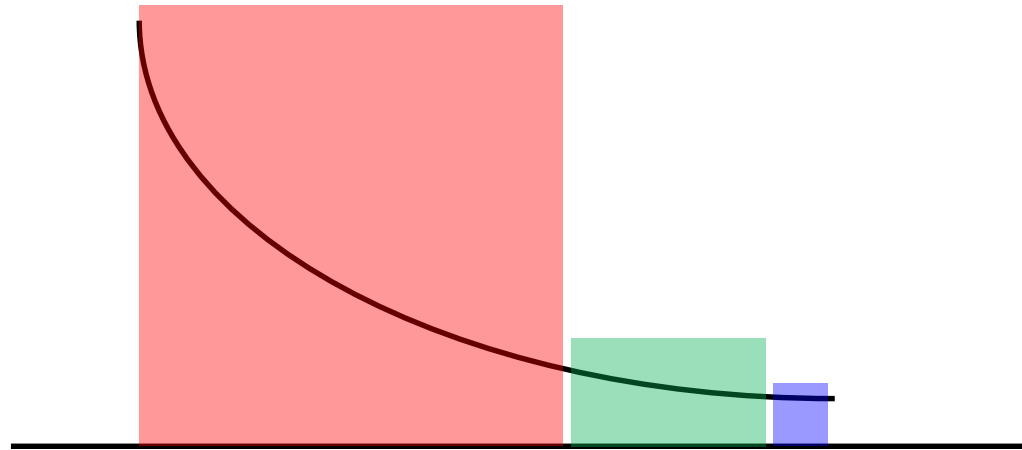
1. **Those who own the machines**
기계를 소유한 ...
2. **Those who can do what machines cannot do**
기계가 못하는 ...
3. **Those who must do what machines don't want to do**
기계가 싫어하는 ...



Scenario 1

('Brave New World')

↑
of population

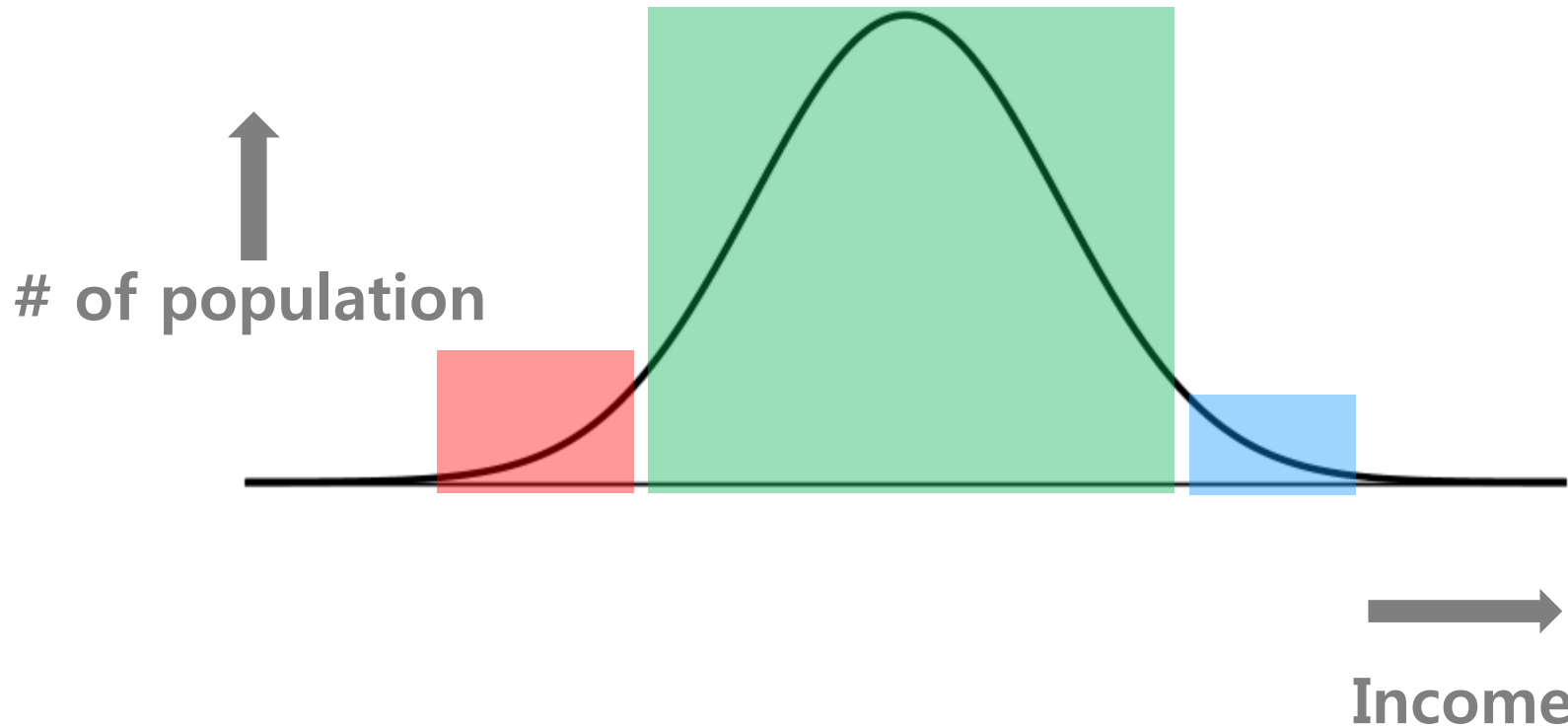


→
Income

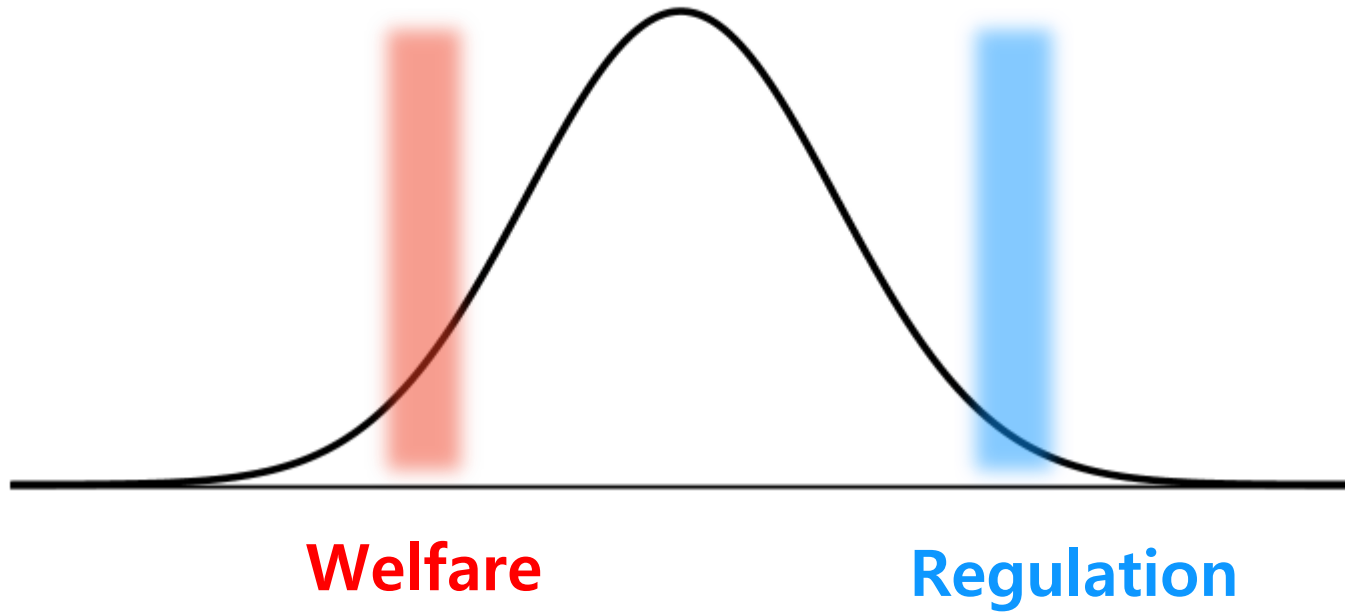


Scenario 2

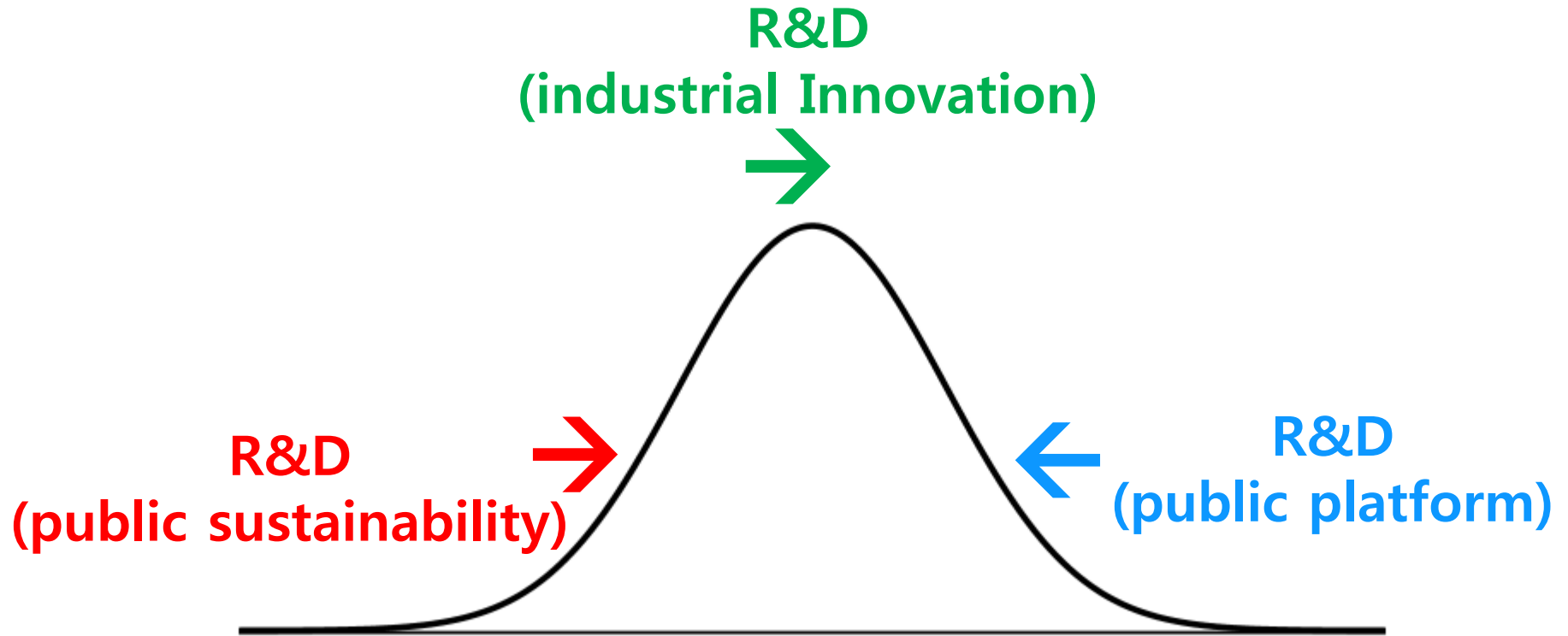
(Hybrid World)



Role of Government



Role of Technology



IRs vs. Testbed

- 1'st Mechanical Rev. • **Factories** • Industrial Complex
- 2'nd Electric Rev. • **Wars** • Technology Park
- 3'rd Digital Rev. • **Capitalism** • Silicon Valley
- 4'th Hybrid Rev. • **(Tech-based) Democracy** • Smart Urbanity



Technology as the Democracy Designer

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