



HSS Seminar, 9:00-10:30 Feb 2nd, 2026

Survive with good information

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Members of Future Wisdom

L5: A. Tanimoto, Y. Li, R. Goperma; L4: R. Basnet;

PD: N. Lucic; Researcher: H. Liu, J. Fatima

Nature gives life freedom; Life uses it to find order.

Exemption

I tried my best to prepare this sharing and hope it is useful but, due to my own limitations, please consider it **on your own responsibility**.

**"The more I see, the
less I know for sure."**

- John Lennon



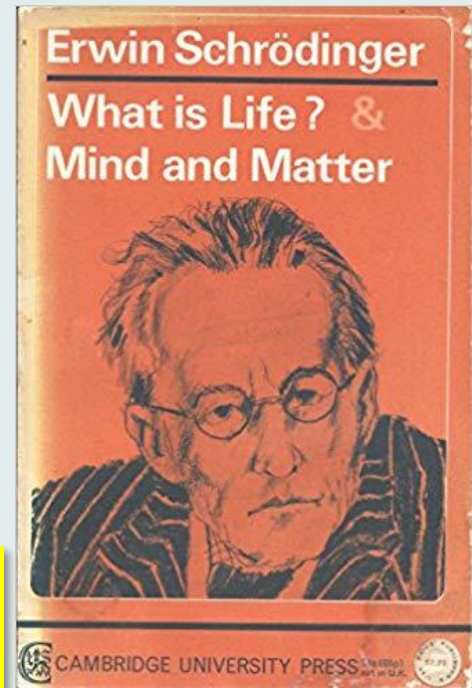
Bias is necessary, but it
can also be misleading.

Survivability: a perspective from Science

- **Schrodinger** observed that ***matter follows the second law of thermodynamics whereas life seems not*** (*What is life?* 1944).
- **The law** says that “Every process occurring in ***nature*** proceeds in the sense in which the sum of the ***entropies*** of all bodies taking part in the process is ***increased***,” (Max Planck, 1897)* where **entropy** is a quantity to estimate the state of **disorder** (uncertainty, freedom, etc). Thus, **entropy ↗ implies disorder ↗**.

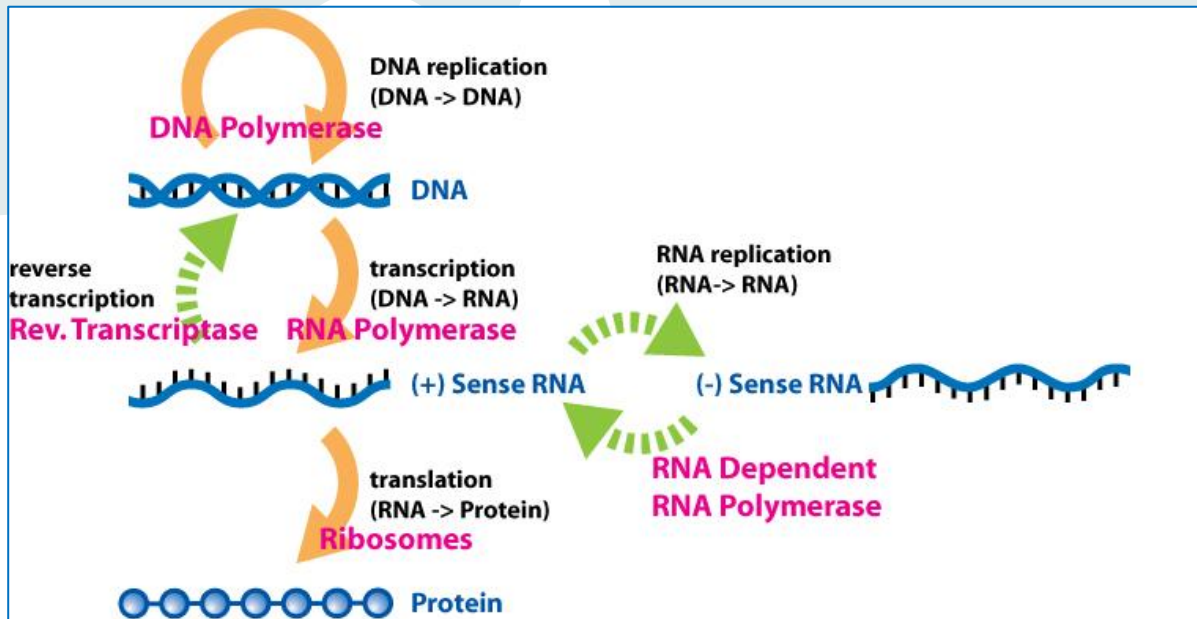
*Different statements also exist.

E. Schrodinger: 1933
Nobel Prize in Physics

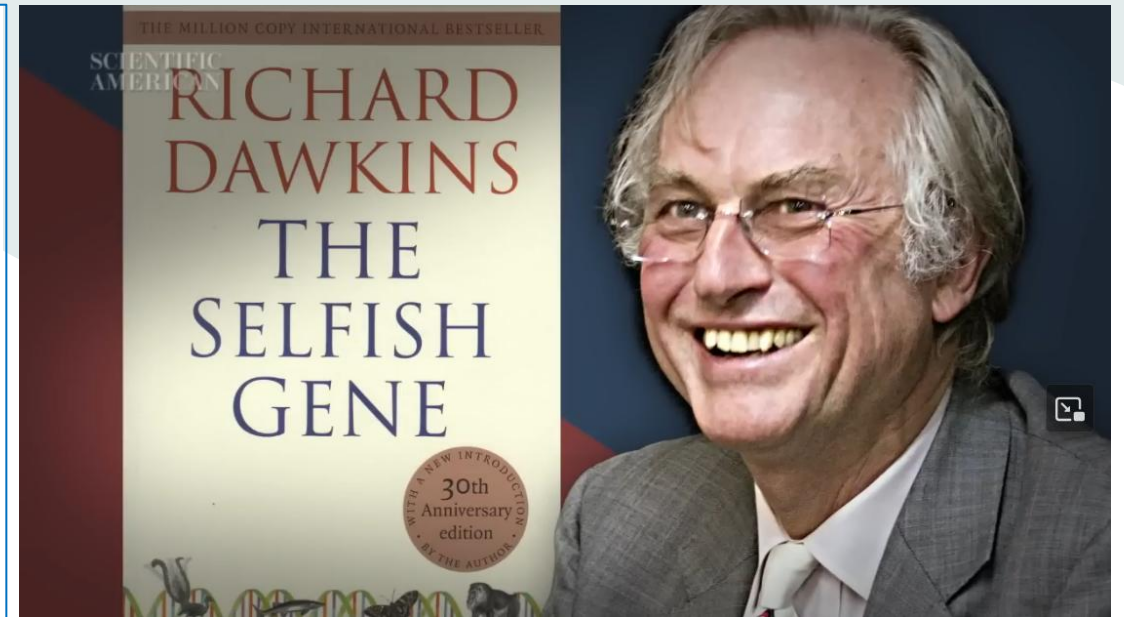


Schrodinger's observation suggests that the **essence of life** (i.e., **survivability**) is associated with **finding (good) orders**.

Notice life processes order with information



Extended Central Dogma, By User:Dhorspool, CC BY-SA 3.0,
<https://commons.wikimedia.org/w/index.php?curid=26070240>



<https://www.scientificamerican.com/video/are-genes-really-selfish2013-12-09/>

Genetic information has a history of about 4 billion years - What a wonder!

Now brain information becomes more important

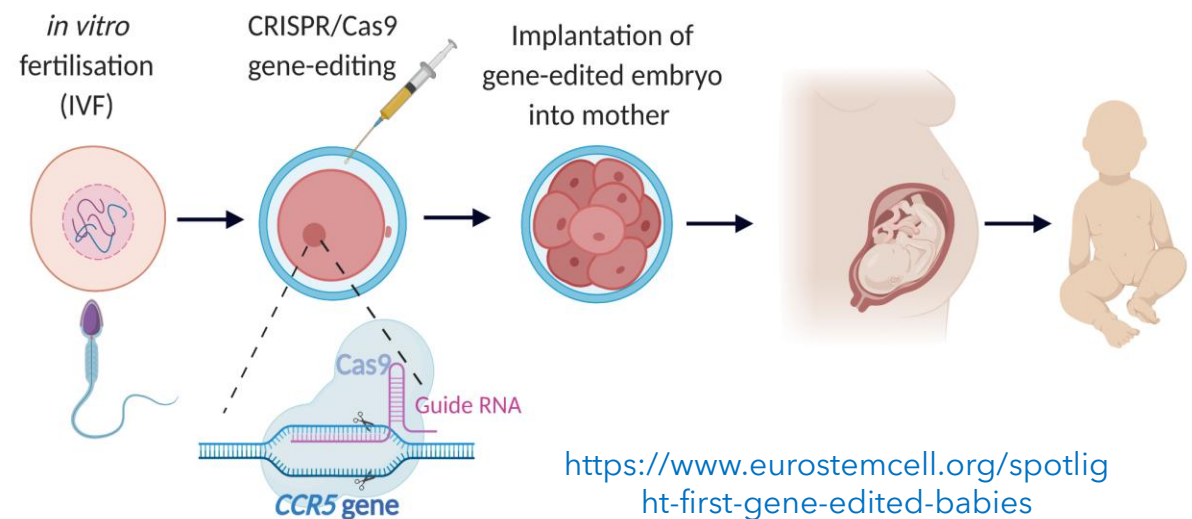
Some recent evidences:

- Hereditary succession -> Democracy (e.g., "One man, one vote", 1880)
- Gender equality (e.g., "One *man*, ..." -> "One *person*, ...", 1960)
- Colorism -> Black lives matter

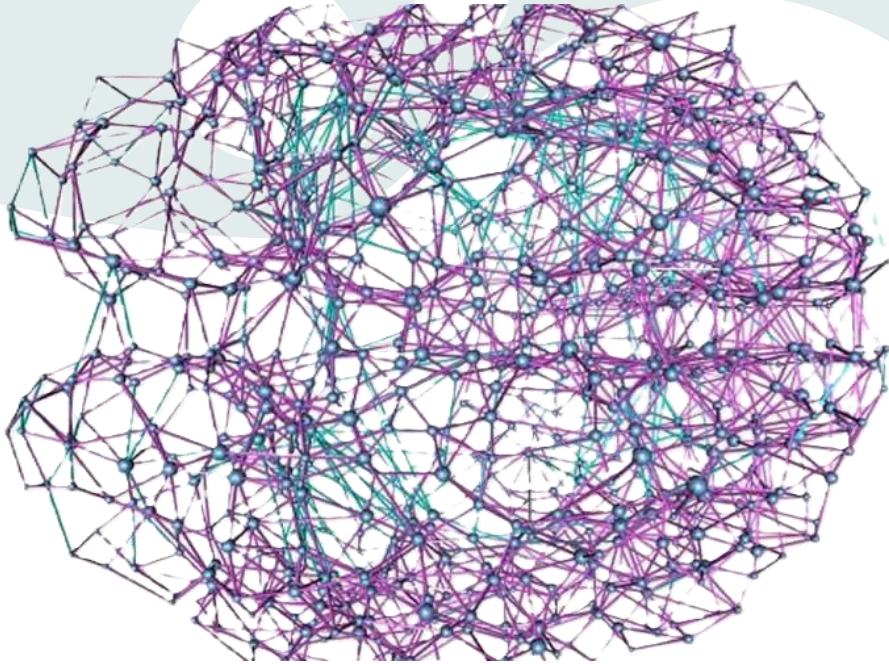


J. Doudna & E. Charpentier shared the 2020 Nobel chemistry prize for discovery of CRISPR.

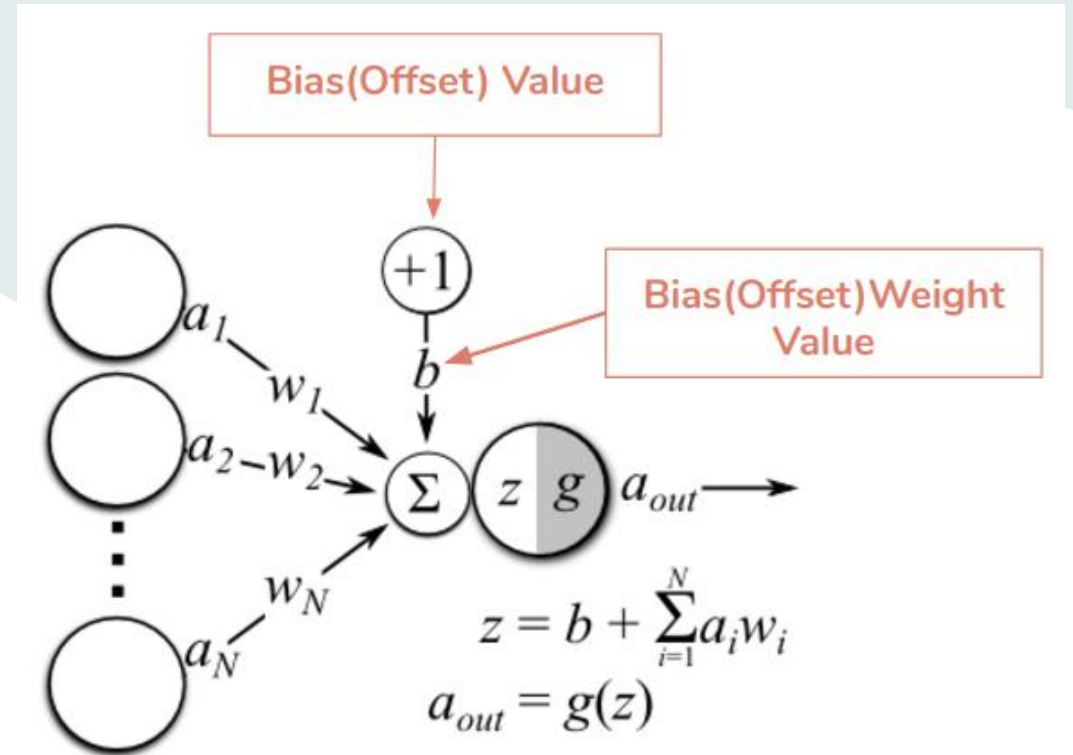
<https://www.nature.com/articles/d41586-020-02765-9>



Today, AI/ICT helps us to find/share more orders



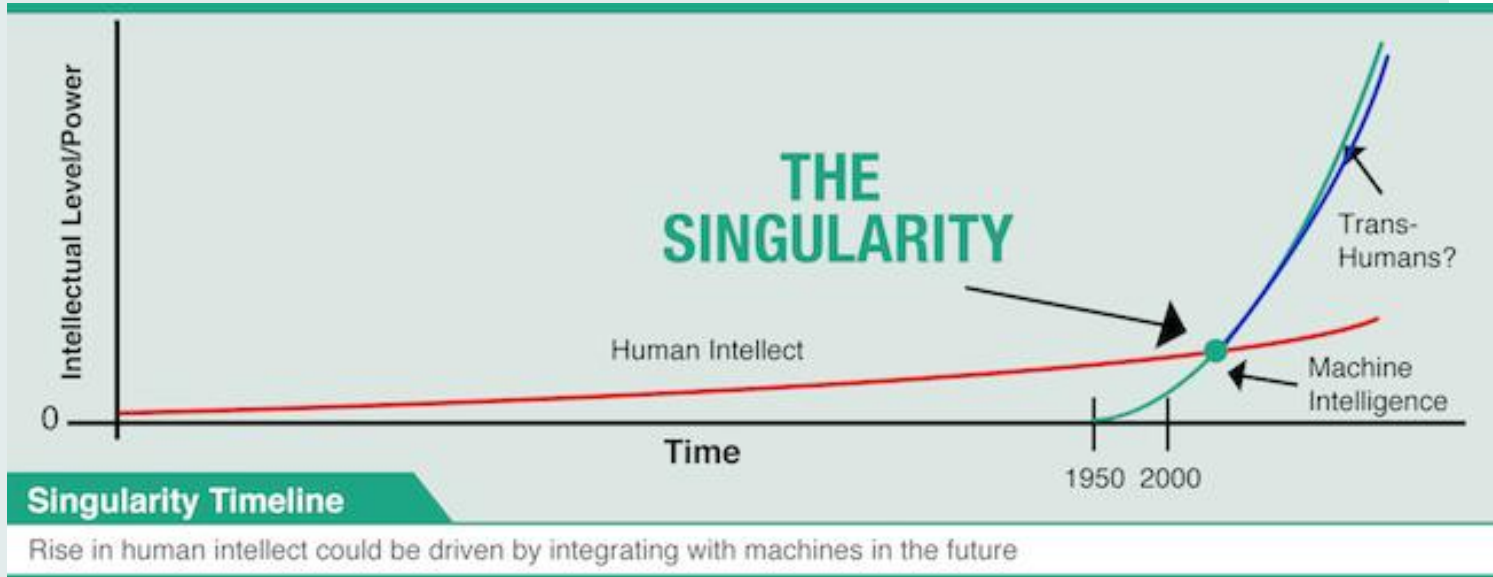
<https://neurosciencenews.com/neural-networks-evolution-brain-2203/>



<https://machine-learning.paperspace.com/wiki/weights-and-biases>

AI learns from brain including neural network, bias, dropout, attention, etc.

In the future (2045?), AI may surpass human. Do you think so? Are you ready for that?



<https://cwtejp1.wikispaces.com/2045+The+Singularity> (Link broken)



Our studies

- **Information Wisdom Theory:** next slide
- **Information/order finding:** Graph learning (Li), medical AI (Goperma), AI for Science (Basnet), math & algorithm for graphs (Fatima, me)
- **Information/order sharing:** Representative theory & One person, one vote (Tanimoto, Lucic, me), equality & socio-economic indicators (Lucic, me), AI agent (Goperma, Basnet), leadership (Liu, me), social networks (Fatima, me)

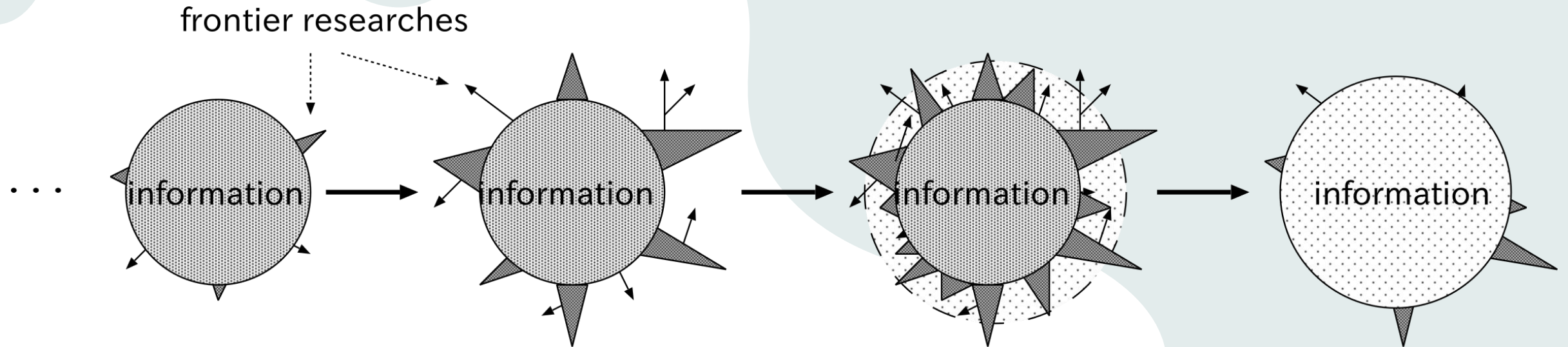
Living in this exciting information era, we are indeed lucky.

My lecture: Information Wisdom Theory

- It studies life, human, society, and AI from the perspective of information.
- Output in 2025 (Students' studies)
 - Life & religion & oshikatsu (fan activities, 推し活) (a student from G.S. Economics)
 - A proposal of Health Care 3.0 (G.S. Medicine)
 - Call for study on ethics of gene-edited (designed) babies (G.S. Agriculture)
 - Fiction to reality: Fictionality in architecture (GSAIS)
 - A proposal of Meaning/Information Conversion Efficiency of energy (G.S. Energy)
 - Art/Culture: meme of humanity (G.S. Management), etc.

APPENDIX

Information finding: Research as an example



Start -> Review the literature (theory & frontier) to identify the **chaos** (spikes) -> Find more evidences and propose a **good theory** to clear/cover the chaos.

Recent AI can do most of the works -> AI for Science (Rojan's interest).

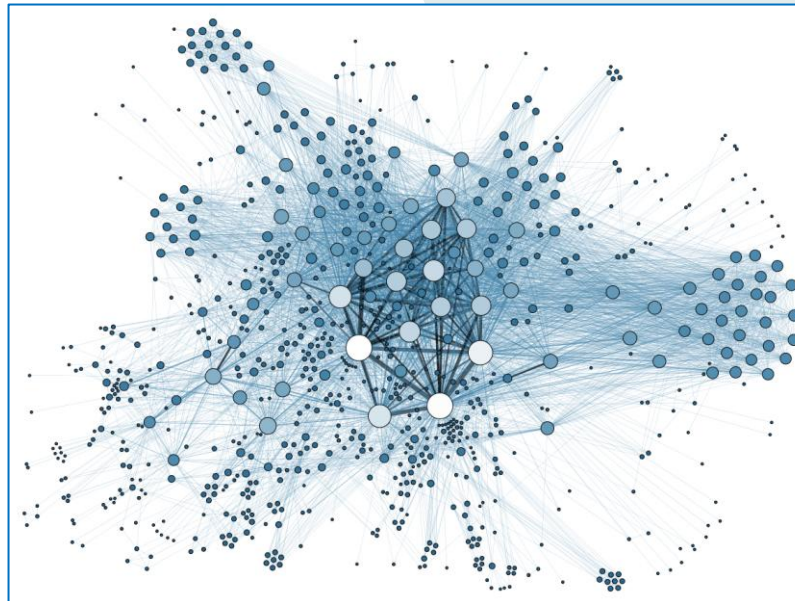
From finding to sharing

Genetic -> **heredity**; **in-brain** -> **interactions**. Particularly, **human** has found efficient ways via external media, society, and recently, ICT systems and AI too.



Claimed "Oldest known drawing by human hands", discovered in **Blombos Cave** in **South Africa**. Estimated to be 73,000 years old.^[2]

https://en.wikipedia.org/wiki/Prehistoric_art



https://upload.wikimedia.org/wikipedia/commons/9/9b/Social_Network_Analysis_Visualization.png

December 11, 2025 Product Release

Introducing GPT-5.2

The most advanced frontier model for professional work and long-running agents.

A new era of intelligence with Gemini 3

Nov 18, 2025
13 min read

Gemini 3 is our most intelligent model that helps you bring any idea to life.



Sundar Pichai
CEO, Google and
Alphabet



Demis Hassabis
CEO, Google DeepMind



Koray Kavukcuoglu
CTO, Google DeepMind
and Chief AI Architect,
Google

Share

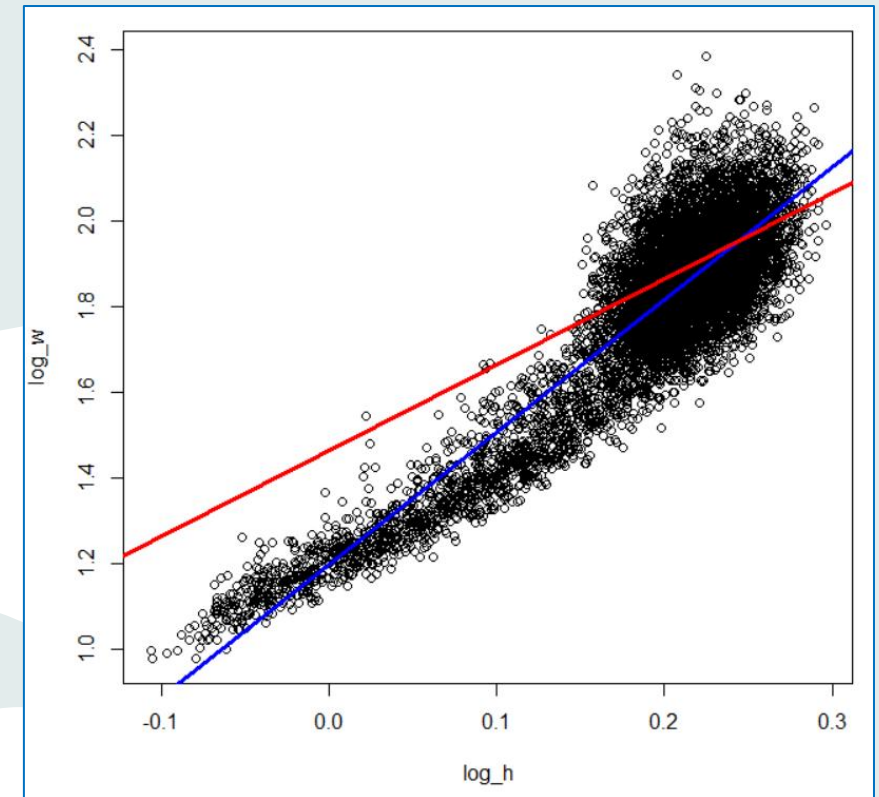


APPENDIX for discussion on Jan 15th

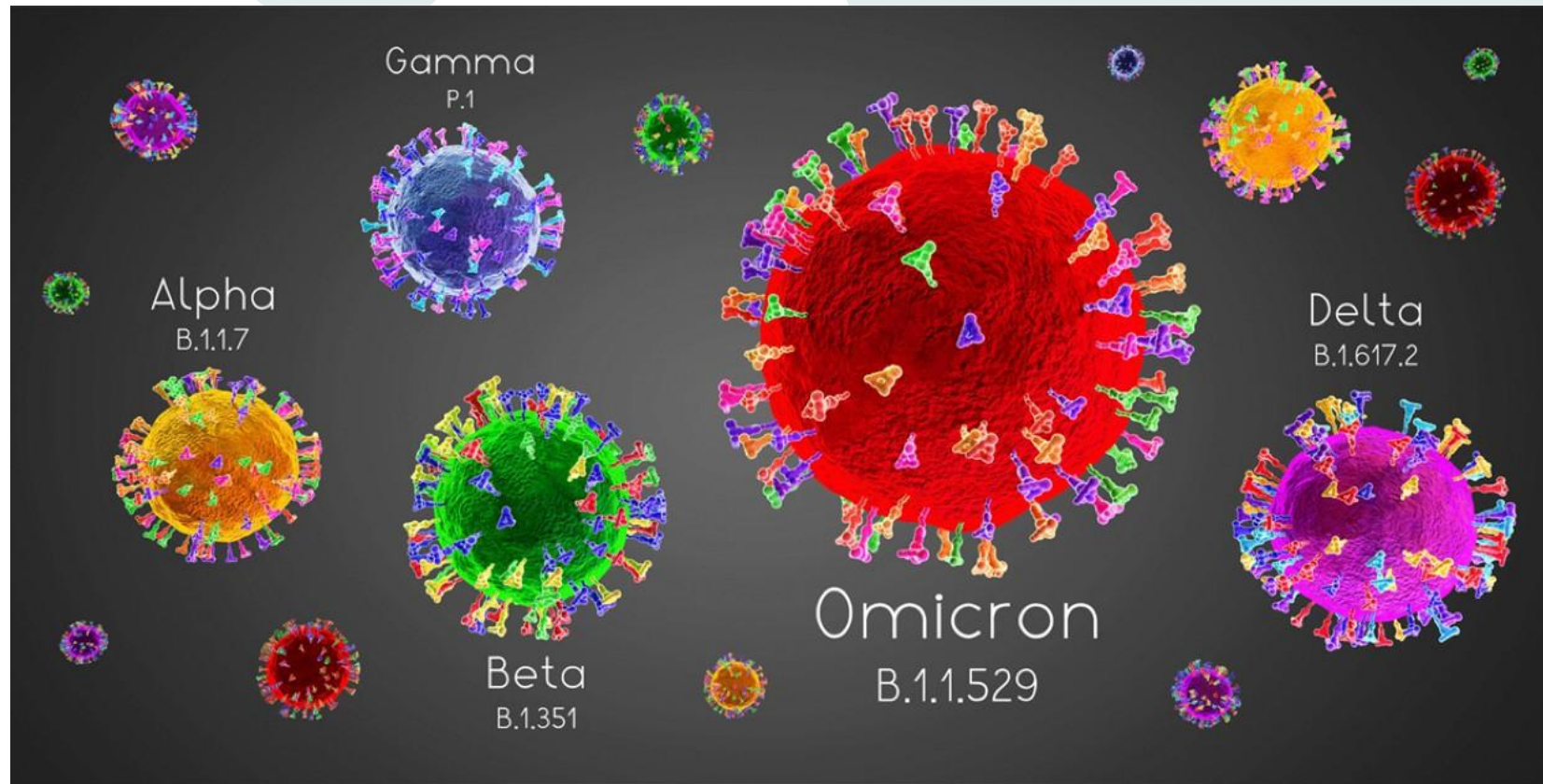
Machine Learning (ML): Key of today's AI

- Assuming the data follows a relation $y = f(x)$, ML is to find the optimal parameters that decide f from known data (= learn) and uses it to predict unknown data. **(Machine finds good information.)**
- E.g., linear regression $\rightarrow f(x) = ax + b$; deep learning $\rightarrow f$ is defined by an artificial neural network.

An example of linear regression



How life finds **good** information?



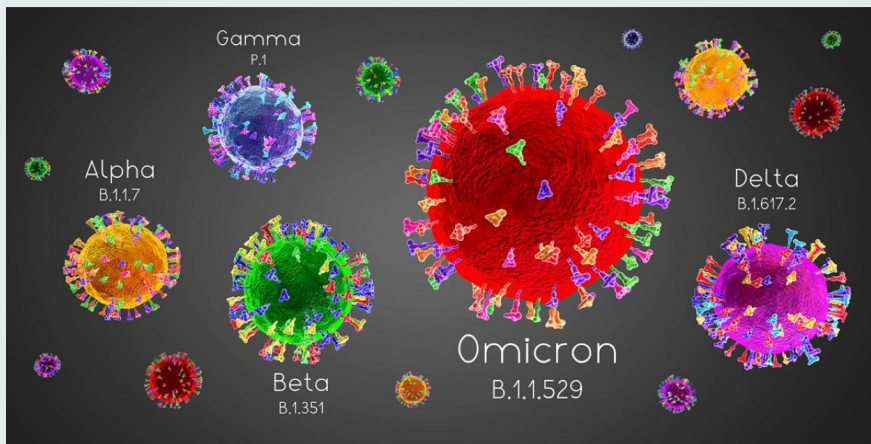
Life:

- Heredity
- Mutation

Hint from AI study & wisdom of survivability

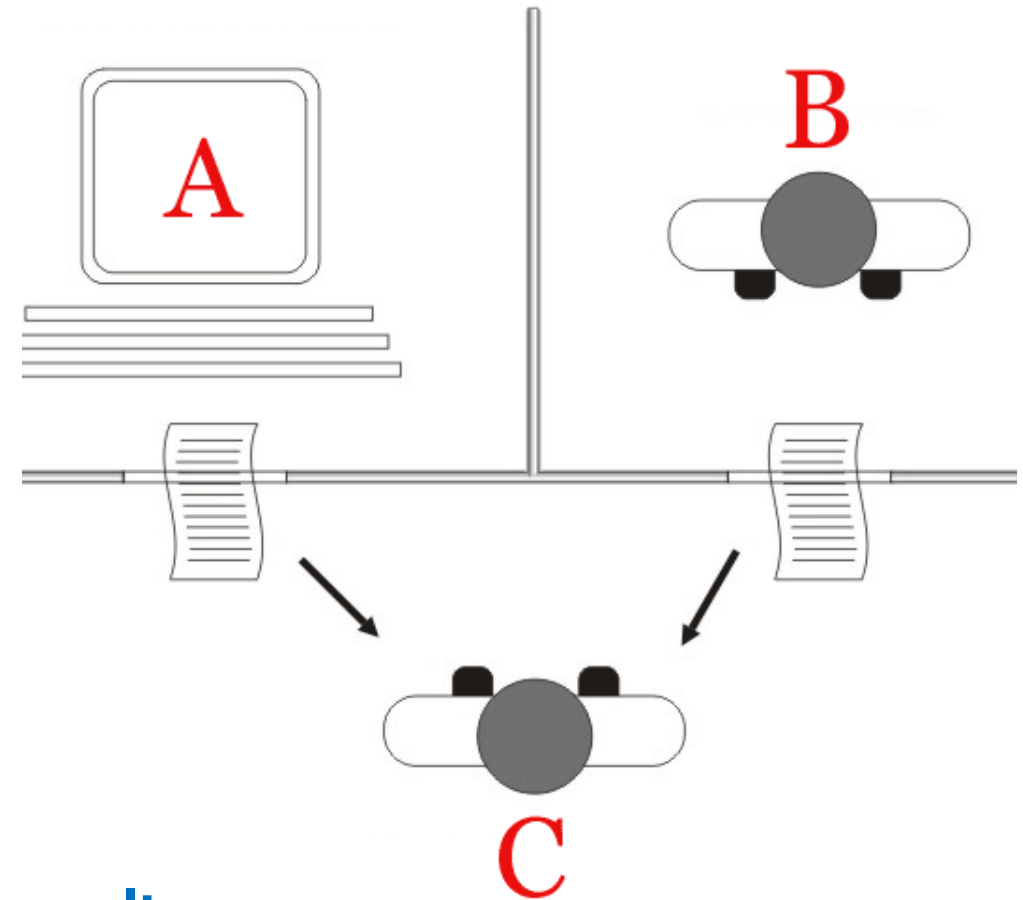
Turing test suggests that human-like intelligence may be mimicked by combining **knowledge** and **randomness**, which align with the actions to survive.

survive = learn + do randomly



<https://www.nature.com/articles/d41587-022-00001-5>

Life
Heredity: learning
Mutation: random result



Turing Test, By Juan Alberto Sánchez Margallo, CC BY 2.5,
<https://commons.wikimedia.org/w/index.php?curid=57298943>

Evidence from neuroscience

サライアンス・ネットワーク

Saliience network

デフォルト・モード・ネットワーク
とエグゼクティブ・コントロール・
ネットワークの仲介役

Switch the next two networks

Default mode network

Executive control network

デフォルト・モード・ネットワーク

自由に創造的な思考・発想を広げるときに活動

エグゼクティブ・コントロール・ネットワーク

明確なゴールのある思考の際に活動

Activated for
free, creative
works (**Do
randomly**)

Activated for
goal-guided
works (**Learn**)



Practice by our
society (e.g.,
globalization or
localization)



survive = learn + do randomly



Applications of this wisdom theory in AI

Published: 27 January 2016

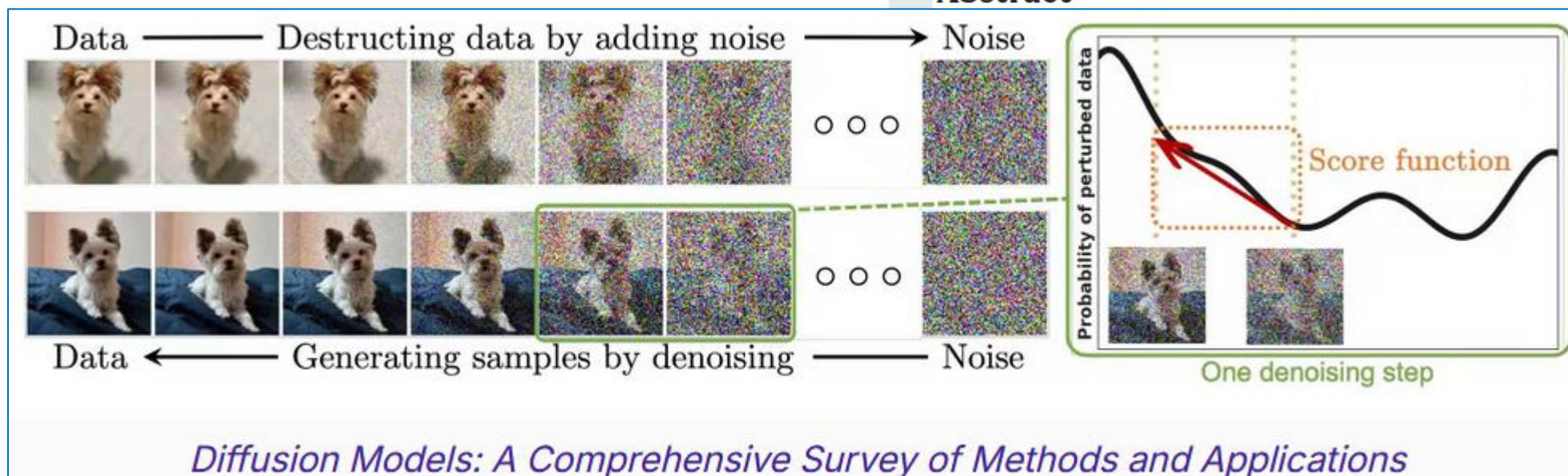
Mastering the game of Go with deep neural networks and tree search

David Silver , Aja Huang, Chris J. Maddison, Arthur Guez, Laurent Sifre, George van den Driessche, Julian Schrittwieser, Ioannis Antonoglou, Veda Panneershelvam, Marc Lanctot, Sander Dieleman, Dominik Grewe, John Nham, Nal Kalchbrenner, Ilya Sutskever, Timothy Lillicrap, Madeleine Leach, Koray Kavukcuoglu, Thore Graepel & Demis Hassabis 

Nature 529, 484–489(2016) | [Cite this article](#)

105k Accesses | 3632 Citations | 3127 Altmetric | [Metrics](#)

Abstract



<https://encord.com/blog/diffusion-models/>

survive = learn + do randomly

ing of classic games for artificial
difficulty of evaluating board
computer Go that uses 'value
to select moves. These deep
vised learning from human
lf-play. Without any lookahead
ne-art Monte Carlo tree search
play. We also introduce a new
h value and policy networks.
a 99.8% winning rate against
other Go programs, and defeated the human European Go champion by 5 games to 0. This is
the first time that a computer program has defeated a human professional player in the full-
sized game of Go, a feat previously thought to be at least a decade away.

Implication of the application to AI

AI is promising in probably all fields, but for that purpose AI needs freedom (randomness) which can be a threat to human society.

“One can imagine such technology outsmarting financial markets, out-inventing human researchers, out-manipulating human leaders, and developing weapons we cannot even understand. Whereas the short-term impact of AI depends on ***who controls*** it, the long-term impact depends on ***whether it can be controlled*** at all.”

— S. Hawking, M. Tegmark, S. Russel and F. Wilczek (2014)

Summary and prediction on survivability



Life 1.0	genetic info.	gene	heredity, mutation
Life 2.0	+ neuro info.	+ brain	+ sharing, fiction
Life 3.0	+ virtual info.	+ device	+ future AI (?)