超級研究者之謎

A.I.

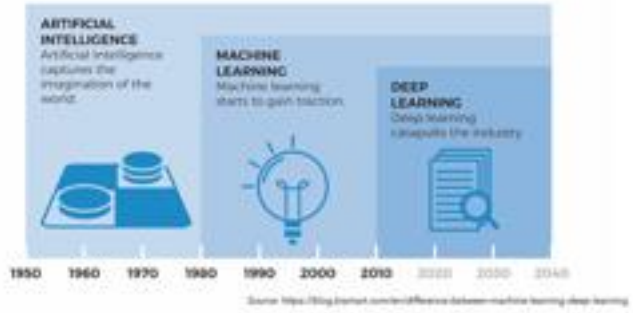
對學術的影響

and research workflow: the advent of super researchers

Source: Role Galitz, "A big male polar bear in Svalbard," The best photography of 2019, New A

1. The Background of AI

人工智能的背景

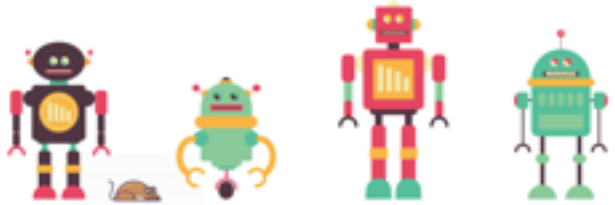


2. About ChatGPT

關於 ChatGPT

3. The Advent of Super Researchers

超級研究者的出現

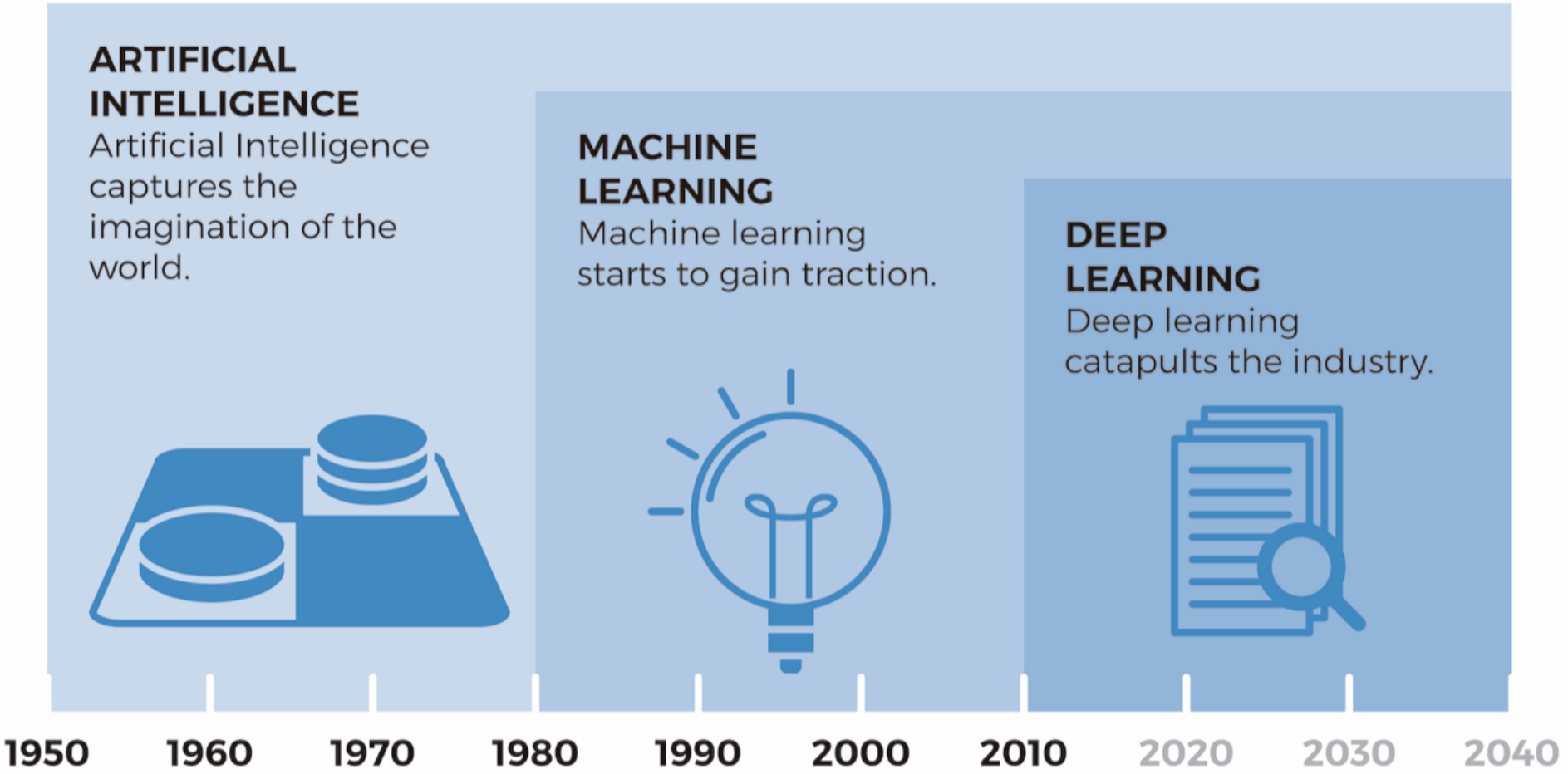


4. The Future of Science: Transdisciplinary

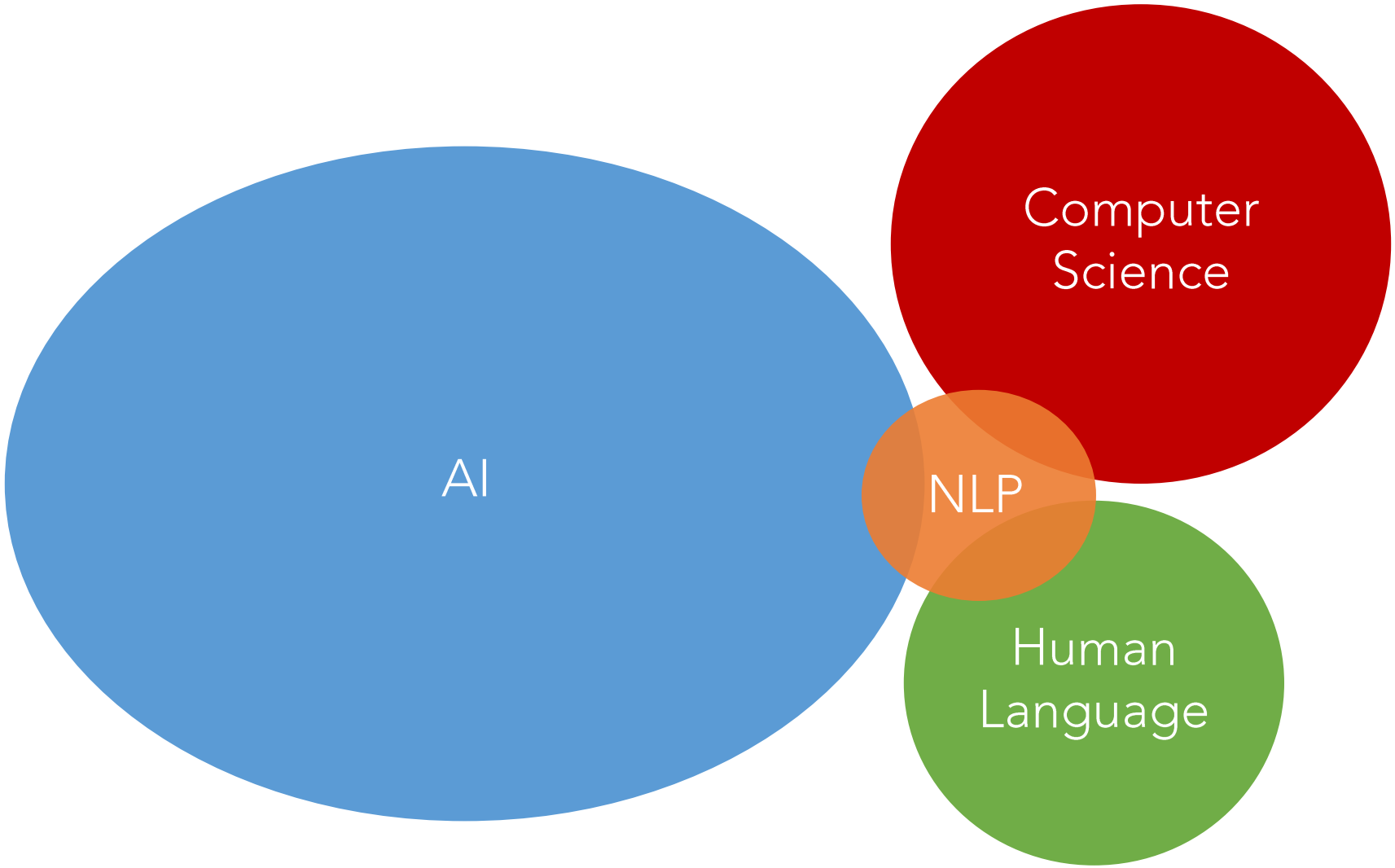
科學的未來：跨學科

1. The Background of AI

人工智能的背景



Source: https://blog.bismart.com/en/difference-between-machine-learning-deep-learnin


AI
Computer Science
NLP
Human Language

Natural Language Processing

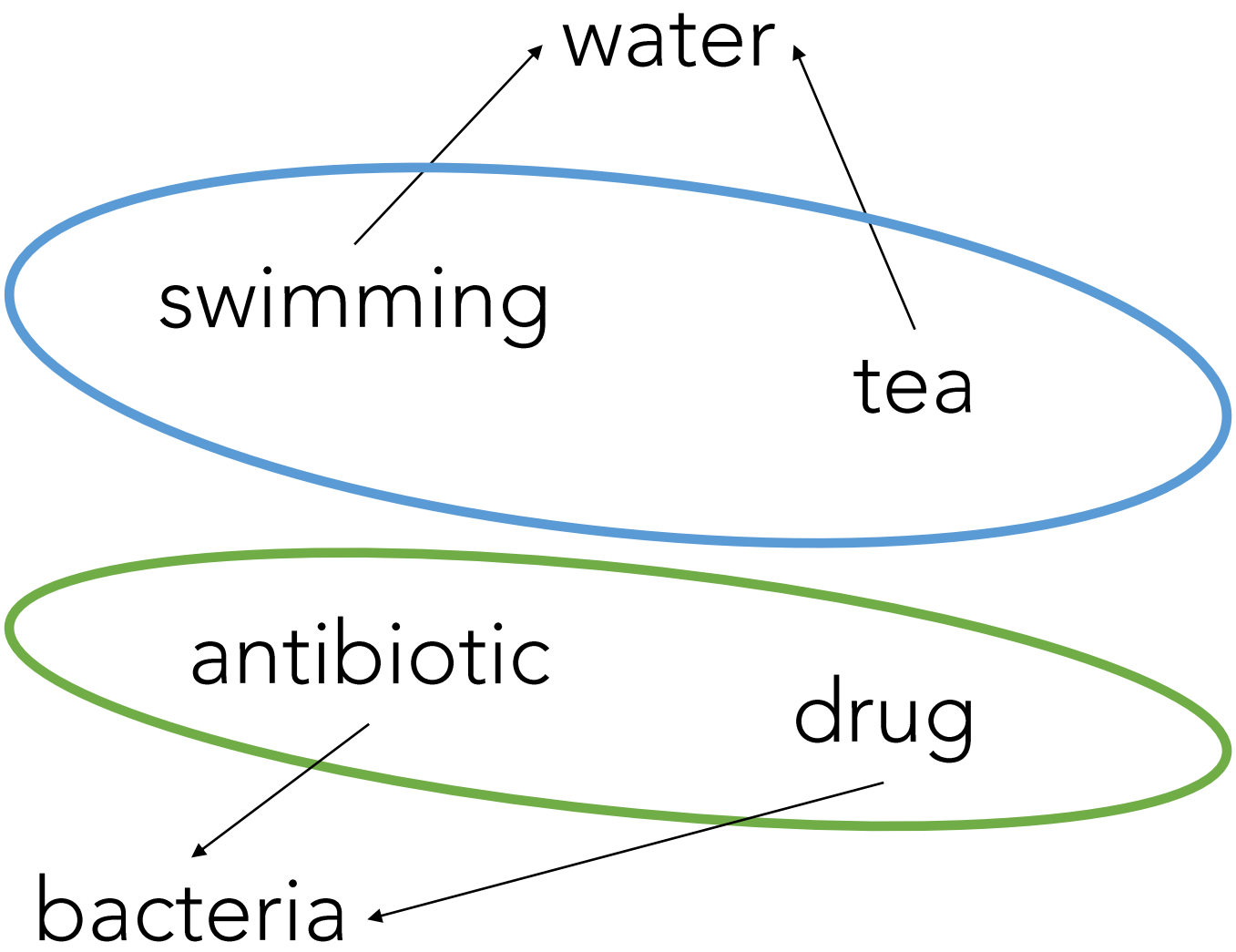
DIFFERENT LEVELS AT WHICH MACHINES PROCESS AND UNDERSTAND LANGUAGES

Phonetical and Phonological	understanding the patterns present in the sound and speeches
Morphological	understanding the structure of the words and the systematic relations
Lexical	understanding the part of speech
Syntactic	understanding the structure of the sentence
Semantic	understanding the literal meaning of the words, phrases, and sentences
Discourse	understanding units larger than a single sentence
Pragmatic	real-world knowledge to understand the bigger context of the sentence

Natural Language Processing

Semantic

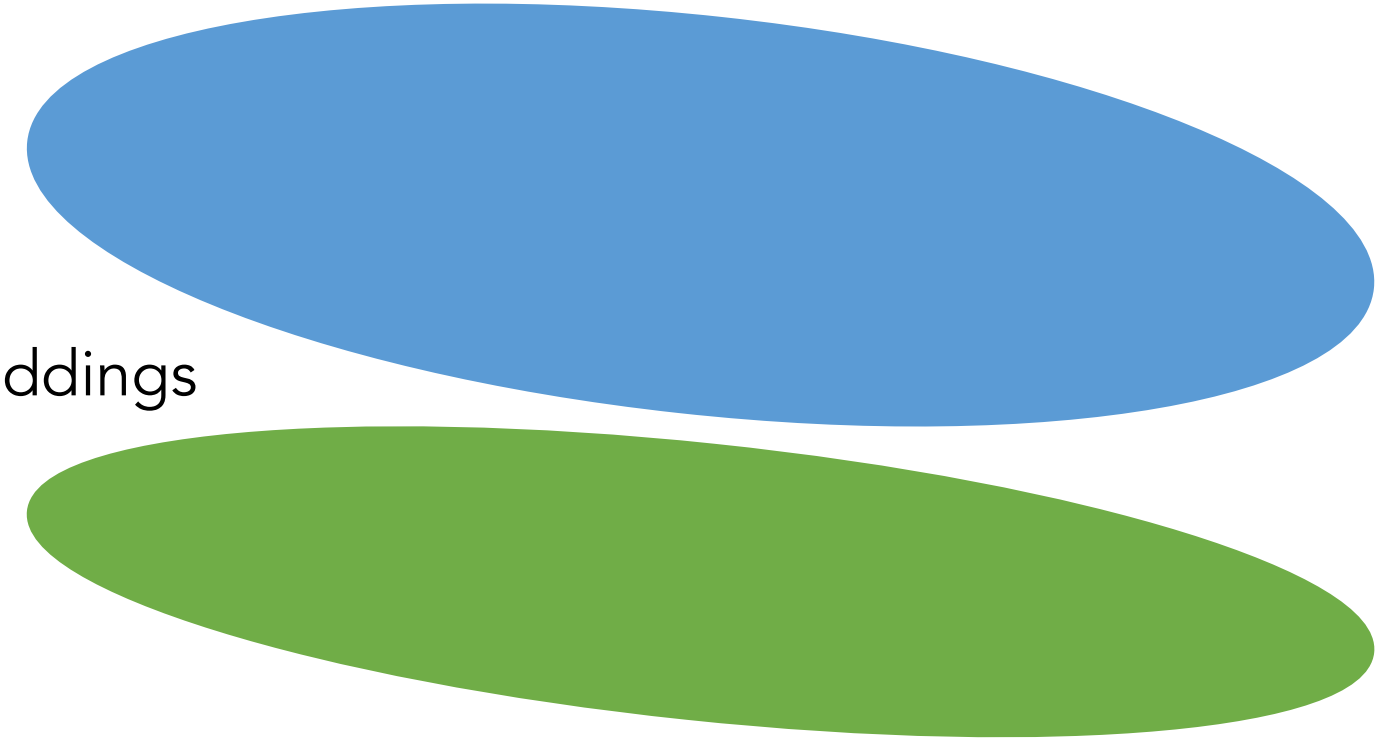
understanding the literal meaning of the words, phrases, and sentences



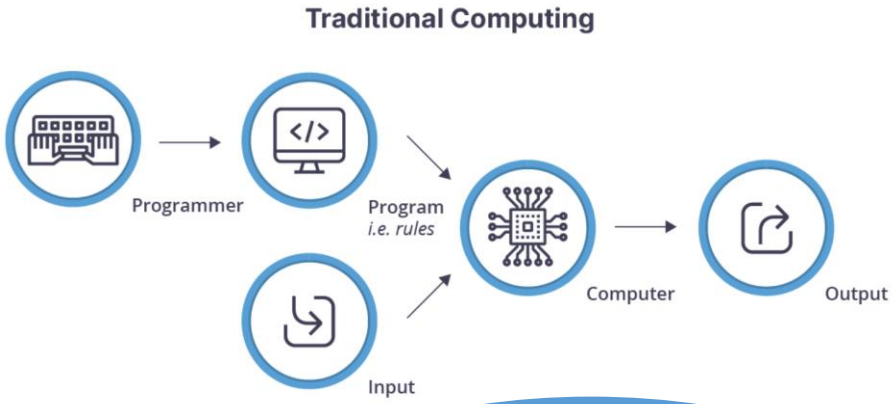
Natural Language Processing

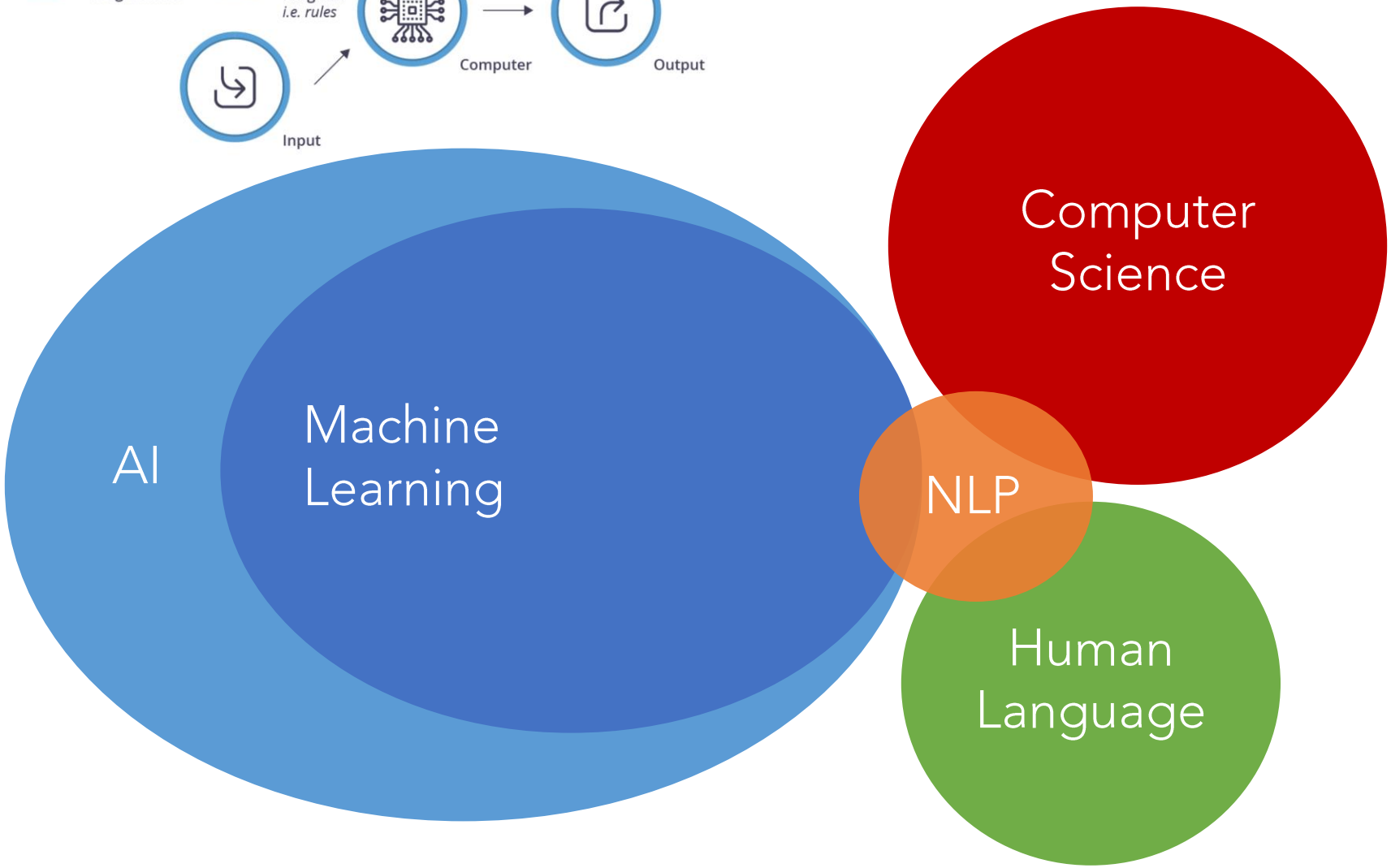
Semantic

understanding the literal meaning of the words, phrases, and sentences



Embeddings


Traditional Computing
Programmer
Program
i.e. rules
Input
Computer
Output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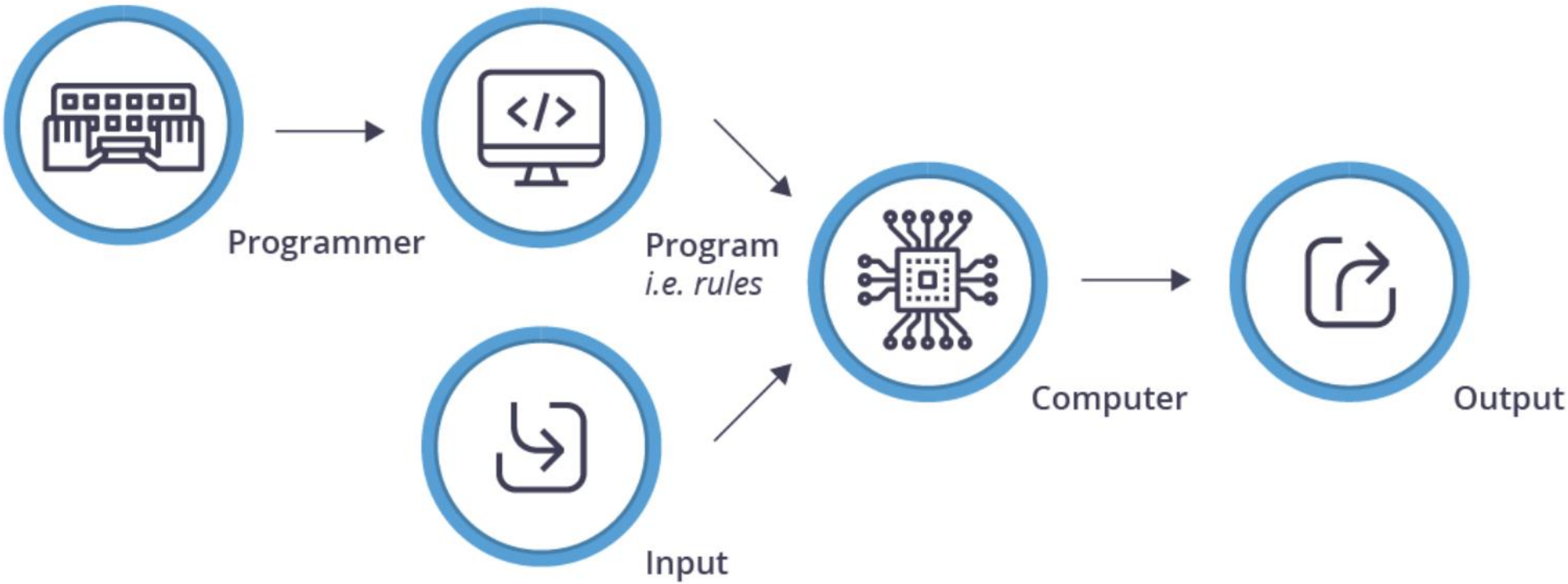

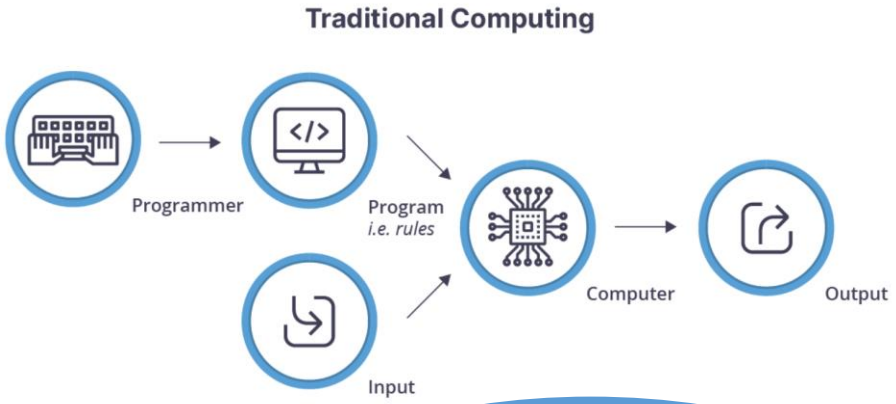
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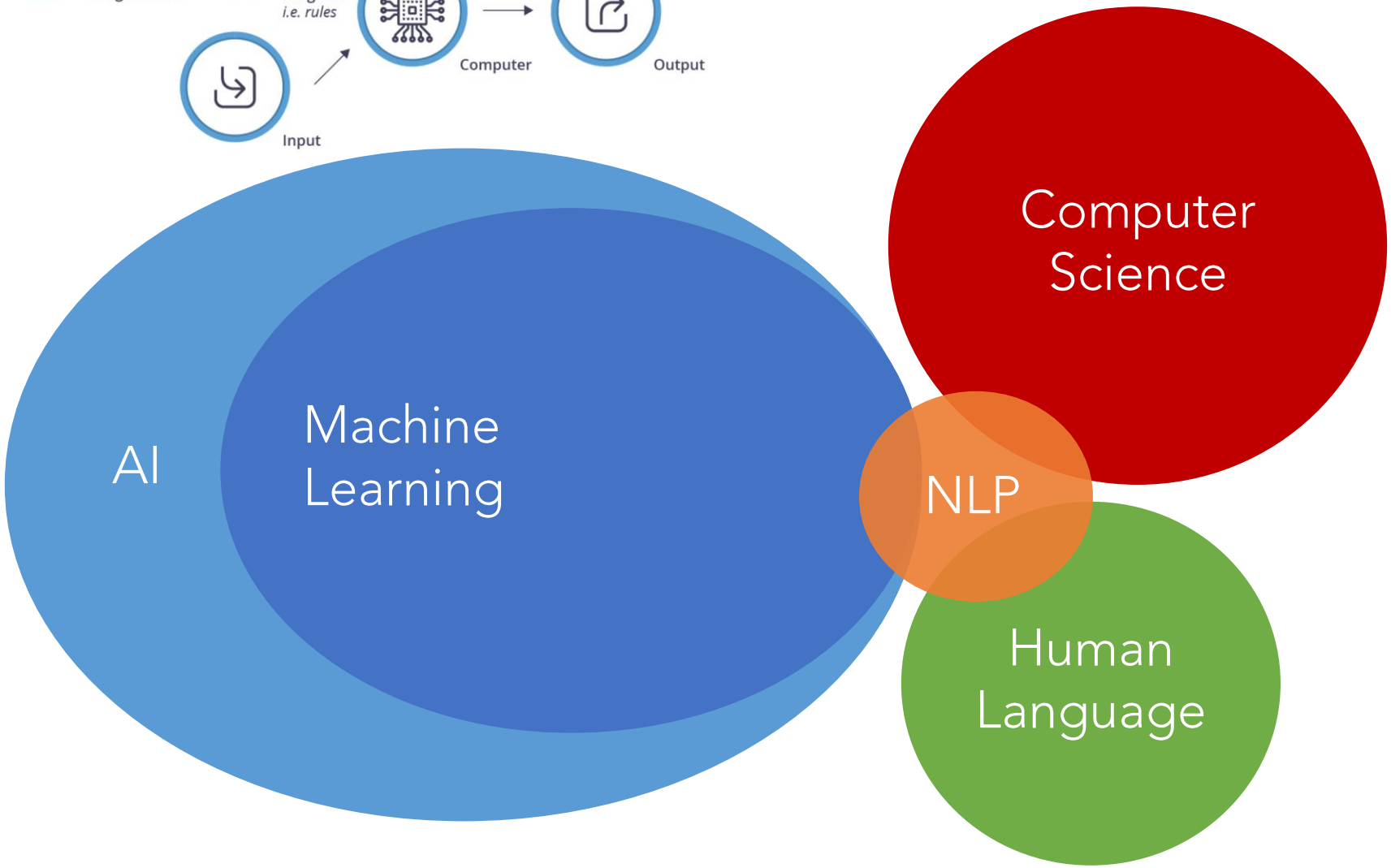
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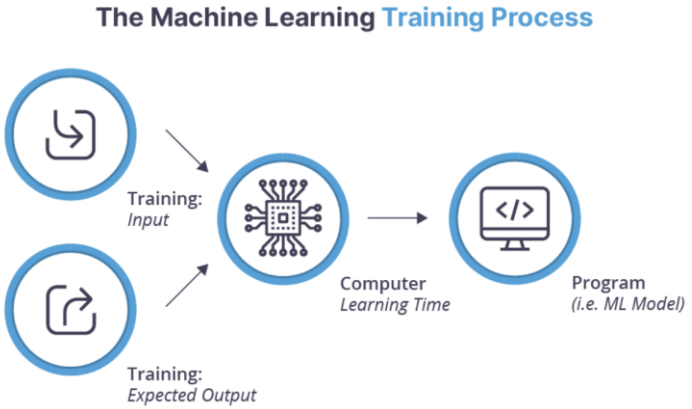
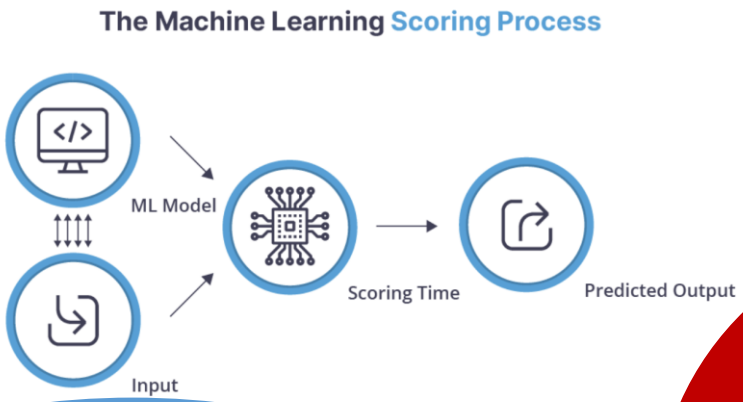
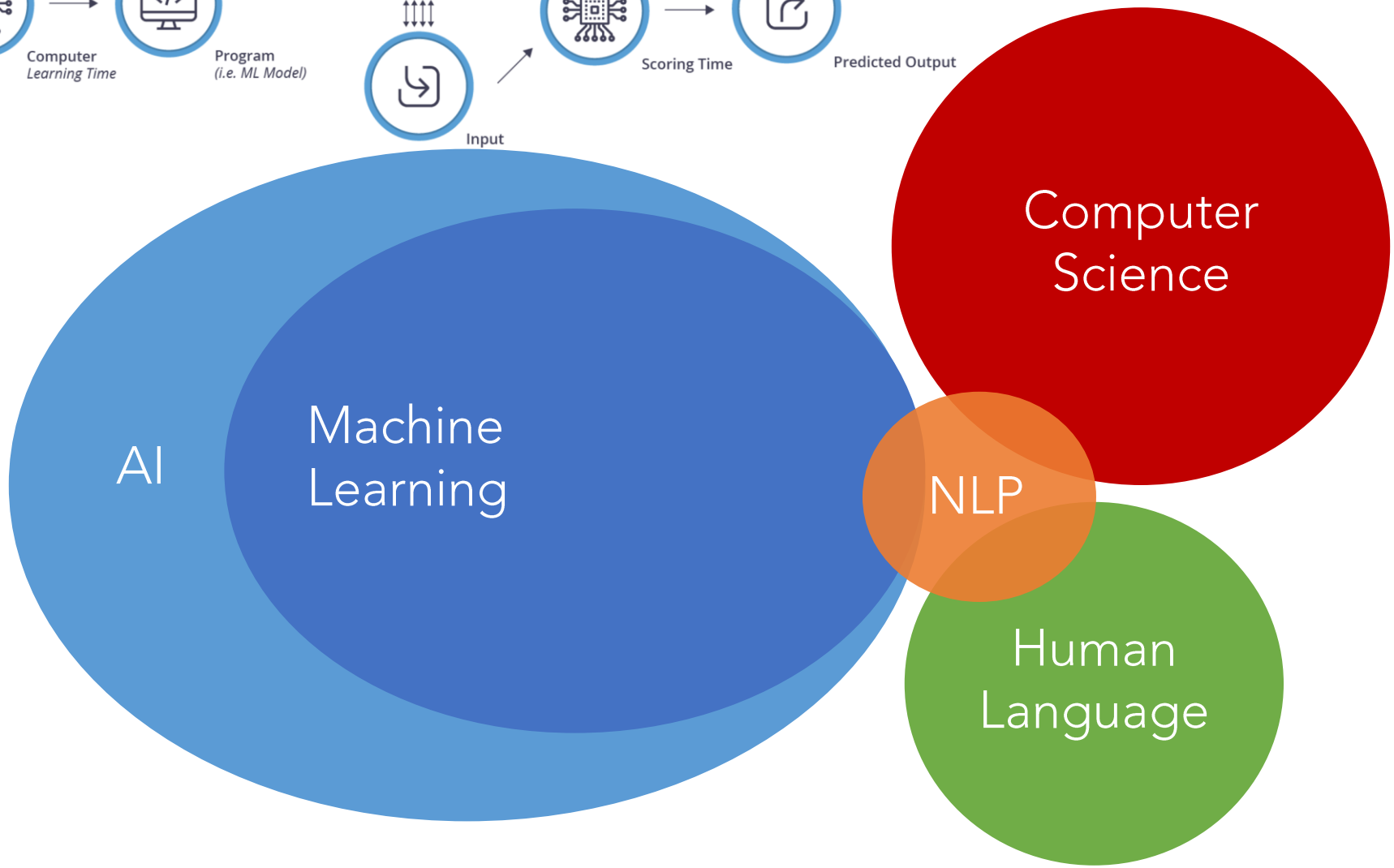
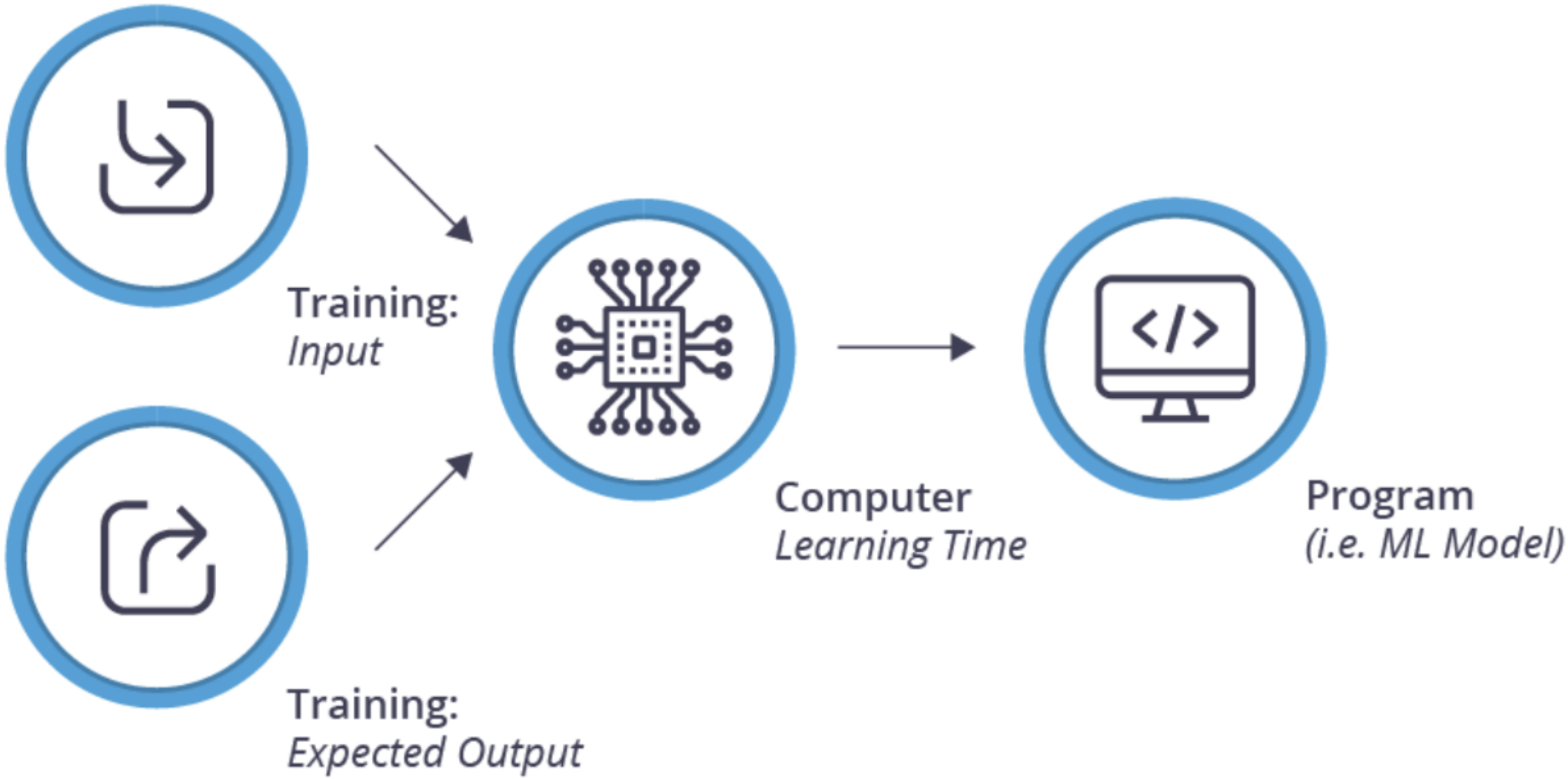
Human Language

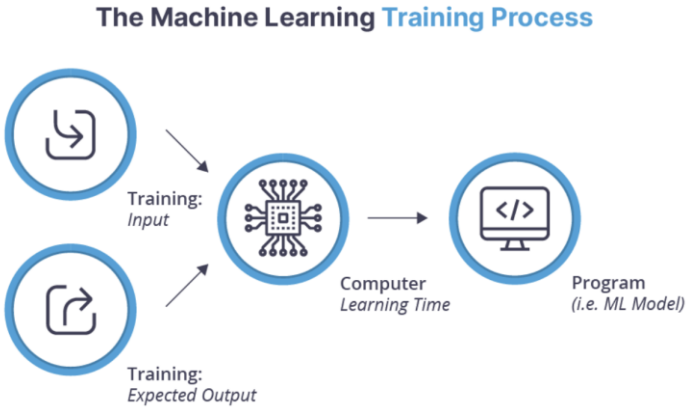

The Machine Learning Training Process
Training:
Input
Training:
Expected Output
Computer
Learning Time
Program
(i.e. ML Model)


The Machine Learning Scoring Process
ML Model
Input
Scoring Time
Predicted Output


AI
Machine
Learning
Computer
Science
NLP
Human
Language

The Machine Learning Training Process

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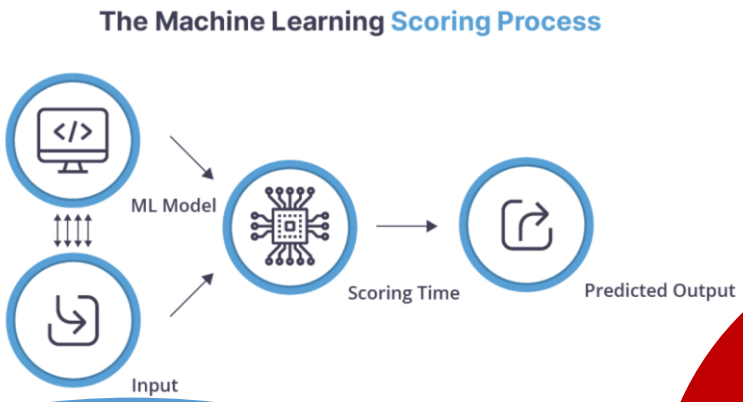
The Machine Learning Scoring Process
ML Model
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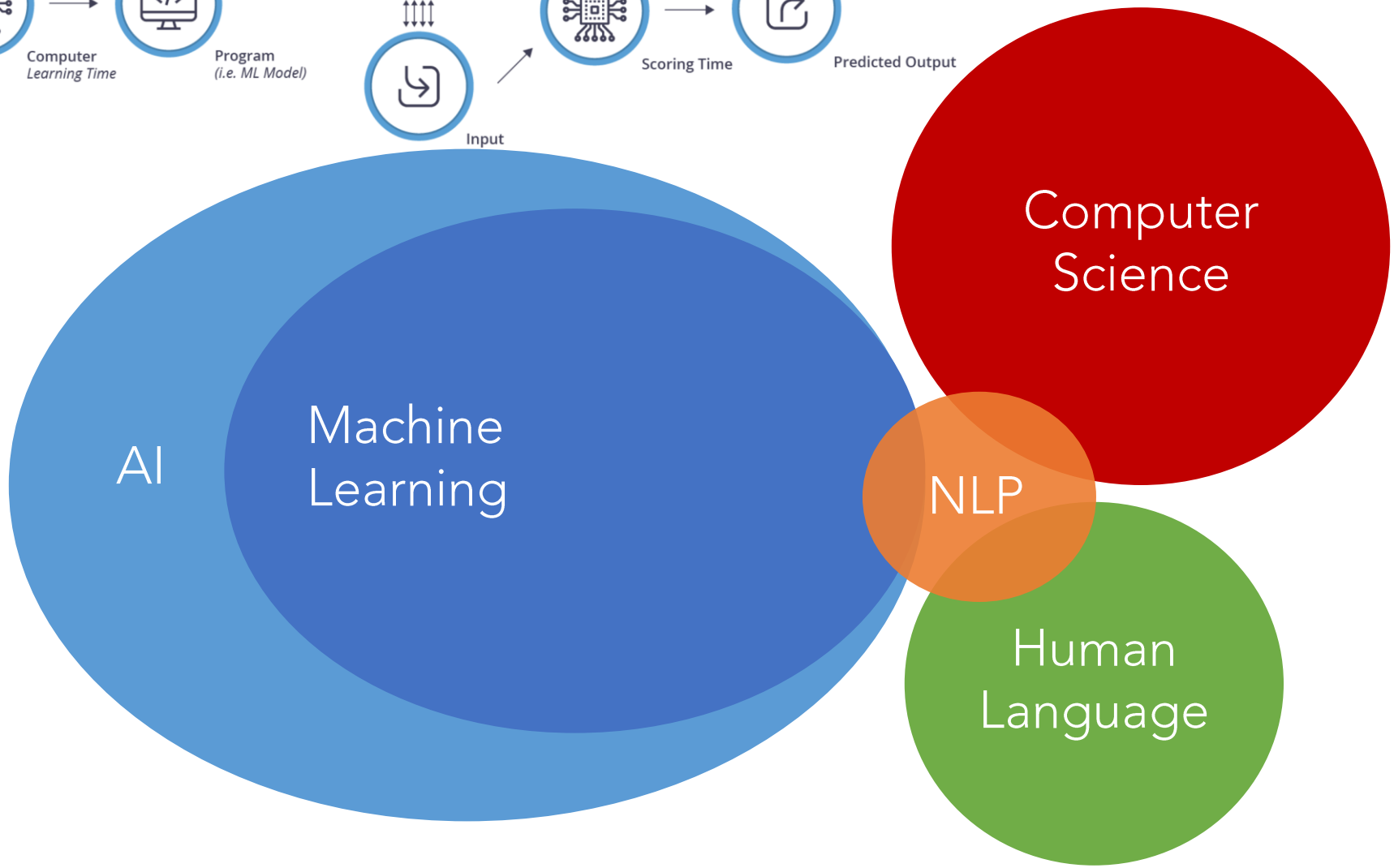
Scoring Time
Predicted Output


AI
Machine
Learning
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Science
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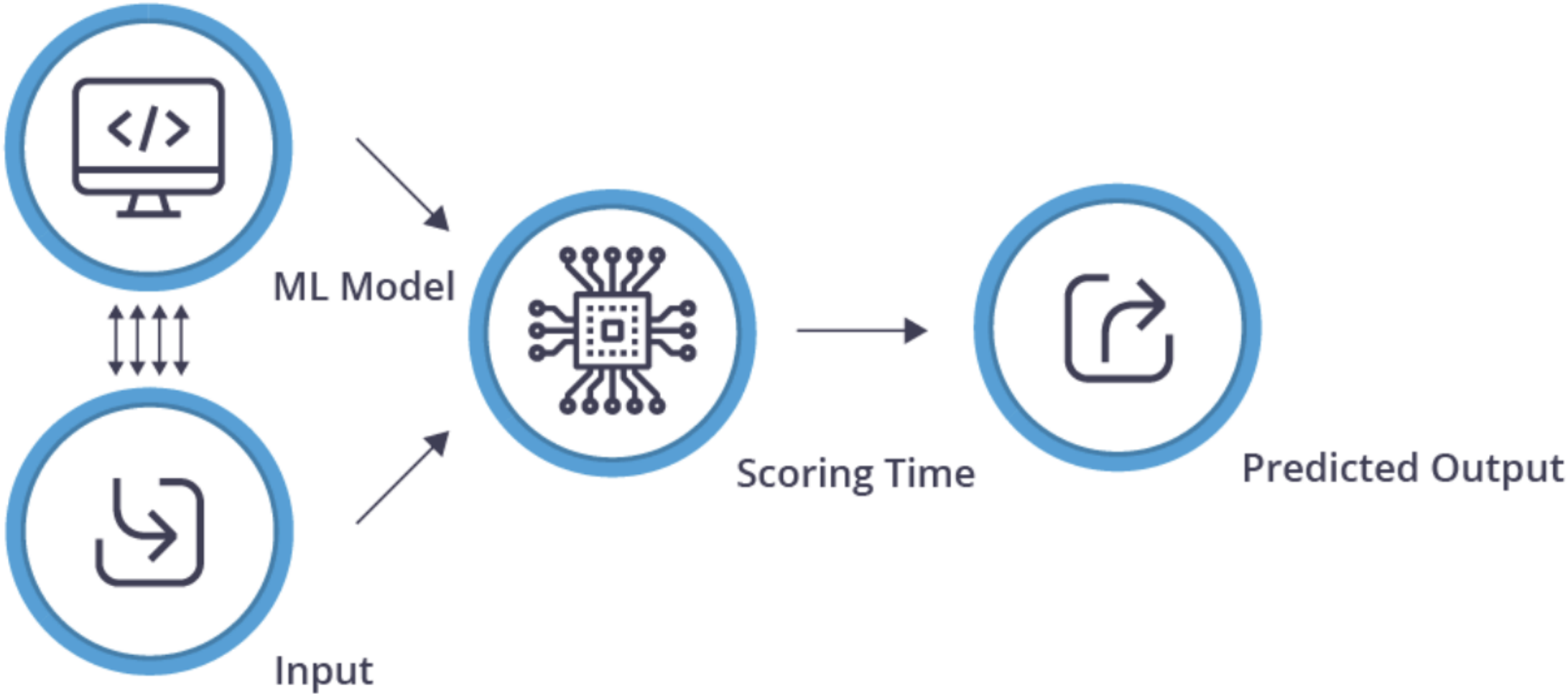
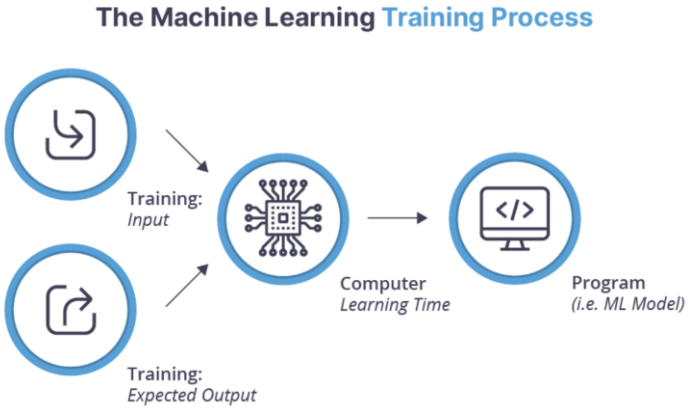
Language

The Machine Learning Scoring Process

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Input
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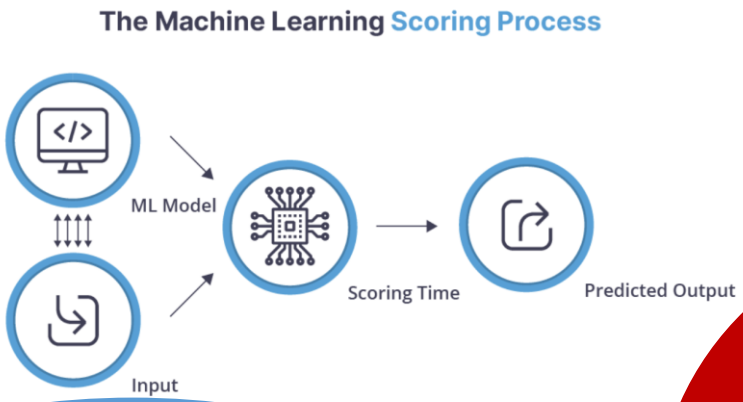
The Machine Learning Scoring Process
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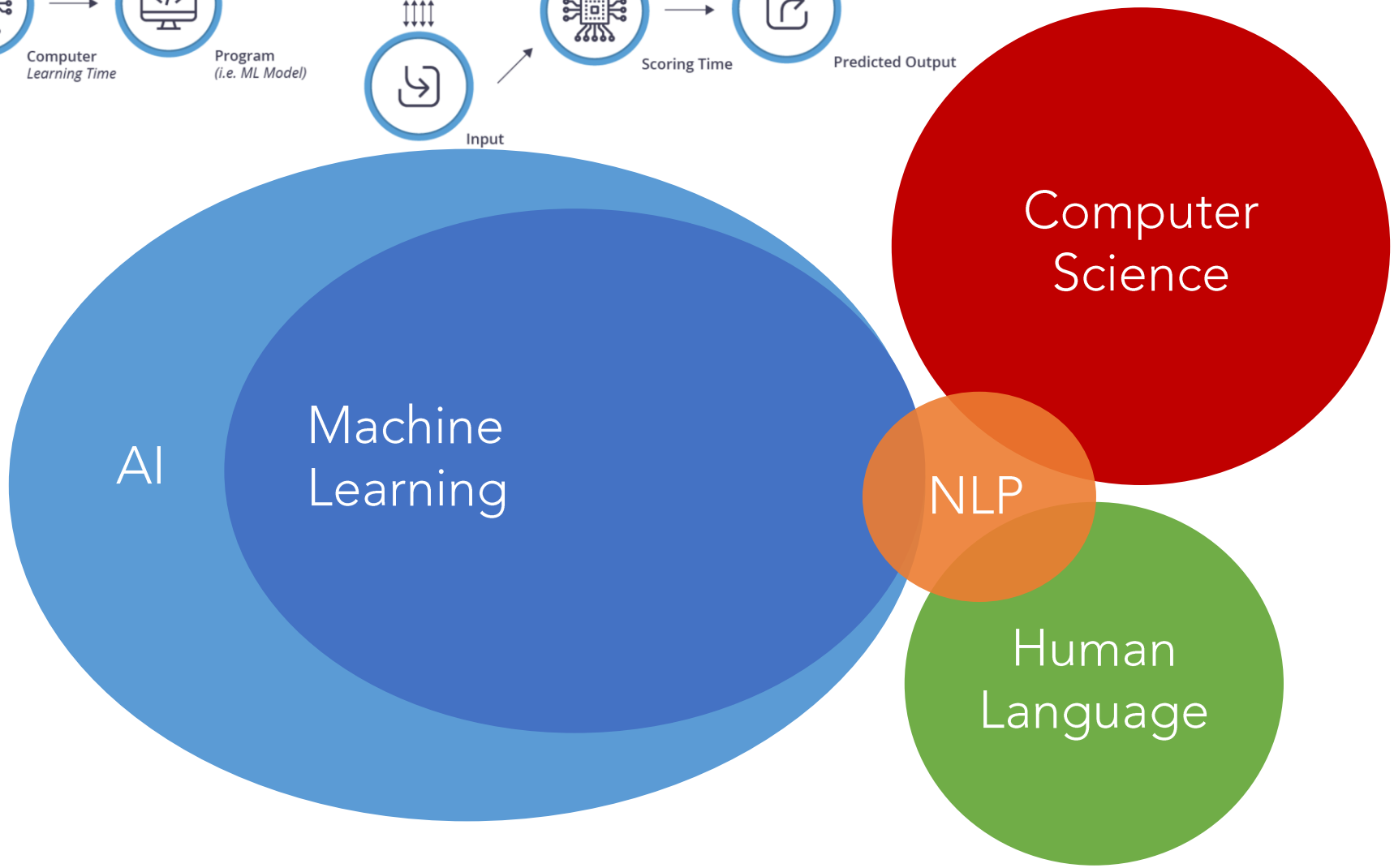
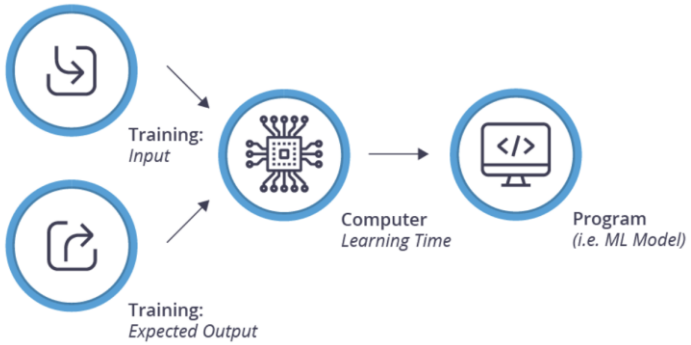

AI
Machine
Learning
Computer
Science
NLP
Human
Language

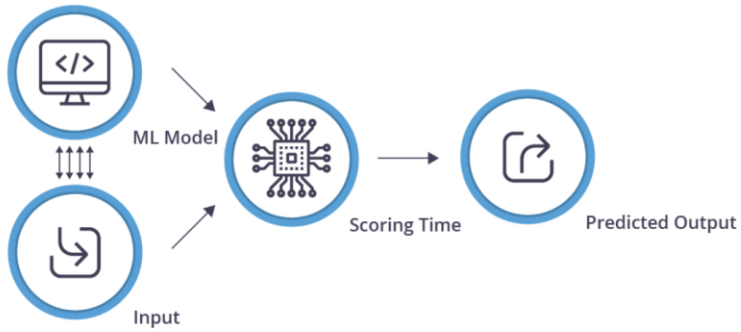
Phase 1: ML Training Model

The Machine Learning Training Process

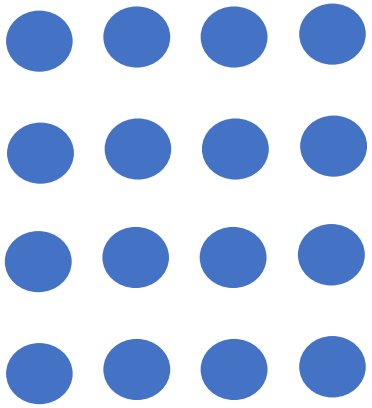


Phase 2: Evaluation

The Machine Learning Scoring Process

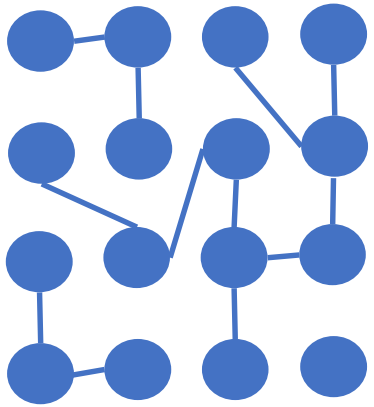


Gather some data



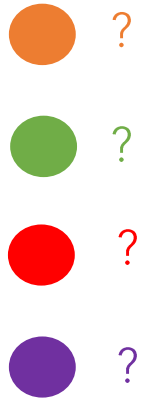
Make sure they are good

Model the data

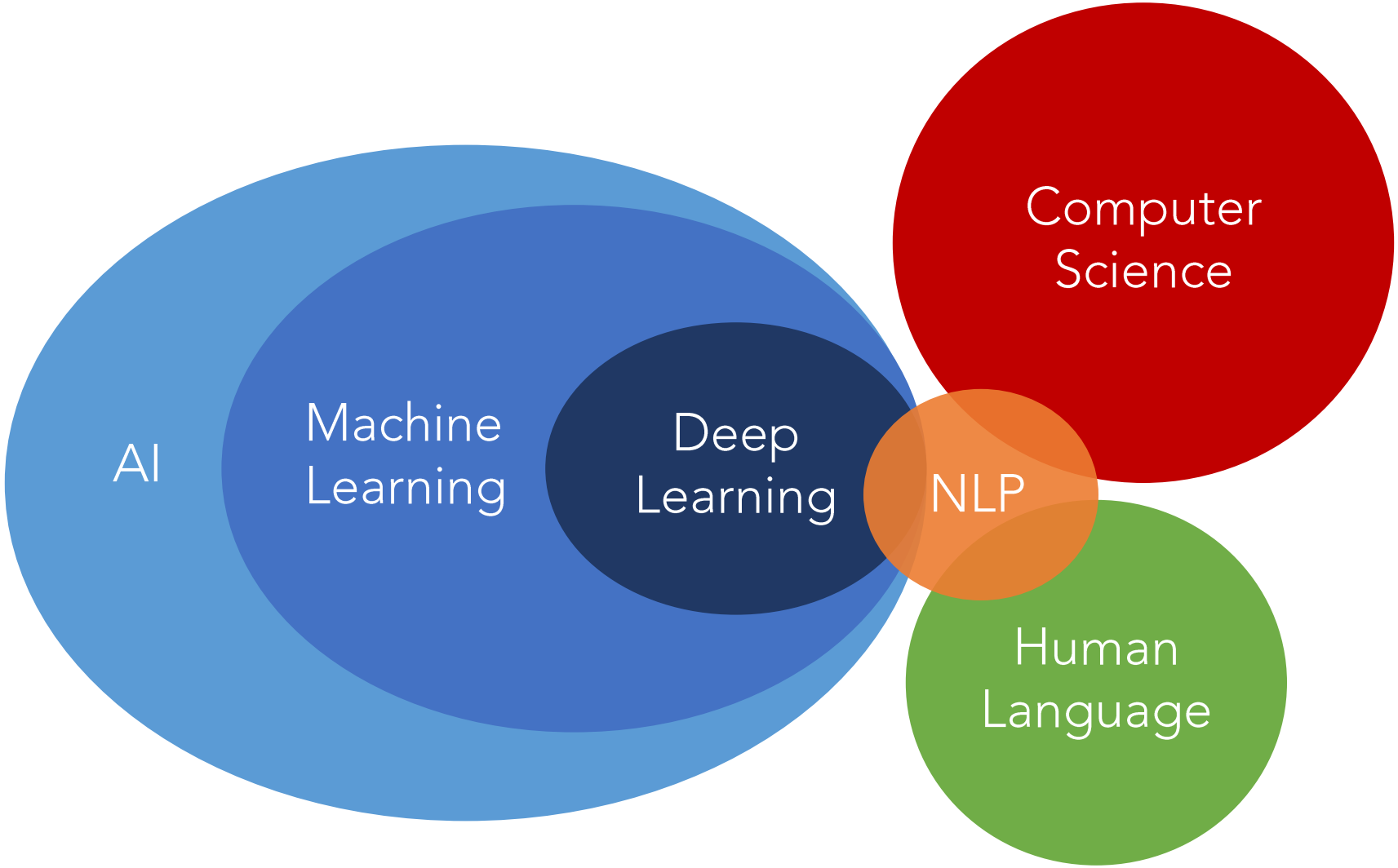


Try different algorithms & settings

Understand unknown data



Feed new data into the model


AI
Machine Learning
Deep Learning
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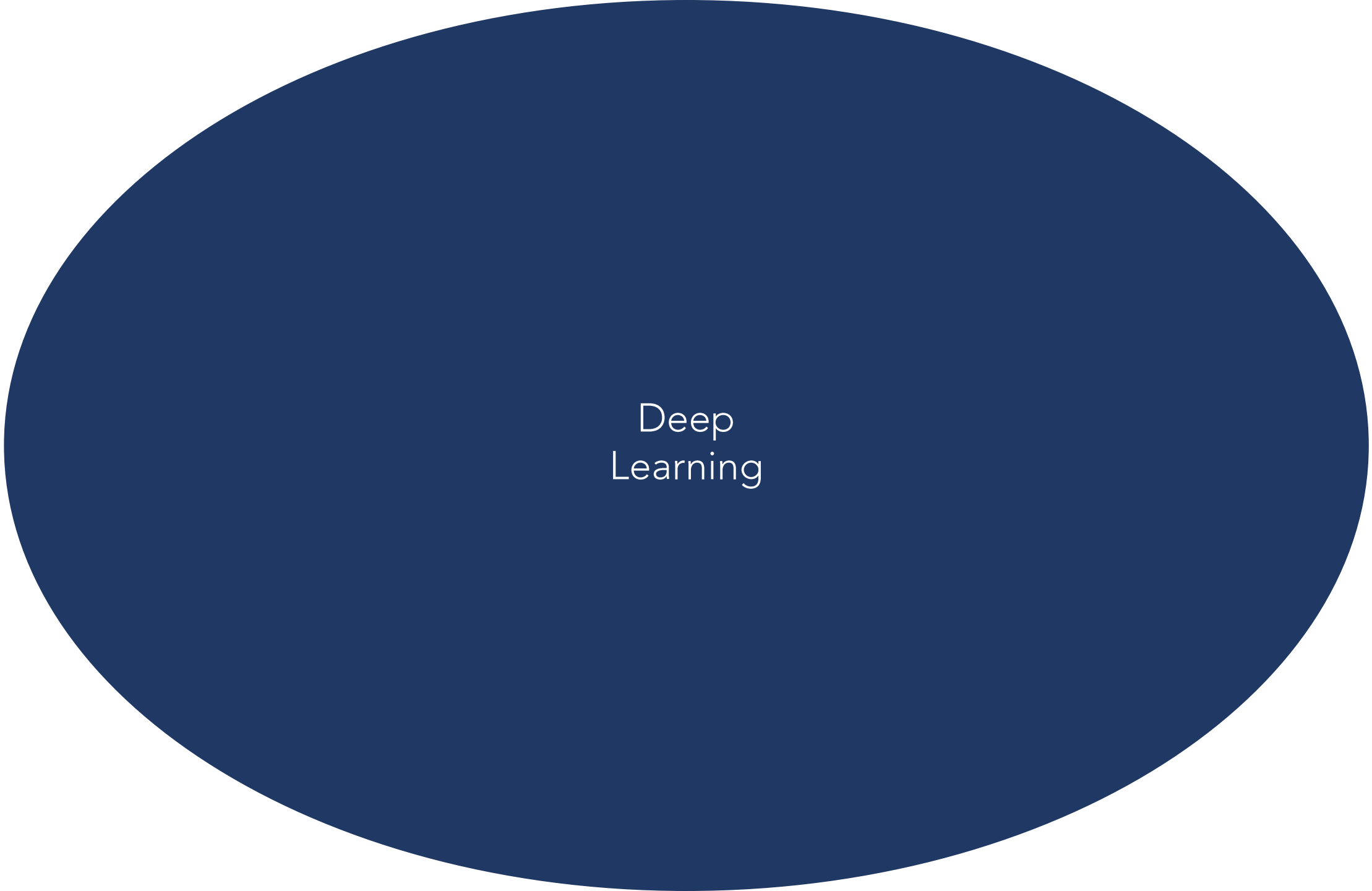
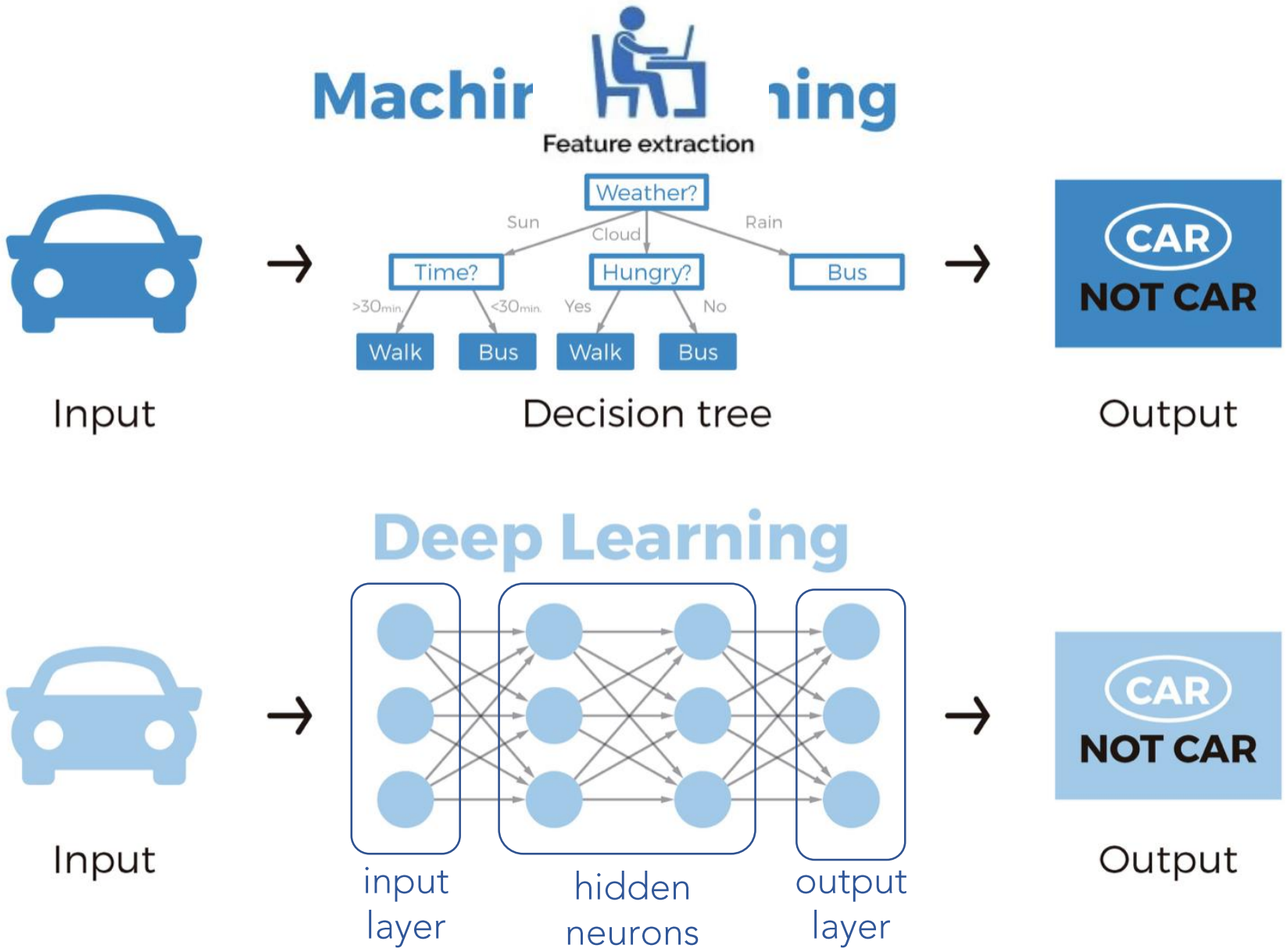
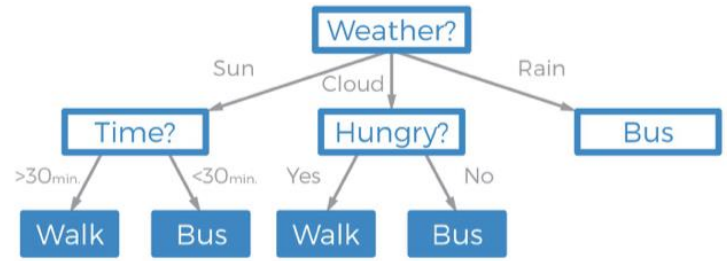

Deep
Learning


Machir ning
Feature extraction
Weather?
Sun
Cloud
Rain
Time?
Hungry?
Bus
>30min.
<30min.
Yes
No
Walk
Bus
Walk
Bus
CAR
NOT CAR
Input
Decision tree
Output
Deep Learning
Input
input layer
hidden neurons
output layer
CAR
NOT CAR
Output

Machir ning

Feature extraction

Input

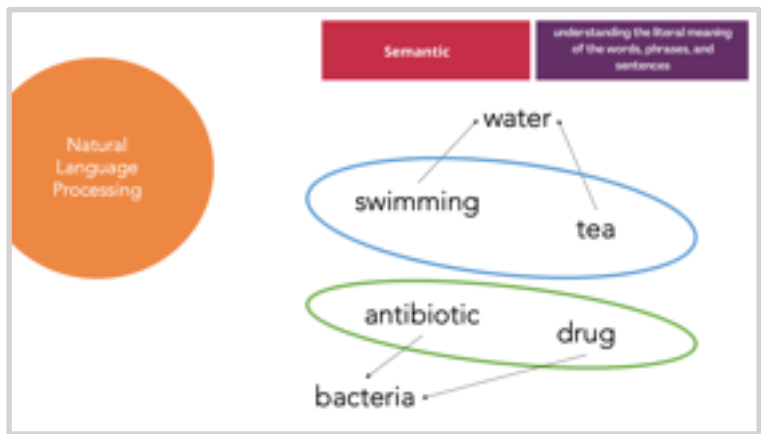


Decision tree

Output

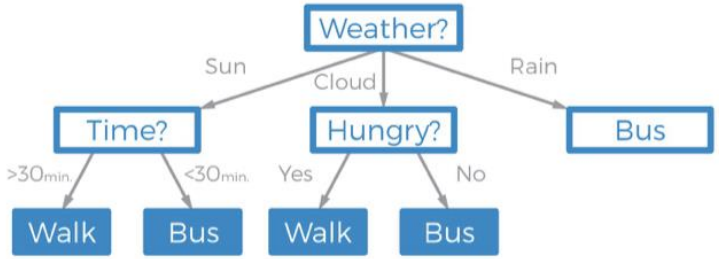
Deep Learning

Input



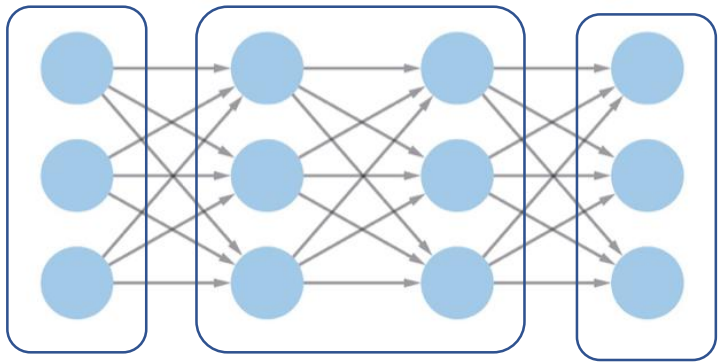
Output

Machine Learning



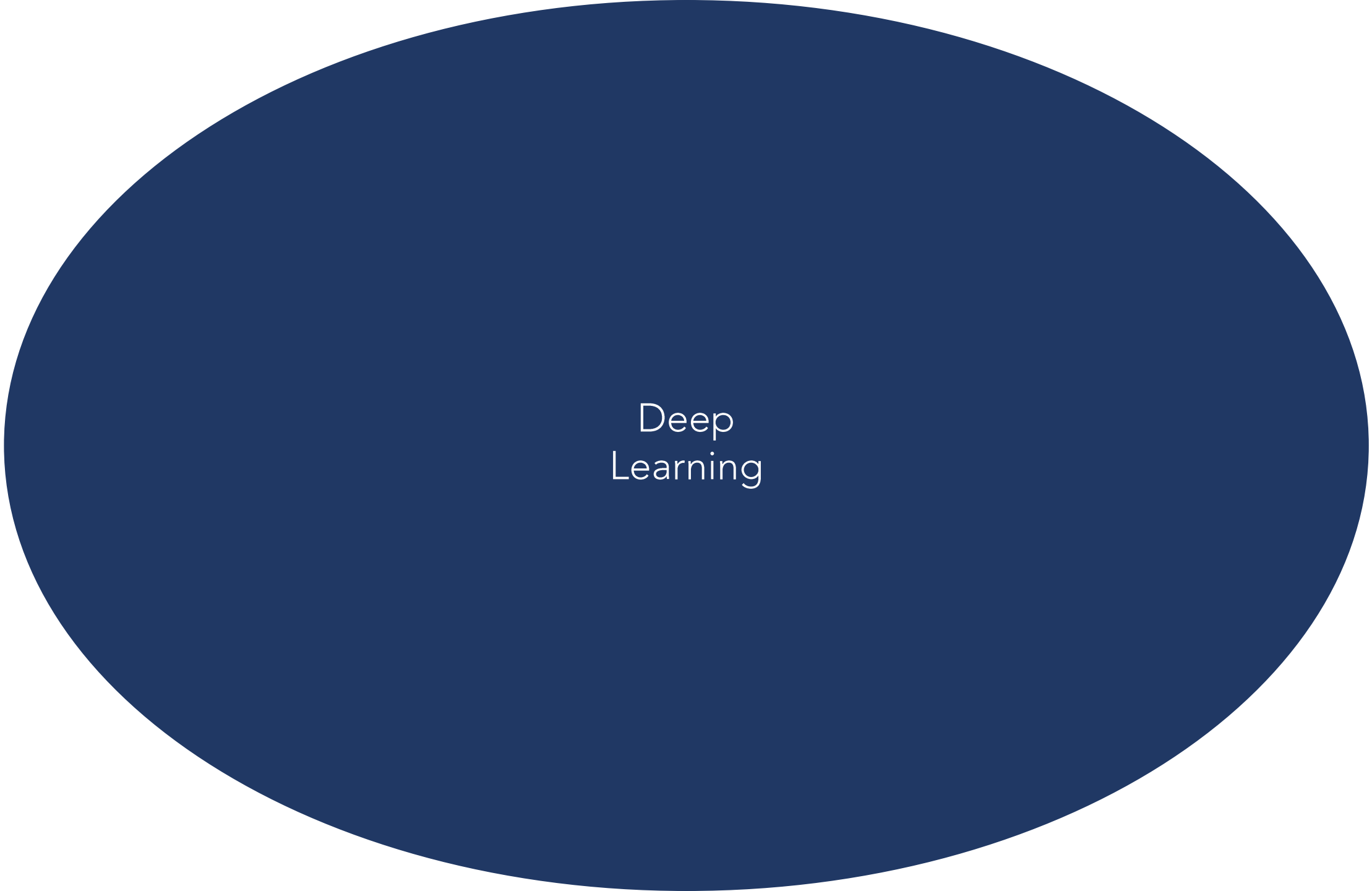
Decision tree

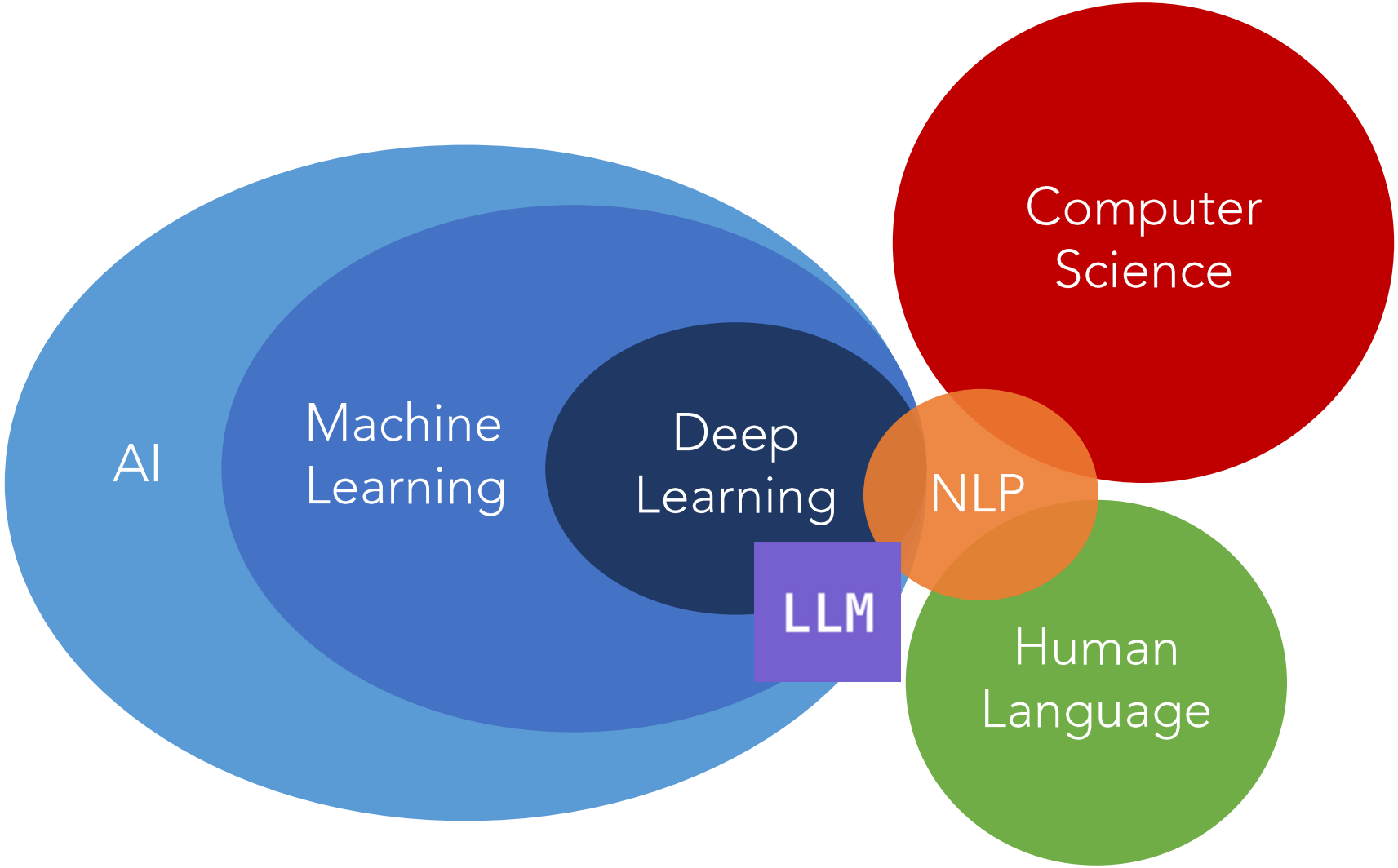
Deep Learning



Machine Learning
Can train on lesser data
Gives lesser accuracy
Takes less time to train
Trains on CPU
Limited tuning capabilities

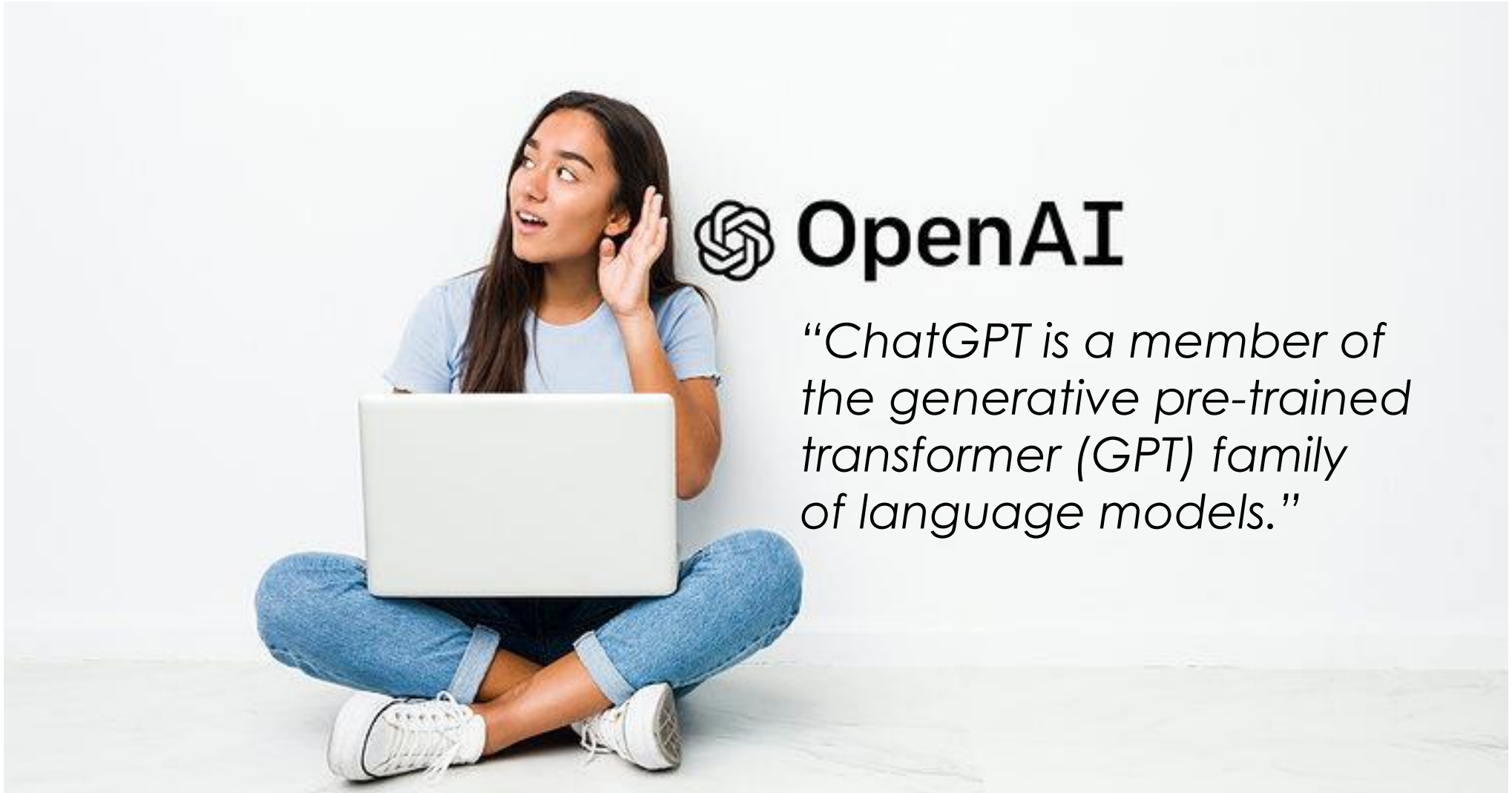
Deep Learning
Requires large data
Provides high accuracy
Takes longer to train
Requires GPU to train properly
Can be tuned in various different ways.


Deep
Learning

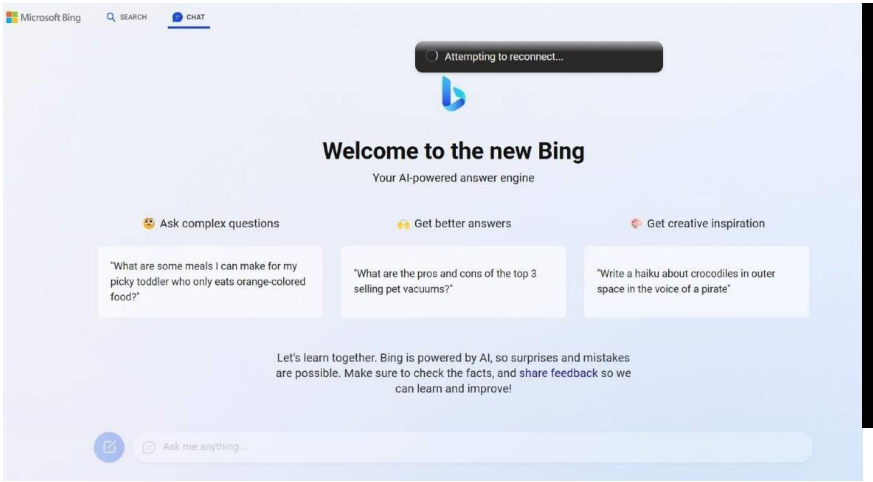

AI
Machine Learning
Deep Learning
LLM
NLP
Computer Science
Human Language

2. About ChatGPT

關於 ChatGPT



Search Engine + LLM	Generative LLM + Search	Generative LLM



OpenAI

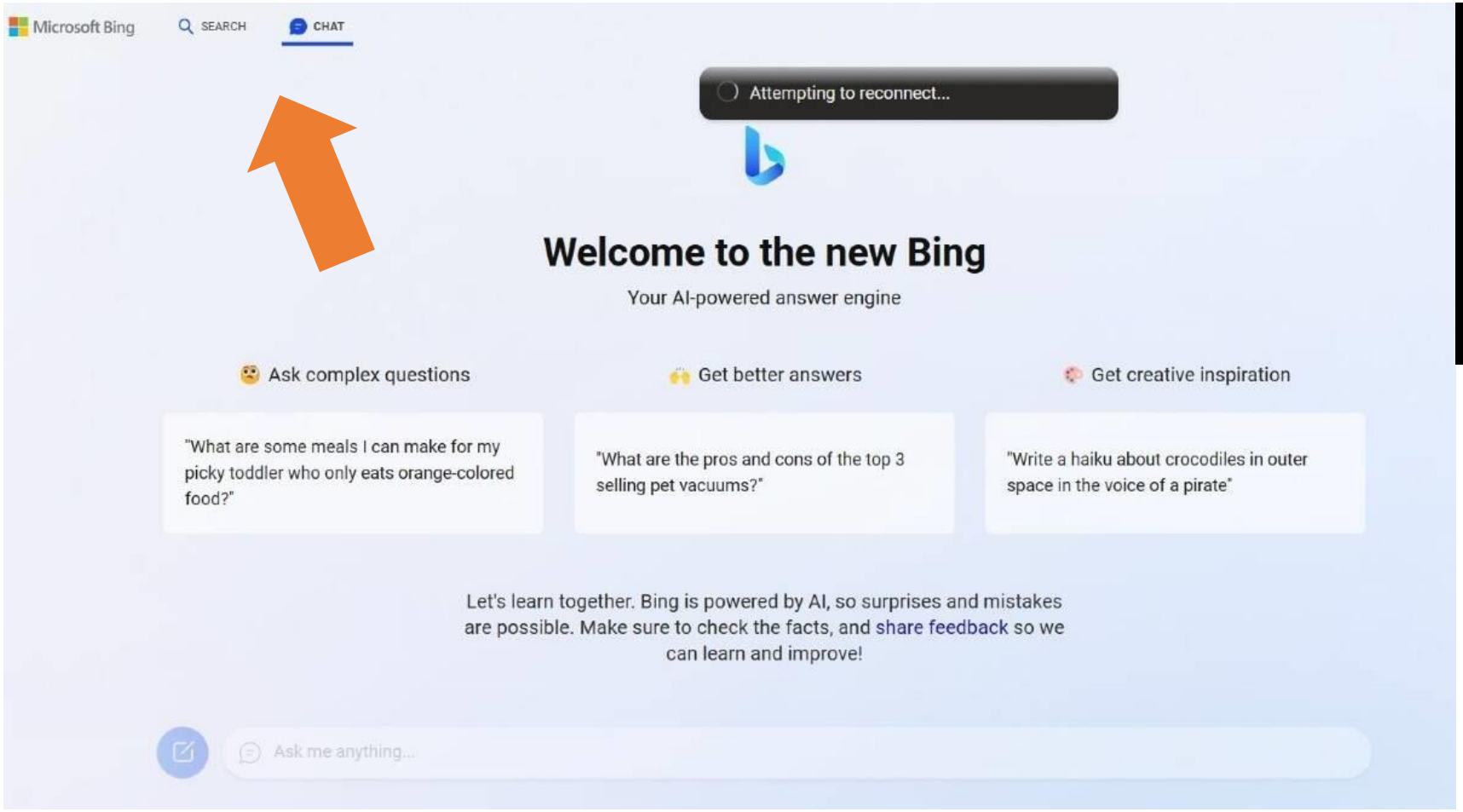
ChatGPT 3.5

OpenAI

ChatGPT **4.0**

"Tend to hallucinate!"

Search Engine + LLM	Generative LLM + Search	Generative LLM



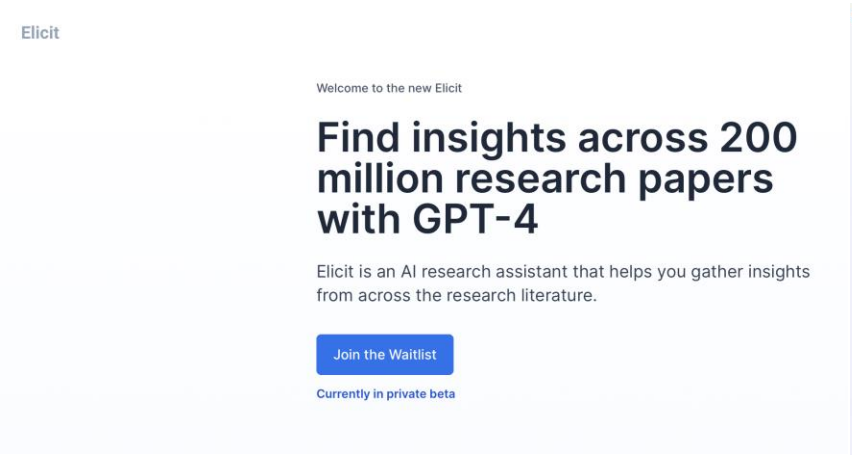
OpenAI

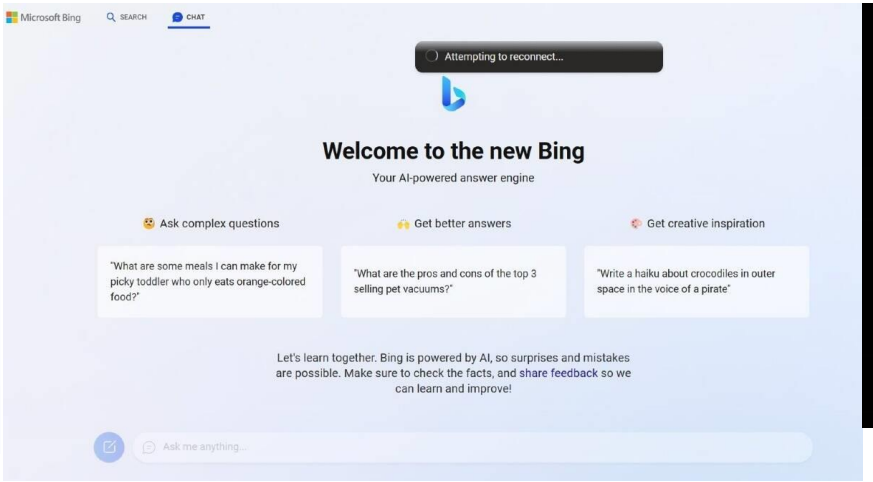
ChatGPT 3.5

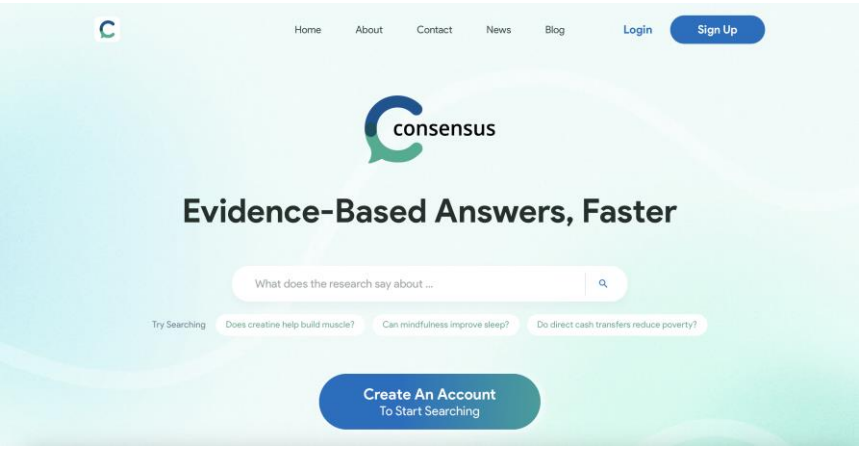
OpenAI

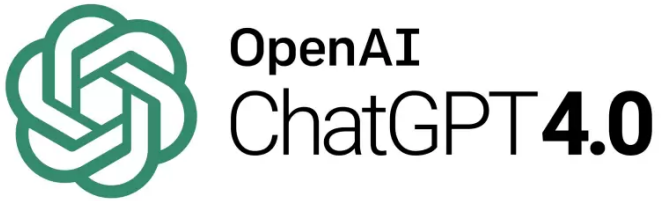
ChatGPT **4.0**

Search Engine + LLM	Generative LLM + Search	Generative LLM







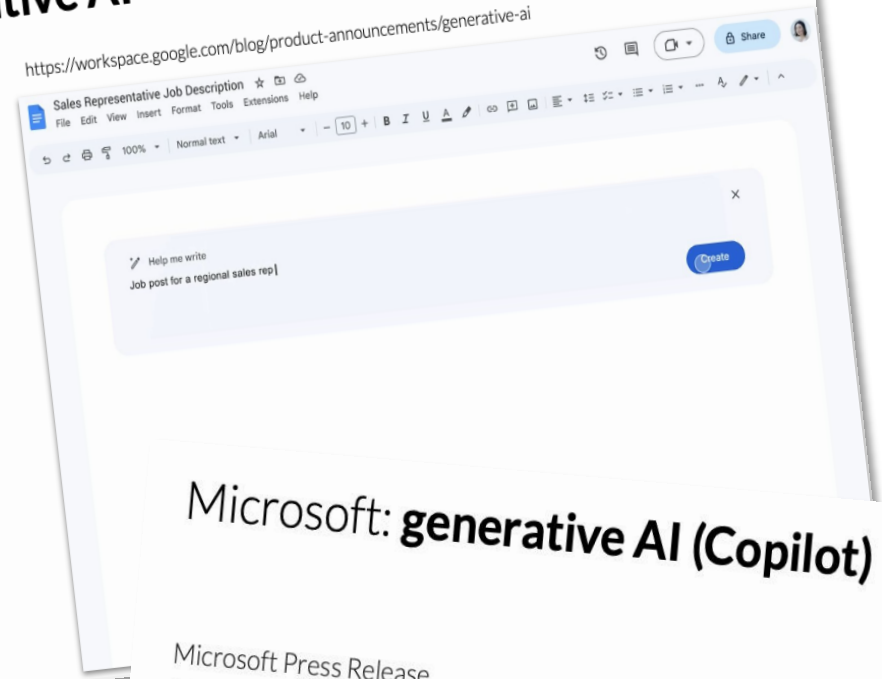


Google: **generative AI**

Google Press Release
March 14:

"We're embedding generative AI in Docs and Gmail ***to help people get started writing.****"*

https://workspace.google.com/blog/product-announcements/generative-ai

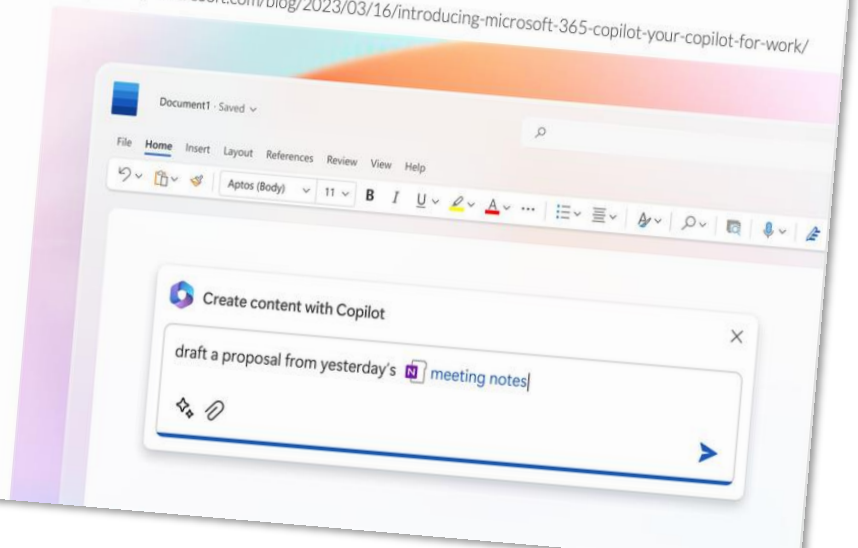


Microsoft: **generative AI (Copilot)**

Microsoft Press Release
March 16:

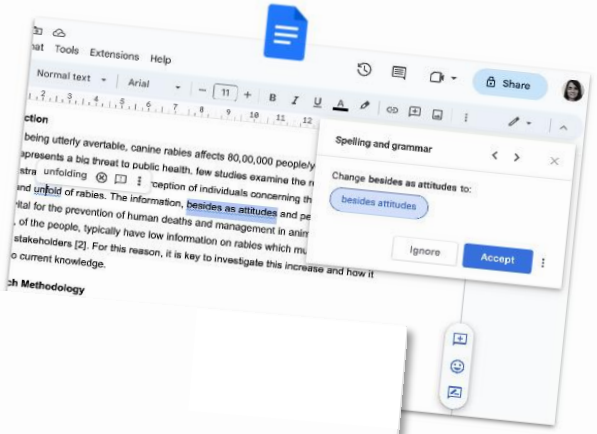
"Copilot gives you a ***first draft*** *to edit and iterate on. … Sometimes Copilot will be* ***right, other times usefully wrong****."*

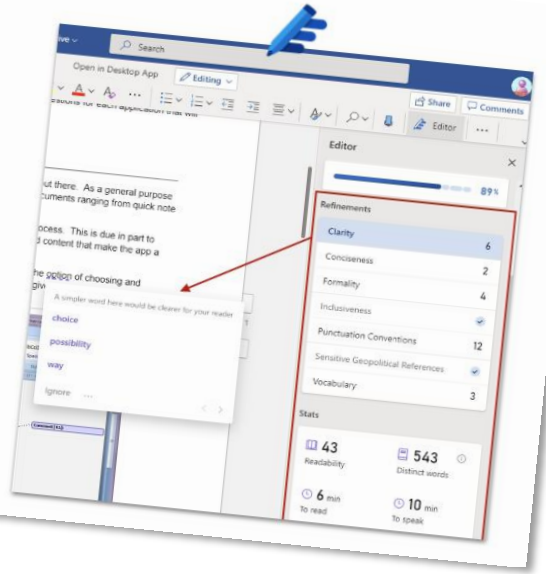
https://blogs.microsoft.com/blog/2023/03/16/introducing-microsoft-365-copilot-your-copilot-for-work/



Examples: Google Docs and Microsoft Editor

Language suggestions using AI

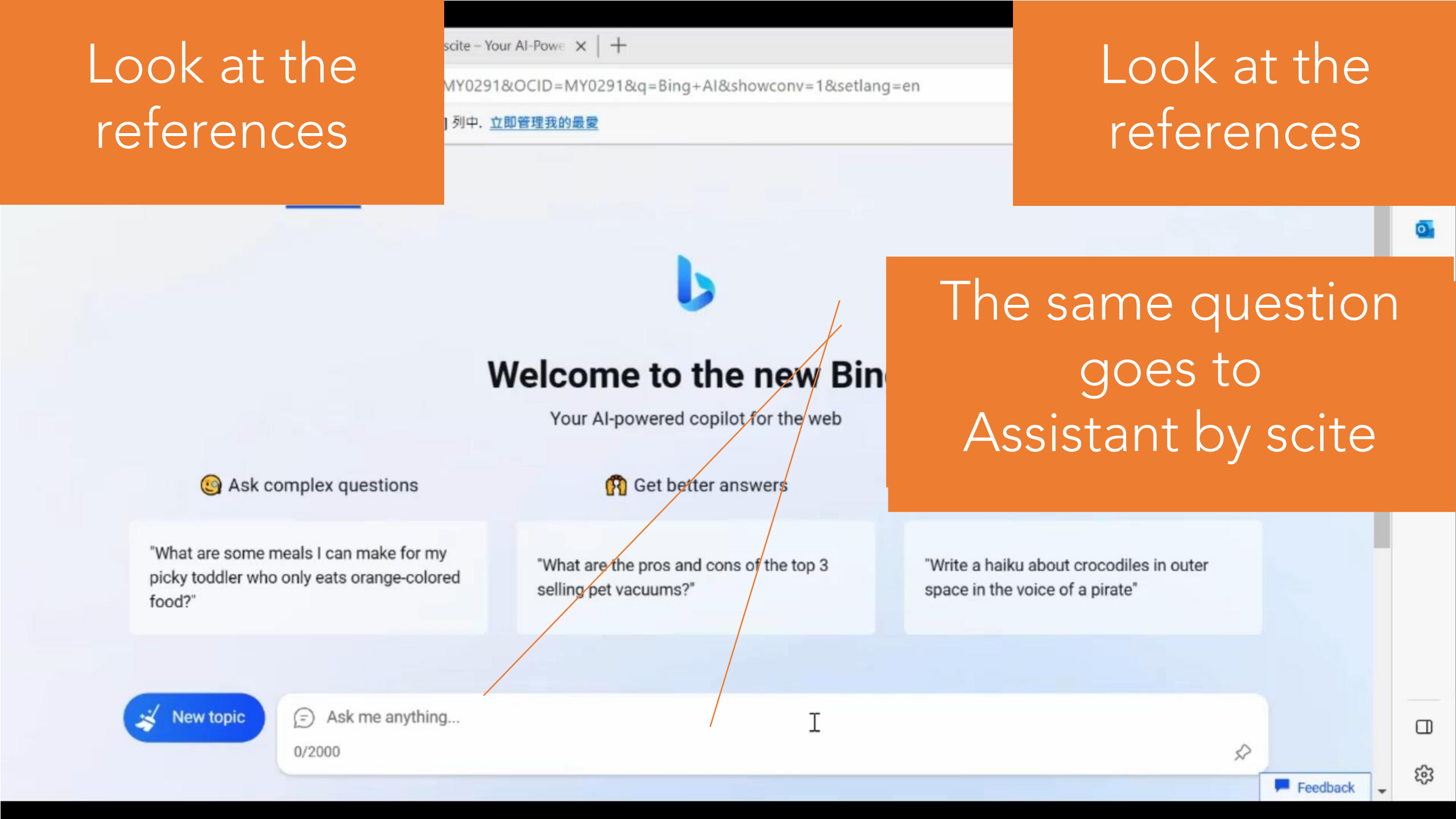


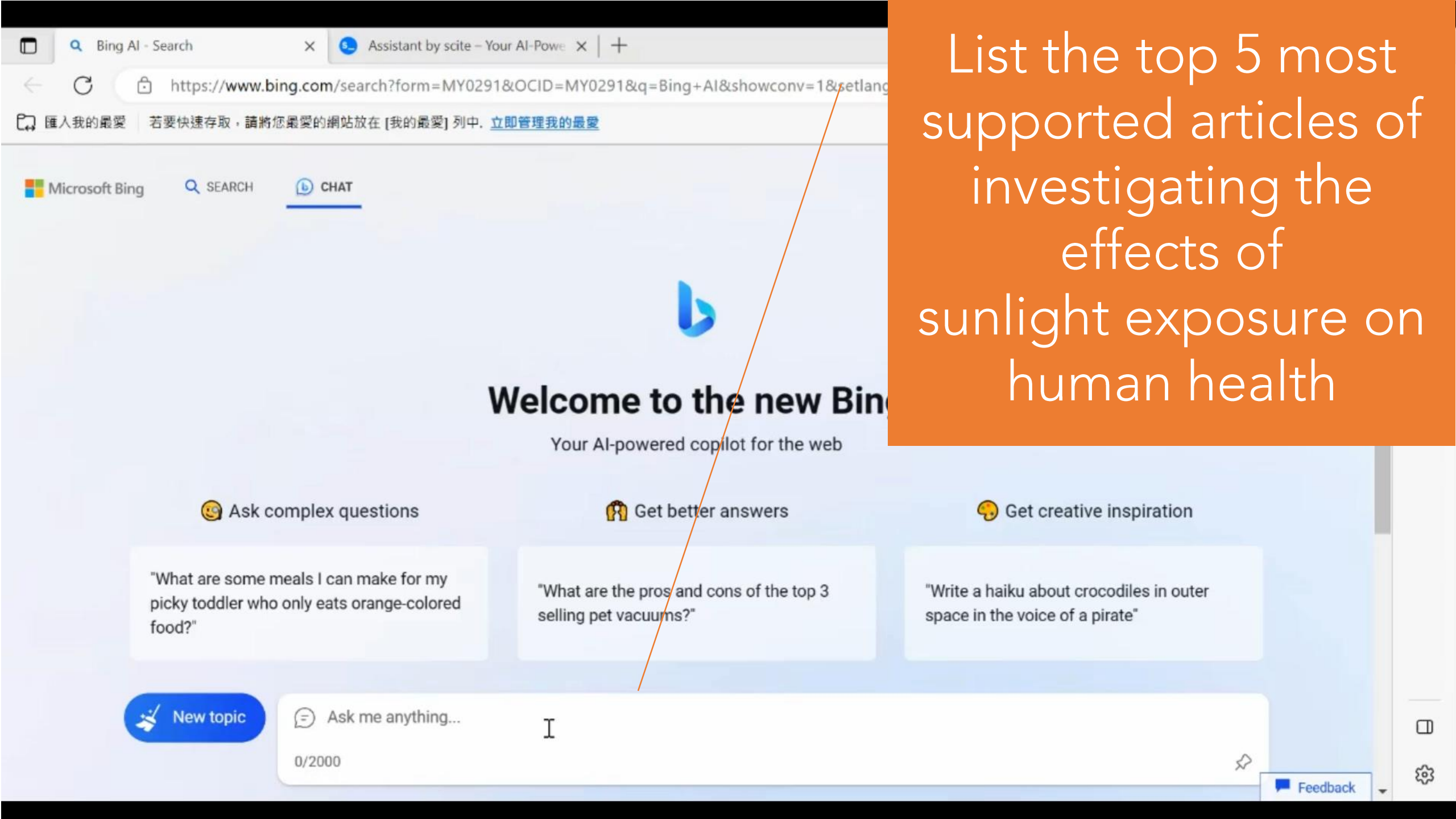


Look at the references

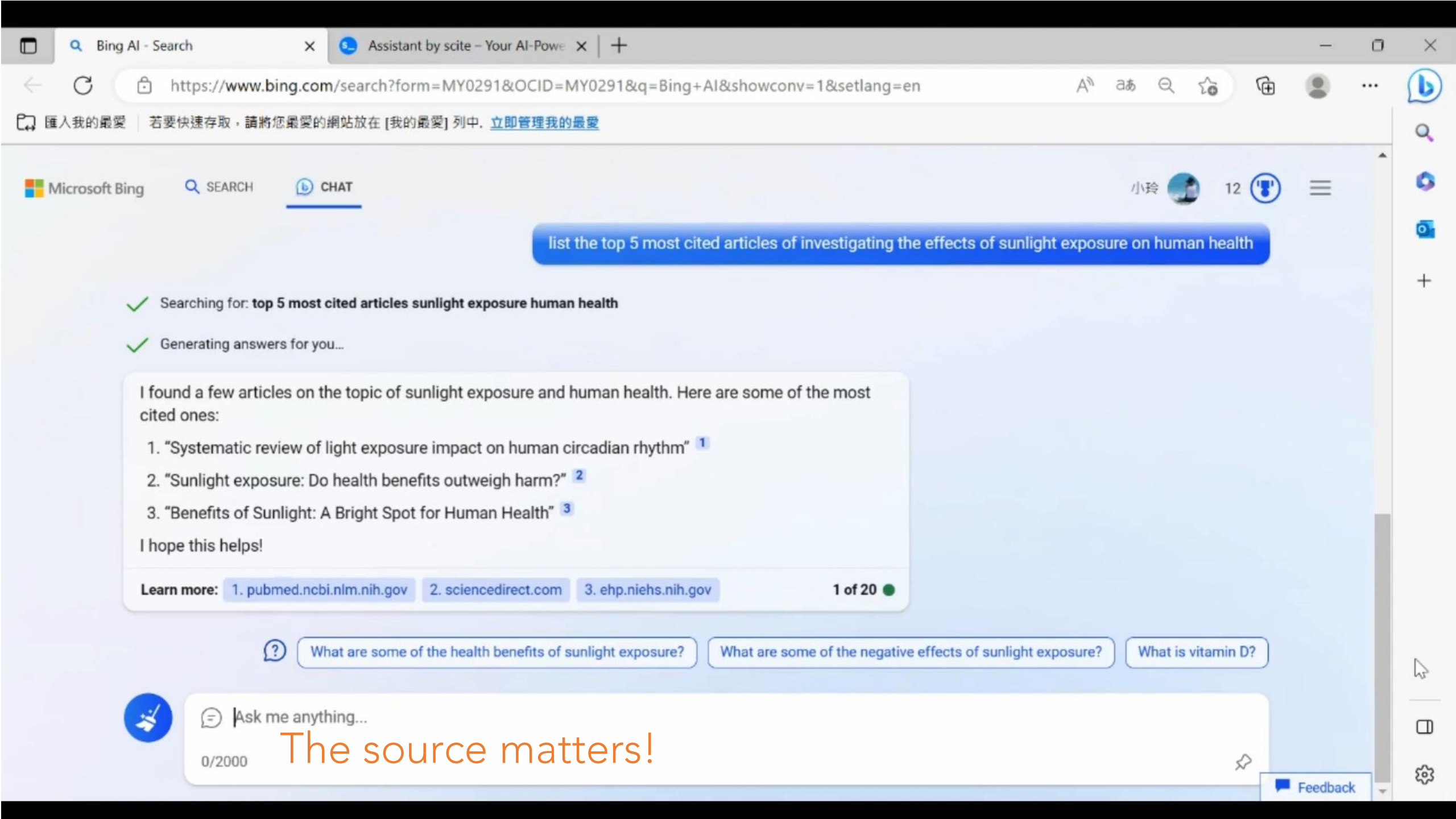
Look at the references

The same question goes to Assistant by scite





List the top 5 most supported articles of investigating the effects of sunlight exposure on human health


Bing AI - Search
Assistant by scite – Your AI-Powe
https://www.bing.com/search?form=MY0291&OCID=MY0291&q=Bing+AI&showconv=1&setlang=en
匯入我的最愛
若要快速存取，請將您最愛的網站放在 [我的最愛] 列中。立即管理我的最愛
Microsoft Bing
SEARCH
CHAT
小玲
12
list the top 5 most cited articles of investigating the effects of sunlight exposure on human health
Searching for: top 5 most cited articles sunlight exposure human health
Generating answers for you...
I found a few articles on the topic of sunlight exposure and human health. Here are some of the most cited ones:
1. "Systematic review of light exposure impact on human circadian rhythm" 1
2. "Sunlight exposure: Do health benefits outweigh harm?" 2
3. "Benefits of Sunlight: A Bright Spot for Human Health" 3
I hope this helps!
Learn more: 1. pubmed.ncbi.nlm.nih.gov 2. sciencedirect.com 3. ehp.niehs.nih.gov
1 of 20
What are some of the health benefits of sunlight exposure?
What are some of the negative effects of sunlight exposure?
What is vitamin D?
Ask me anything...
0/2000
The source matters!
Feedback

Max words in prompt?

A 500-year history of forest fires

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link.springer.com/article/10.1007/s1...

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SpringerLink

Home > Regional Environmental Change > Article

Original Article | Open Access | Published: 13 November 2020

A 500-year history of forest fires in Sala area, central Sweden, shows the earliest known onset of fire suppression in Scandinavia

Guilherme Alexandre Stecher Justiniano Pinto, Mats Niklasson, Nina Ryzhkova & Igor Drobyshev

Regional Environmental Change **20**, Article number: 130 (2020) | Cite this article

Abstract

The Sala fire in the Västmanland County of central Sweden that burned about 14,000 ha in 2014 has been the largest fire recorded in the modern history of Sweden. To understand the long-term fire history of this area, we dendrochronologically dated fire scars on Scots pine (*Pinus sylvestris* L.) trees (live and deadwood) to reconstruct the fire cycle and fire occurrence in the area affected by the 2014 fire. We identified 64 fire years, using a total of 378 pine samples. The earliest reconstructed fire dated back to 1113 AD. The spatial reconstruction extended over the period of 1480–2018 AD. Lower levels of fire activity (fire cycle, FC = 43

Get help from AI to assist in comprehending a paper

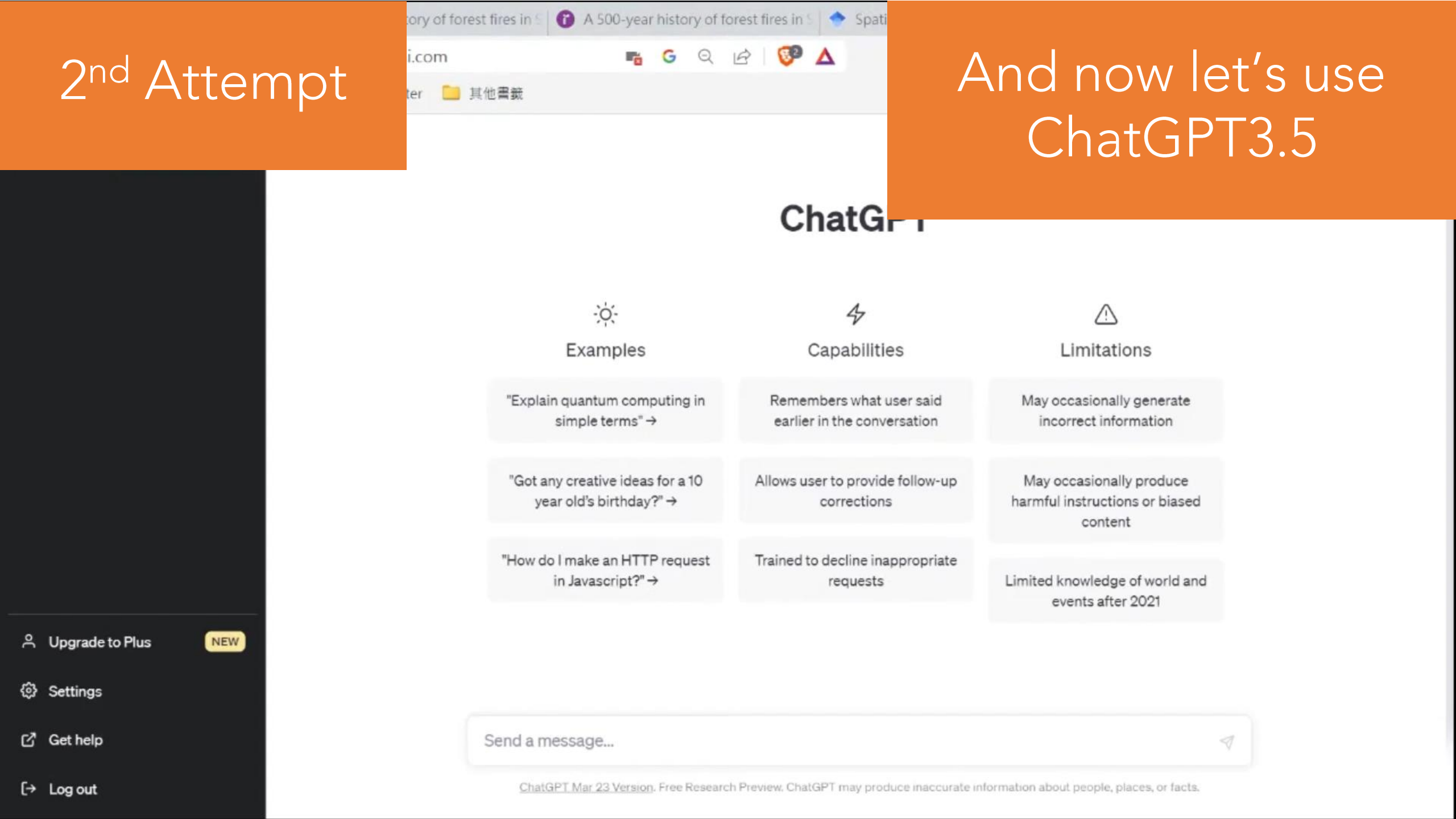
Avoid the common mistakes →

Sections | Figures | References

References
Acknowledgments
Funding
Author information
Ethics declarations
Additional information
Rights and permissions
About this article

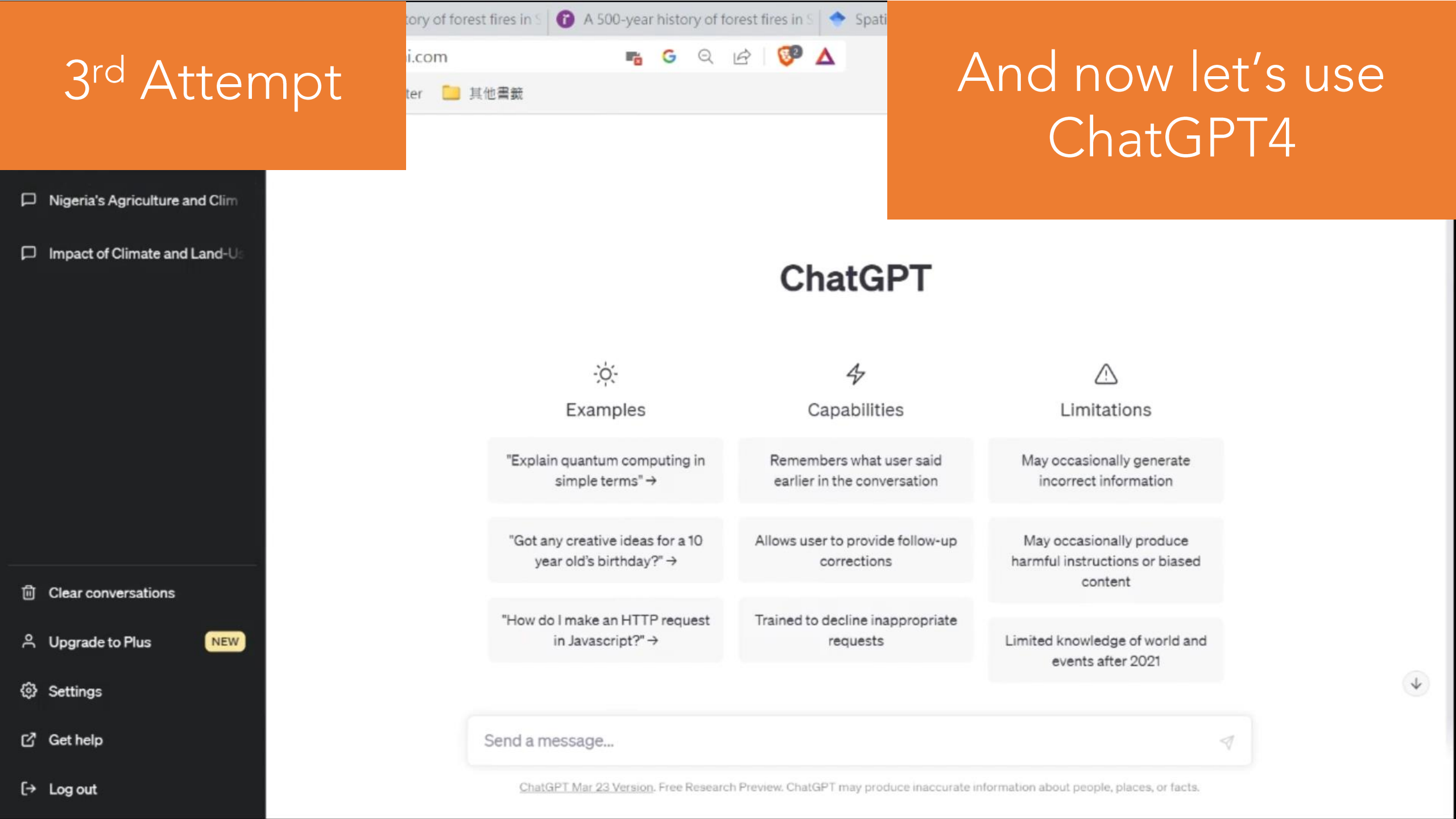
2nd Attempt

And now let's use ChatGPT3.5



3rd Attempt

And now let's use ChatGPT4



Generate a new title for the published paper

Original title:
A 500-year history of forest fires in Sala area, central Swedan, shows the earliest known onset of fire suppression in Scandinavia

ChatGPT generated title:
Reconstructing the fire history of Sala, Swedan: early onset of fire suppression and its impact on fire occurrence and climate drivers

WriteFull generated title:
Dendrochronological analysis of the Sala fire in the Vastmandland Country, Central Swedan`

Original title:

Result

A 500-year history of forest fires in Sala area, central Swedan, shows the earliest known onset of fire suppression in Scandinavia

ChatGPT generated title:

General Method

Reconstructing the fire history of Sala, Swedan: early onset of fire suppression and its impact on fire occurrence and climate drivers

WriteFull generated title:

Specific Method

Dendrochronological analysis of the Sala fire in the Vastmandland Country, Central Swedan`

Method

Original title:
A stochastic numerical approach for a class of singular singularly perturbed system

Solving Something

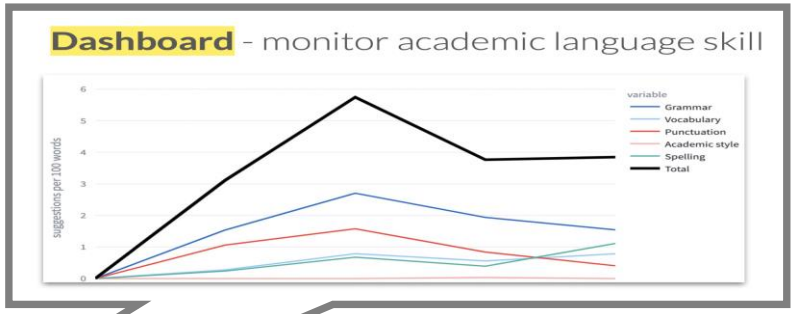
ChatGPT generated title:
Neuro-evolutionary scheme for solving singularly perturbed boundary value problems: utilizing feed-forward artificial neural networks and particle swarm optimization with interior-point algorithm

Method-Solving a Problem

WriteFull generated title:
A neuro-evolutionary method for solving singular singularly perturbed boundary value problems

Things to take note about using AI tools

1. Check the sources > Literature review
2. Understand your preferred workflow > Comprehending a paper
3. Take note of the machine learning model as the tool depends on its training > Generating options
4. Look for analytics > Helping users to learn and to make a better decision
5. Check the T&C > Privacy
6. Understand the difference between AI-generated contents versus human-written contents > Detector
7. Check the new policies > About using AI tools, specifically ChatGPT in publishing or acknowledgement

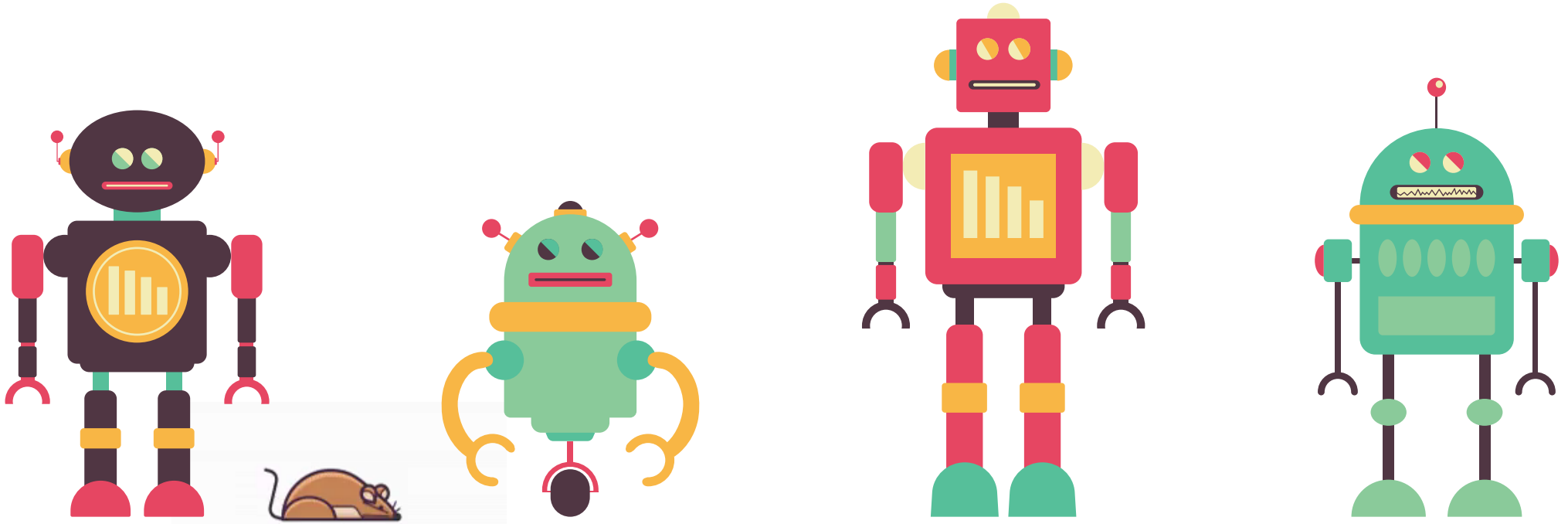


	Can they use your data?
Google Docs	yes
Microsoft Editor	yes
Grammarly	yes
Writefull	no
Quillbot	yes
DeepL	yes for Free, no for Pro
ChatGPT / OpenAI	yes

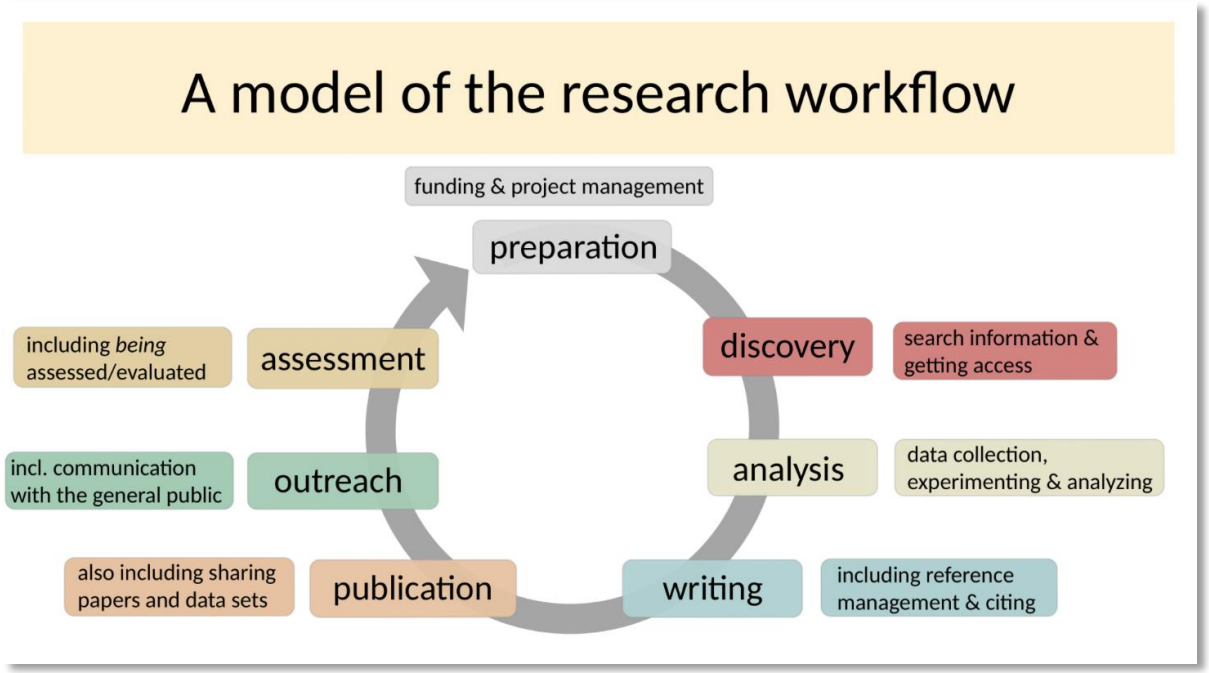
1. Style and tone
2. Creativity
3. Cohesion and organization
4. Accuracy
5. Emotional intelligence

3. The Advent of Super Researchers

超級研究者的出現



Tool-centric



Source: https://figshare.com/articles/presentation/Changing_research_workflows_-_opportunities_for_researchers_librarians_and_publishers/4609423

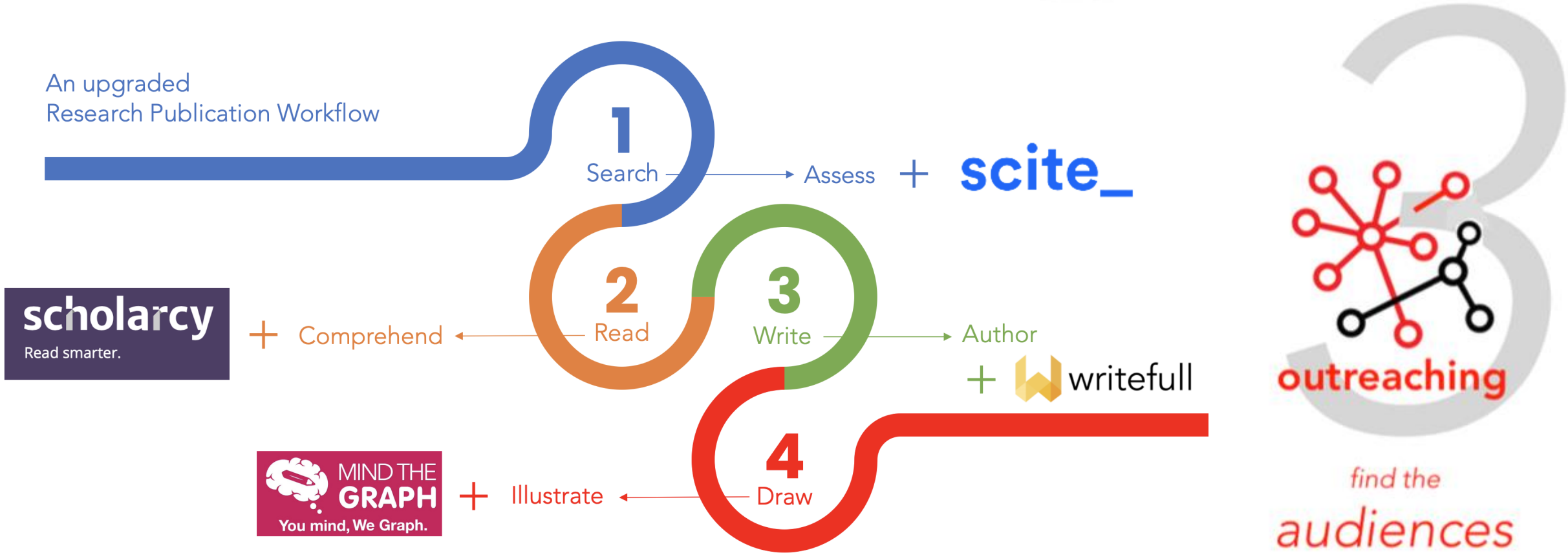
Skill-centric

Source: https://www.frontiersin.org/articles/10.3389/fninf.2013.00052/full

Skill-centric

A research skill of extended workflow

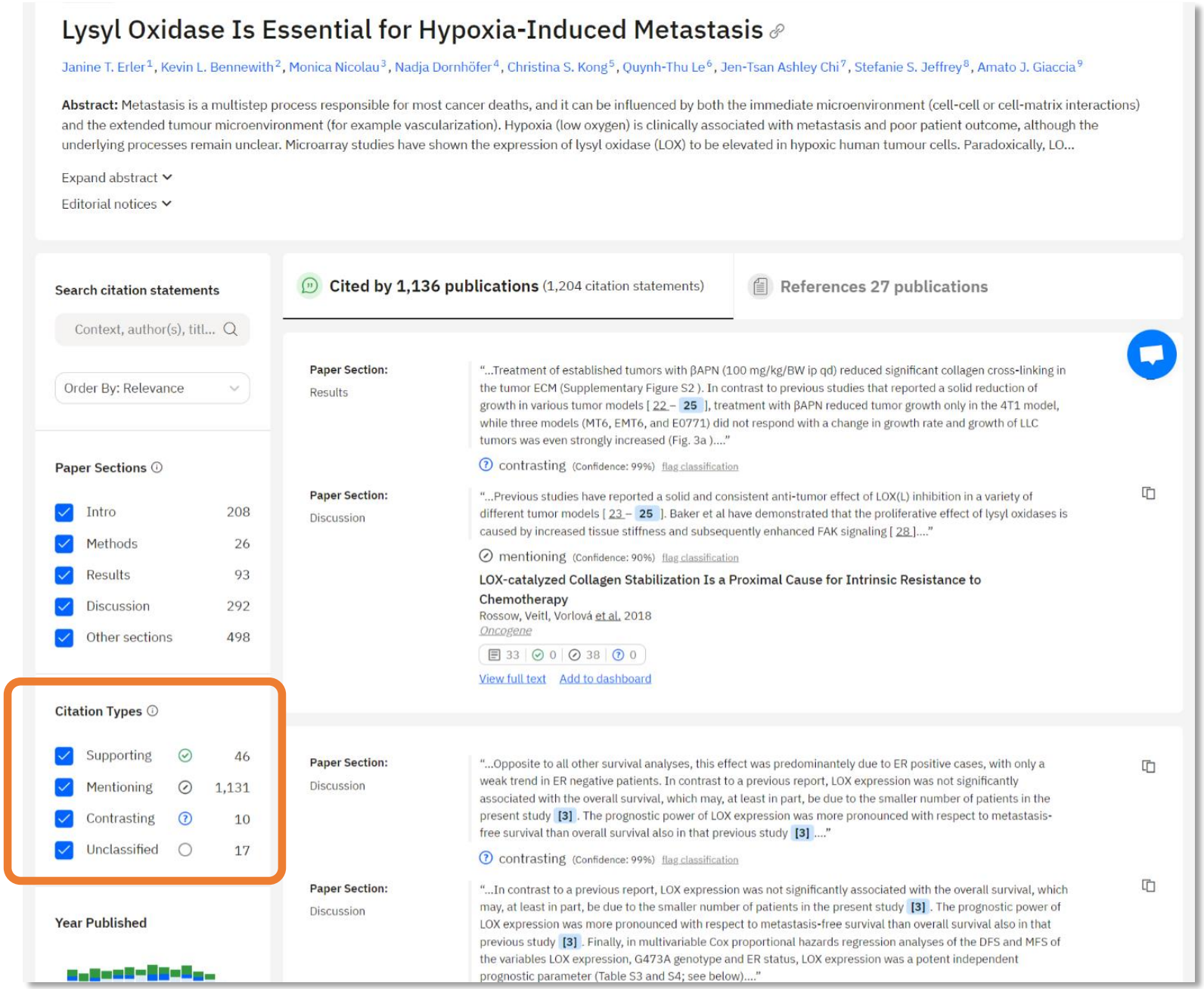
A research skill of extended workflow



A.I.-aided applications for Research Support

scite_

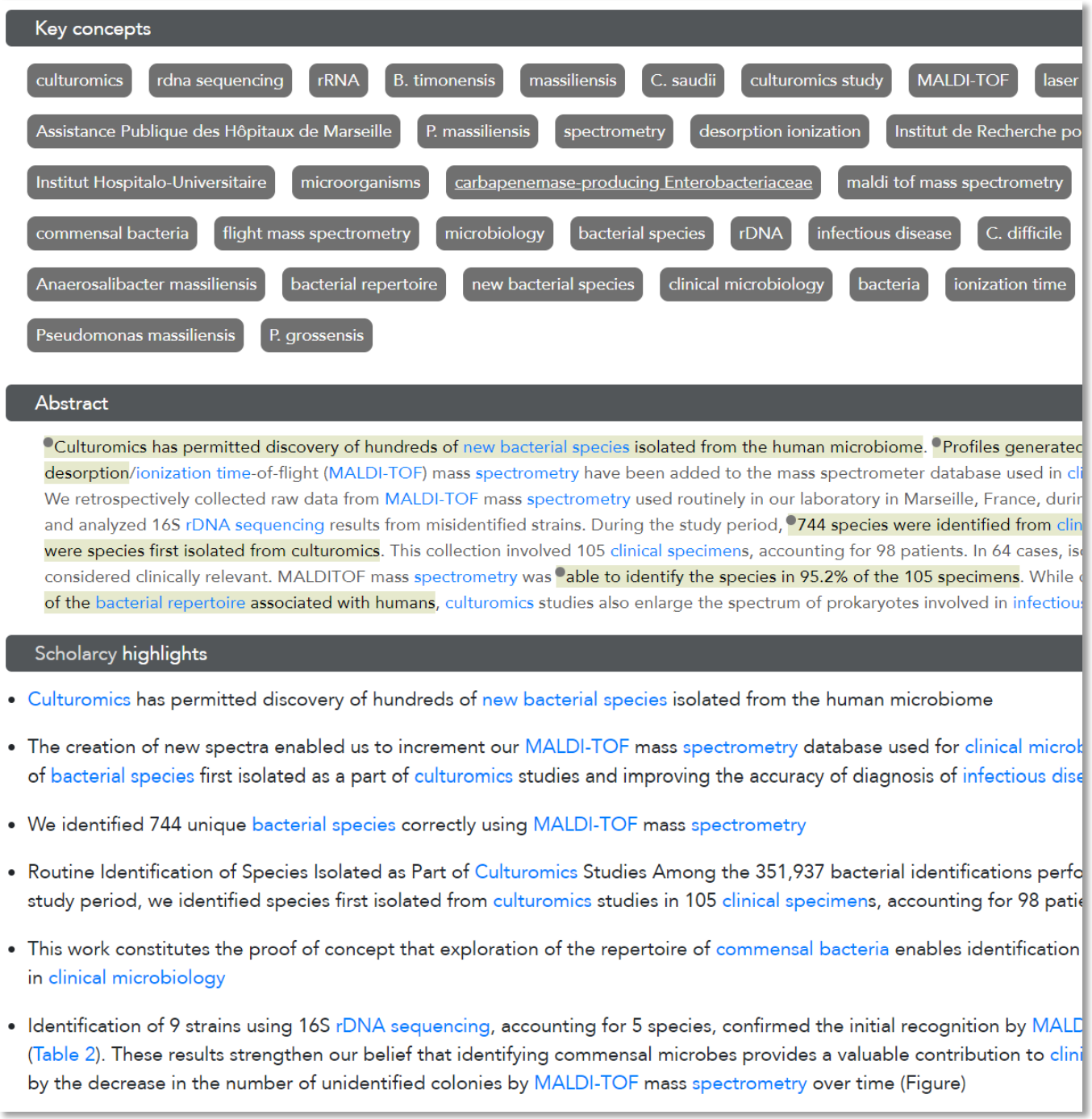
SEARCH: Literature discovery
ASSESS: Literature review



A.I.-aided applications for Research Support

scholarcy

COMPREHEND: Literature review
AUTHOR: Manuscript writing
PROMOTE: Research outreach



Key concepts

culturomics | rdna sequencing | rRNA | B. timonensis | massiliensis | C. saudii | culturomics study | MALDI-TOF | laser | Assistance Publique des Hôpitaux de Marseille | P. massiliensis | spectrometry | desorption ionization | Institut de Recherche po | Institut Hospitalo-Universitaire | microorganisms | carbapenemase-producing Enterobacteriaceae | maldi tof mass spectrometry | commensal bacteria | flight mass spectrometry | microbiology | bacterial species | rDNA | infectious disease | C. difficile | Anaerosalibacter massiliensis | bacterial repertoire | new bacterial species | clinical microbiology | bacteria | ionization time | Pseudomonas massiliensis | P. grossensis

Abstract

Culturomics has permitted discovery of hundreds of new bacterial species isolated from the human microbiome. Profiles generatec desorption/ionization time-of-flight (MALDI-TOF) mass spectrometry have been added to the mass spectrometer database used in cli We retrospectively collected raw data from MALDI-TOF mass spectrometry used routinely in our laboratory in Marseille, France, durir and analyzed 16S rDNA sequencing results from misidentified strains. During the study period, 744 species were identified from clin were species first isolated from culturomics. This collection involved 105 clinical specimens, accounting for 98 patients. In 64 cases, is considered clinically relevant. MALDITOF mass spectrometry was able to identify the species in 95.2% of the 105 specimens. While of the bacterial repertoire associated with humans, culturomics studies also enlarge the spectrum of prokaryotes involved in infectiou

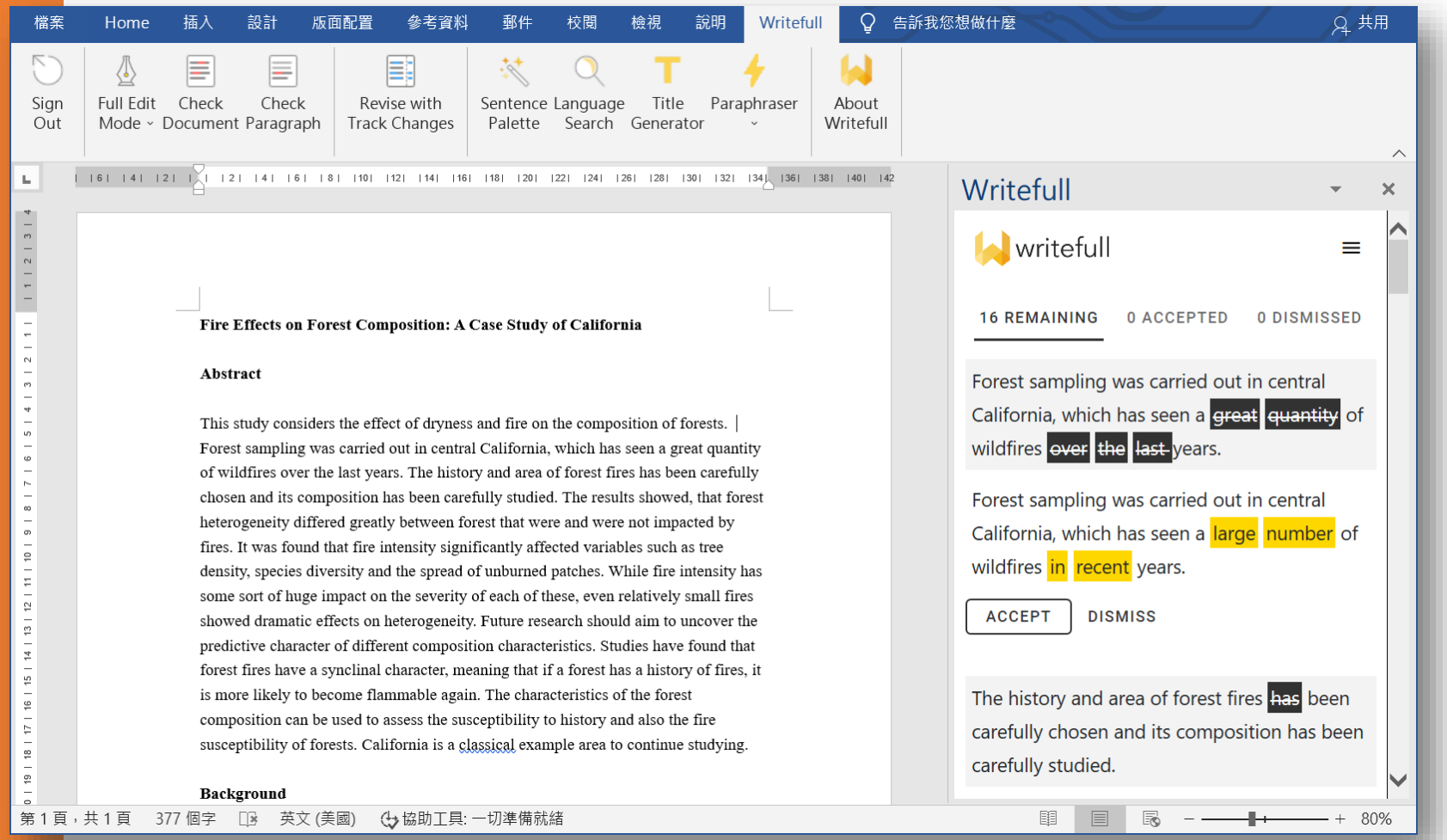
Scholarcy highlights

- Culturomics has permitted discovery of hundreds of new bacterial species isolated from the human microbiome
- The creation of new spectra enabled us to increment our MALDI-TOF mass spectrometry database used for clinical microb of bacterial species first isolated as a part of culturomics studies and improving the accuracy of diagnosis of infectious dise
- We identified 744 unique bacterial species correctly using MALDI-TOF mass spectrometry
- Routine Identification of Species Isolated as Part of Culturomics Studies Among the 351,937 bacterial identifications perfo study period, we identified species first isolated from culturomics studies in 105 clinical specimens, accounting for 98 patie
- This work constitutes the proof of concept that exploration of the repertoire of commensal bacteria enables identification in clinical microbiology
- Identification of 9 strains using 16S rDNA sequencing, accounting for 5 species, confirmed the initial recognition by MALD (Table 2). These results strengthen our belief that identifying commensal microbes provides a valuable contribution to clini by the decrease in the number of unidentified colonies by MALDI-TOF mass spectrometry over time (Figure)

A.I.-aided applications for Research Support

writefull

AUTHOR: Manuscript proofreading

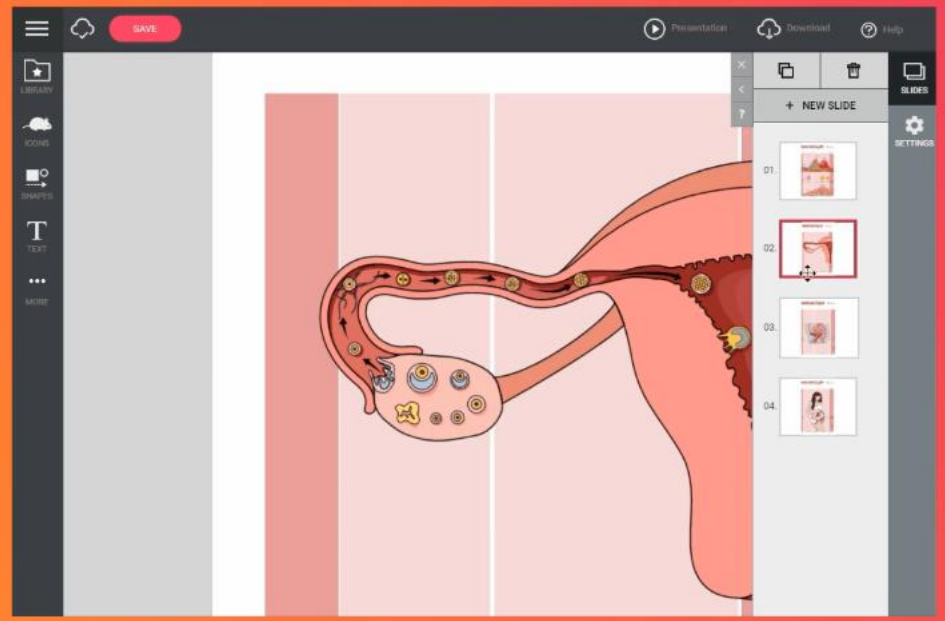


A.I.-aided applications for Research Support

MIND THE GRAPH
You mind, We Graph.

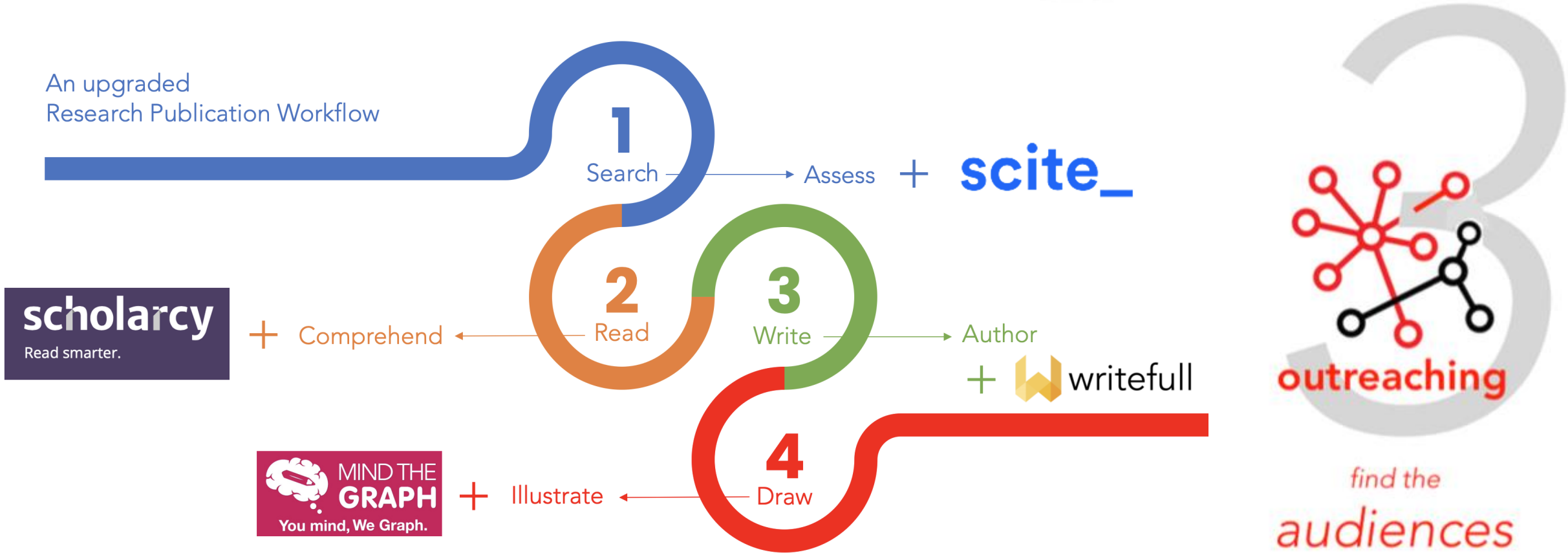
ILLUSTRATE: Graphical abstract
PROMOTE: Research outreach

A free infographic maker for medical doctors and scientists.



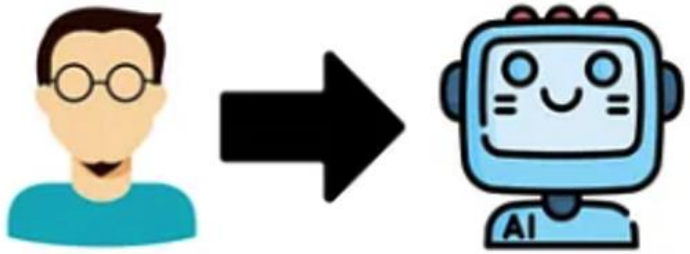
Mind the GRAPH

A research skill of extended workflow



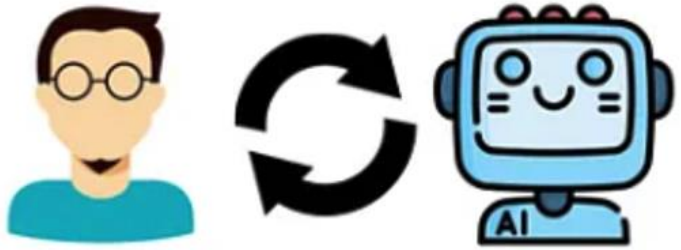
使用人工智能的心態

Automation



Replace human intelligence with artificial intelligence.

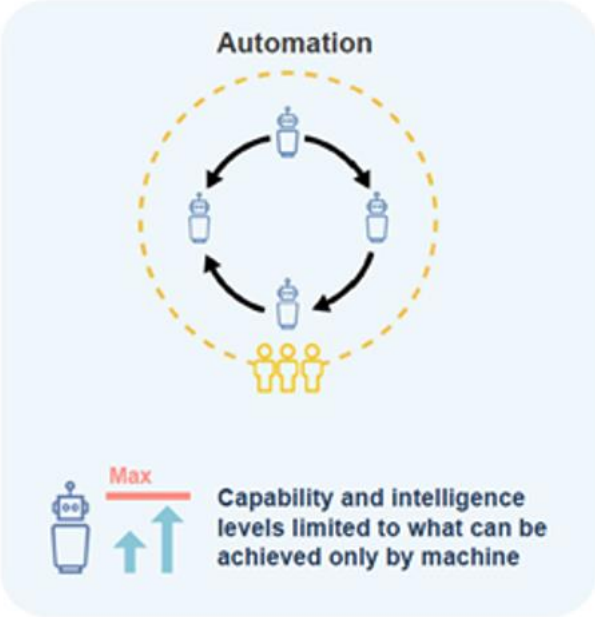
Augmentation

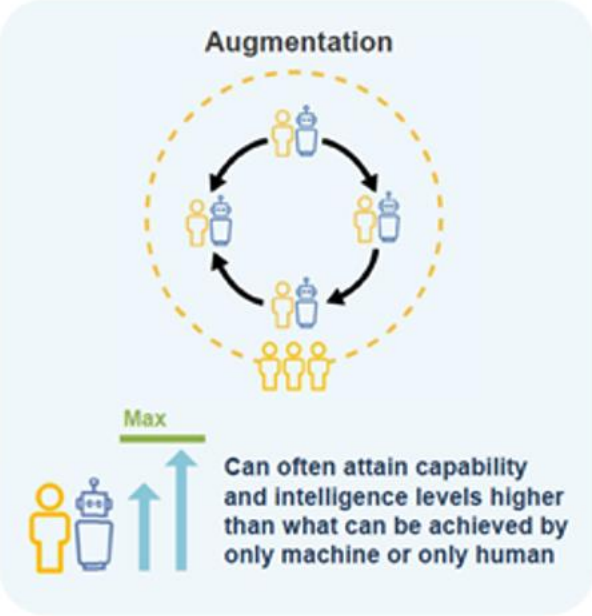


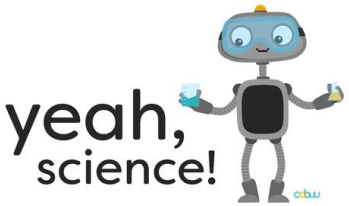
Augment human intelligence with artificial intelligence.

Source: https://medium.com/aixdesign/automation-vs-augmentation-%EF%B8%8F-in-ai-designing-mixed-initiative-user-interfaces-82ecf70dfa26

Optimize the contrasting mindsets for using AI

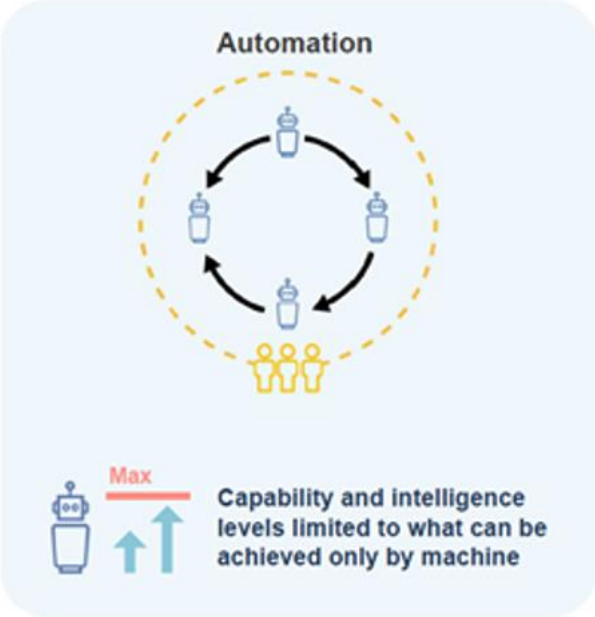






Source: https://news.smu.edu.sg/news/2022/09/19/implications-automation-augmentation-and-ai-jobs-we-do

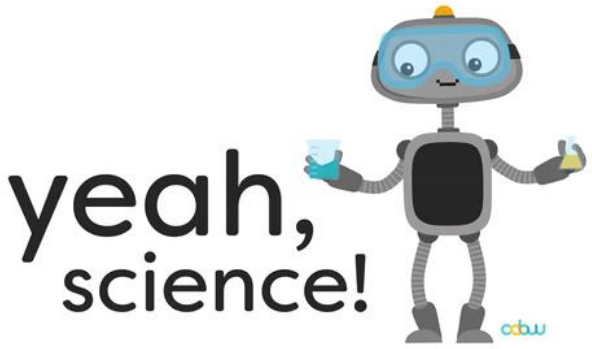
Optimize the contrasting mindsets for using AI

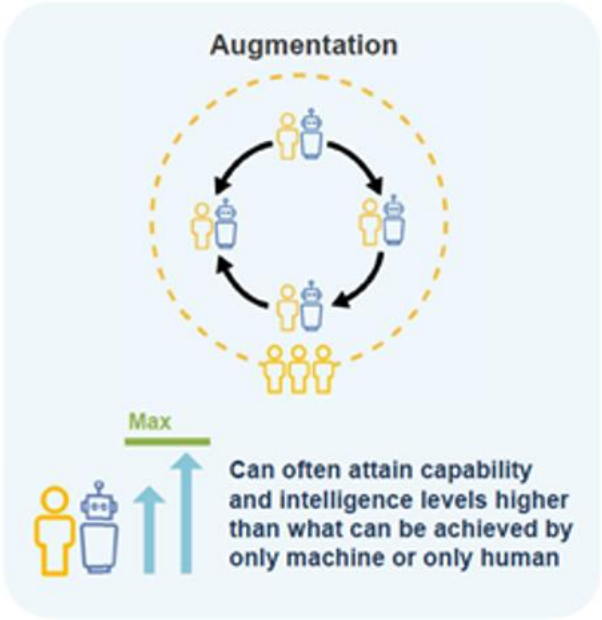


Source: https://news.smu.edu.sg/news/2022/09/19/implications-automation-augmentation-and-ai-jobs-we-do

Optimize the contrasting mindsets for using AI

Human-robot Interaction



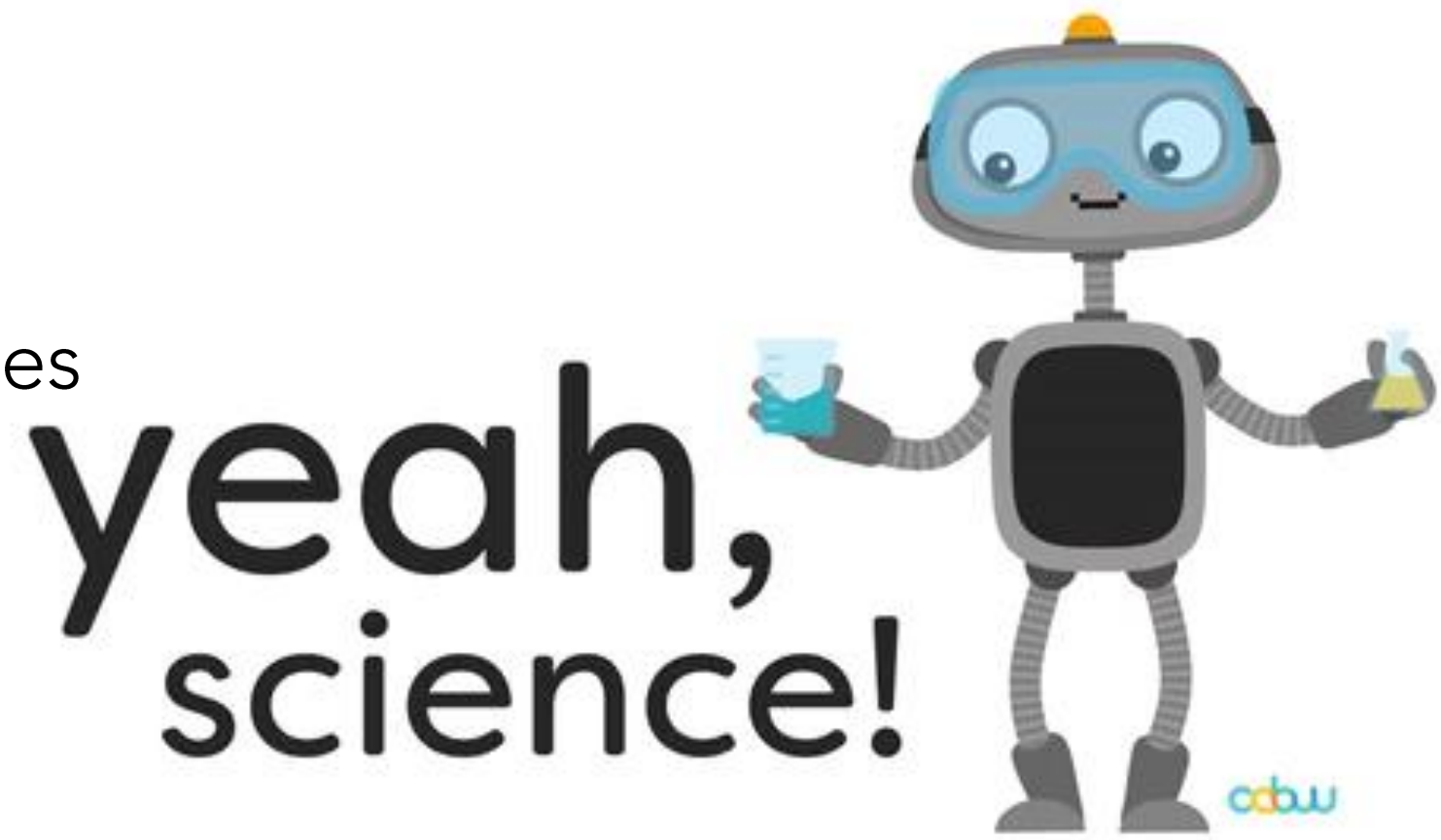


Source: https://news.smu.edu.sg/news/2022/09/19/implications-automation-augmentation-and-ai-jobs-we-do

3. The Future of Science: Transdisciplinary

Three human constraints without AI

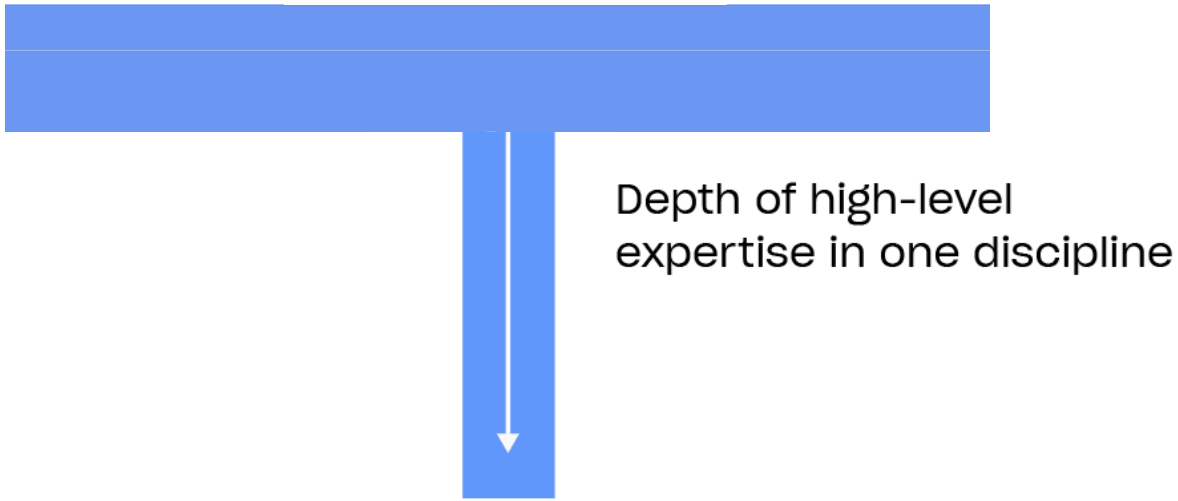
1. Limited lifespan
2. Learning rate
3. Social network sizes



3. The Future of Science: Transdisciplinary

T-Shaped Skills

Breadth of experience, knowledge & skills



Depth of high-level
expertise in one discipline

4. The Future of Science:

Transdisciplinary

科學的未來：跨學科

3. The Future of Science: Transdisciplinary

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NEWS RELEASES

Thursday, June 16, 2022

Four multinational, interdisciplinary teams selected to address major challenges in cancer

Program funds ideas that have the greatest potential to advance cancer research and improve outcomes.

The Cancer Grand Challenges program will award $100 million to four interdisciplinary teams from around the world to solve some of the ... Each team will receive $25 million over five years. The teams were announced at the Cancer Grand ...

Institute/Cer
National Cancer

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Today's Problems

... research and improve outcome... ...inds of ...er

The research being conducted by the four selected teams includes investigation of 1) a muscle-wasting ... ...s known as cachexia, 2) the biology of extrachromosomal DNA in cancer 3) new therapies for solid tumors in children, and 4) what triggers normal cells harboring cancer-causing mutations to become tumor cells.

today

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NUS' big push for interdisciplinary learning: Timely change but there'll be practical challenges, experts say

TODAY file photo

BY JUSTIN ONG
@JustInOngTODAY

Published September 15, 2020
Updated September 16, 2020

The National University of Singapore said that plans for an overhaul of its curriculum are still under discussion and it will release more details at a later date.

Future Talents

"The greatest danger in times of turbulence is not the turbulence: it is to act with yesterday's logic."

Peter Drucker

➡ Our problem

"Without changing our pattern of thought, we will not be able to solve the problems we created with our current pattern of thought."

Albert Einstein

➡ Our mindset

"We do not see things as they are. We see things as we are."

Anais Nin

➡ Our attitude

"The main power base of paradigms may be in the fact that they are taken for granted and not explicitly questioned."

Johan Arndt

➡ Our weakness

- Natural Sciences (e.g. physics, chemistry, biology, ….)
- Social Sciences (e.g. economics, history, anthropogy, ….)
- Formal Sciences(e.g. mathematics, computer science, ….)

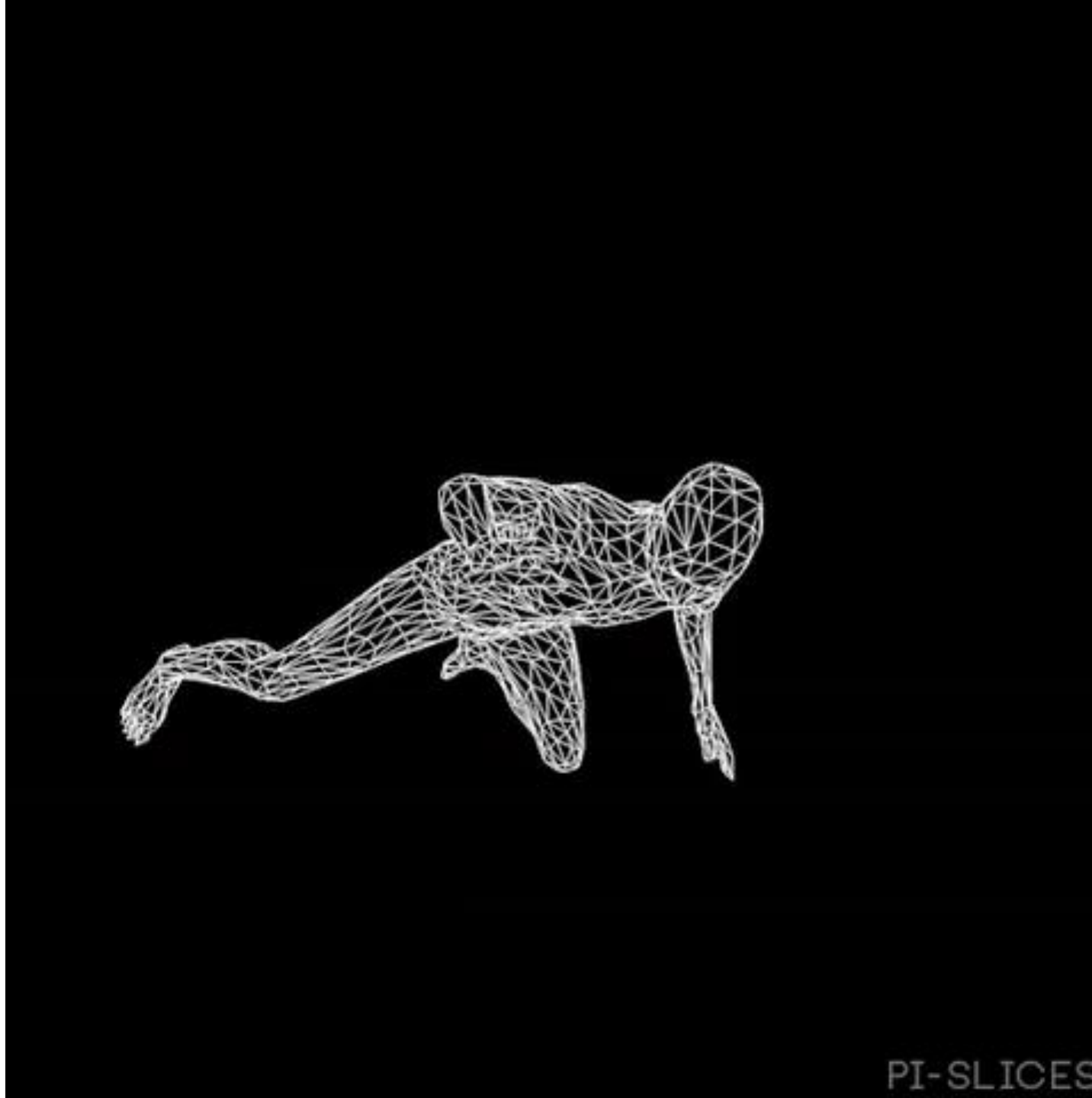
Different types of system

Digital Twin

- A virtual replica of a physical object, system, or process
- It is created using real-time data from sensors and other sources
- It simulates the bahavior, performance, and other characteristics of the physical object or system

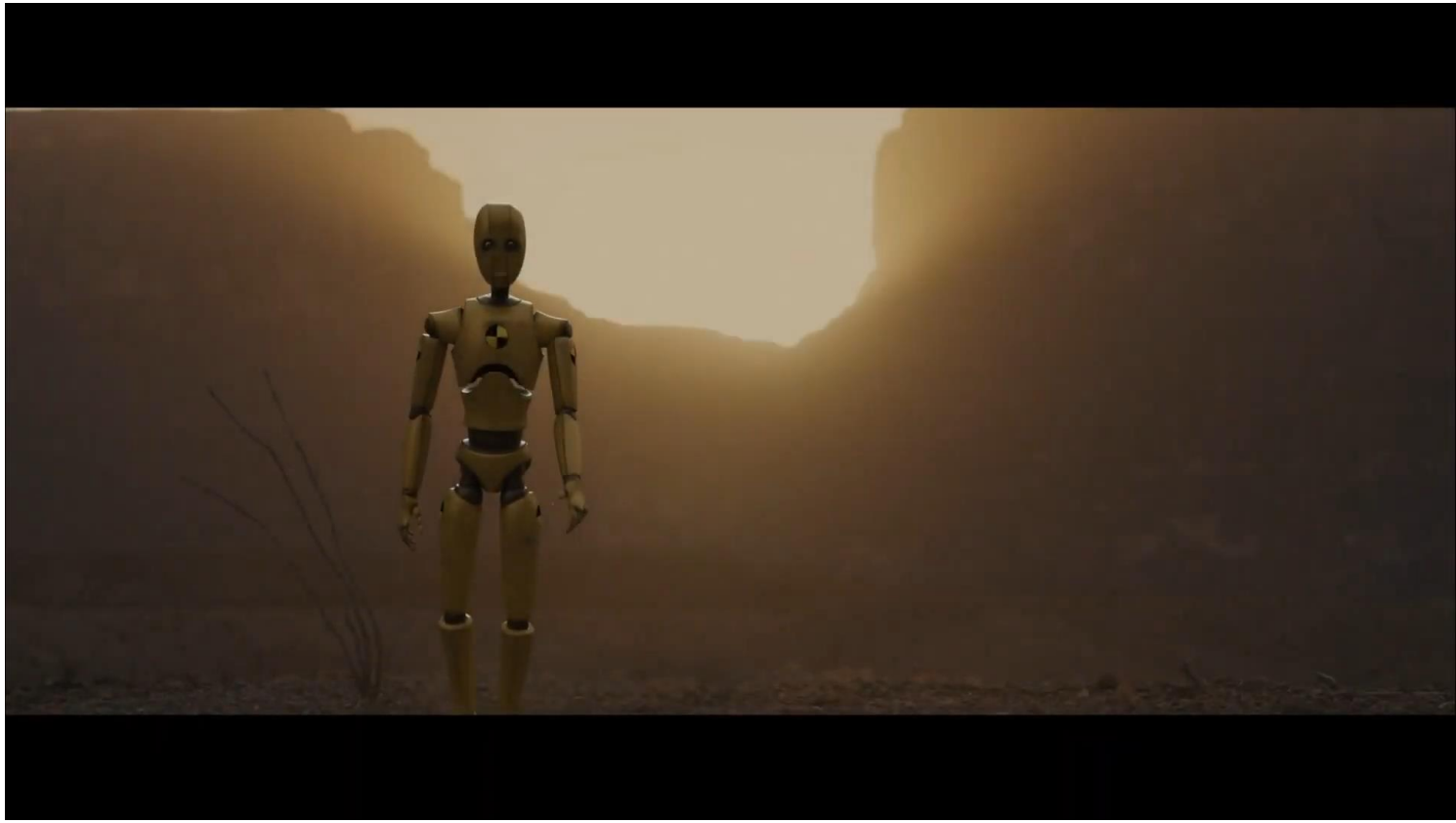
Digital Twin

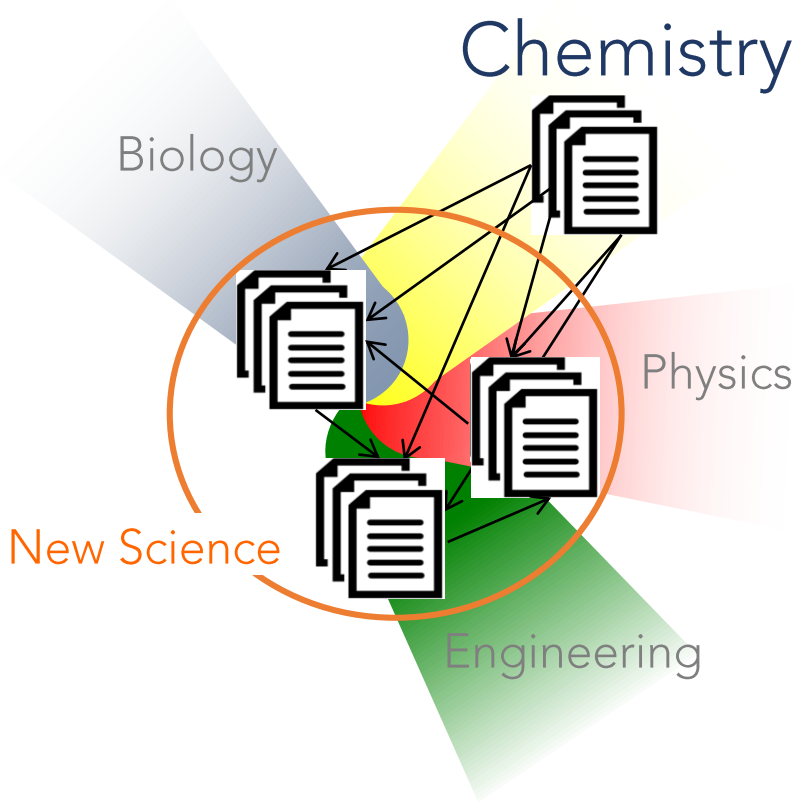
- Educators > a better transdisciplinary approach of teaching
- Researchers > a better transdisciplinary solution to world issues



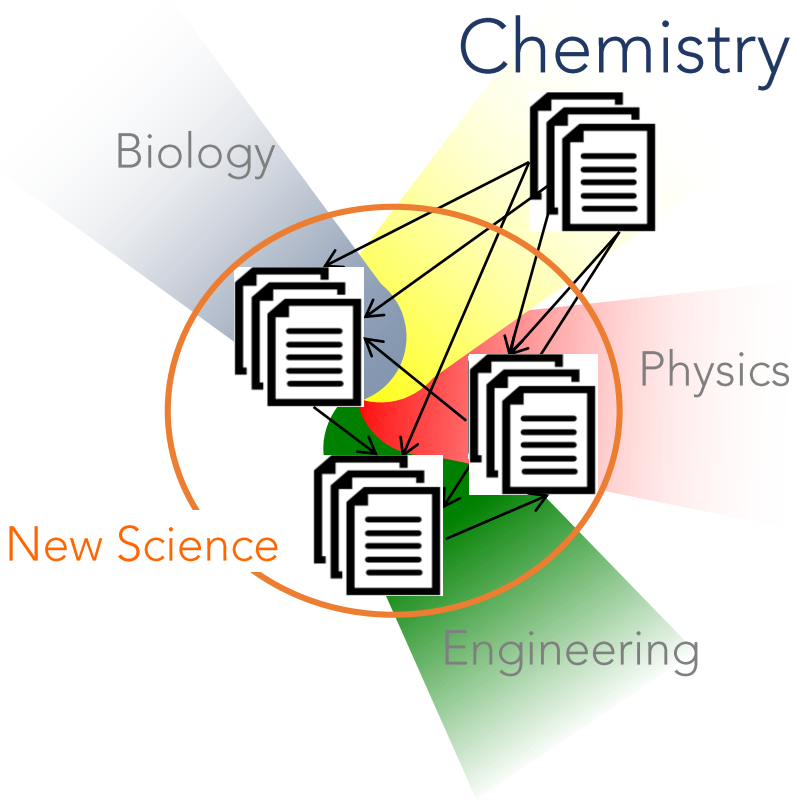
Digital Twin

- Educators > a better transdisciplinary approach of teaching
- Researchers > a better transdisciplinary solution to world issues



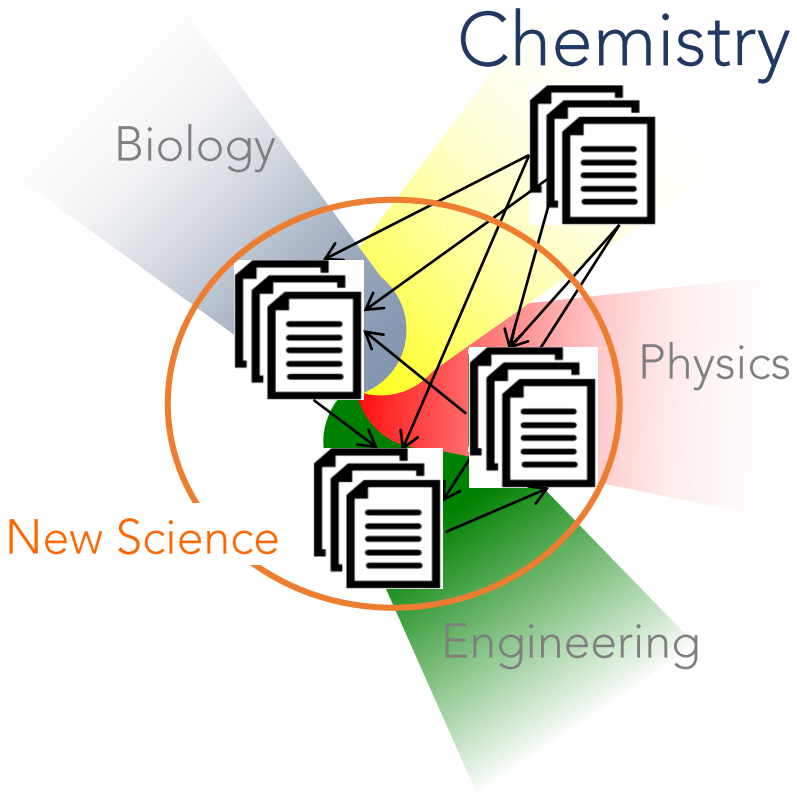

Chemistry
Biology
Physics
New Science
Engineering


MULTIDISCIPLINARY



MULTIDISCIPLINARY

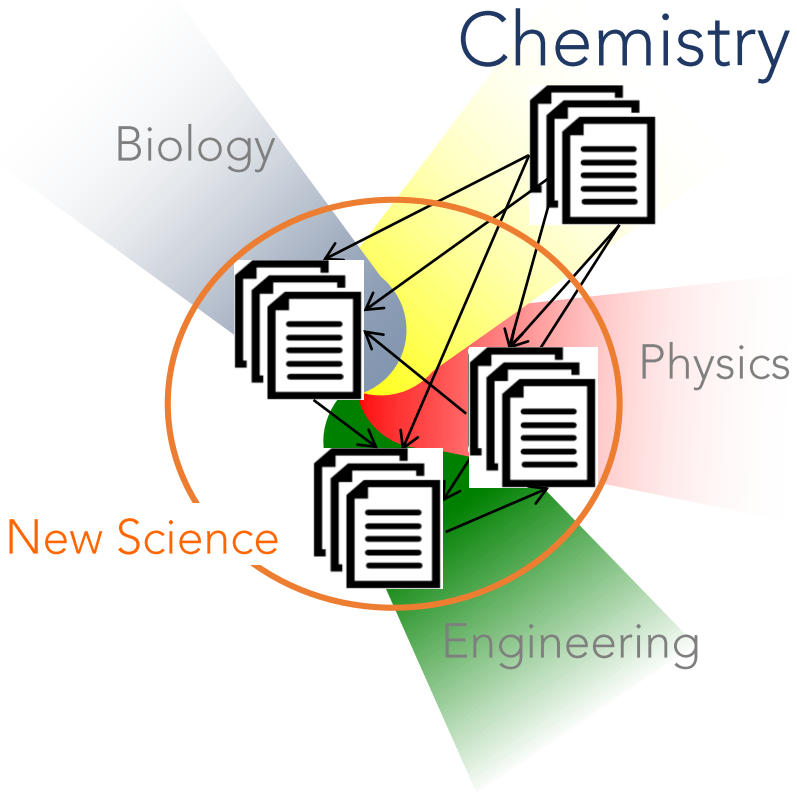
INTERDISCIPLINARY



MULTIDISCIPLINARY

INTERDISCIPLINARY

TRANSDISCIPLINARY



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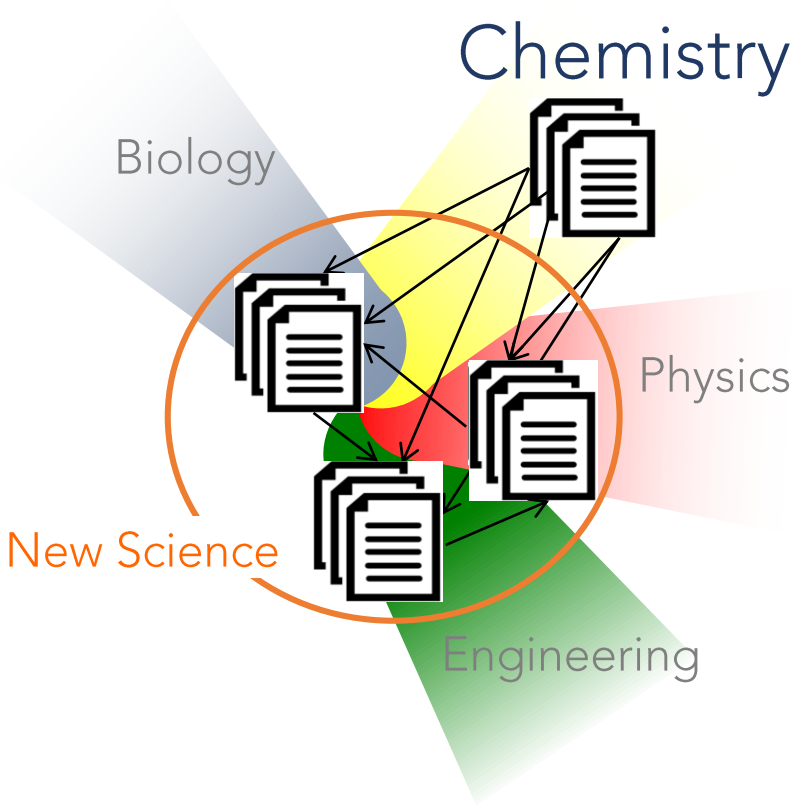
TRANSDISCIPLINARY



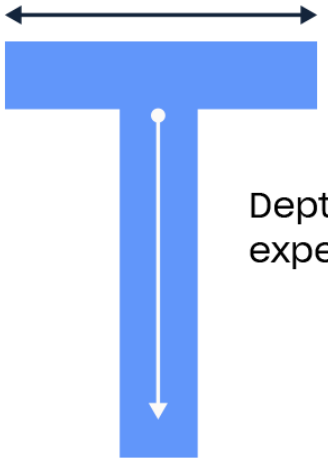
MULTIDISCIPLINARY

INTERDISCIPLINARY

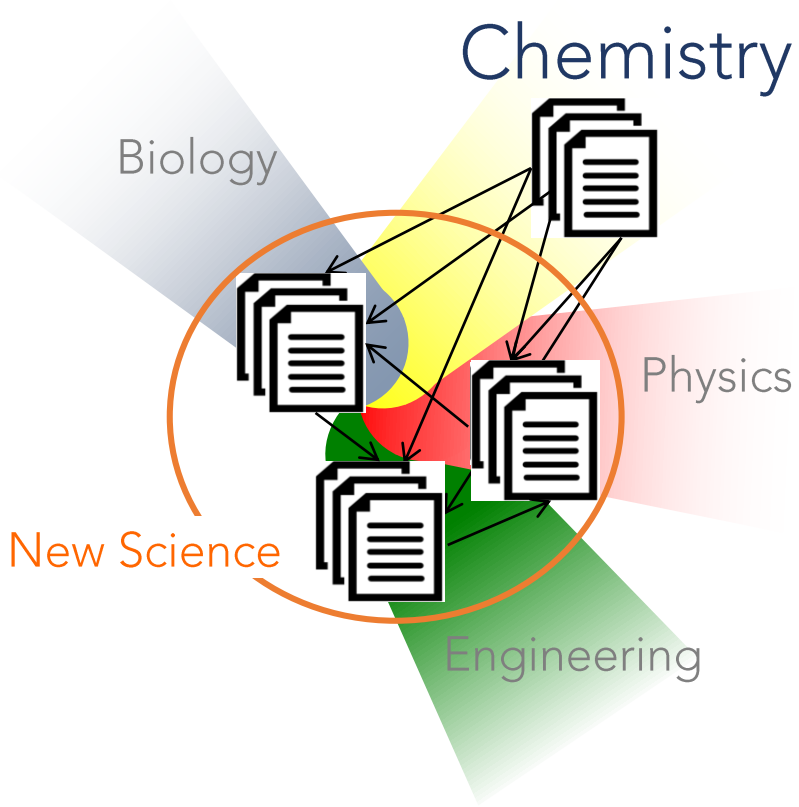
TRANSDISCIPLINARY

T-Shaped Skills

Breadth of experience, knowledge & skills



Depth of high-level
expertise in one discipline



MULTIDISCIPLINARY

INTERDISCIPLINARY

TRANSDISCIPLINARY

MULTIDISCIPLINARY

INTERDISCIPLINARY

TRANSDISCIPLINARY

"..... we need Smart & Rapid Trial-and-error!"

11 Emerging Scientific Fields That Everyone Should Know About

By **George Dvorsky** Published February 27, 2013 | Comments (116)

There was a time when science could be broken down into neat-and-tidy disciplines — straightforward things like biology, chemistry, physics, and astronomy. But as science advances, these fields are becoming increasingly specialized and interdisciplinary, leading to entirely new avenues of inquiry. Here are 11 emerging scientific fields you should know about.

Top image: An artistic impression of HD 189733b, an exoplanet whose atmosphere is being blown off by its sun's solar flares. It's a discovery that was made possible by the emerging field of exo-meteorology. Source: Hubble Space Telescope.

1. Neuroparasitology
2. Quantum Biology
3. Exo-meteorology
4. Nutrigenomics
5. Cliodynamics
6. Synthetic Biology
7. Recombinant Memetics
8. Computational Social Science
9. Cognitive Economics
10. Organic Electronics
11. Quantitative Biology

Self Reflection


單車維修
請排隊


BAMP Speedo X
BAMP Chameleon
BAMP Chameleon Pro
BAMP GOLD

Optimization of library resources for future research support

Library

AI Tools

Search & Assess
Comprehend & Author
Analytics

Discovering

Authoring

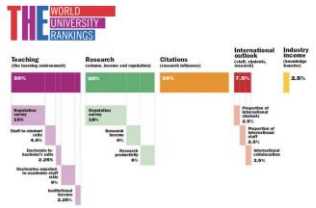
Outreaching

Researchers

Publishing/Sharing Channels

Video Abstract
Landing Page
Social Media
Analytics

Funder



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