

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

人工智慧的背景



Source: <https://bigthink.com/eric-lipton/ai-research-timeline-machine-learning-deep-learning/>

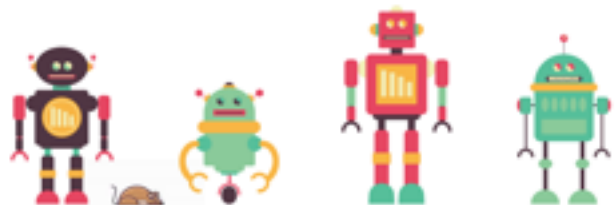
2. About ChatGPT

關於 ChatGPT



3. The Advent of Super Researchers

超級研究者的出現



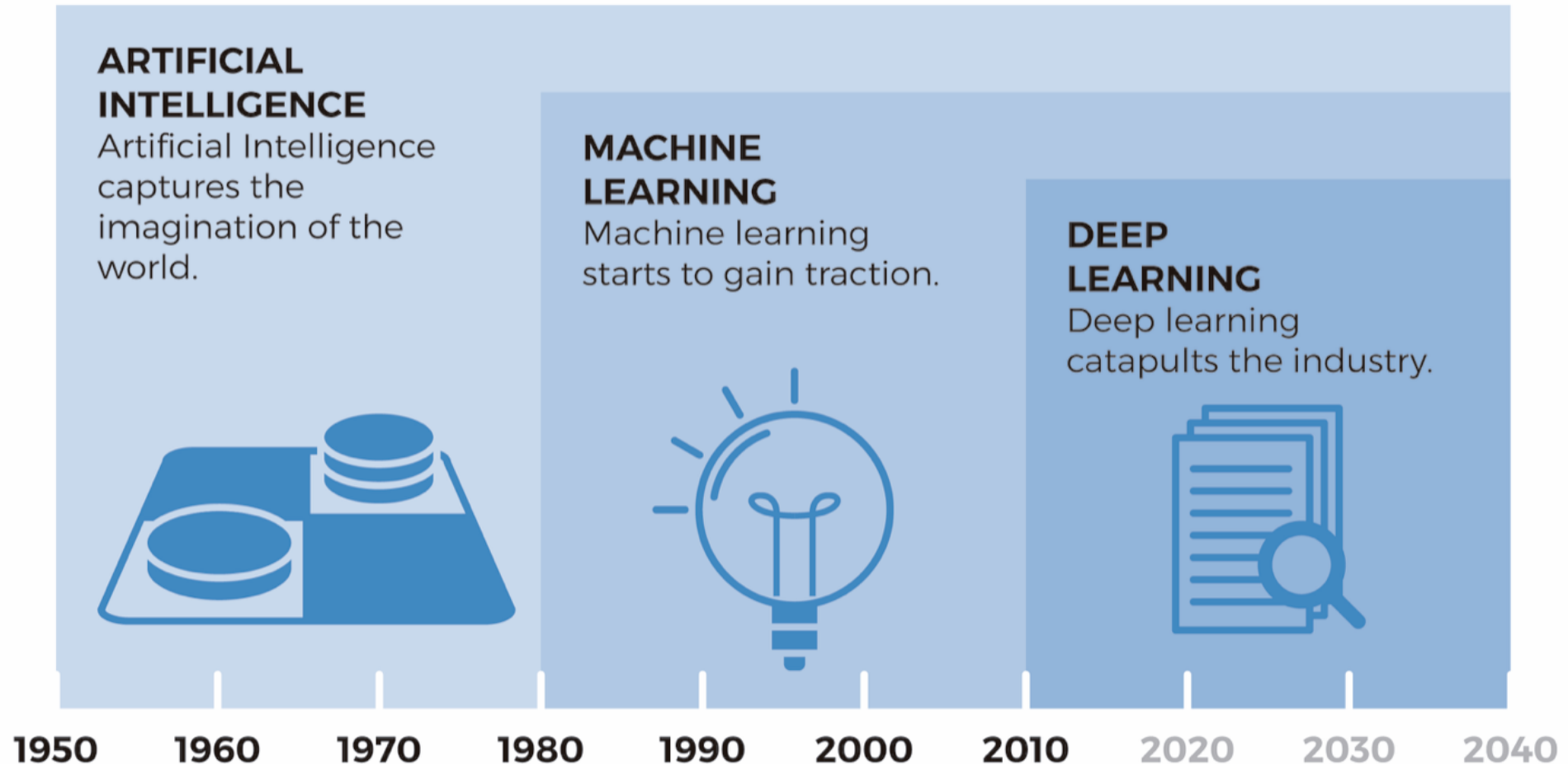
4. The Future of Science: Transdisciplinary

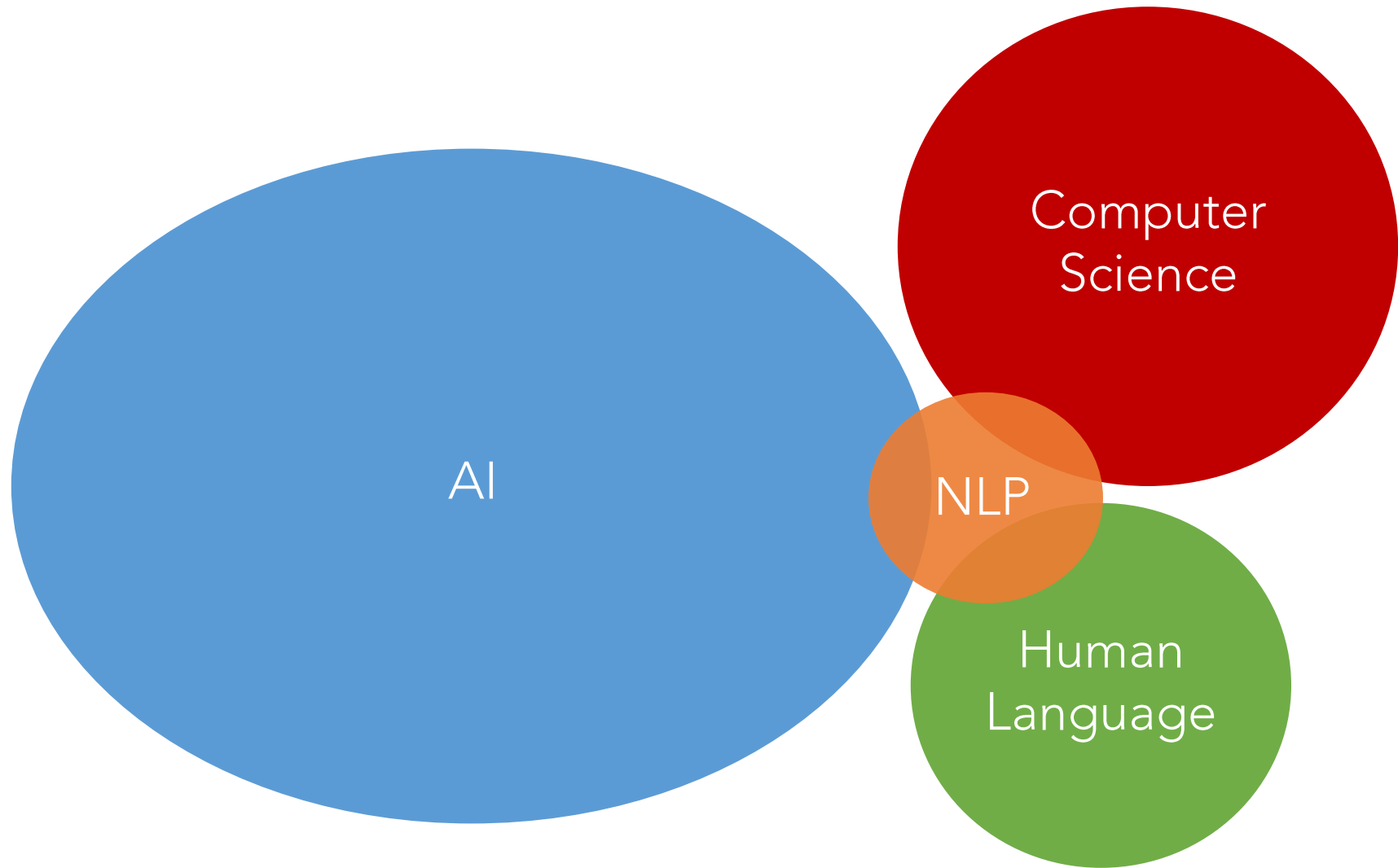
科學的未來：跨學科



1. The Background of AI

人工智能的背景






AI

Computer
Science

NLP

Human
Language



Natural
Language
Processing

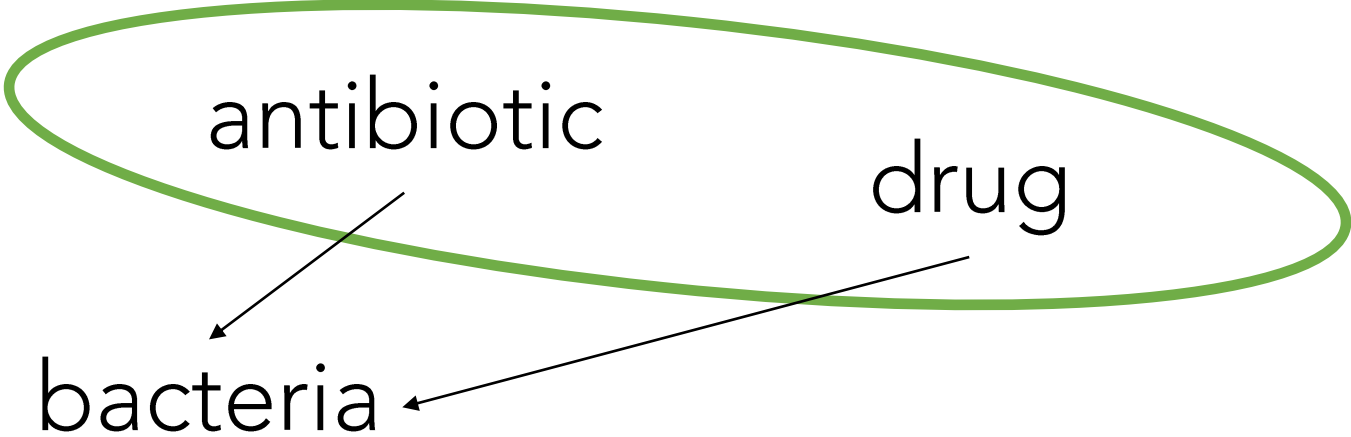
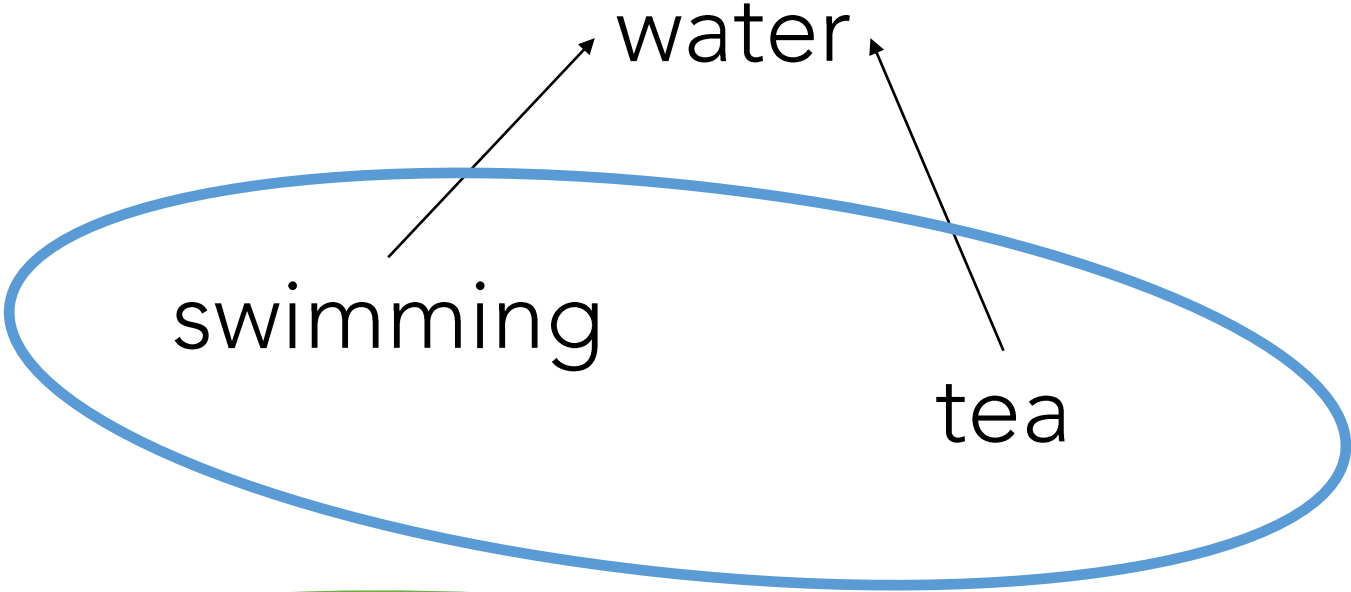
DIFFERENT LEVELS AT WHICH MACHINES PROCESS AND UNDERSTAND LANGUAGES

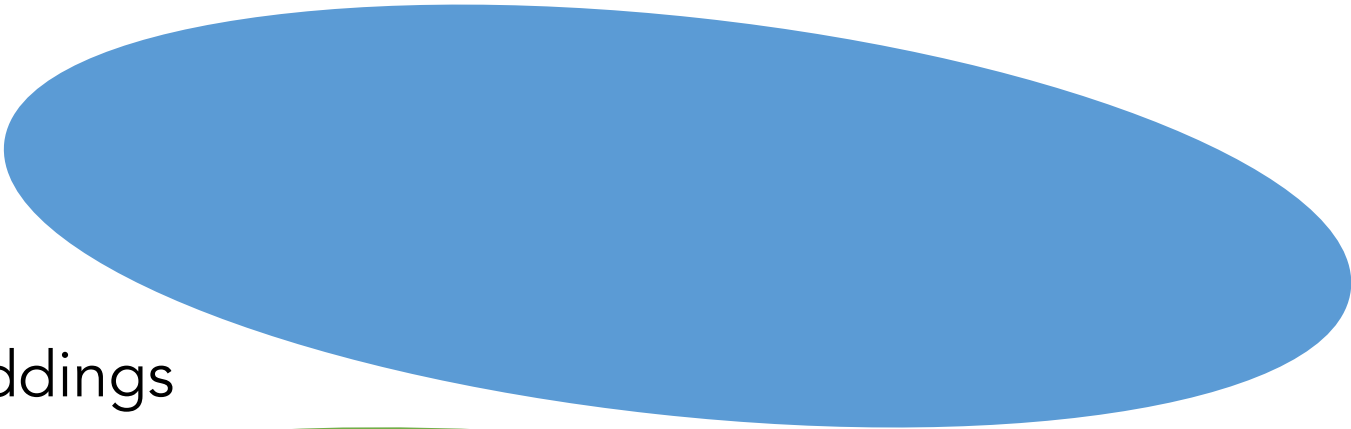
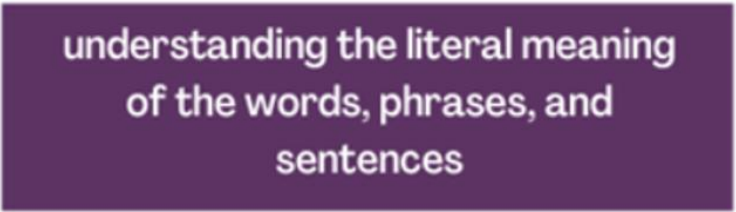
Phonetical and Phonological	understanding the patterns present in the sound and speeches
Morphological	understanding the structure of the words and the systematic relations
Lexical	understanding the part of speech
Syntactic	understanding the structure of the sentence
Semantic	understanding the literal 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

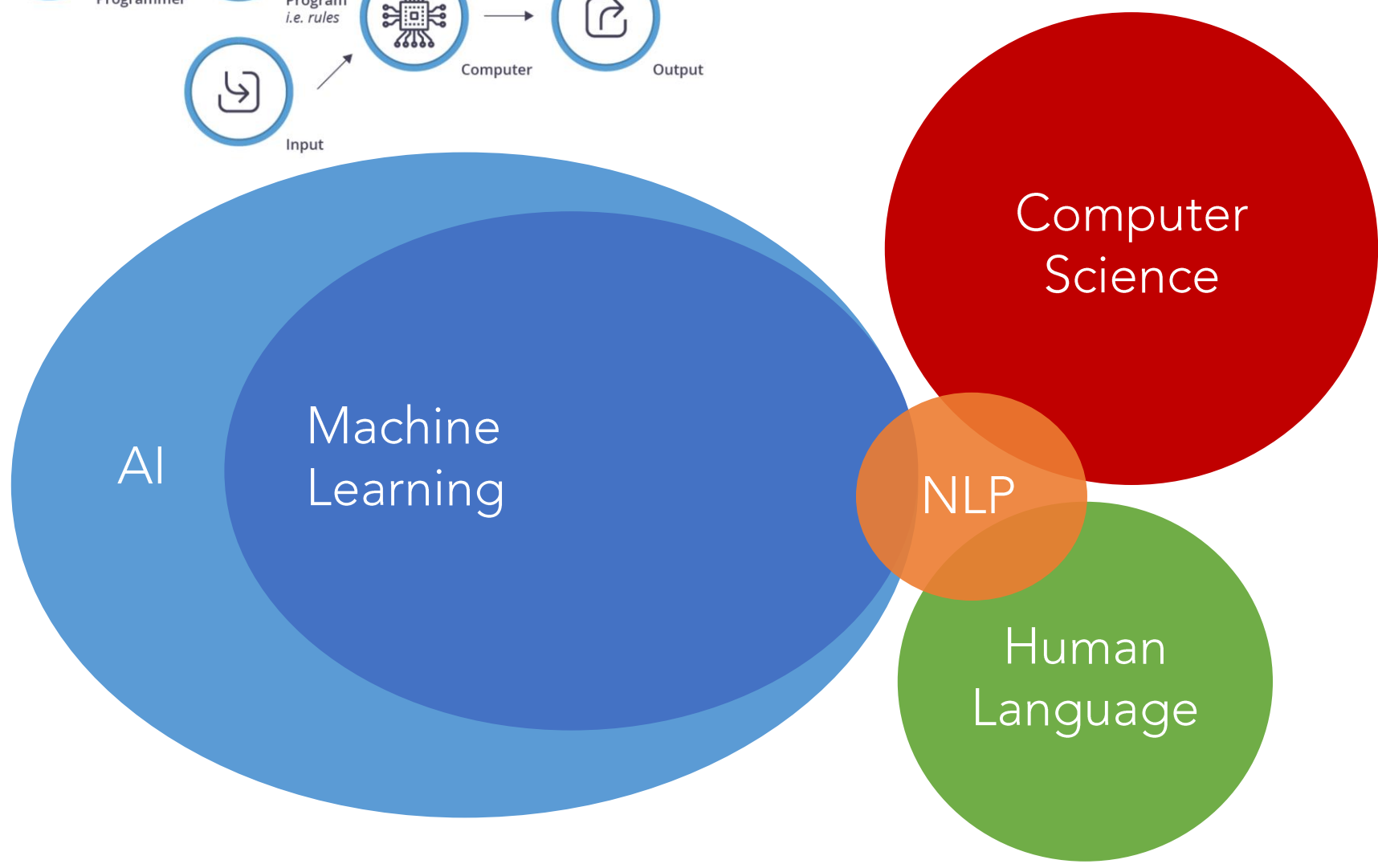
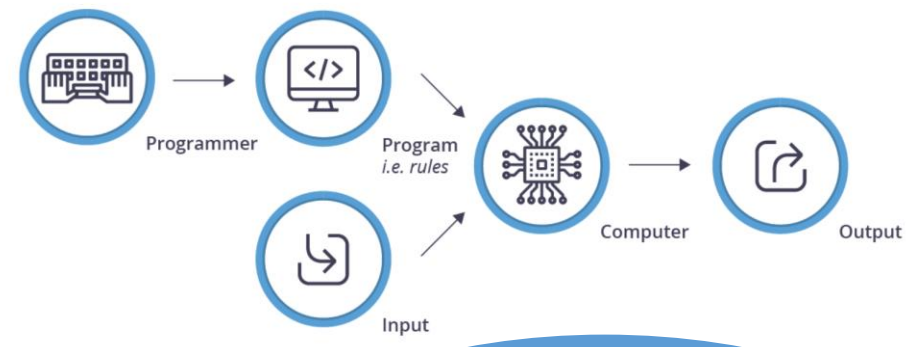
Semantic

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

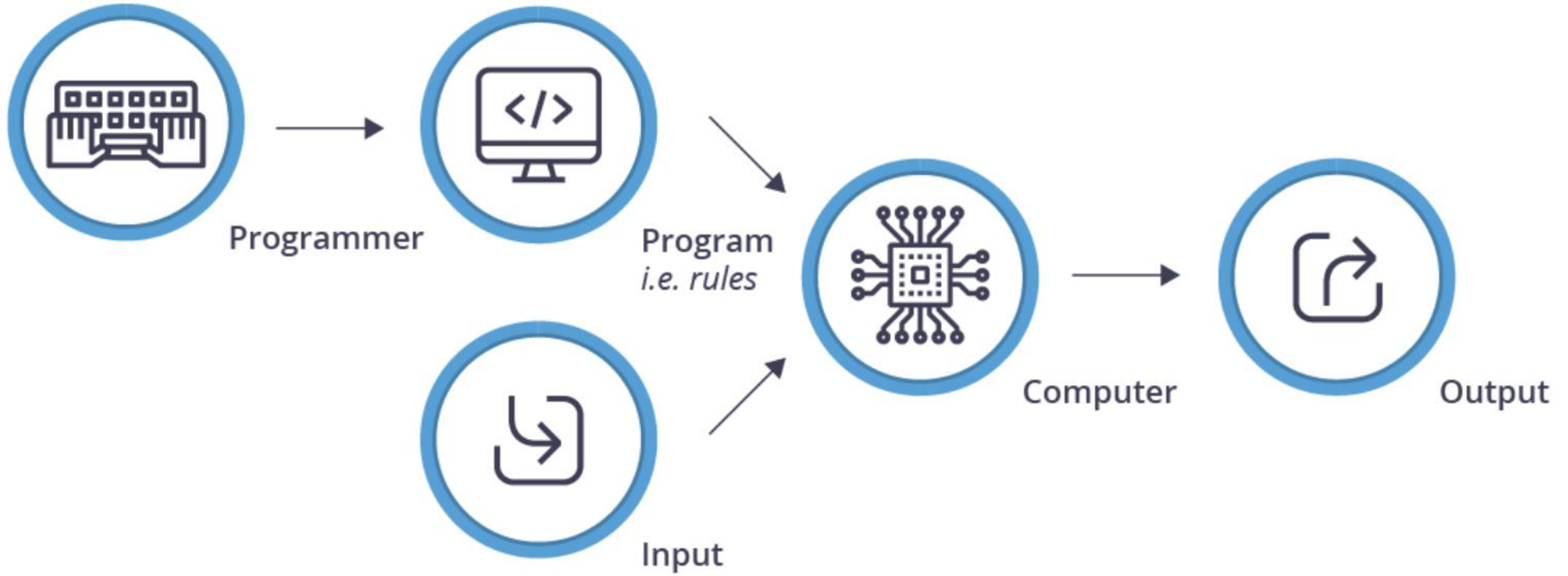




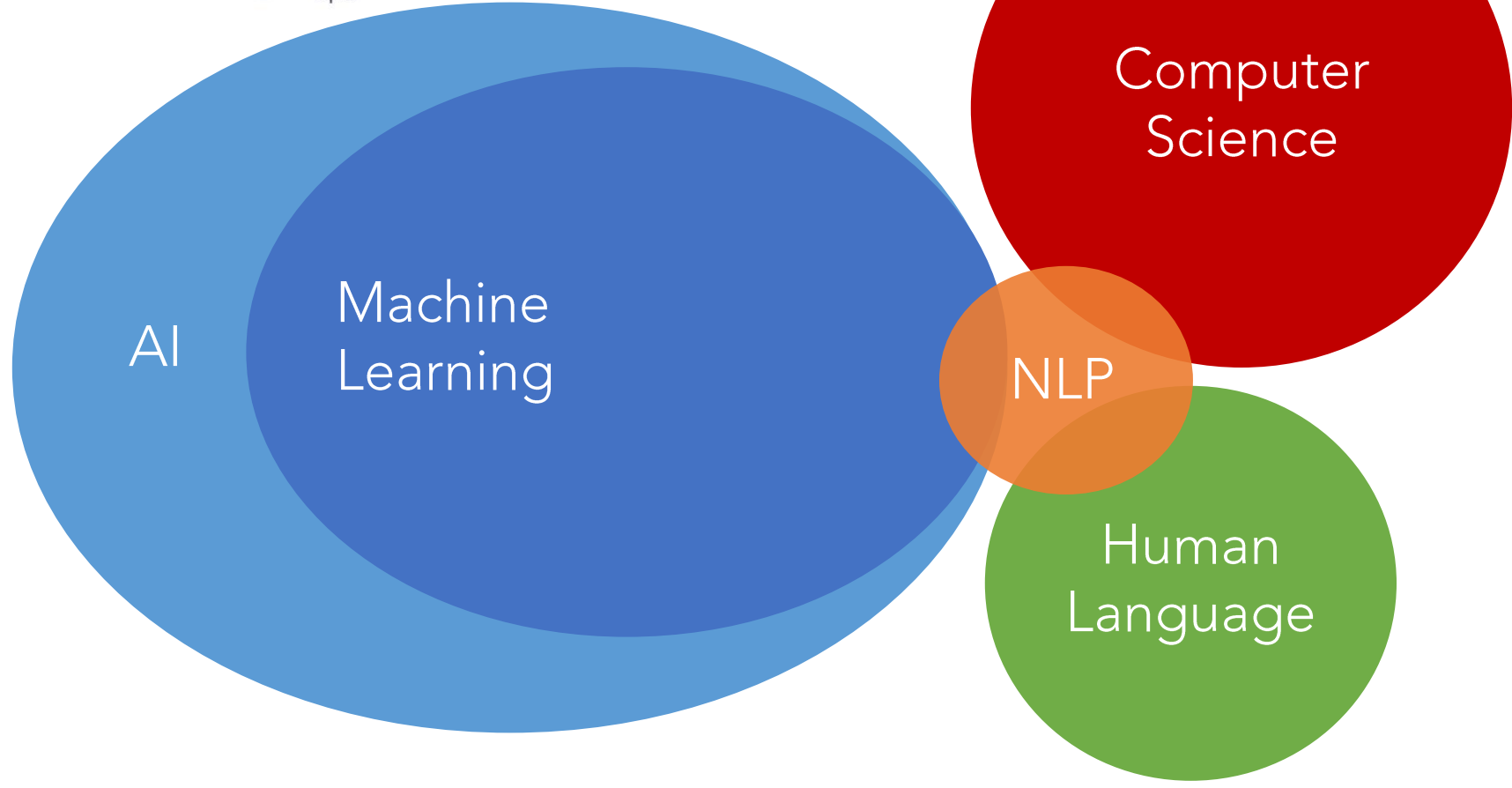
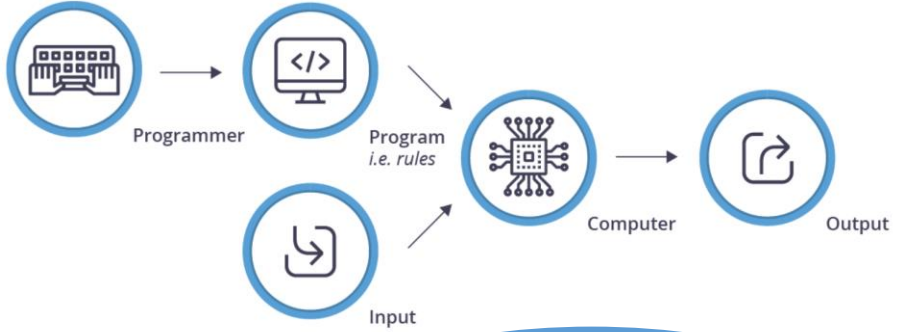
Traditional Computing



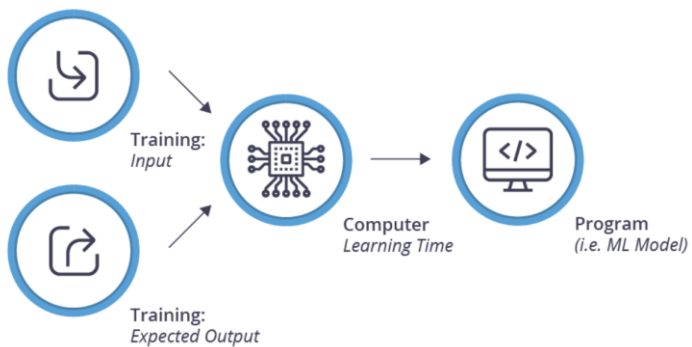
Traditional Computing



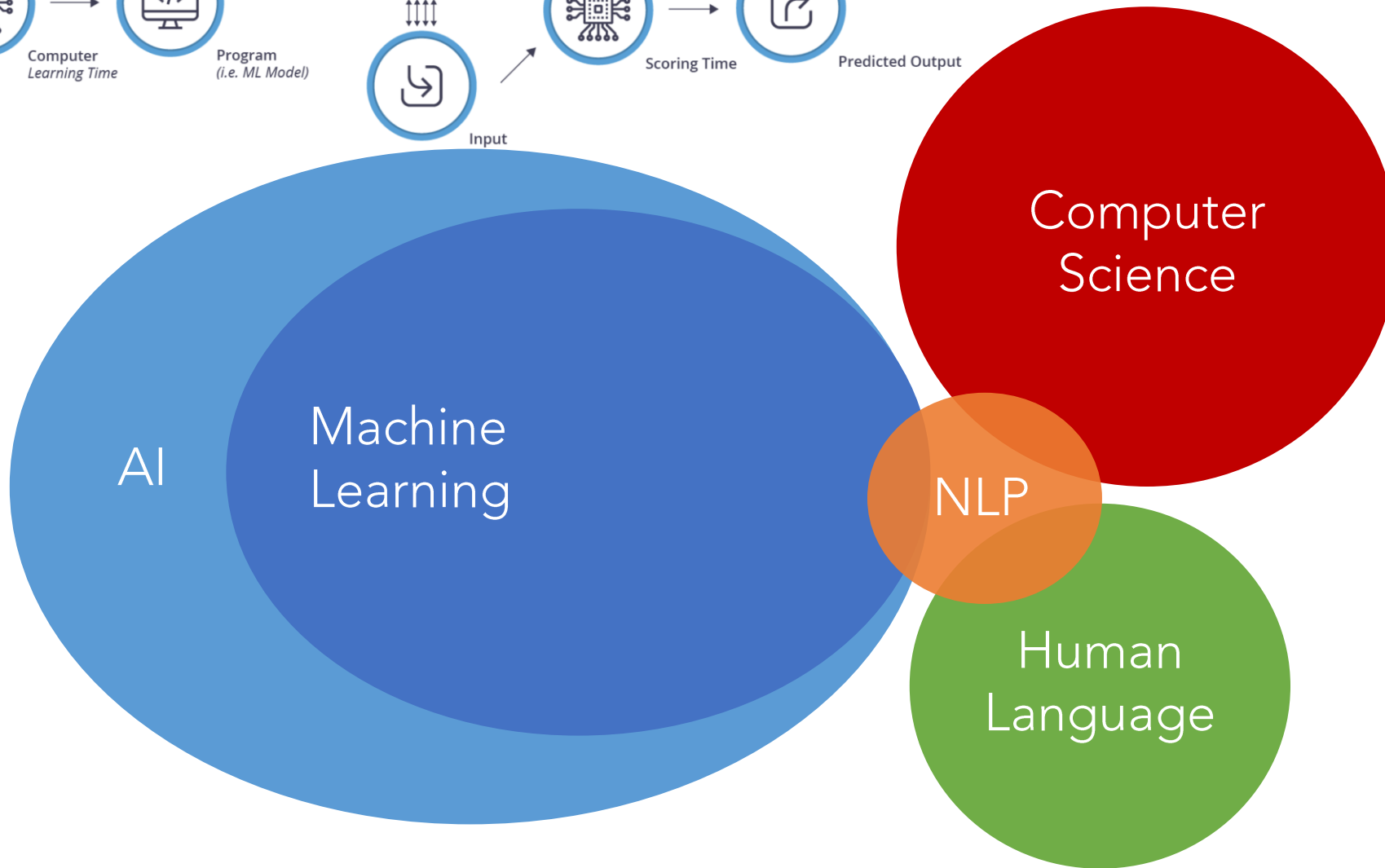
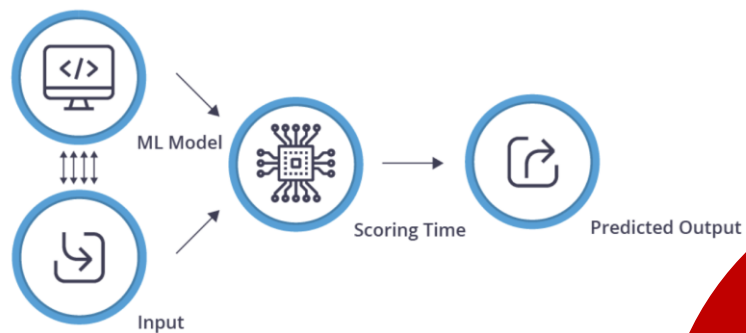
Traditional Computing



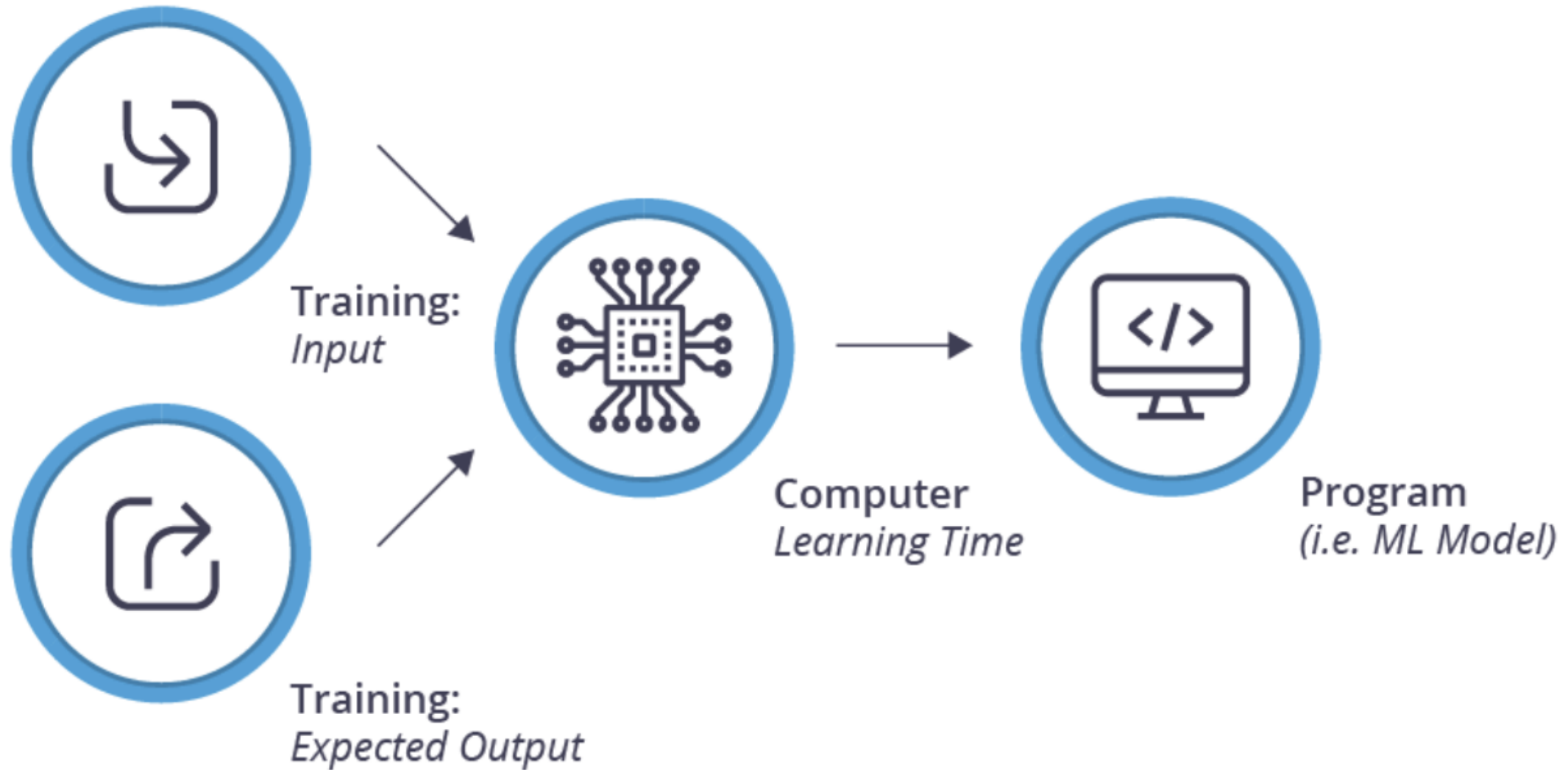
The Machine Learning Training Process



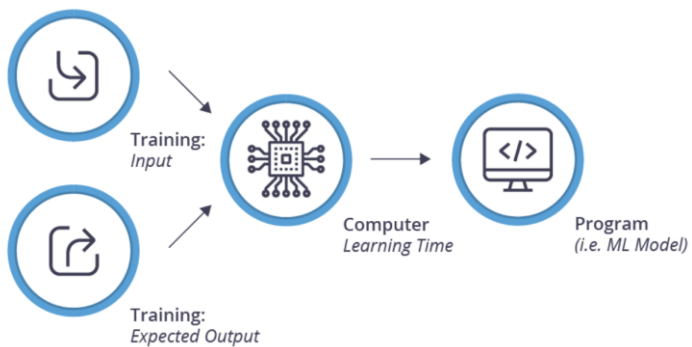
The Machine Learning Scoring Process



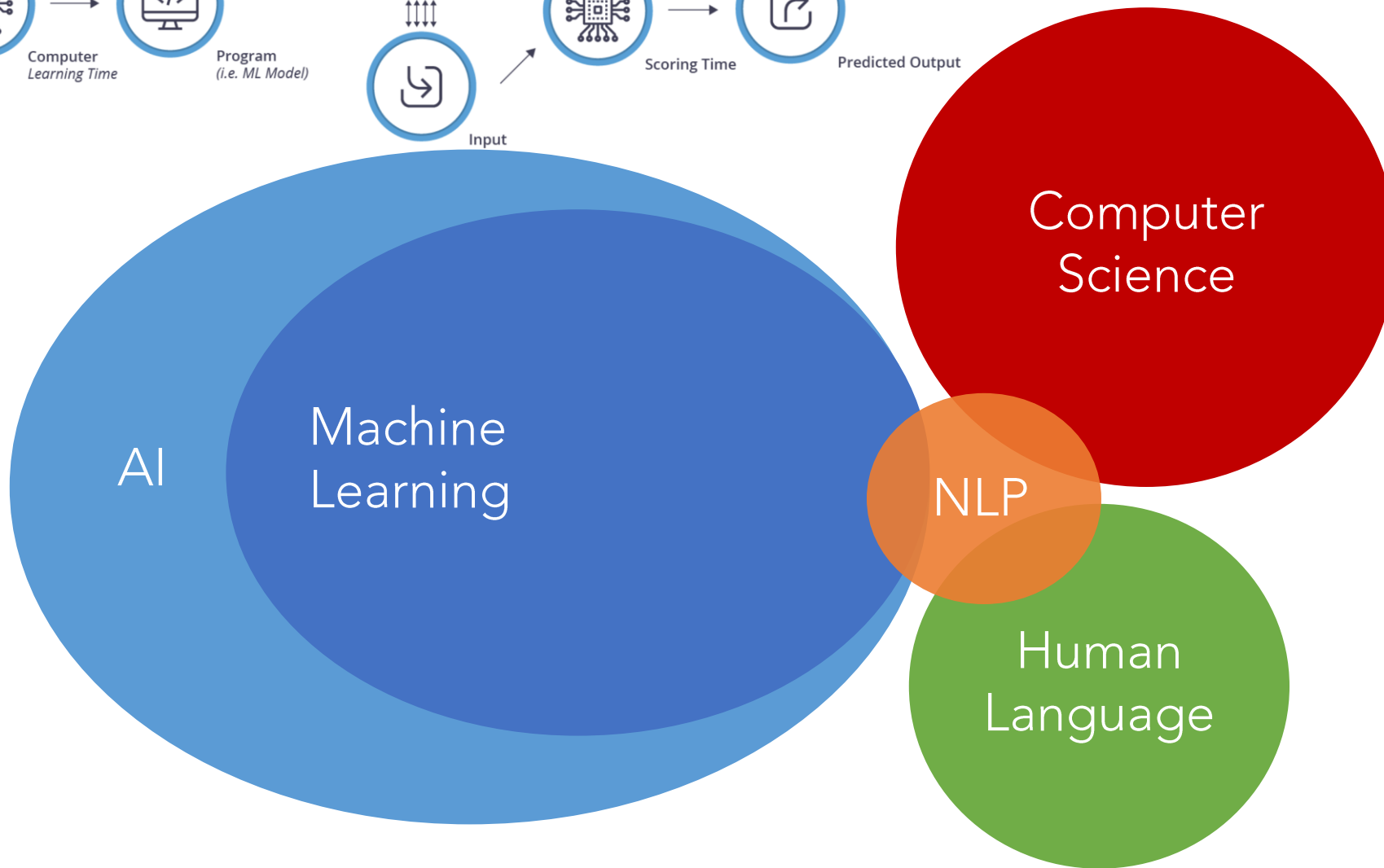
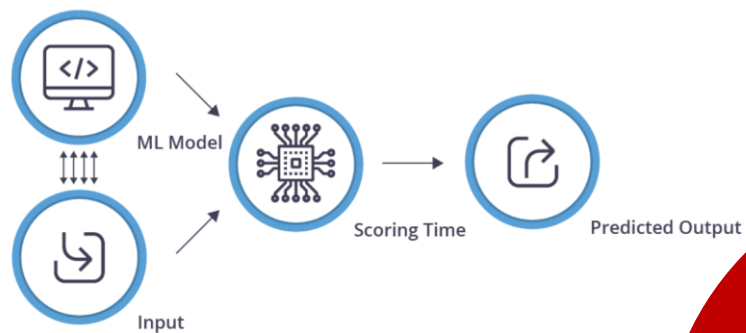
The Machine Learning **Training Process**



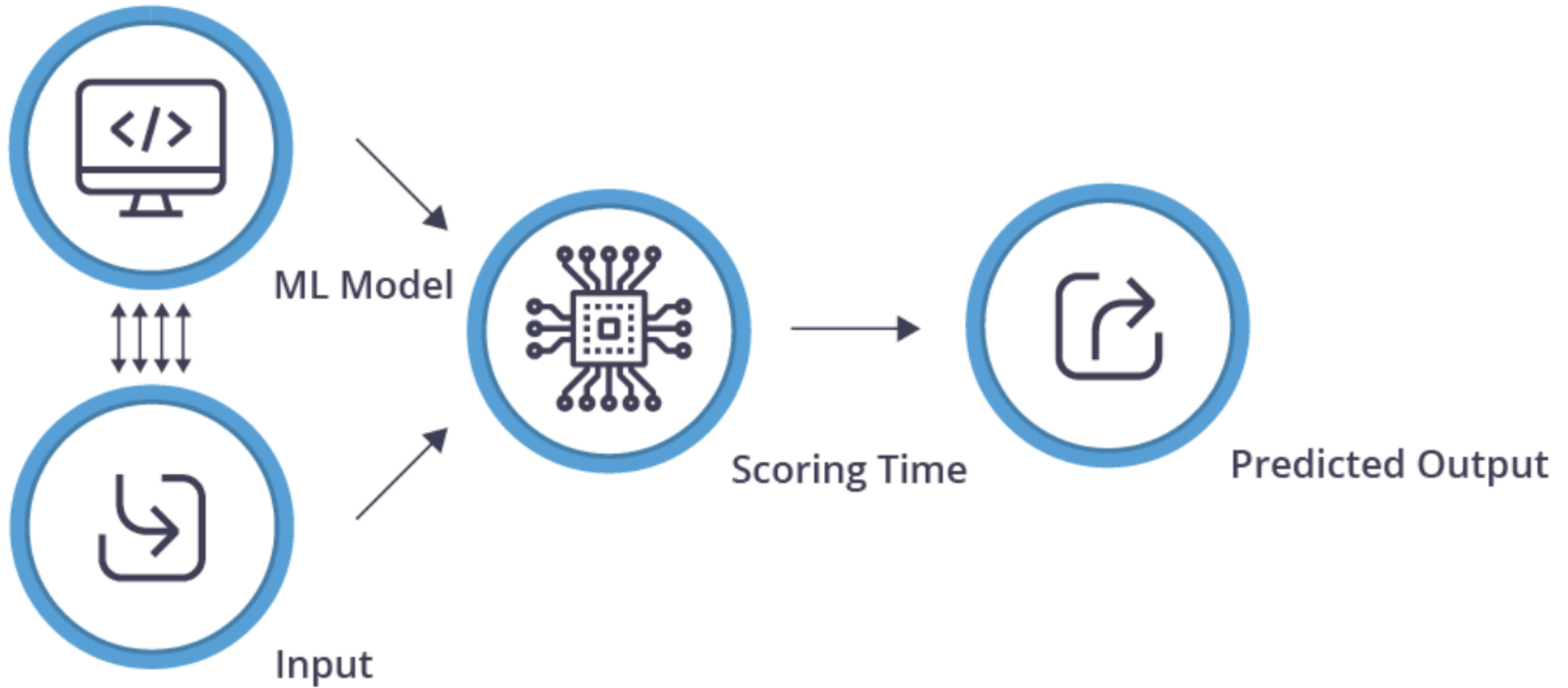
The Machine Learning Training Process



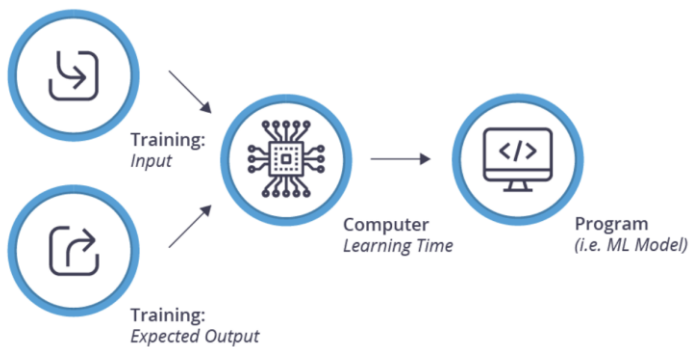
The Machine Learning Scoring Process



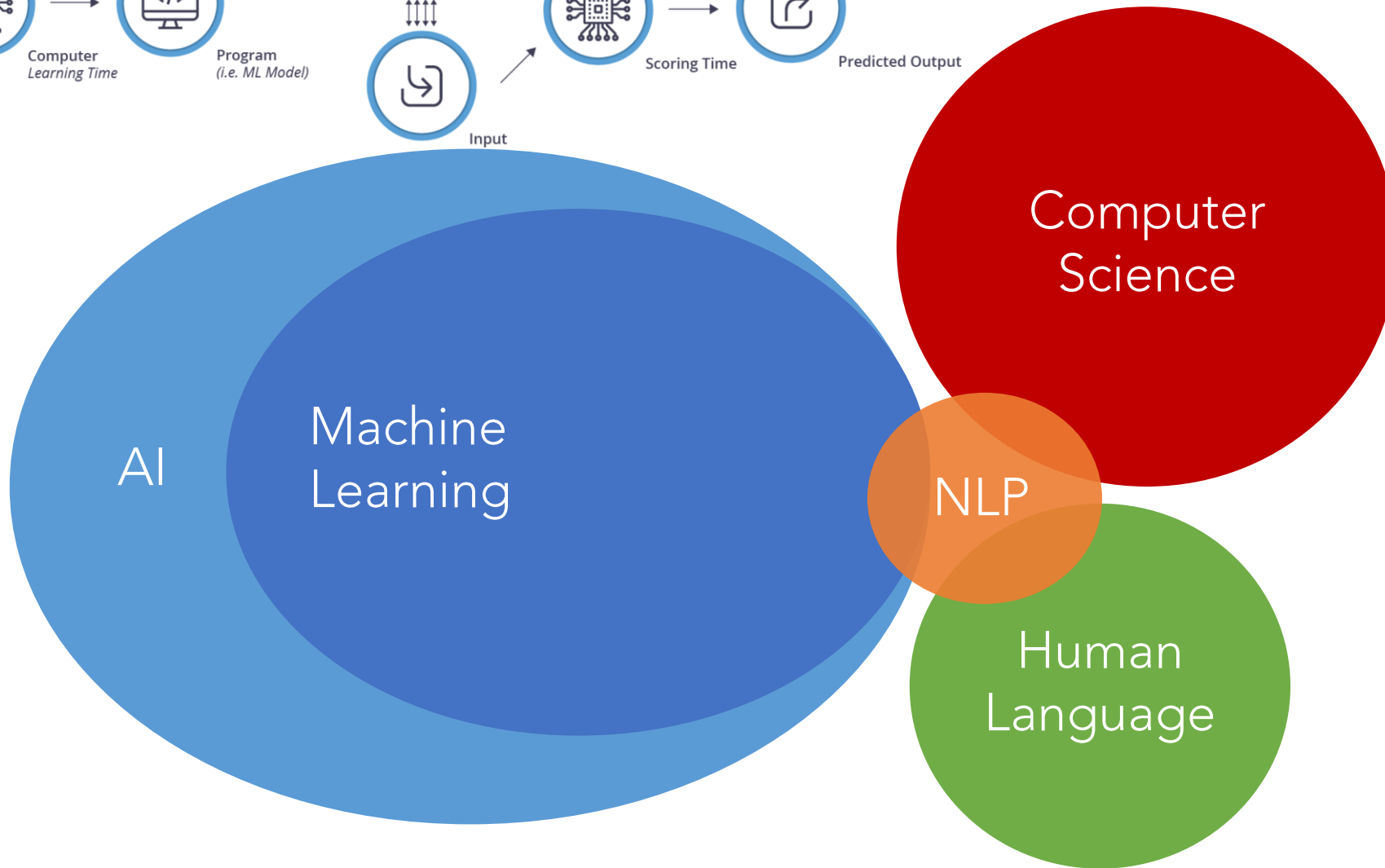
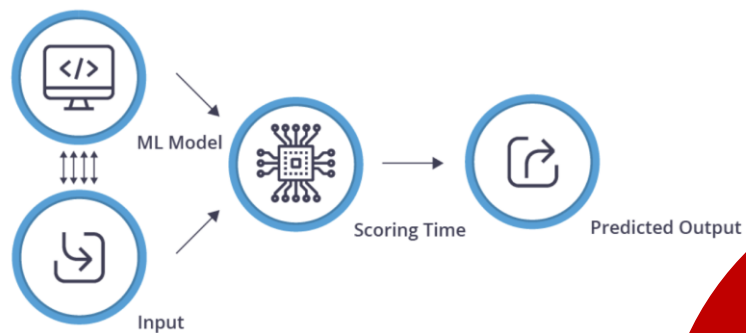
The Machine Learning Scoring Process



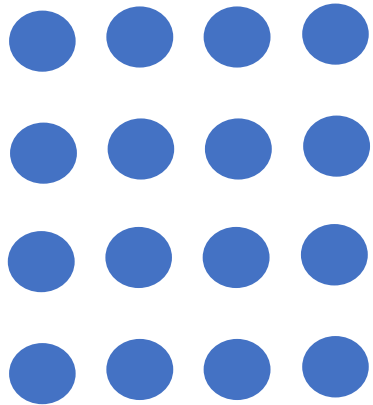
The Machine Learning Training Process



The Machine Learning Scoring Process



Gather some data

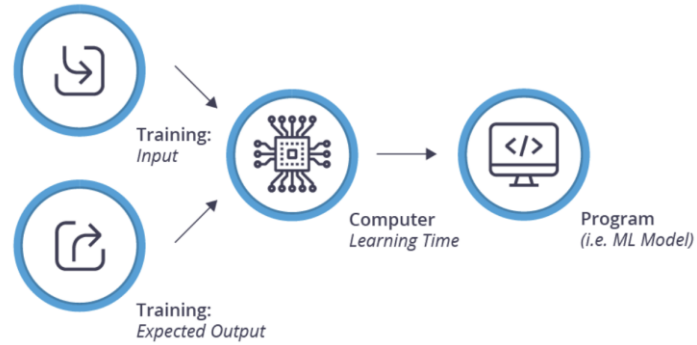


Make sure they are good

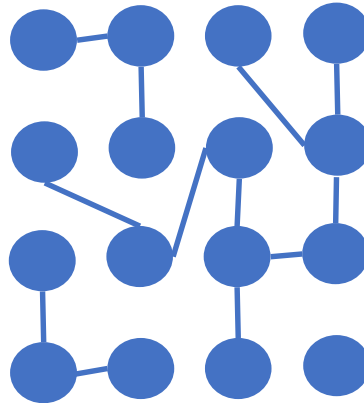


Phase 1: ML Training Model

The Machine Learning **Training Process**



Model the data

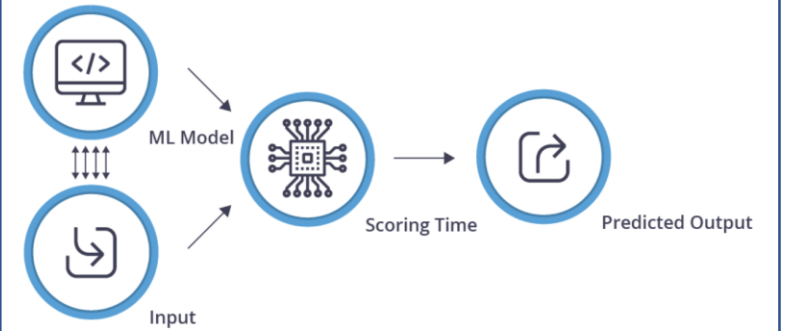


Try different algorithms & settings

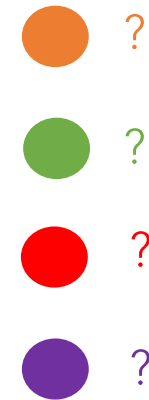


Phase 2: Evaluation

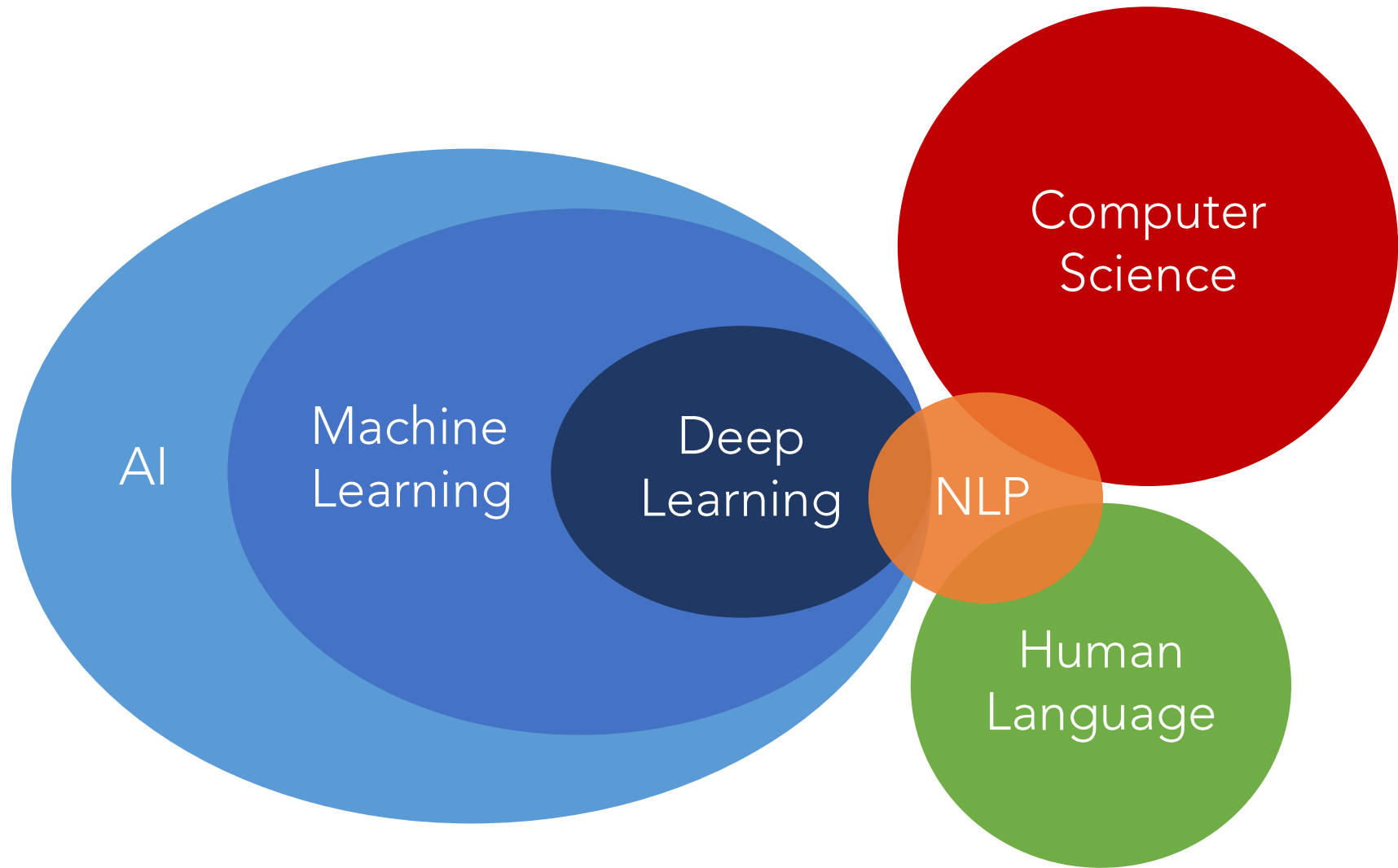
The Machine Learning **Scoring Process**



Understand unknown data



Feed new data into the model



AI

Machine Learning

Deep Learning

NLP

Computer Science

Human Language



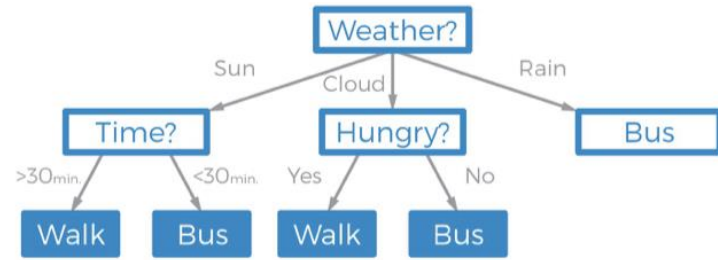
Deep
Learning

Machir ing

Feature extraction



Input



Decision tree

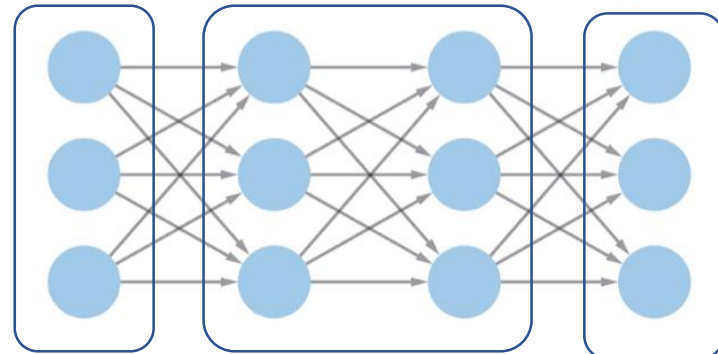


Output

Deep Learning



Input



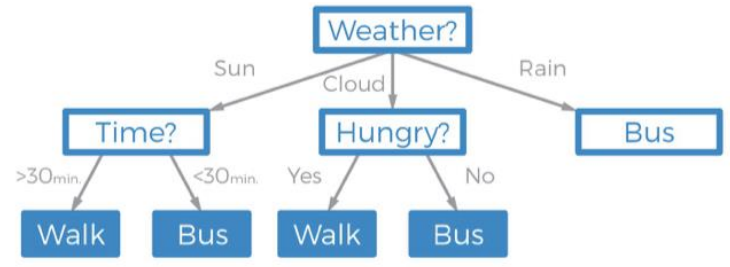
Output

Machir ring

Feature extraction



Input



Decision tree

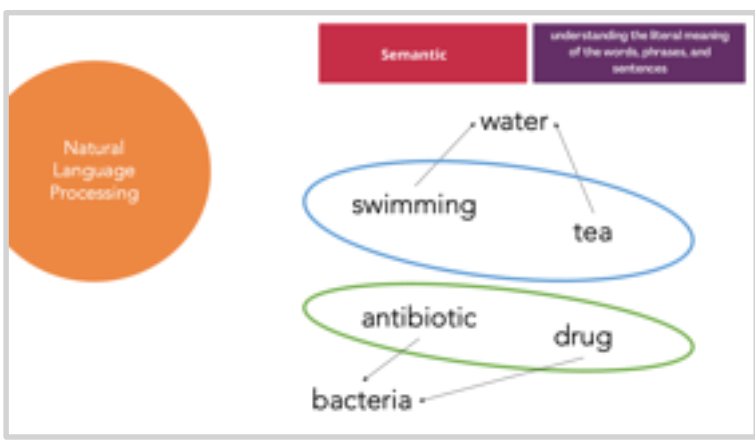


Output

Deep Learning

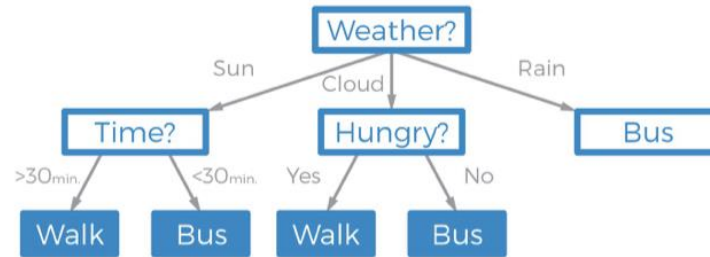


Input



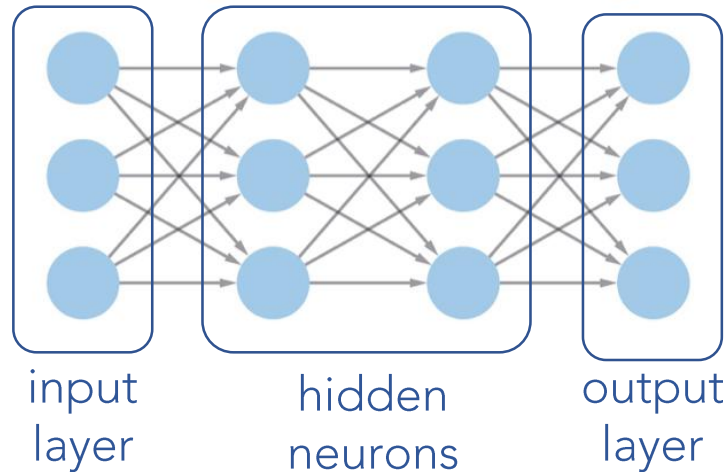
Output

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

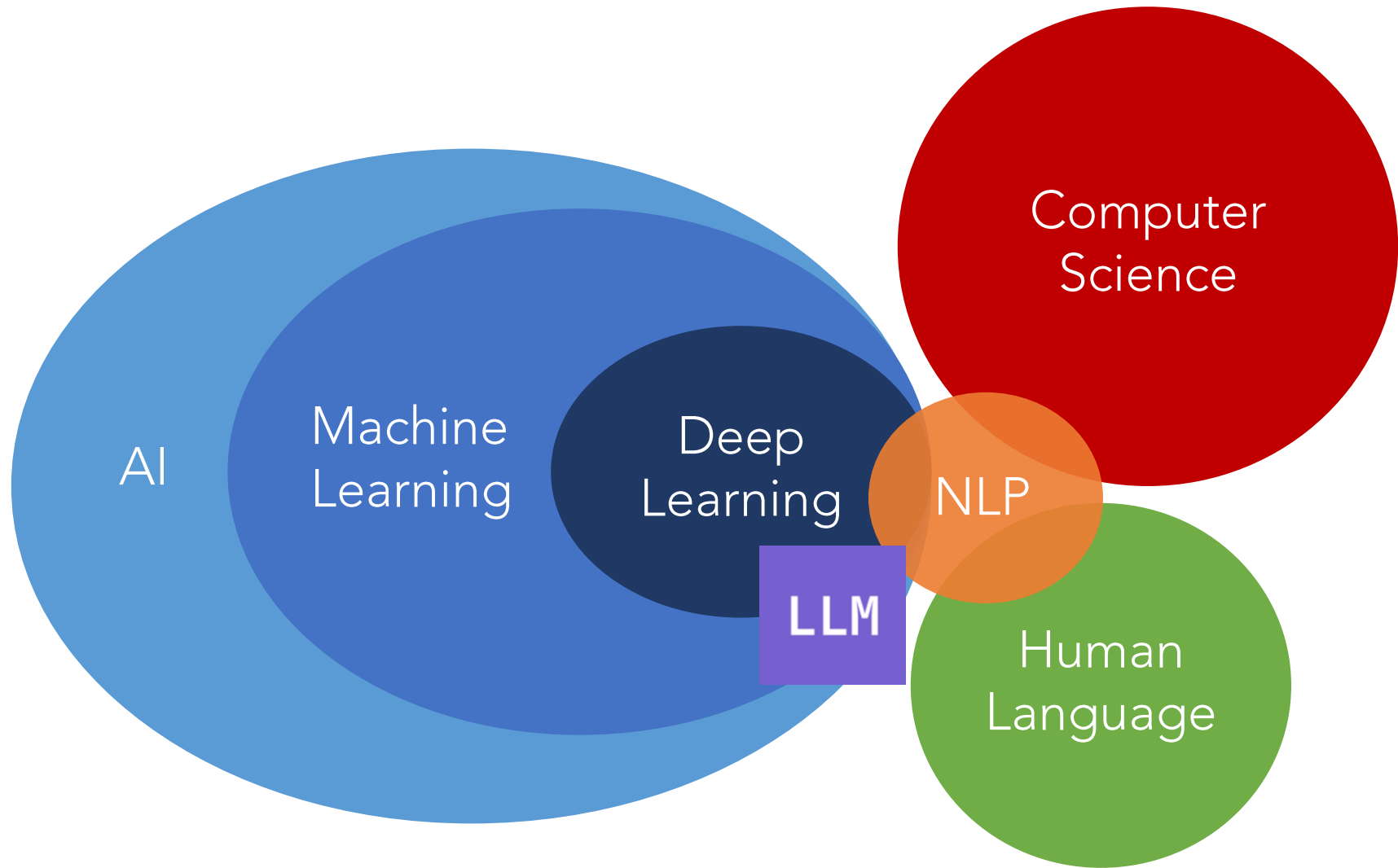
Takes longer to train

Requires GPU to train properly

Can be tuned in various different ways.

A dark blue oval shape is centered on a white background. Inside the oval, the words "Deep Learning" are written in a white, sans-serif font, stacked vertically with "Deep" on top and "Learning" below it.

Deep
Learning



AI

Machine Learning

Deep Learning

LLM

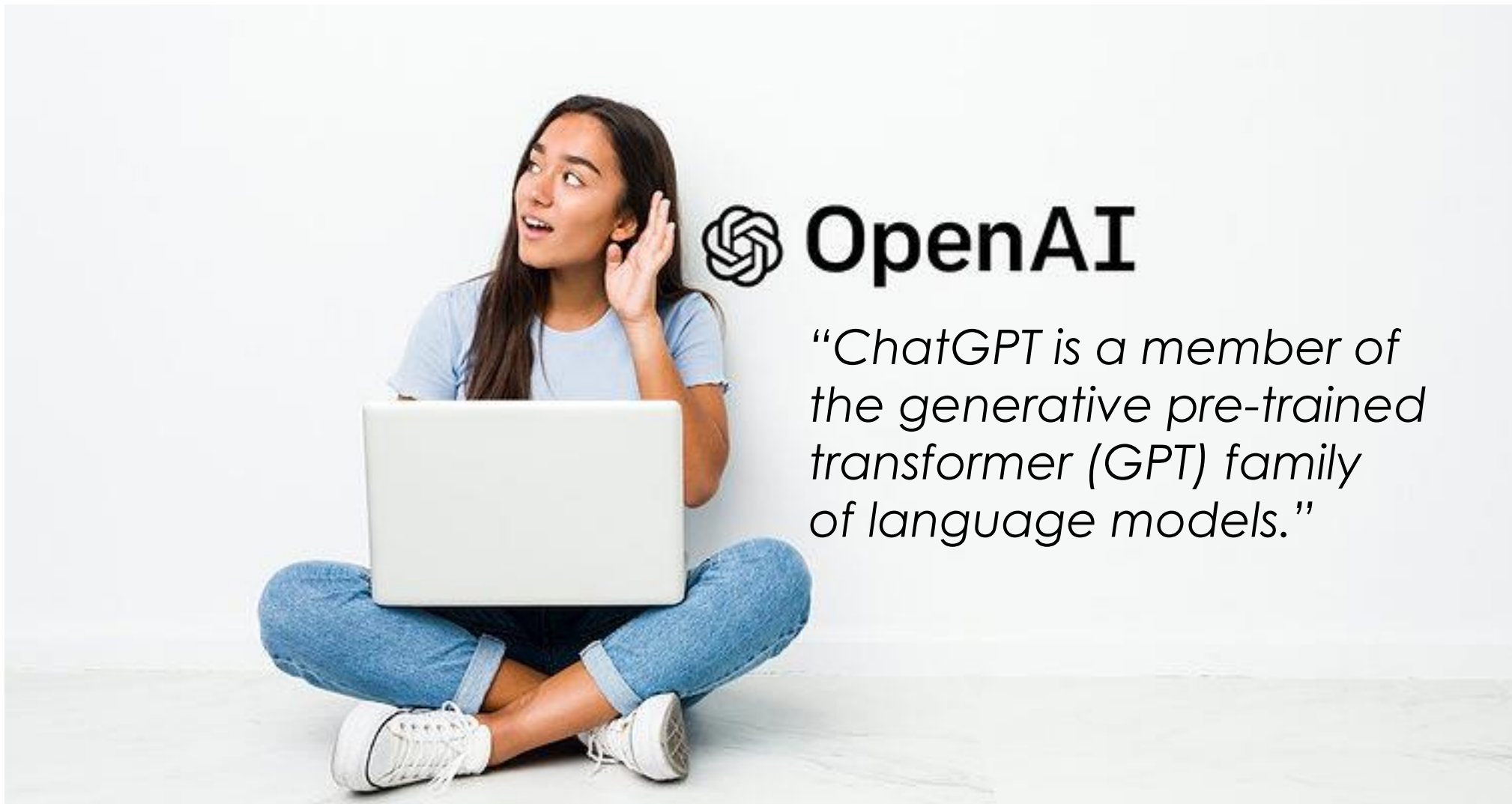
NLP

Computer Science

Human Language

2. About ChatGPT

關於 ChatGPT



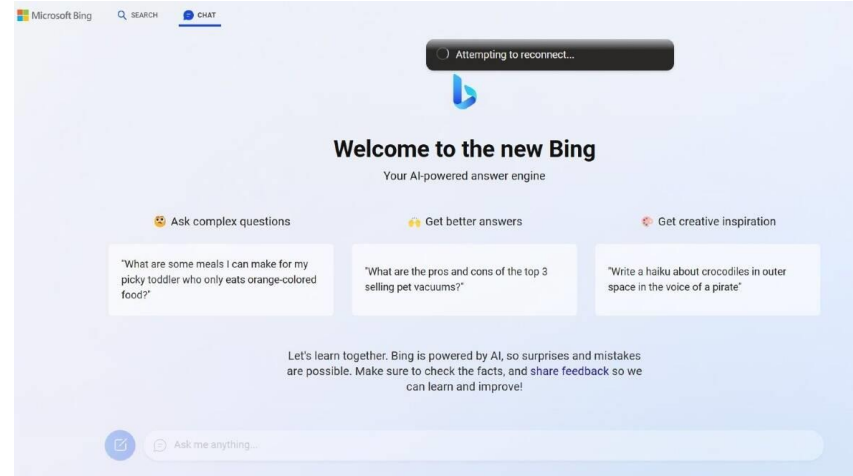
OpenAI

“ChatGPT is a member of the generative pre-trained transformer (GPT) family of language models.”


Search Engine + LLM

Generative LLM + Search

Generative LLM



 **OpenAI**
ChatGPT 3.5

 **OpenAI**
ChatGPT 4.0

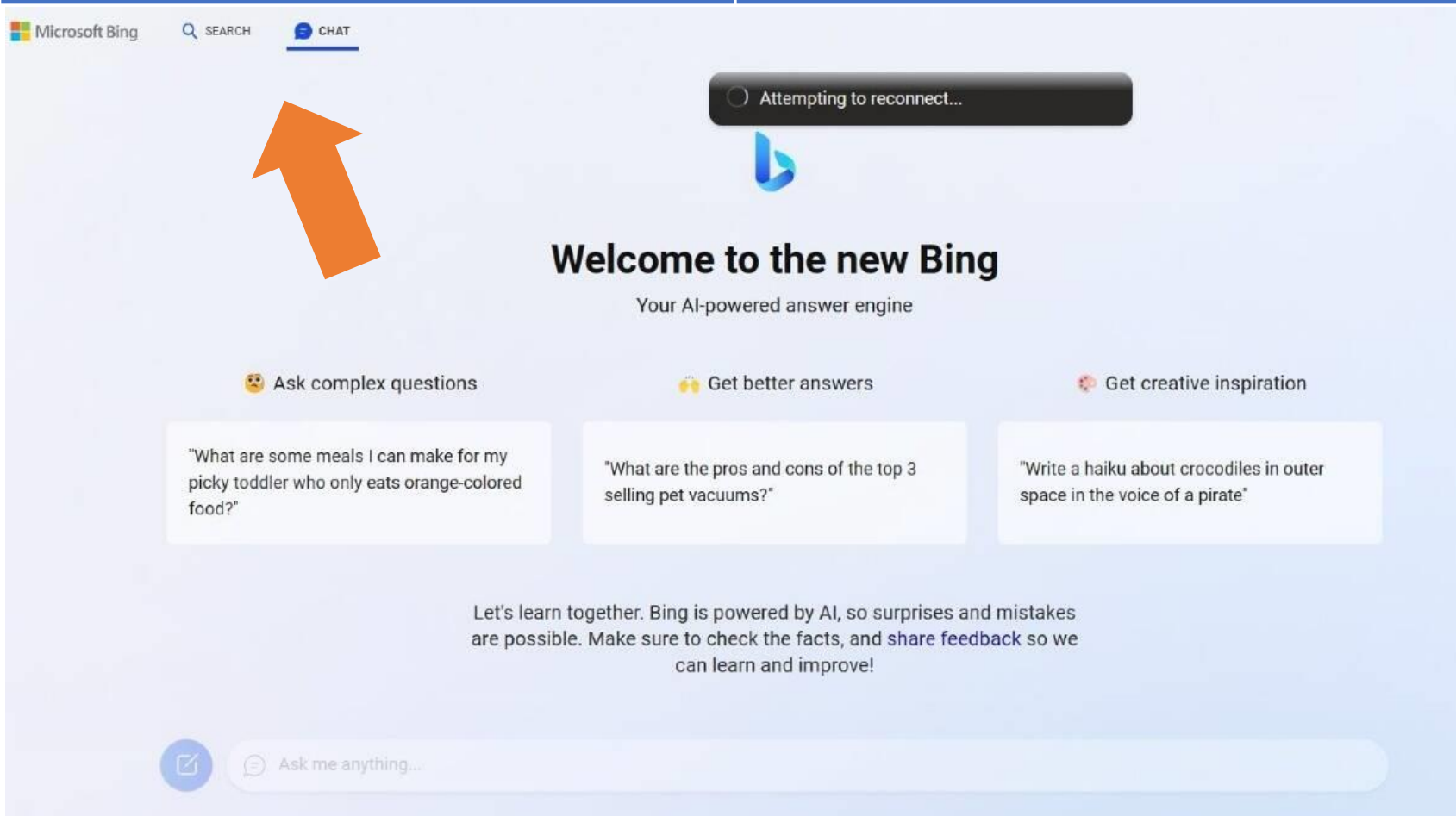


“Tend to hallucinate!”


Search Engine + LLM

Generative LLM + Search

Generative LLM



 **OpenAI**
ChatGPT 3.5

 **OpenAI**
ChatGPT **4.0**

Search Engine + LLM

Generative LLM + Search

Generative LLM

Elicit

Welcome to the new Elicit

Find insights across 200 million research papers with GPT-4

Elicit is an AI research assistant that helps you gather insights from across the research literature.

[Join the Waitlist](#)

Currently in private beta

Microsoft Bing

Attempting to reconnect...

Welcome to the new Bing

Your AI-powered answer engine

- Ask complex questions
- Get better answers
- Get creative inspiration

"What are some meals I can make for my picky toddler who only eats orange-colored food?"

"What are the pros and cons of the top 3 selling pet vacuums?"

"Write a haiku about crocodiles in outer space in the voice of a pirate"

Let's learn together. Bing is powered by AI, so surprises and mistakes are possible. Make sure to check the facts, and share feedback so we can learn and improve!

Ask me anything...



OpenAI

ChatGPT 3.5

consensus

Evidence-Based Answers, Faster

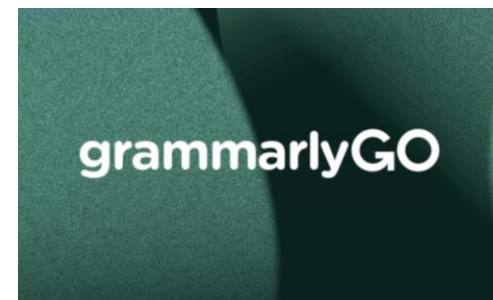
What does the research say about ...

Try Searching: Does creatine help build muscle? Can mindfulness improve sleep? Do direct cash transfers reduce poverty?

[Create An Account To Start Searching](#)



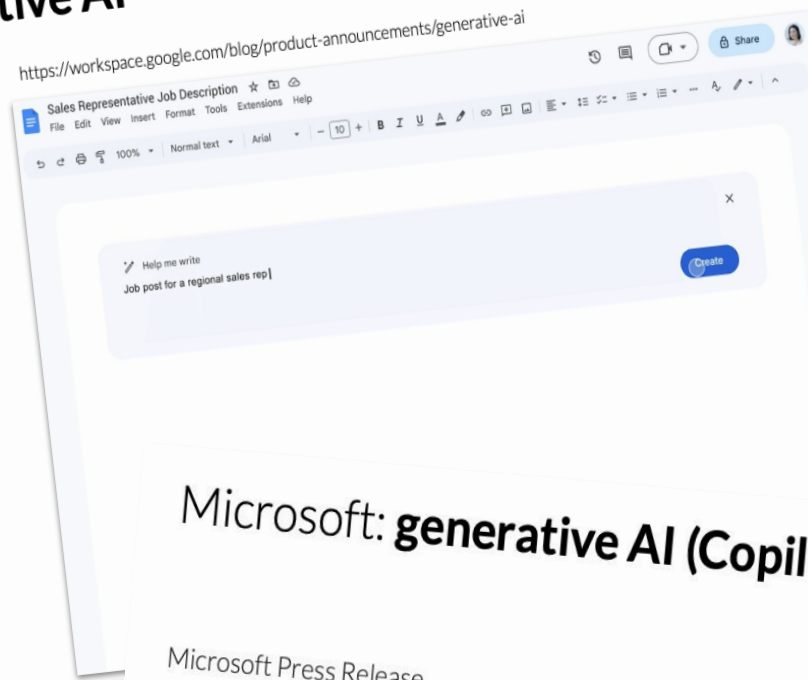
OpenAI
ChatGPT **4.0**



Google: generative AI

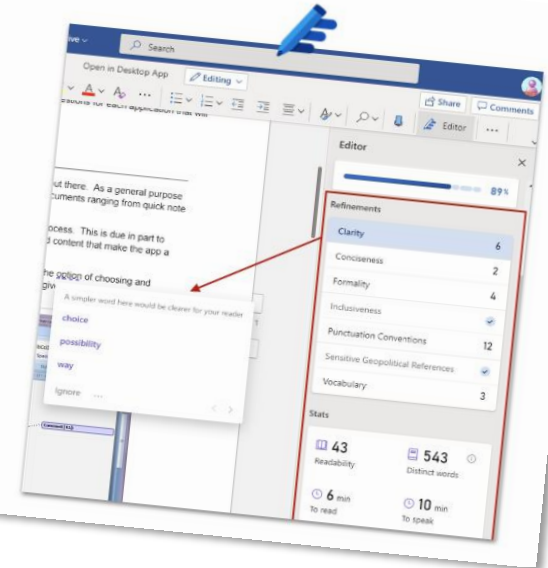
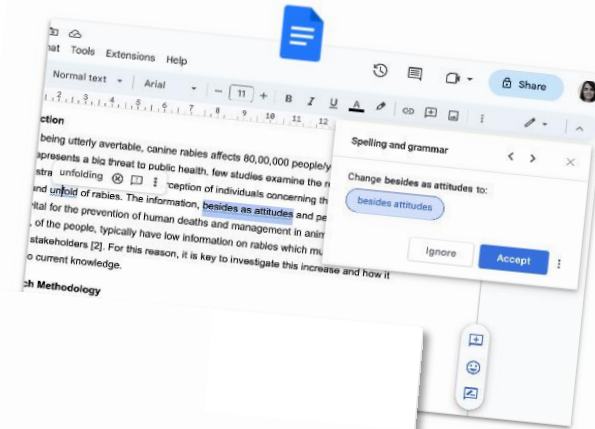
Google Press Release
March 14:

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



Examples: Google Docs and Microsoft Editor

Language suggestions using AI

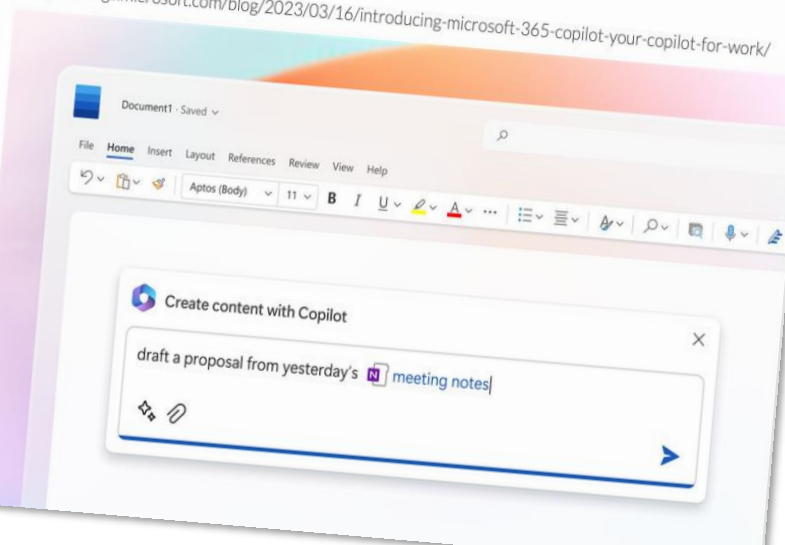


Microsoft: generative AI (Copilot)

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**."

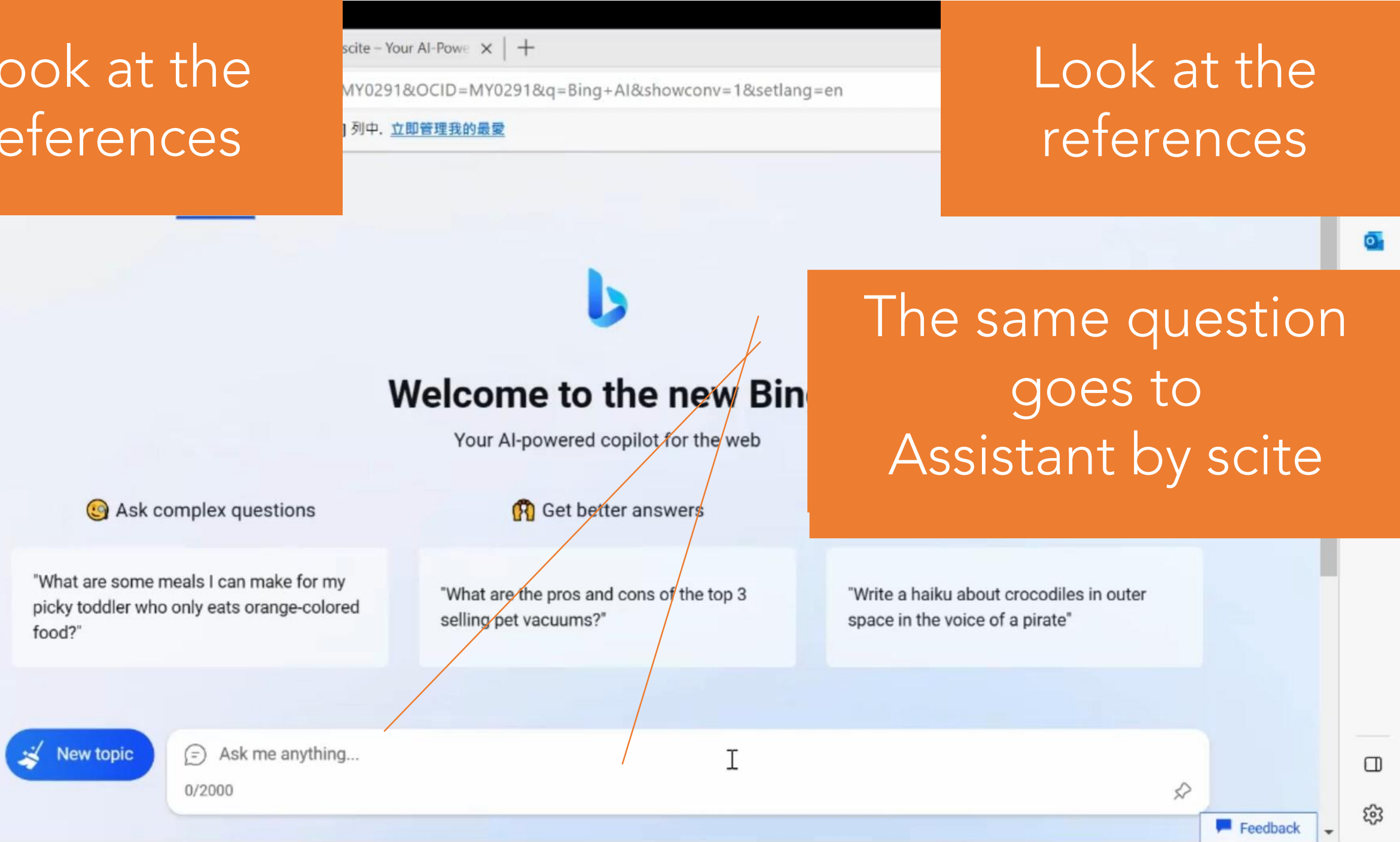
<https://blogs.microsoft.com/blog/2023/03/16/introducing-microsoft-365-copilot-your-copilot-for-work/>

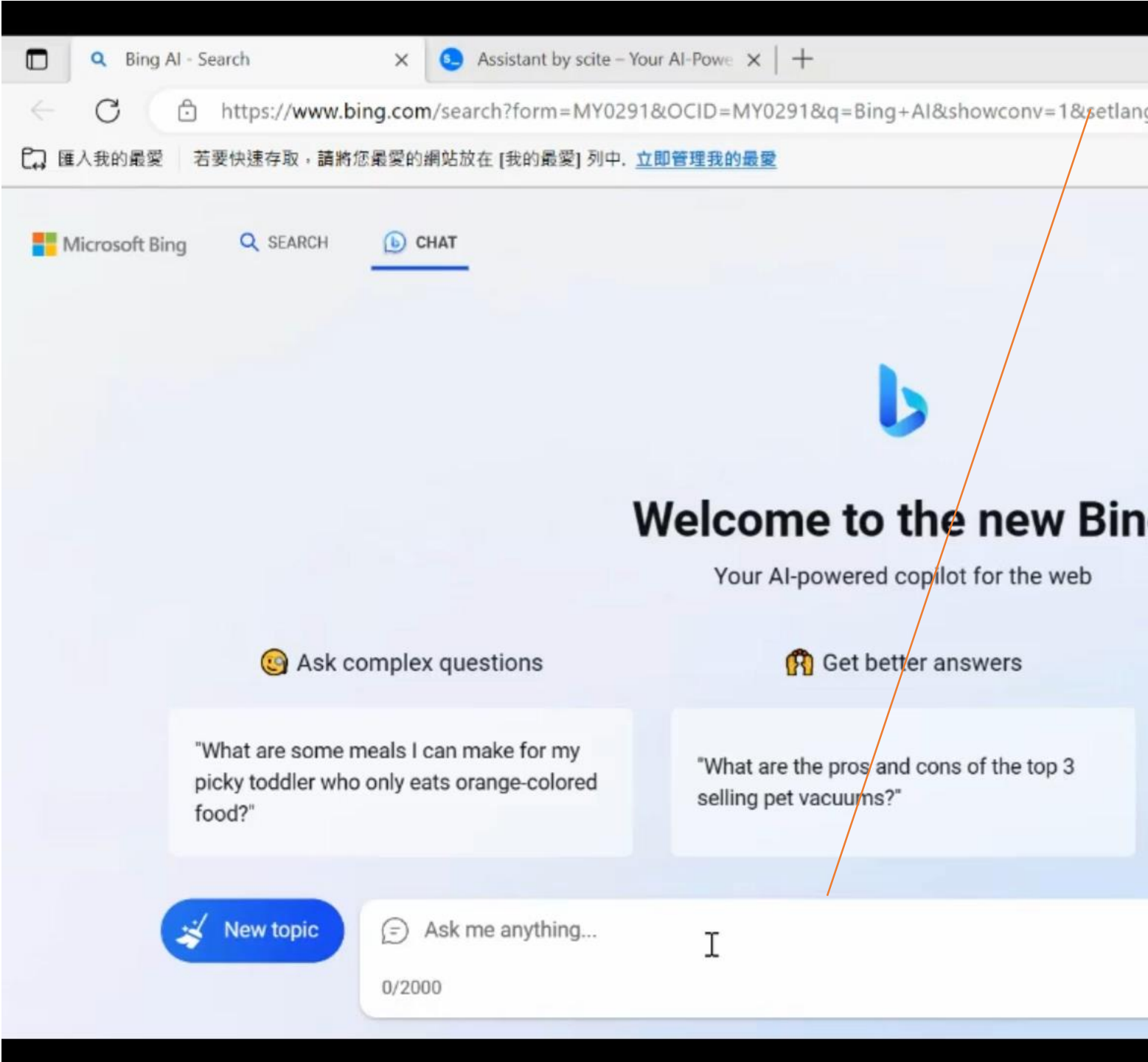


Look at the references

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

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](https://pubmed.ncbi.nlm.nih.gov) [2. sciencedirect.com](https://sciencedirect.com) [3. ehpniehs.nih.gov](https://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!

Max words in prompt? A 500-year history of forest fires x Your Scholarcy library
link.springer.com/article/10.1007/s1...
Stony Point Consu... Today / Me Web Importer 其他書籍



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](#)

2281 Accesses | 7 Citations | 4 Altmetric | [Metrics](#)

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

ChatGPT



Examples

"Explain quantum computing in simple terms" →

"Got any creative ideas for a 10 year old's birthday?" →

"How do I make an HTTP request in Javascript?" →



Capabilities

Remembers what user said earlier in the conversation

Allows user to provide follow-up corrections

Trained to decline inappropriate requests



Limitations

May occasionally generate incorrect information

May occasionally produce harmful instructions or biased content

Limited knowledge of world and events after 2021

Send a message...



Upgrade to Plus

NEW

Settings

Get help

Log out

3rd Attempt

And now let's use
ChatGPT4

Nigeria's Agriculture and Clim

Impact of Climate and Land-Us

Clear conversations

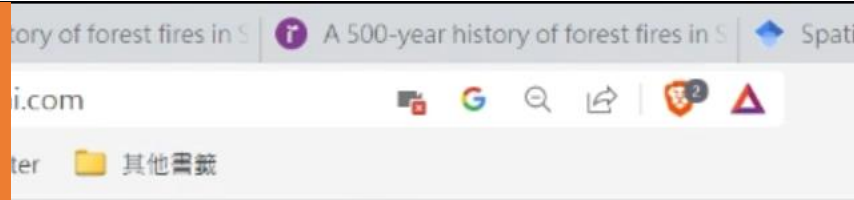
Upgrade to Plus

NEW

Settings

Get help

Log out



ChatGPT



Examples

"Explain quantum computing in simple terms" →

"Got any creative ideas for a 10 year old's birthday?" →

"How do I make an HTTP request in Javascript?" →



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Send a message...



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`

Result

Original title:

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

General Method

ChatGPT generated title:

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

Specific Method

WriteFull generated title:

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

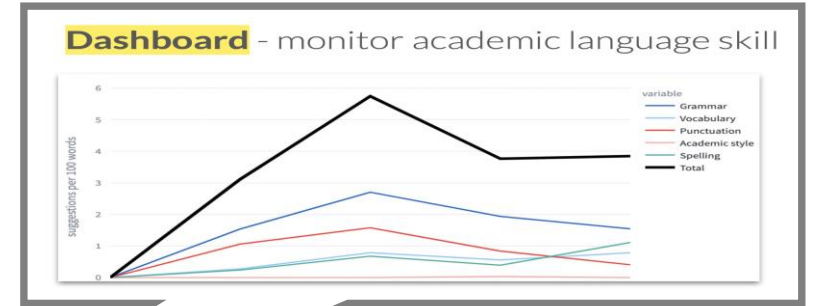
Method-Solving a Problem

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

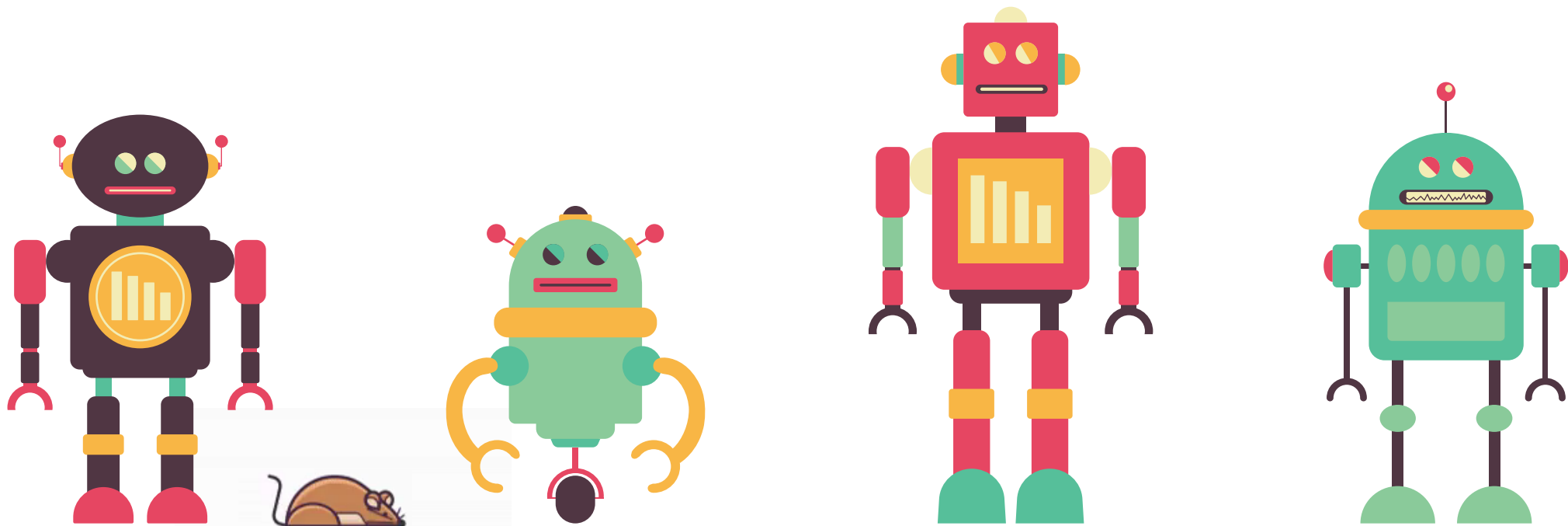
1. Style and tone
2. Creativity
3. Cohesion and organization
4. Accuracy
5. Emotional intelligence

Nurse Education in Practice
Volume 66, January 2023, 103537

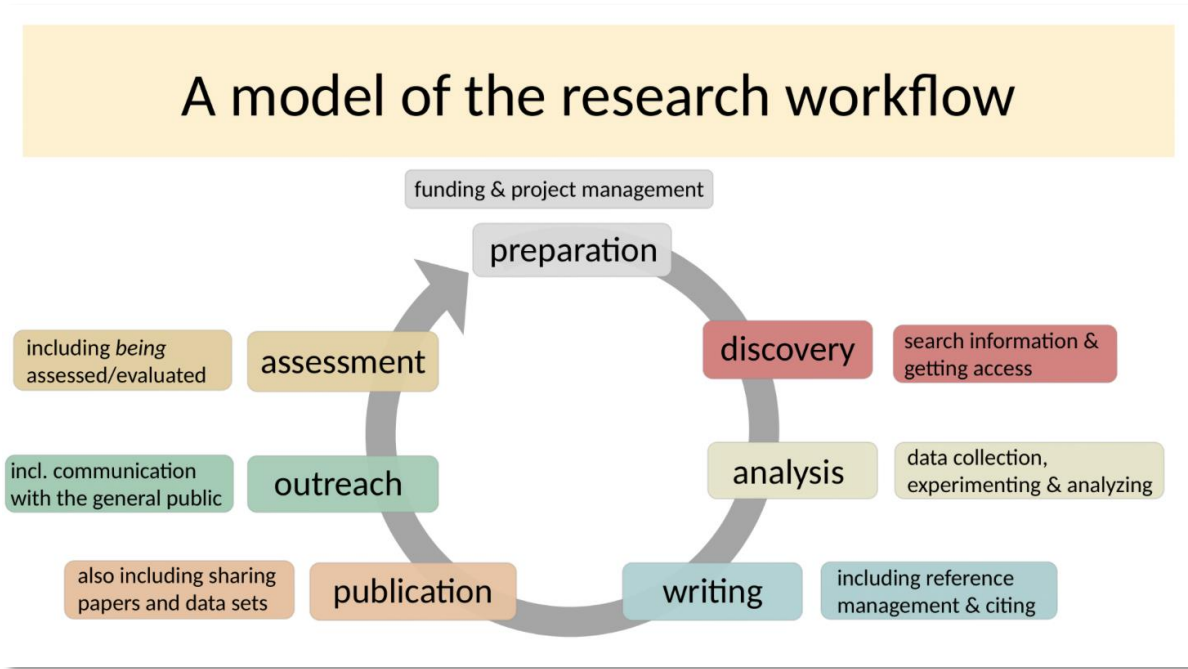
Editorial
Open artificial intelligence platforms in nursing education: Tools for academic progress or abuse?
Siebhan O'Connor^{a,1}, ChatGPT^b

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



*find the
questions*



*find the
channels*



*find the
audiences*

A research skill of extended workflow



A research skill of extended workflow

An upgraded
Research Publication Workflow



A.I.-aided applications for Research Support

scite_

SEARCH: Literature discovery
ASSESS: Literature review

Lysyl Oxidase Is Essential for Hypoxia-Induced Metastasis [🔗](#)

Janine T. Erler¹, Kevin L. Bennewith², Monica Nicolau³, Nadja Dornhöfer⁴, Christina S. Kong⁵, Quynh-Thu Le⁶, Jen-Tsan Ashley Chi⁷, Stefanie S. Jeffrey⁸, Amato J. Giaccia⁹

Abstract: Metastasis is a multistep process responsible for most cancer deaths, and it can be influenced by both the immediate microenvironment (cell-cell or cell-matrix interactions) and the extended tumour microenvironment (for example vascularization). Hypoxia (low oxygen) is clinically associated with metastasis and poor patient outcome, although the underlying processes remain unclear. Microarray studies have shown the expression of lysyl oxidase (LOX) to be elevated in hypoxic human tumour cells. Paradoxically, LOX...

Expand abstract **▼**
Editorial notices **▼**

Search citation statements

Context, author(s), titl... 🔍

Order By: Relevance **▼**

Paper Sections

<input checked="" type="checkbox"/>	Intro	208
<input checked="" type="checkbox"/>	Methods	26
<input checked="" type="checkbox"/>	Results	93
<input checked="" type="checkbox"/>	Discussion	292
<input checked="" type="checkbox"/>	Other sections	498

Citation Types

<input checked="" type="checkbox"/>	Supporting	🟢	46
<input checked="" type="checkbox"/>	Mentioning	🟡	1,131
<input checked="" type="checkbox"/>	Contrasting	🔴	10
<input checked="" type="checkbox"/>	Unclassified	⊖	17

Year Published

Cited by 1,136 publications (1,204 citation statements)

References 27 publications

Paper Section: Results

"...Treatment of established tumors with β APN (100 mg/kg/BW ip qd) reduced significant collagen cross-linking in the tumor ECM (Supplementary Figure S2). In contrast to previous studies that reported a solid reduction of growth in various tumor models [22 – 25], treatment with β APN reduced tumor growth only in the 4T1 model, while three models (MT6, EMT6, and E0771) did not respond with a change in growth rate and growth of LLC tumors was even strongly increased (Fig. 3a)..."

🔍 contrasting (Confidence: 99%) [flag classification](#)

Paper Section: Discussion

"...Previous studies have reported a solid and consistent anti-tumor effect of LOX(L) inhibition in a variety of different tumor models [23 – 25]. Baker et al have demonstrated that the proliferative effect of lysyl oxidases is caused by increased tissue stiffness and subsequently enhanced FAK signaling [28]..."

🔍 mentioning (Confidence: 90%) [flag classification](#)

LOX-catalyzed Collagen Stabilization Is a Proximal Cause for Intrinsic Resistance to Chemotherapy

Rossow, Veitl, Vorlová et al, 2018
Oncogene

📄 33 | 🟢 0 | 🟡 38 | 🔴 0

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Paper Section: Discussion

"...Opposite to all other survival analyses, this effect was predominately due to ER positive cases, with only a weak trend in ER negative patients. In contrast to a previous report, LOX expression was not significantly associated with the overall survival, which may, at least in part, be due to the smaller number of patients in the present study [3]. The prognostic power of LOX expression was more pronounced with respect to metastasis-free survival than overall survival also in that previous study [3]..."

🔍 contrasting (Confidence: 99%) [flag classification](#)

Paper Section: Discussion

"...In contrast to a previous report, LOX expression was not significantly associated with the overall survival, which may, at least in part, be due to the smaller number of patients in the present study [3]. The prognostic power of LOX expression was more pronounced with respect to metastasis-free survival than overall survival also in that previous study [3]. Finally, in multivariable Cox proportional hazards regression analyses of the DFS and MFS of the variables LOX expression, G473A genotype and ER status, LOX expression was a potent independent prognostic parameter (Table S3 and S4; see below)..."

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 generated by desorption/ionization time-of-flight (MALDI-TOF) mass spectrometry have been added to the mass spectrometer database used in clinical microbiology. We retrospectively collected raw data from MALDI-TOF mass spectrometry used routinely in our laboratory in Marseille, France, during the study period and analyzed 16S rDNA sequencing results from misidentified strains. During the study period, 744 species were identified from clinical specimens that were species first isolated from culturomics. This collection involved 105 clinical specimens, accounting for 98 patients. In 64 cases, isolates were considered clinically relevant. MALDI-TOF mass spectrometry was able to identify the species in 95.2% of the 105 specimens. While only a small fraction of the bacterial repertoire associated with humans, culturomics studies also enlarge the spectrum of prokaryotes involved in infectious diseases.

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 microbiology of bacterial species first isolated as a part of culturomics studies and improving the accuracy of diagnosis of infectious diseases
- 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 performed during the study period, we identified species first isolated from culturomics studies in 105 clinical specimens, accounting for 98 patients
- This work constitutes the proof of concept that exploration of the repertoire of commensal bacteria enables identification of bacterial species in clinical microbiology
- Identification of 9 strains using 16S rDNA sequencing, accounting for 5 species, confirmed the initial recognition by MALDI-TOF (Table 2). These results strengthen our belief that identifying commensal microbes provides a valuable contribution to clinical microbiology by the decrease in the number of unidentified colonies by MALDI-TOF mass spectrometry over time (Figure)

A.I.-aided applications for Research Support



AUTHOR: Manuscript proofreading

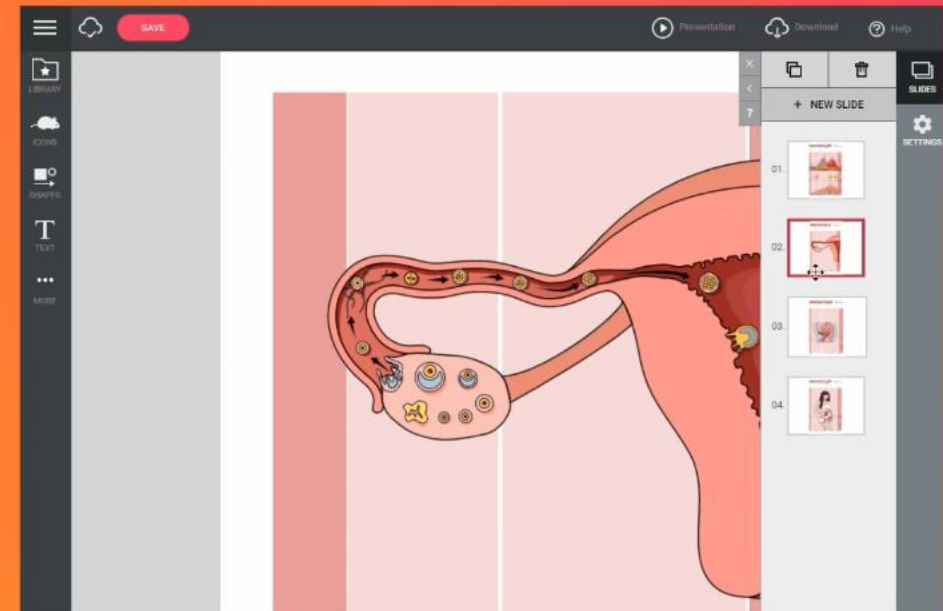
The screenshot displays the Writefull application interface within a Microsoft Word environment. The top ribbon includes tabs for '檔案', 'Home', '插入', '設計', '版面配置', '參考資料', '郵件', '校閱', '檢視', '說明', and 'Writefull'. The 'Writefull' tab is active, showing icons for 'Sign Out', 'Full Edit Mode', 'Check Document', 'Check Paragraph', 'Revise with Track Changes', 'Sentence Palette', 'Language Search', 'Title Generator', 'Paraphraser', and 'About Writefull'. The main document area shows a manuscript titled 'Fire Effects on Forest Composition: A Case Study of California'. The 'Abstract' section contains the following text: 'This study considers the effect of dryness and fire on the composition of forests. | Forest sampling was carried out in central California, which has seen a great quantity of wildfires over the last years. The history and area of forest fires has been carefully chosen and its composition has been carefully studied. The results showed, that forest heterogeneity differed greatly between forest that were and were not impacted by fires. It was found that fire intensity significantly affected variables such as tree density, species diversity and the spread of unburned patches. While fire intensity has some sort of huge impact on the severity of each of these, even relatively small fires showed dramatic effects on heterogeneity. Future research should aim to uncover the predictive character of different composition characteristics. Studies have found that forest fires have a synclinal character, meaning that if a forest has a history of fires, it is more likely to become flammable again. The characteristics of the forest composition can be used to assess the susceptibility to history and also the fire susceptibility of forests. California is a classical example area to continue studying.' The 'Background' section is partially visible. The right sidebar shows the Writefull interface with the company logo, a status bar indicating '16 REMAINING', '0 ACCEPTED', and '0 DISMISSED'. It displays two suggested rewrites for the highlighted sentence: 'Forest sampling was carried out in central California, which has seen a great quantity of wildfires over the last years.' and 'Forest sampling was carried out in central California, which has seen a large number of wildfires in recent years.' Below these are 'ACCEPT' and 'DISMISS' buttons. A third suggestion is partially visible: 'The history and area of forest fires has been carefully chosen and its composition has been carefully studied.' The bottom status bar shows '第 1 頁, 共 1 頁', '377 個字', '英文 (美國)', and '協助工具: 一切準備就緒'. The zoom level is set to 80%.

A.I.-aided
applications for
Research Support



ILLUSTRATE: Graphical abstract
PROMOTE: Research outreach

A free infographic maker
for medical doctors
and scientists.



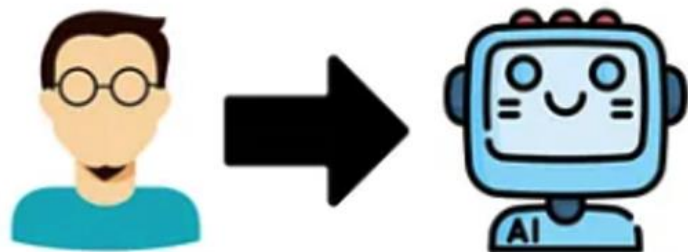
A research skill of extended workflow

An upgraded
Research Publication Workflow



使用人工智能的心態

Automation



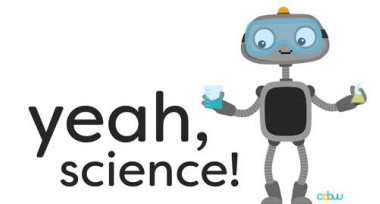
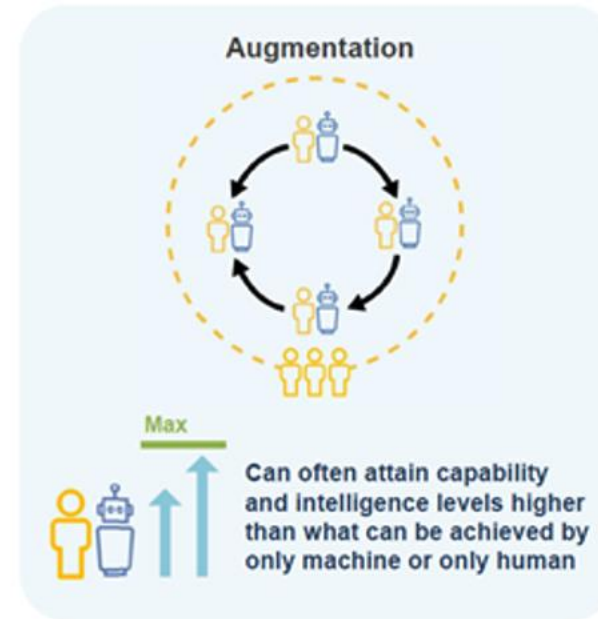
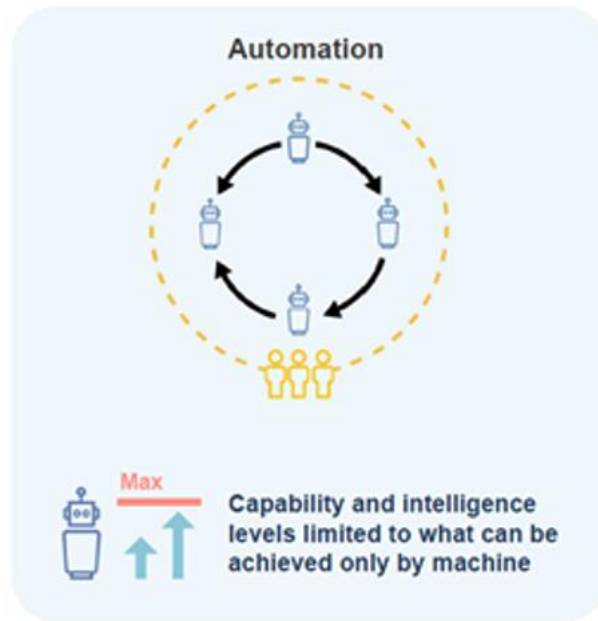
Replace human intelligence with artificial intelligence.

Augmentation

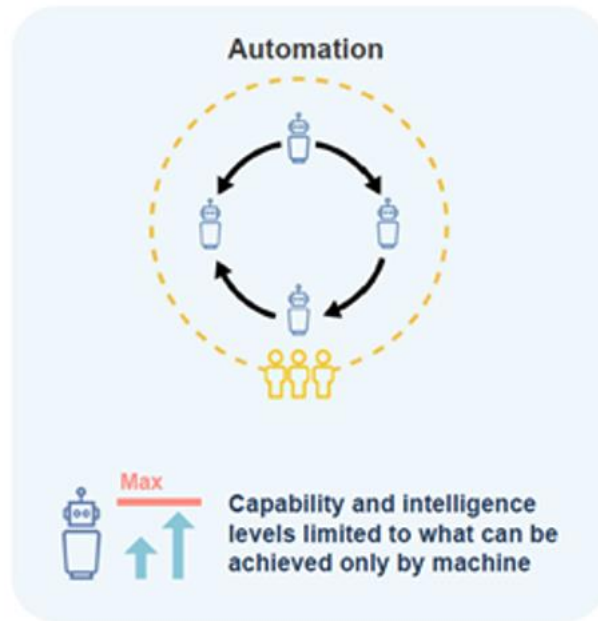


Augment human intelligence with artificial intelligence.

Optimize the contrasting mindsets for using AI



Optimize the contrasting mindsets for using AI



yeah,
science!



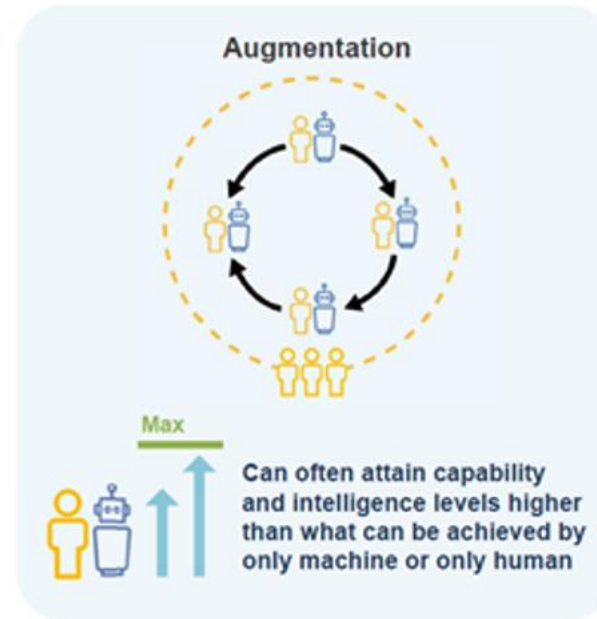
Source: <https://news.smu.edu.sg/news/2022/09/19/implications-automation-augmentation-and-ai-jobs-we-do>

Optimize the contrasting mindsets for using AI



Human-robot
Interaction

yeah,
science!



3. The Future of Science: Transdisciplinary

Three human constraints without AI

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

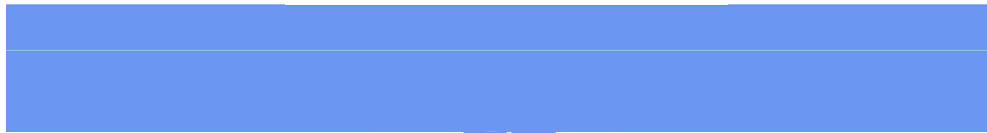
yeah,
science!



3. The Future of Science: Transdisciplinary

T-Shaped Skills

Breadth of experience, knowledge & skills



Depth of high-level expertise in one discipline

yeah,
science!



4. The Future of Science: Transdisciplinary

科學的未來：跨學科



3. The Future of Science: Transdisciplinary



U.S. Department of Health & Human Services

NIH National Institutes of Health
Turning Discovery Into Health

Health Information | Grants & Funding | News & Events | Research & Training | Institutes at NIH

Home » News & Events » News Releases

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 most vexing cancer problems. Each team will receive \$25 million over five years. The teams were announced at the Cancer Grand Challenges Summit in Washington, D.C.

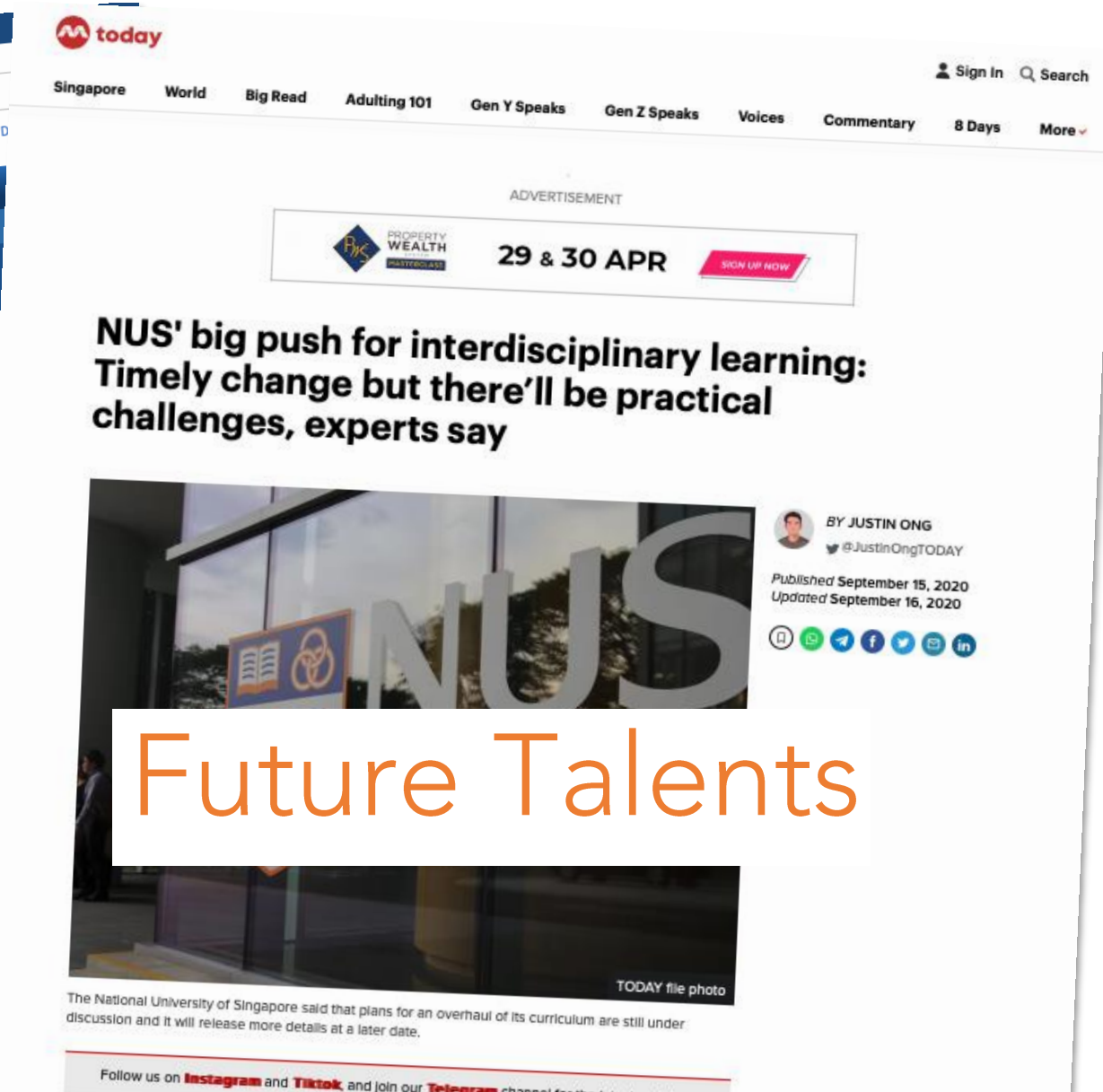
The research being conducted by the four selected teams includes investigation of 1) a muscle-wasting condition known as cachexia, 2) the biology of extrachromosomal DNA in cancer 3) new therapies for solid tumors in children, and 4) what triggers normal cells harboring cancer-causing mutations to become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

Institute/Center: National Cancer Institute

Contact: NCI Press Office, 240-760-6600

Connect: Subscribe, RSS Feed

Today's Problems



today

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PROPERTY WEALTH PARTNERSHIP 29 & 30 APR SIGN UP NOW

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

BY JUSTIN ONG
@JustinOngTODAY

Published September 15, 2020
Updated September 16, 2020

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TODAY file photo

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.

Follow us on Instagram and TikTok, and join our Telegram channel for the latest updates.

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, anthropology,)
- Formal Sciences(e.g. mathematics, computer science,)



Different types of system

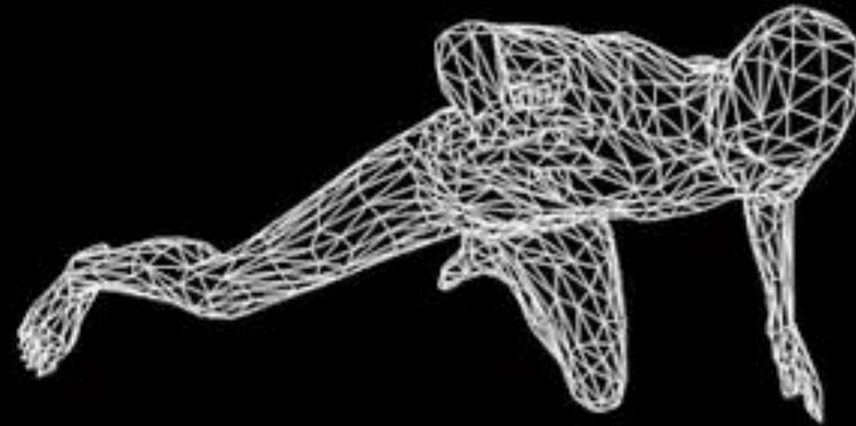


Digital Twin

- 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 behavior**, performance, and other characteristics of the physical object or system

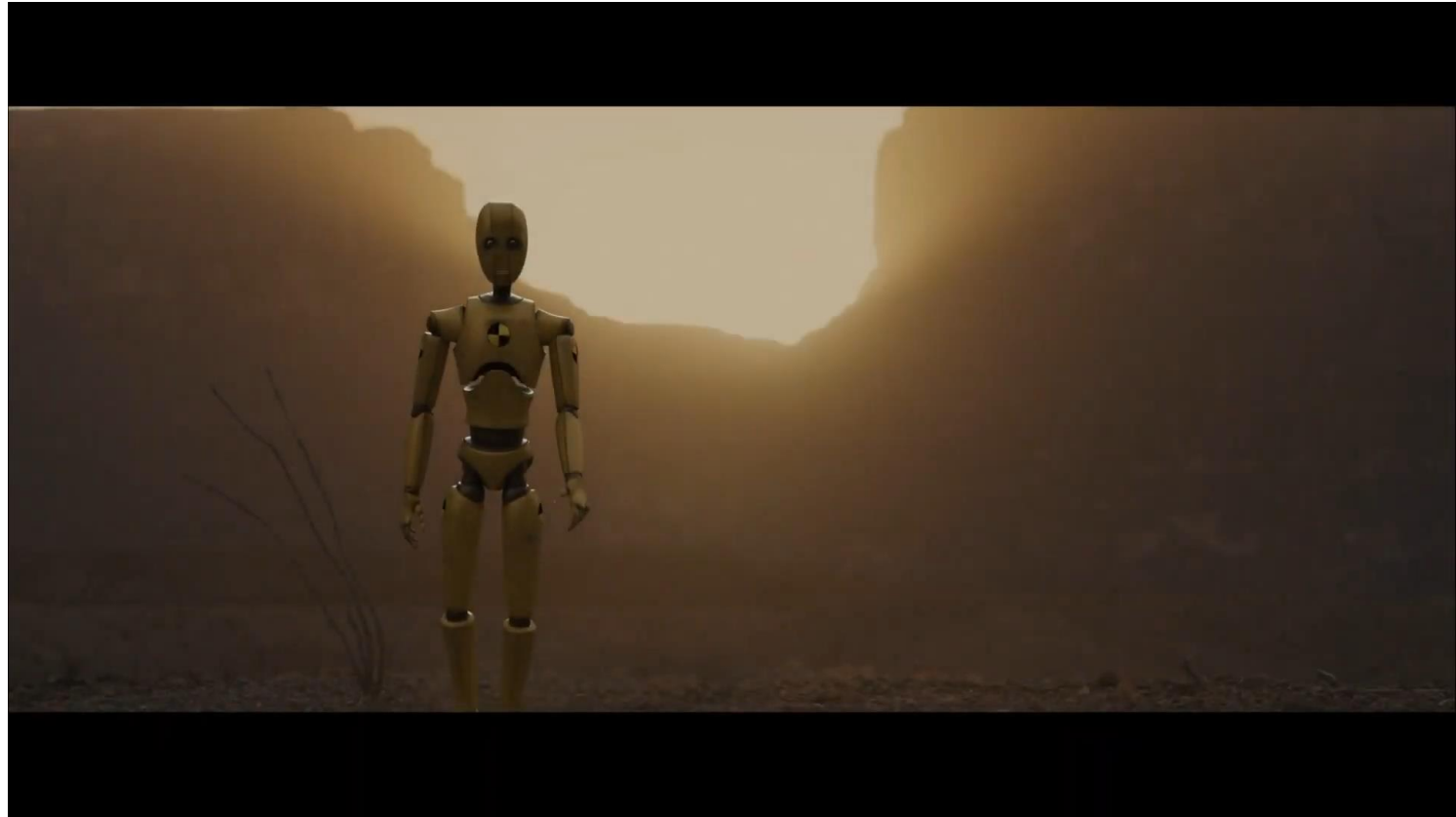
Digital Twin

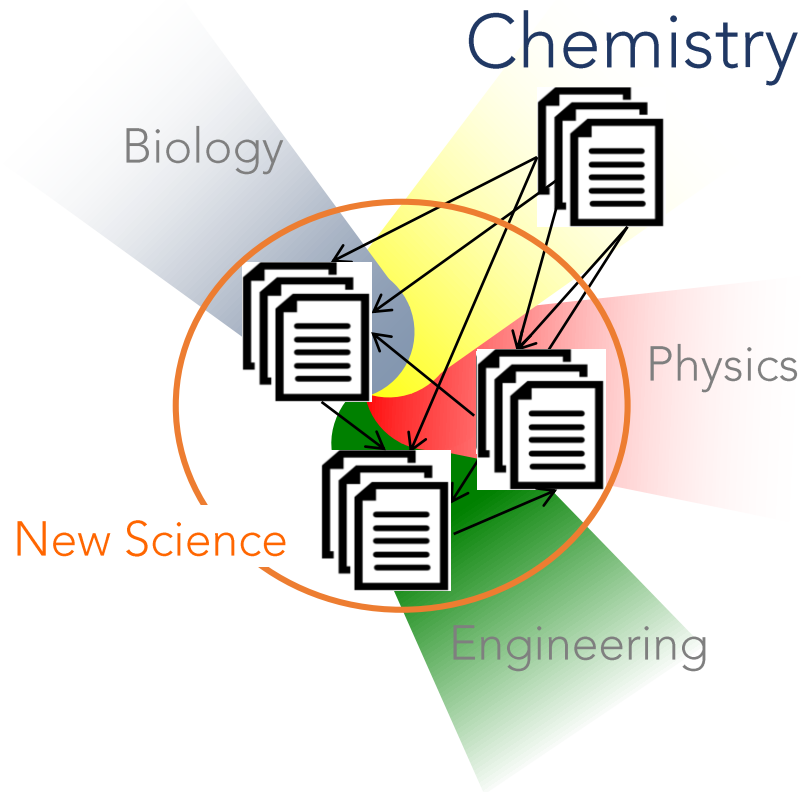
- Educators > a better transdisciplinary approach of teaching
- Researchers > a better transdisciplinary solution to world issues

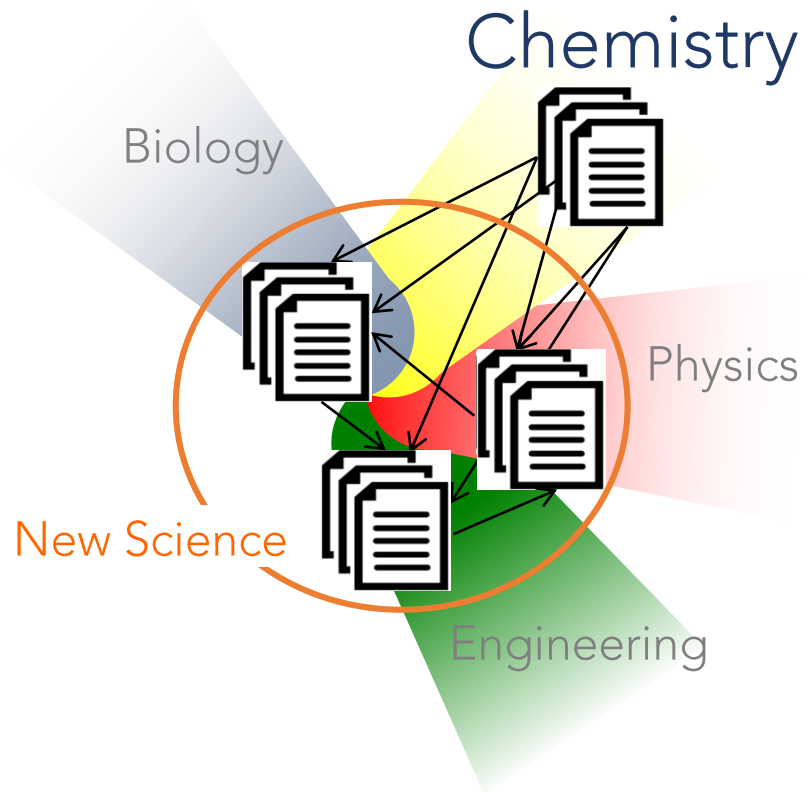


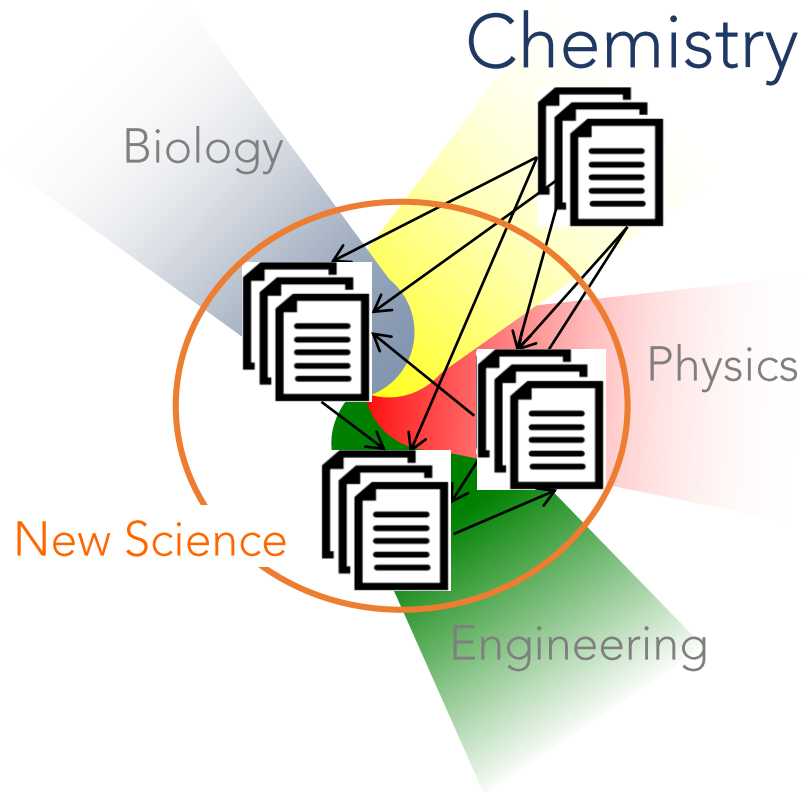
Digital Twin

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









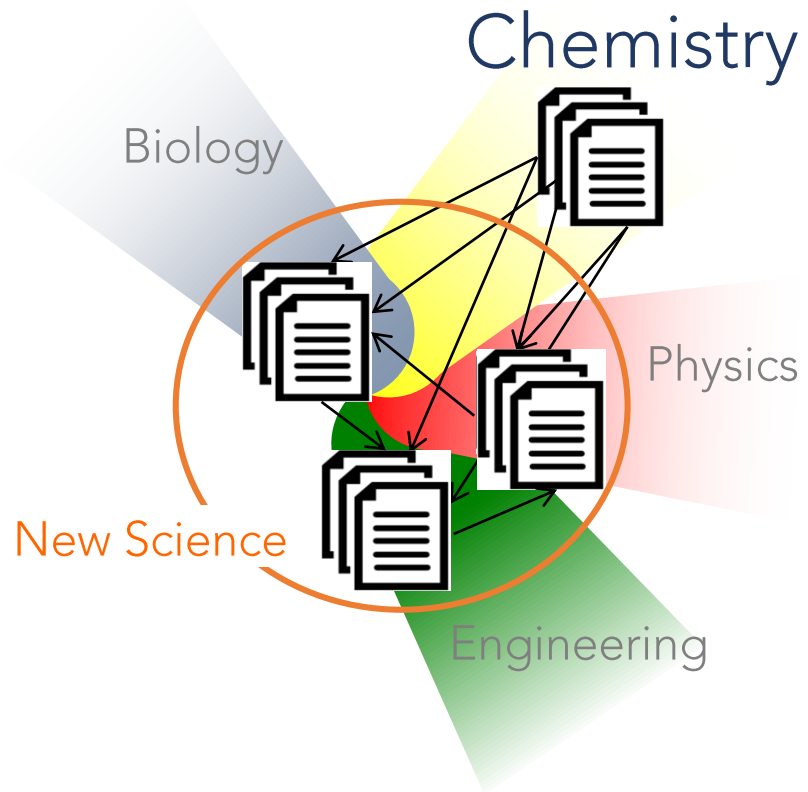
MULTIDISCIPLINARY



INTERDISCIPLINARY



TRANSDISCIPLINARY



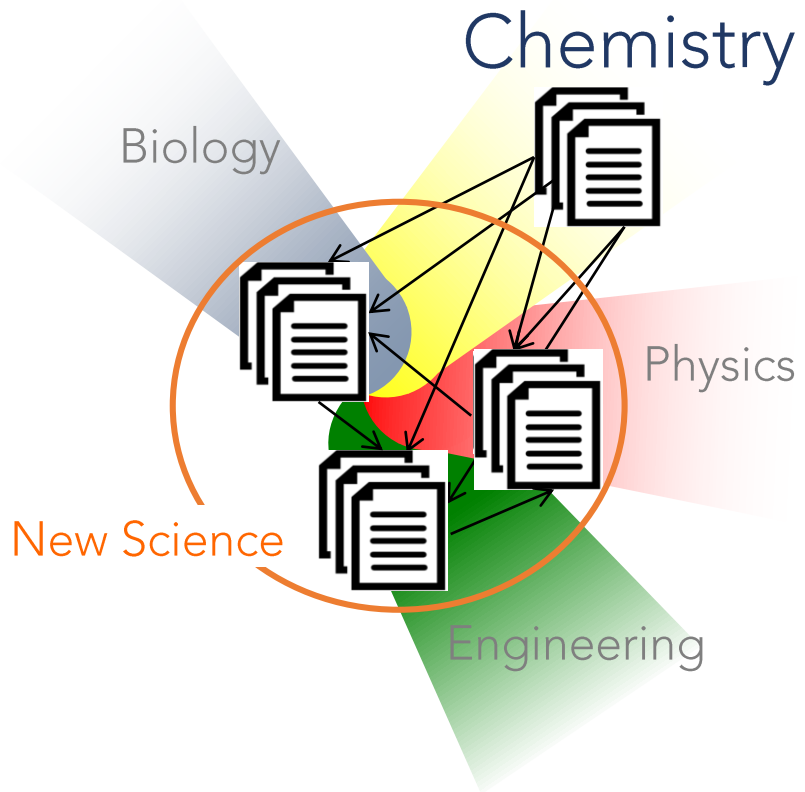
MULTIDISCIPLINARY



INTERDISCIPLINARY



TRANSDISCIPLINARY



MULTIDISCIPLINARY



INTERDISCIPLINARY



TRANSDISCIPLINARY

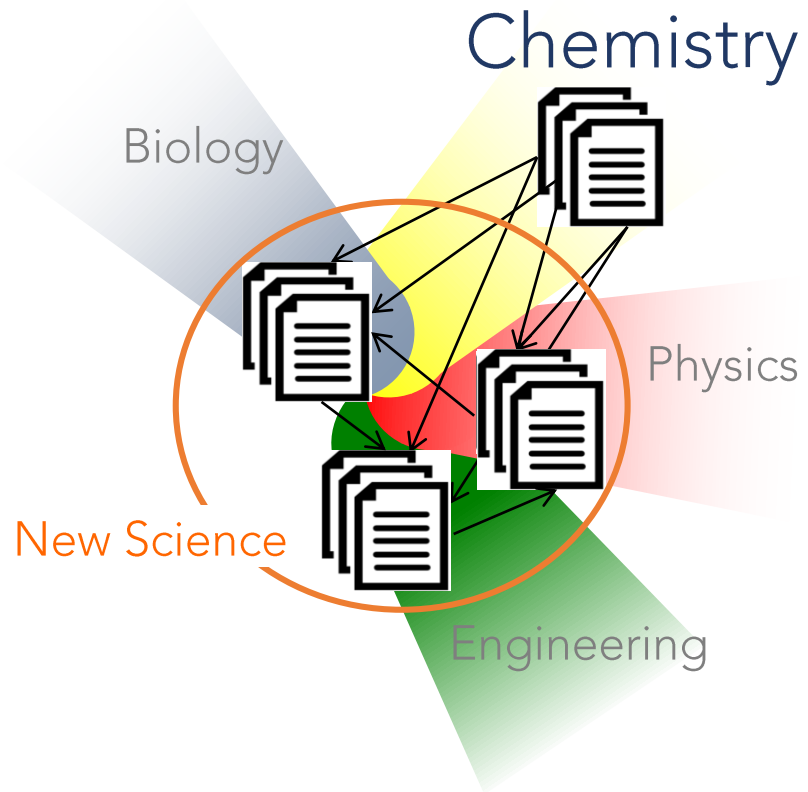
T-Shaped Skills

Breadth of experience, knowledge & skills



Depth of high-level expertise in one discipline





MULTIDISCIPLINARY



INTERDISCIPLINARY



TRANSDISCIPLINARY

<p>1 NO POVERTY</p>	<p>2 ZERO HUNGER</p>	<p>3 GOOD HEALTH AND WELL-BEING</p>	<p>4 QUALITY EDUCATION</p>	<p>5 GENDER EQUALITY</p>	<p>6 CLEAN WATER AND SANITATION</p>
<p>7 AFFORDABLE AND CLEAN ENERGY</p>	<p>8 DECENT WORK AND ECONOMIC GROWTH</p>	<p>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</p>	<p>10 REDUCED INEQUALITIES</p>	<p>11 SUSTAINABLE CITIES AND COMMUNITIES</p>	<p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p>
<p>13 CLIMATE ACTION</p>	<p>14 LIFE BELOW WATER</p>	<p>15 LIFE ON LAND</p>	<p>16 PEACE, JUSTICE AND STRONG INSTITUTIONS</p>	<p>17 PARTNERSHIPS FOR THE GOALS</p>	<p>THE GLOBAL GOALS For Sustainable Development</p>



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)



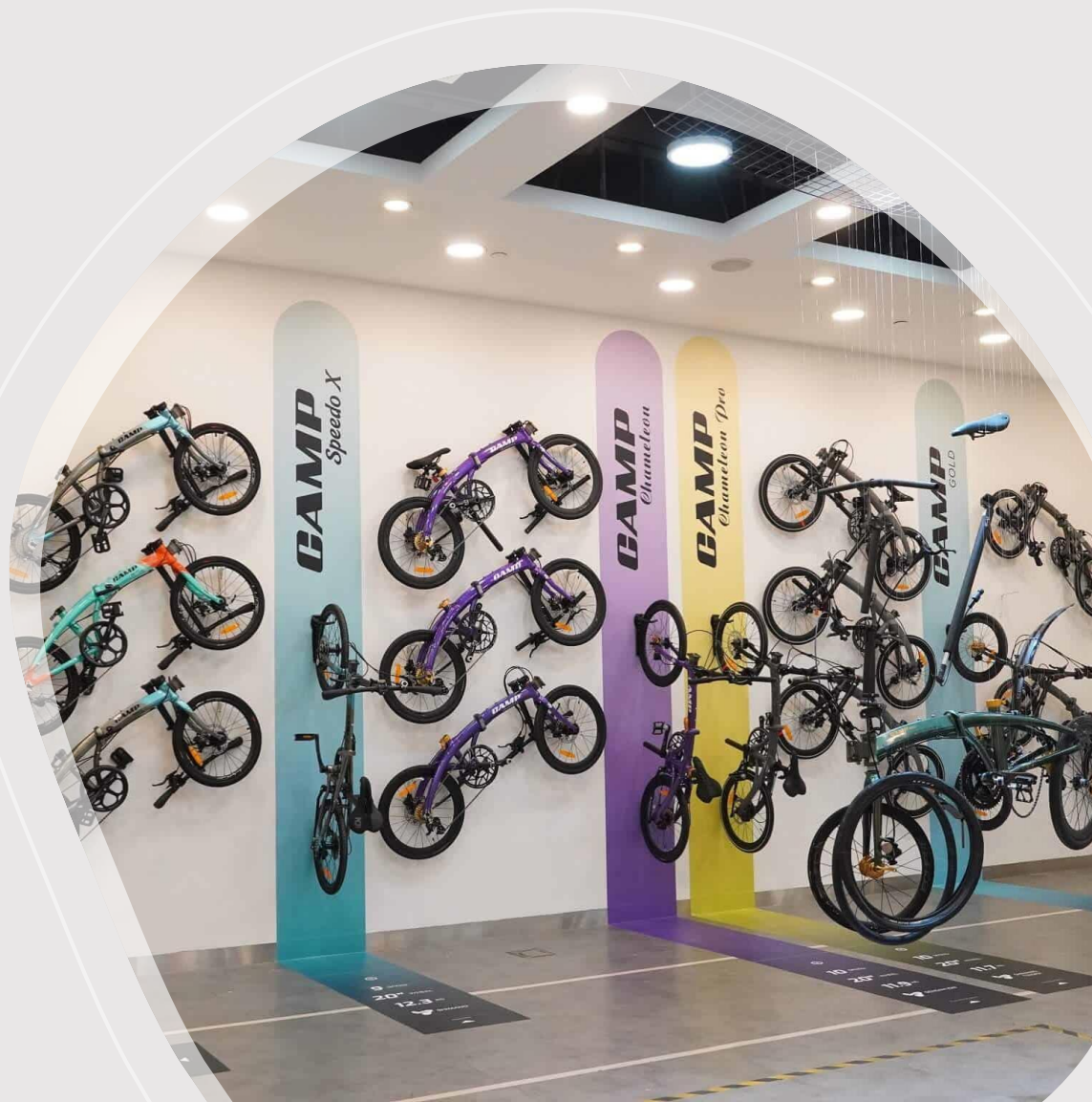
There was a time when science could be broken down into neat-and- tidy disciplines — straightforward things like biology, chemistry, physics, and astronomy. But as science advances, these fields are becoming increasingly specialized and interdisciplinary, leading to entirely new avenues of inquiry. Here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





Optimization of library resources for future research support

DISCOVERY



Discovery Tools & Contents



Citation Index Database

- Dimensions
- Web of Science
- Scopus

Directional Discovery



Search

- Science Direct
- ProQuest



Journals

- IEEE
- Emerald
- Springer Nature
- JSTOR

Specific Discovery



Other Contents



Recommended OA (including in-house)

AUTHORING & PUBLISHING



Reviewing Tools



Editing Tools

- iThenticate



Reference Management Tools

- Zotero
- Mendeley



Journal Selection Guides

- JCR
- CiteScore

ASSESSMENT & ENGAGEMENT



Platforms

- IR
- CRIS



Engagement & Impact Quantification



Evaluation Tools

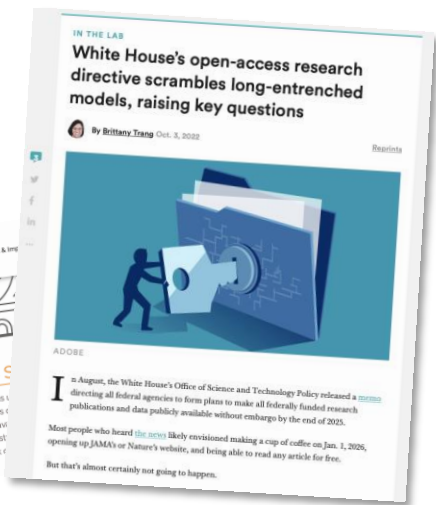
- Web of Science
- Scopus
- Altmetrics



Library

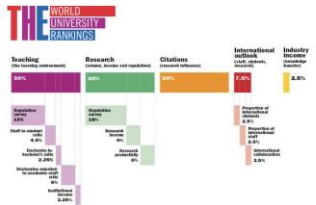


Funder



Researchers

60% of university **RANKING** criteria came from research quantity, quality, and reputation



QS WORLD UNIVERSITY RANKINGS

Academic Reputation	40%
Employer Reputation	10%
Faculty Student Ratio	20%
Citations per Faculty	20%
International Faculty Ratio	5%
International Student Ratio	5%
International Research Network	5% (for 2023 edition)
Employment Outcomes	5% (for 2023 edition)

University

SHANGHAI RANKING

1.3. Indicators and Weights for ARWU

Criteria	Indicator	Code	Weight
Quality of Education	Number of articles written by Nobel Prize and Fields Medalists	ARWU01	25%
Quality of Faculty	Staff of an Institution writing Nobel Prize and Fields Medalists	ARWU02	25%
Quality of Faculty	Highly Cited Researchers	ARWU03	25%
Research Output	Papers published in "Nature" and "Science"	ARWU04	25%
Research Output	Papers indexed in Science Citation Index Expanded and Social Science Citation Index	ARWU05	25%
Peer-Review Performance	Peer-review academic performance of an institution	ARWU06	10%

The indicators represented in Shanghai Ranking and other rankings such as London School of Economics, ARWU is not considered, and the weight of ARWU is reduced to other indicators.



Thank You

<https://iesresearch.solutions>





we share your discovery

woeifuhwong@gmail.com

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