

CTM

E-Newsletter

02 2024
February

AI Semis: Now and The Future

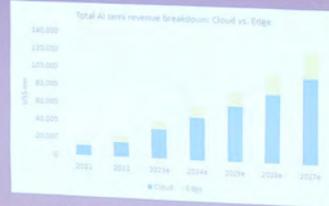
• Growth perspective:

1. Edge AI semis: 32% CAGR, 2023-27
2. Inference AI semis: 60% CAGR, 2023-27
3. Custom AI semis: 85% CAGR, 2023-27

Within Cloud AI, Inference AI chips to outgrow training...



Edge AI semis could grow slightly faster than cloud



... and Custom AI chips to outgrow general purpose



圖：耐能智慧公司創辦人劉峻誠先生

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Feature story- AI is Here ! Run!

專題報導 - 生成式 AI 的發展與應用

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發行人：科管院林哲群院長

執行總編：科管院陳怡芬行銷策略長

風傳媒財經 周岐原主編

共同編輯：盧妙卿、彭美婷

網站：www.ctm.nthu.edu.tw



人工智慧來了！快跑！



作者：經濟系四年級 黃薌芸

隨著 AI 人工智慧逐漸發展，AI 一步步地走進我們的生活。身為科管院學生的我們，或多或少感到有些不知所措，那麼，我們可以做些什麼呢？首先，試著了解更多肯定是第一步！

讓我們一起來尋找答案：身為清大學子的我們，身處的校園是如何因應 AI 呢？身為學生，我們可以怎麼運用 AI 更加聰明、有效率地學習呢？身為即將邁入職場的新鮮人，AI 會不會取代原本可能屬於我的工作呢？

| 校園發生啥 |

清華大學如何與 AI 共處

「來不及了，作業就請 ChatGPT 好朋友幫忙寫好了。」

「噢噢糟糕，這次的作業竟然因為違反規定拿零分！」

ChatGPT 問世後，使用 AI 的浪潮席捲而來，學習與教學因此劇變。學生開始運用

方便快速的「生成式 AI」幫助自己書寫作業、產出觀點。這股衝擊讓不少教師開始憂心，畢竟「零思考」的學習並非理想狀態，種種規定因此應運而生，課堂中，也開始「有限制」或「完全禁止」AI 在學習中使用，為什麼會有這類規定呢？學校做了哪些事因應 AI 到來？

2023 年 5 月 1 日，清華大學 AI 工作小組公佈了「大學教育場域 AI 協作、共學與素養培養指引」，引導師生與 AI 共學 (Learning with AI)、與 AI 協作 (Working with AI)，以多元方式培養學生 AI 素養 (AI competence)。

在這份指引中，針對「如何將 AI 應用於教學與學習中」提出多種建議，尤其強調「透明」與「負責」；指引中要求課程須明確訂定使用 AI 的規範，學生與教師使用 AI 時，除了必須誠實揭露外，也應該具備檢核其正確性的判讀能力，並對自己產生的內容負責。

為了培養學生的 AI 素養，學校也提供各種工作坊與講座資源，更開設了兩種學分學程，給想更進一步了解人工智慧的同學們修習，分別是 19 學分的「人工智慧與應用基礎學分學程」以及 21 學分的「人工智慧與應用進階學分學程」。未來，學校也會有更多微學分課程和 AI 融入各領域的課程，讓師生都能夠更了解 AI，更好的與 AI 共學、協作與成長。

| 智慧學習術 |

我可以怎麼聰明使用 AI ！

面對世界巨變，我們究竟可以如何運用人工智慧，適當地、聰明地輔助我們學習呢？我們遇到不同狀況時，其實可以用不同方式使用 AI，順利度過難關！

狀況① 太多資訊了 | 文本摘要抓重點

遇到太多資訊或是長篇文本時，可以運用 AI 進行摘要及統整，快速地找到重點，幫助自己更有效率的彙整文獻重點，更專注於理解和應用資訊。

狀況② 發想卡住了 | 創意及結構參考

AI 能夠激發一些發想時的參考，不論是創意點子，或是寫作、訪談、報告架構，都能提供靈感。在 AI 提供的架構基礎上，再進一步補充與完善產出。

狀況③ 完稿之後 | 文章糾錯與潤飾

寫完文章之後，也可以使用 AI 協助糾錯、校正及潤飾內文，讓 AI 幫你再檢查一遍，避免不必要的錯誤。

狀況④ 想學新東西 | 新技能輔助學習

學習程式語言時，AI 也能幫大忙！生成式

AI 大大降低了寫程式的門檻，不僅能建立基礎的語法基底，更能協助解答一些你沒辦法解決的問題。

新的世界迎面而來，讓我們一起試著練習當個有技巧的學習者吧，聰明使用 AI，聰明學習！

| 職涯停看聽 |

要被 AI 取代了怎麼辦！

「你的工作正在被 AI 搶走！」

「AI 就快要取代人類了！」

在不久的將來，就即將要踏進職場的我們，不斷的聽到「再不進步就會被 AI 取代」的聲音。其實，不是 AI 會取代人類，而是會取代不懂 AI 的人。因此，身為學生的我們，需要培養自己「不斷學習新技能」的能力，以及「與科技協作」的能力，讓自己持續學習和成長，應對不斷變化的職場需求。

人工智慧的來臨，勢必會影響未來的工作樣態，這不僅是機會，也是挑戰。具備良好的創造性思維、解決問題的能力和跨領域合作能力也變得更為重要，懷抱著自主學習的習慣和終身學習的意識，通過學習和不斷提升自己的技能，才能更好地應對職場的變化，找到適合自己的職涯發展方向。

人工智慧的腳步太快了，快到我們逃不了。什麼時候會被趕上、被超越，我們都不知道。所以，快跑吧，跑起來就能跟上腳步，就能不被潮流淹沒，就會找到解答。

跟著人工智慧一起，跑吧。

生成式 AI 的發展與應用



作者：經濟學系 24 級 黃禹璇

在當今技術迅速發展的時代，生成式 AI 的進步不僅令人矚目，更為日常生活和商業帶來深遠影響。去年 11 月初，耐能智慧公司創辦人劉峻誠應邀前來本校演講，席間，劉峻誠深入剖析生成式 AI 的未來發展。

劉峻誠在 Kneron GPT 演示中指出，這款問答系統能夠理解並回應各種複雜問題，展現深度學習和自然語言處理技術的結合成果。他強調，AI 不僅能在資訊檢索和數據分析方面表現卓越，還能在用戶互動等領域發揮重要作用。

當前 AI 技術快速發展，但到底有多快？劉峻誠指出，業界對計算資源的需求增長極為驚人，為了支持更加先進的模型，AI 所需的算力每幾個月便增加一倍。這個現象

引發對於地球資源是否能夠跟上 AI 發展速度的擔憂，特別是在碳排放和環保方面。面對這一挑戰，耐能智慧公司推出新型晶片的 AI 解決方案，專為 AI 和機器學習設計的 NPU 被視為最具潛力的晶片。NPU 的高效能和低能耗使其成為推動 AI 技術持續發展的關鍵。除此之外，隨著 NPU 技術漸漸成熟，未來所有設備都將裝備這種晶片，從而實現設備智慧化。帶來全知全能的 AI 系統，結合 NPU 的高效能，將能夠更加用戶友善，並在保障環境永續的同時，實現更廣泛的應用。

劉峻誠在演講中指出，Transformer 神經網路相較於 CNN(卷積神經





網路)，前者識別能力有重大突破，尤其是處理空間訊息和時間序列方面，Transformer 展現更優異的性能。這一進展對於自動駕駛領域的應用意義重大。未來，應用於紅綠燈和車輛的 Transformer 不僅能提高識別精準度，還能實現資訊在車輛之間互傳，從而提升自動駕駛的安全性和效率。隨著這項技術進一步發展，我們有望見證自動駕駛技術出現一大飛躍。

此外，劉峻誠提及耐能智慧公司的平台 Kneo，這個平台類似於 App Store；它獨特之處在於，任何裝有耐能智慧公司晶片的設備都能通過該網站下載各種由不同開發者創建的程式，即使普通設備也將能獲得 AI 化能力。這預告一個更加智慧化和連接性強的科技世界即將到來。

劉峻誠並在演講展示與多個企業合作的成果，將 AI 技術應用於各項實際場景中。其中包括與阿里巴巴的合作，將人臉辨識技術應用於門把手上，提供更便捷的身份認證功能。同時，醫療機構也利用其技術監測病人身體狀況，實現更全面的健康管理。除此之外，AI 技術也廣泛應用於交通領域，在巴士盲點偵測方面，提高公共交通工具的安全性。這些合作案例展示耐能智慧公司的 AI 技術在不同領域的實際應用，為各行各業帶來更智慧化、更安全的解決方案。

在演講的最後階段，劉峻誠分享一段個人感悟與成就。他表示，從未想過自己所著作的書籍會被多個國際大學用作教學材料，甚至公司開發的產品還能夠與國際大型企業並駕齊驅。劉峻誠為此多次鼓勵聽眾，表示大家不要妄自菲薄，強調每個人一定都有機會成功。這番話不僅彰顯劉峻誠身為行業領導者的謙遜，也為在場聽眾提供寶貴啟示，無論面對多大的挑戰，只要持續努力，成功是可能實現的。

Q & A

Q 請問講者怎麼知道 AI 領域值得發展？並且貴公司要如何與大型企業匹敵？

A： 劉峻誠提到，他的公司最初只有兩名員工，但他始終相信，只要心中有清晰的目標和堅定的意志，就能逐步實現夢想。他鼓勵現場聽眾，不論面對何種困難，都不要忘記最初的熱情和目標。

Q 請問講者台灣以電資科技為大宗，身為商學院的學生要如何提升競爭力？

A： 劉峻誠強調，技術學習雖然重要，但在商業中最具挑戰性的是定價策略和經營方面。他自己也積極地學習商學院所擅長的領域，希望在商業營運方面有更全面的能力。此外，他強調順從自己內心的重要性，相信內心的聲音能夠引領自己走向一條獨特的道路。這些觀點不僅給學生們對於未來發展方向的啟示，也提醒他們在追求技術之餘，更要關注商業營運的重要性。

院內大小事

CTM Hightlight

作者：由院辦公室提供

This article is provided by CTM Office

資源
分享

3樓討論室已開放，歡迎預約借用

The discussion room on the 3rd floor is now open for reservations. You are welcome to book your slot.

預約系統

Space Booking
System



3 月科管院內活動預告

Upcoming events

舉辦日期 Date	語言 Language	院內單位 Office/ Department	主題 (中英) Topic	地點 (中英) Venue	報名連結 Registration
3/05	英文 English	科管院 EMI 計畫辦公室 EMI Program Office	CTM English Corner - What's your choice of wish list?	台積館 3 樓 聰淑空間 3F Tsung-Shu Space, TSMC Building	
3/09	中文 Chinese	科管院 EMI 計畫辦公室 EMI Program Office	學術英文寫作和 口說工作坊 Workshop for Academic Writing and Speaking	台積館 223 教室 R223, TSMC Building	
3/12	英文 English	科管院 EMI 計畫辦公室 EMI Program Office	CTM English Corner- DAAD Sharing: Study in Germany	台積館 3 樓 堃勝書齋 3F Kun Sheng Reading Lounge, TSMC Building	
3/19	英文 English	科管院 EMI 計畫辦公室 EMI Program Office	CTM English Corner- Your priority in Life	台積館 3 樓 聰淑空間 3F Tsung-Shu Space, TSMC Building	
3/22	英文 English	學士班國際學程 IBBA Program	How to be Resilient: Navigating Your Career and Anxiety	台積館 待確認 TBC	
3/28	中文 Chinese	科管院 College of Technology Management	孫運璿科技講座 - 段錦泉 院士 "金融學術研究轉戰人工智 能創業之旅"	台積館 1 樓 孫運璿演講廳	

AI is Here! Run!



作者：經濟系四年級 黃薌芸

As AI (Artificial Intelligence) gradually advances, it steps into our lives bit by bit. As students at CTM, we may feel somewhat bewildered. So, what can we do? First and foremost, trying to understand more is the initial step!

Let's search for answers together: As students of National Tsing Hua University, how does our campus adapt to AI? As students, how can we use AI to learn more intelligently and efficiently? As fresh graduates entering the workforce, will AI replace the jobs that might have been ours?

| Campus Buzz |

How does National Tsing Hua University coexist with AI

"It's too late, let's ask our good friend

ChatGPT to help with the assignment."

"Oh no, this assignment got zero because it violated the rules!"

With the emergence of ChatGPT, the wave of AI usage swept through, drastically altering learning and teaching. Students began using convenient and fast "generative AI" to assist in writing assignments and forming opinions. This impact made many teachers concerned because "thoughtless learning" is not an ideal state. Consequently, various regulations emerged. In classrooms, there are now "restrictions" or "complete prohibitions" on the use of AI in learning. Why are there such regulations? What measures has the school taken in response to the arrival of AI?

On May 1, 2023, the AI Working Group of

National Tsing Hua University announced the "Guidelines for AI Collaboration, Co-learning, and Literacy Cultivation in University Education," guiding teachers and students in co-learning with AI, working with AI, and cultivating students' AI literacy.

In these guidelines, various suggestions are proposed for "how to apply AI to teaching and learning," emphasizing "transparency" and "responsibility." The guidelines require courses to clearly establish norms for the use of AI. When students and teachers use AI, they must not only be honest about it but also have the ability to check its correctness and take responsibility for their own content.

To cultivate students' AI literacy, the school also provides various workshops and lecture resources and offers two credit programs for students who want to further understand artificial intelligence: the 19-credit "Artificial Intelligence and Application Fundamentals Credit Program" and the 21-credit "Artificial Intelligence and Application Advanced Credit Program." In the future, the school will also offer more micro-credit courses and courses integrating AI into various fields so that both teachers and students can better understand AI, learn and grow with AI collaboratively.

| Smart Learning Tips |

How can I use AI smartly!

Facing the great changes in the world, how can we use artificial intelligence appropriately and smartly to assist our learning? When we encounter different situations, we can actually use AI in

different ways to smoothly overcome challenges!

Situation 1: Too much information | Text summarization to capture key points

When faced with too much information or lengthy texts, AI can be used to summarize and consolidate, quickly finding key points to help us more efficiently organize document highlights and focus more on understanding and applying information.

Situation 2: Stuck in ideation | Creative and structural references

AI can inspire some references during ideation, whether it's creative ideas or writing, interview, or report structures, it can provide inspiration. Build on the structure provided by AI and further supplement and refine the output.

Situation 3: After completing the draft | Article proofreading and embellishment

After writing an article, AI can also assist in proofreading, correcting, and embellishing the text, allowing AI to check it again to avoid unnecessary errors.

Situation 4: Want to learn something new | New skill-assisted learning

When learning programming languages, AI can also be a big help! Generative AI greatly reduces the threshold for writing code, not only building a basic syntax foundation but also helping to solve problems you can't solve.

A new world is approaching, let's try to be skillful learners together, use AI wisely, and learn smartly!



| Career |

What if I'm about to be replaced by AI!

"Your job is being taken over by AI!" "AI is about to replace humans!"

In the near future, as we are about to step into the workforce, we constantly hear the voice of "if you don't progress, you'll be replaced by AI." In fact, it's not AI replacing humans, but replacing those who don't understand AI. Therefore, as students, we need to cultivate the ability to "continuously learn new skills" and the ability to "collaborate with technology," so that we can continue to learn and grow, and respond to the constantly changing demands of the workplace.

The advent of artificial intelligence is bound to affect the future work patterns, which is not only an opportunity but also a challenge. Possessing good creative

thinking, problem-solving abilities, and interdisciplinary collaboration skills becomes more important. Embracing the habit of autonomous learning and the awareness of lifelong learning, by learning and continuously improving our skills, can we better cope with the changes in the workplace and find a suitable career development direction for ourselves.

The pace of artificial intelligence is too fast, so fast that we cannot escape it. We don't know when we will be caught up with or surpassed. So, let's run, run to keep up with the pace, not be overwhelmed by the trend, and find the answers.

Follow artificial intelligence and run together.

The Development and Application of Generative AI



作者：經濟學系 24 級 黃禹璇

In today's rapidly evolving technological landscape, the advancements in generative AI have not only drawn significant attention but have also brought profound impacts on daily life and business. In early November last year, the founder & CEO of Kneron, Albert Liu, was invited to give a speech at our school. During his presentation, Albert Liu delved deep into the future development of generative AI.

Albert Liu highlighted in the Kneron GPT demonstration that the question-answering system could understand and respond to various complex queries, showcasing the integration

of deep learning and natural language processing technologies. He emphasized that AI excels not only in information retrieval and data analysis but also plays a crucial role in user interaction and other domains.

The current pace of AI technological development is remarkable, but just how fast is it progressing? Albert Liu pointed out that the industry's demand for computing resources is growing astonishingly, with the computational power needed for AI models doubling every few months to support more advanced models. This phenomenon raises concerns

about whether the Earth's resources can keep pace with the speed of AI development, especially in terms of carbon emissions and environmental sustainability. In response to this challenge, Kneron Intelligence has introduced a new type of chip-based AI solution designed specifically for AI and machine learning, known as the NPU, which is seen as the most promising chip. The high efficiency and low power consumption of NPUs make them key drivers for the continued development of AI technology. Furthermore, as NPU technology matures, all devices in the future are expected to be equipped with these chips, thus realizing device intelligence. With the advent of all-knowing AI systems combined with the high efficiency of NPUs, applications could become more user-friendly while ensuring environmental sustainability, leading to broader applications.

Albert Liu pointed out in his speech that compared to Convolutional Neural Networks (CNNs), Transformer neural networks have made significant breakthroughs in recognition capabilities, especially in handling spatial information and time series. This advancement holds significant implications for the field of autonomous driving. In the future, Transformers applied to traffic lights and vehicles could not only improve recognition

accuracy but also facilitate information exchange between vehicles, thus enhancing the safety and efficiency of autonomous driving. As this technology further develops, we can expect to witness a major leap in autonomous driving technology.

Additionally, Albert Liu mentioned Kneron's platform, Kneo, which is similar to the App Store; its uniqueness lies in the fact that any device equipped with Kneron Intelligence chips can download various programs created by different developers through the website, even ordinary devices can gain AI capabilities. This foreshadows a more intelligent and interconnected technological world on the horizon.

Albert Liu also showcased collaborative achievements with multiple enterprises during the presentation, demonstrating the application of AI technology in various practical scenarios. These include collaborations with Alibaba, where facial recognition technology is applied to doorknobs, providing convenient identity authentication functions. Additionally, healthcare institutions utilize their technology to monitor patients' health conditions, achieving comprehensive health management. Furthermore, AI technology is widely applied in the transportation sector, improving the safety of public transportation

with bus blind-spot detection. These collaborative cases demonstrate the practical applications of Kneron Intelligence's AI technology in different fields, providing smarter and safer solutions across various industries.

In the final stage of the speech, Albert Liu shared some personal insights and achievements. He expressed that he never imagined that his books would be used as teaching materials by several international universities, and even products developed by his company could compete with large international enterprises. Albert Liu repeatedly encouraged the audience, stating that everyone should not underestimate themselves and emphasizing that everyone has the opportunity to succeed. These words not only highlight Albert Liu's humility as an industry leader but also provide valuable insights for the audience, reminding them that no matter how significant the challenges, success is achievable through continuous effort.

Q & A

Q: How did the speaker know that the AI field was worth developing? How will your company compete with large enterprises?

A: Albert Liu mentioned that his company initially had only two employees, but he always believed

that as long as there is a clear goal and a firm will, dreams can be gradually realized. He encouraged the audience to never forget their initial enthusiasm and goals, regardless of the difficulties they face.

Q: Taiwan focuses on electrical and electronic technology. As a student in a business school, how can I enhance my competitiveness?

A: Albert Liu emphasized that while technical learning is important, the most challenging aspects of business lie in pricing strategies and operations. He actively learns the areas where business schools excel, hoping to have a more comprehensive ability in business operations. Furthermore, he stressed the importance of following one's inner voice, believing that one's inner voice can lead to a unique path. These viewpoints not only provide students with insights into future development directions but also remind them to focus on the importance of business operations while pursuing technology.



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