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College of Computer Science
National Yang Ming Chiao Tung University

# 陽明交大資訊人
# NYCU CCS MAGAZINE

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# 走向國際、走向未來

隨著我將於 2025 年 7 月 31 日卸任資訊學院院長，回顧這段旅程，我心中充滿感謝與期待。接任之初，我便思考如何讓全世界快速認識資訊學院，並宣示我們劍指「世界第一」的信心與目標。「資訊先鋒牛車雕塑」的揭幕，正是讓人記住「陽明交大、電腦第一」的高效策略之一。而要實現這個願景，首要之務便是推動學院全面走向國際。如今，我將這份使命交棒給即將上任的謝續平院長，深信他將帶領資訊學院持續邁向更高的國際舞台。

2024 年我們設立國際資訊碩士班，提供豐厚獎助學金與台灣頂尖企業實習機會，吸引來自世界各地的優秀學生加入；同時積極與全球頂尖大學合作，推動如 UIUC 3+X 計畫，擴展學生出國交換與雙聯學制的機會。本期中也收錄多位學生的心得回饋，展現跨文化學習與實作的豐碩成果。

2025 上半年期間，學院師生表現更是亮眼：彭文孝教授榮獲 IEEE Fellow、高孟駿教授獲得德國 Humboldt 研究獎、吳俊峯與劉育綸兩位教授同獲 2024 年李國鼎青年研究獎，並由吳俊峯教授摘下 2025 TSIA 半導體獎，充分展現學術實力與產業影響力。

在今年度傑出校友頒獎典禮上，本院系友蕭清志與卞志祥獲頒陽明交大傑出校友榮譽。蕭清志學長帶領士通資訊轉型為緯創軟體，營收成長數十倍，並致力推動產學合作與永續科技生態；卞志祥學長則擔任台灣微軟總經理，推動 AI、雲端、智慧醫療與數位永續，創立台灣氣候聯盟，引領台灣邁向數位轉型。他們的故事，展現資訊教育的力量與交大人不忘初心、勇攀高峰的精神。

適逢資訊學院創院 20 週年暨學系成立 60 週年，我們特別編纂紀念特刊《從 0 與 1 到無限未來》，回顧發展歷程，收錄歷任院長的省思與願景、資深師長與系友的真情分享，展現資訊人的熱情與傳承精神。同時，我們正積極推動資訊二館建設，打造一座結合跨域創新、產學合作與永續研發的新基地。這項工程需要全體資訊人的共同參與，感謝林憲銘學長率先捐款三億台幣，誠摯邀請您支持，一起開創交大資訊的下一個高峰。

感謝每一位與我同行的夥伴，是你們讓資訊學院成為我人生中最值得驕傲的一段旅程。未來，我將以不同的角色，持續為這個學院奉獻所能，讓這股改變世界的力量不斷延續，照亮更多人的未來。

資訊學院院長

陳志成

2025.06





# Reaching the World, Shaping the Future

As I prepare to step down from my role as Dean of the College of Computer Science on July 31, 2025, I look back on this journey with deep gratitude and excitement for the future. From the very beginning of my tenure, I focused on how we could quickly elevate our college's global presence and boldly declare our ambition to become a world leader in the field. One of the key initiatives that helped solidify our identity — "NYCU: Leading the Future of Computing" — was the unveiling of the Pioneer of Computing Ox-cart sculpture. Achieving this vision required a clear first step: driving the College toward full internationalization. Now, as I pass this mission to the incoming Dean, Professor Shiuhpyng Shieh, I am confident that under his leadership, the College of Computer Science will continue to reach new heights on the global stage.

In 2024, we launched the International Graduate Program at the College of Computer Science, offering generous scholarships and internship opportunities with leading companies in Taiwan to attract outstanding students from around the world. We also established active partnerships with top universities globally, including initiatives such as the UIUC 3+X Program, to expand opportunities for student exchanges and dual-degree programs. This issue features reflections from several students, showcasing the meaningful outcomes of cross-cultural learning and practical experience.

The first half of 2025 has been marked by exceptional accomplishments from our faculty and students. Professor Wen-Hsiao Peng was named an IEEE Fellow, and Professor Mong-Jen Kao received the prestigious Humboldt Research Fellowship from Germany. Professors Chun-Feng Wu and Yu-Lun Liu were both honored with the 2024 K. T. Li Young Researcher Award, with Professor Wu also receiving the 2025 TSIA Semiconductor Award. These achievements reflect the College's strong commitment to academic excellence and its growing impact in the industry.

At this year's Outstanding Alumni Awards ceremony, we proudly honored two distinguished alumni, Mr. Ching-Chih Hsiao and Mr. Sean Pien, with the prestigious NYCU Outstanding Alumni Award. Mr. Hsiao played a pivotal role in transforming S.T. Information Technology into Wistron ITS, achieving significant revenue growth. He has also been a strong advocate for industry-academia collaboration and the development of sustainable technology ecosystems. Mr. Pien, General Manager of Microsoft Taiwan, has led advancements in AI, cloud computing, smart healthcare, and digital sustainability. He also founded the Taiwan Climate Alliance, spearheading Taiwan's digital transformation. Their achievements showcase the power of a computer science education and embody the NYCU spirit of staying true to our roots while relentlessly pursuing excellence.

This year marks the 20th anniversary of the College and the 60th anniversary of our department's founding. To celebrate this milestone, we have produced a special publication titled "From 0 and 1 to an Infinite Future." It traces our journey, features reflections and visions from former deans, and includes heartfelt contributions from senior faculty and alumni—capturing the passion and legacy of the NYCU Computer Science community. We are also making great strides in the construction of our Second Computer Science Building, which will become a vibrant hub for interdisciplinary innovation, industry collaboration, and sustainable research. This ambitious project relies on the collective support of our entire community. I want to extend my deepest gratitude to alumnus Simon Lin for his generous lead donation of NT$300 million. I warmly invite all of you to join us in shaping the next chapter of NYCU Computer Science's history.

To all my partners who have shared this journey with me: thank you. It is because of your support that the College of Computer Science has become one of the most meaningful and rewarding chapters of my life. As I move forward, I remain committed to contributing in new ways, ensuring that this transformative legacy continues to inspire many more futures to come.

**Dean of the College of Computer Science**

2025.06

# 陽明交大資訊學院開設國際資訊碩士班 吸引國際人才來台就業

文／胡翔祐

隨著全球供應鏈重整，東協及南亞國家等新興市場國家迅速崛起，台灣由政府乃至企業也為了該趨勢而緊鑼密鼓地佈局著，目的不為別的，就是期望能夠提升與當地國家的貿易及投資關係，創造更具多元性與彈性的國際合作。為此，政府提供了許多針對國際人才留台的政策，例如：「新南向政策」、「強化人口及移民政策」等，而企業也沒閒著，透過與學校簽訂產學合作計劃，提供外籍人才在台灣頂尖企業實習的機會，同時，也能吸引更多國際人才來台就讀，創造雙贏的局面。

陽明交大資訊學院本次配合國家發展委員會擴大招募人才策略規劃，以及產業界建議擴大吸引及留用我國培育的僑外生，設立「國際資訊碩士班」。國際資訊碩士班希望招收來自全世界各地區的優秀學生，因此全程採用英語授課，期望能降低因語言障礙以至於不想來台的情形。

為了進一步提升優秀人才來台深造意願，國際資訊碩士班提供了豐富的獎助學金及前往台灣頂尖企業實習的機會。獎助學金部分，不但提供兩年學雜費全額補助，還有每月新台幣一萬元的生活津貼，期許能透過減輕經濟負擔，讓前來異鄉苦讀的優秀學子們專注在學業上；實習的部分，在碩士班第二年起，學生們將有機會前往台灣頂尖企業進行短期實習，獲得實務與理論驗證的經驗，提升職場競爭力。

陽明交大資訊學院國際資訊碩士班已與許多台灣一流企業攜手合作，包含聯發科、啟碁科技、華碩、台灣大哥大、訊舟科技、群聯電子、慧榮科技等，成為國際學生留台意願之一大利多，學生在研究所之研究主題便與合作企業之核心技術高度相關，畢業後可立即任職於合作企業成為正式員工，畢業即就業的機制，讓頂尖國際學子在陽明交大資訊學院完成學位後，到頂級企業任職的管道更通暢也具保障。未來，這些在台灣功成名的國際校友回其母國後，也能擔任台灣企業與國際市場的橋樑，幫助企業拓展當地業務，同時將台灣的 IT 技術與產業經驗帶回母國，強化雙邊科技合作。

透過國際資訊碩士班，陽明交大資訊學院不僅響應國家政策對於國際人才培育的目標，更積極為台灣科技產業打造高端國際人才庫。透過獎助學金與企業實習機會，有效降低世界各國學生來台深造的門檻，並提供穩定的職涯發展機會。隨著台灣與世界的交流日益深化，這些來台學習的優秀人才，無論留台工作期間或期滿返國發展，都將成為台灣與全球科技產業合作的重要推手，為區域經濟與產業發展注入新動能。陽明交大資訊學院的努力，將進一步鞏固台灣在國際科技人才競爭中的優勢，實現雙贏的長遠目標。





# NYCU CCS Launches International Graduate Program of College of Computer Science to Attract Global Talent to Taiwan

As global supply chains undergo restructuring, emerging markets in ASEAN and South Asia are rapidly rising in prominence. In response to this trend, both the Taiwanese government and private sector are proactively making strategic plans to strengthen trade and investment ties with these regions, aiming to foster more diversified and flexible international collaborations. To support this goal, the government has introduced a range of policies to encourage international talent to stay in Taiwan, such as the "New Southbound Policy" and enhanced population and immigration strategies. Meanwhile, businesses are also actively participating by signing industry-academia collaboration agreements with universities, offering internships at top Taiwanese companies for international students. These initiatives not only attract more foreign talent to study in Taiwan but also create a win-win situation for all parties involved.

To align with the National Development Council's strategy to expand talent recruitment and to heed industry recommendations to attract and retain international students educated in Taiwan, the College of Computer Science at National Yang Ming Chiao Tung University (NYCU CCS) has established the International Graduate Program of College of Computer Science. This program aims to recruit outstanding students from around the world and is taught entirely in English to eliminate language barriers that might otherwise discourage students from studying in Taiwan.

To further enhance the appeal of studying in Taiwan for top global talent, the program offers generous scholarships and internship opportunities at leading Taiwanese companies. Scholarships include full coverage of tuition and fees for two years, along with a monthly living stipend of NT$10,000. These benefits are designed to ease the financial burden for international students, enabling them to focus fully on their studies. Starting from the second year, students will have the opportunity to undertake short-term internships with top-tier companies in Taiwan, gaining valuable experience that bridges theory and practice and enhances their competitiveness in the job market.

NYCU CCS's International Graduate Program of College of Computer Science has already formed partnerships with many of Taiwan's leading enterprises, including MediaTek, Arcadyan, ASUS, Taiwan Mobile, Edimax, Phison, and Silicon Motion. These collaborations serve as a strong incentive for international students to remain in Taiwan. Students' research topics during their graduate studies are closely aligned with the core technologies of these partner companies, enabling a smooth transition from academia to employment. Upon graduation, students can seamlessly begin working at these partner companies as full-time employees, making the pathway from graduation to employment both efficient and secure. After returning to their home countries, successful international alumni can also serve as vital bridges between Taiwanese enterprises and international markets, helping businesses expand abroad while bringing Taiwan's IT technologies and industry expertise back to their own countries—thereby strengthening bilateral technological cooperation.

Through the International Graduate Program of College of Computer Science, NYCU CCS not only supports national policy goals related to cultivating global talent but also actively builds a high-level international talent pool for Taiwan's tech industry. By offering scholarships and internship opportunities, the program effectively lowers the barriers for students around the world to pursue advanced education in Taiwan, while also providing stable career development prospects. As Taiwan continues to deepen its engagement with the global community, these outstanding international students—whether they choose to remain in Taiwan or return home after their studies—will play a crucial role in driving international collaboration in the tech industry, injecting new vitality into regional economic and industrial development. NYCU CCS's efforts will further solidify Taiwan's competitive edge in the global race for tech talent and help realize long-term, mutually beneficial outcomes.

# UIUC-CS 3+X 雙聯學制

文／胡翔祐

在全球教育日趨國際化的浪潮下，陽明交通大學資訊學院積極與世界頂尖大學合作，為學生提供出國交換與雙聯學制的機會，期許學子能拓展視野、汲取多元知識。2024 年秋季，三位資工系同學——游建峰、劉珀睿與侯博軒參與了與伊利諾大學香檳分校（UIUC）之間的合作計畫，展開了一段增廣見聞之旅。

游建峰同學是參與 UIUC 3+X 雙聯學碩士計畫的首屆學生。他提到，UIUC 作為美國 CS 領域長年名列前茅的學校，不僅在學術資源上豐沛，其校園環境也極為優秀。游建峰分享到：「儘管香檳地處偏遠，但其寧靜的學習氛圍和完善的校園設施，讓他能夠全心投入課業。」他修習了三門進階課程，包括資料庫系統、電腦安全與物聯網與無線網路，並特別提到 UIUC 自建的 SQL 評分系統能即時回饋學生答案，提升了學習效率。他與同儕合作的 Roomba Wi-Fi 專案亦讓他從實作中獲得豐富經驗。

劉珀睿也同樣於 2024 年進入 UIUC 修課，他選擇了四門涵蓋平行運算、電腦視覺、互動圖學及深度學習的課程。他指出 UIUC 課程難度普遍高於本校，作業與專題數量多且需大量時間投入。儘管如此，劉珀睿還是特別推薦《Deep Learning for Computer Vision》一課，他認為教授教學熱忱十足，課程內容緊貼最新 AI 發展，如 Transformer 與 Diffusion Model 等皆有涉略，但考試難度也不容小覷，需要深度理解課堂內容才能應付。課外方面，他亦提到雖然 UIUC 娛樂資源有限，但透過校內社團與國際生活動，仍能建立豐富的人際網絡。

侯博軒同學也同樣參與了 3+2 雙聯學制，在大學三年結束後直接赴 UIUC 攻讀碩士。他提到香檳地區雖有「玉米田」的戲稱，但正因地處鄉間，更能專注學習。侯博軒特別對平行運算與電腦視覺兩門課留下深刻印象。在《Applied Parallel Programming》課中，他學習了 GPU 加速與 CUDA 實作技巧，課程設計結合理論與實務，挑戰性十足。而在《Computer Vision》課中，教授透過圖像輔助說明繁瑣的影像處理概念，讓學生得以更容易掌握抽象內容。除了課程內容以外，侯同學也提到 UIUC 教學系統高度數位化，大多數課程皆提供錄影與字幕，對非英語母語學生或初來乍到的留學生而言皆相當友善。

綜觀三位同學的交換經歷，他們皆展現出高度的學習熱誠與自我挑戰精神。這些寶貴的經驗不僅豐富了他們的學術養分，也為未來欲踏出台灣、走向國際舞台的學弟妹們提供了真實且深刻的借鏡。

在陽明交通大學推動國際化腳步不斷加快的今天，游建峰、劉珀睿與侯博軒的分享，無疑是最具說服力的證明——走出舒適圈，才能開拓世界的廣度。期盼未來有更多資訊學院的學子，能勇敢地走上這條充滿挑戰但精彩絕倫的國際學習旅程，成為連結台灣與世界的橋梁。





# UIUC–CS 3+X Dual Degree Program

In response to the global trend toward internationalized education, the College of Computer Science at National Yang Ming Chiao Tung University (NYCU) has been actively collaborating with top universities around the world. These efforts aim to provide students with opportunities for overseas exchanges and dual degree programs, encouraging them to broaden their horizons and absorb diverse knowledge. In the fall of 2024, three students from the Department of Computer Science—Jian-Fong Yu, Yi-Ruei Liu, and Bo-Syuan Hou—embarked on an enriching journey through a collaboration with the University of Illinois at Urbana-Champaign (UIUC).

Jian-Fong Yu was among the first cohort to participate in the UIUC 3+X dual-degree master's program. He noted that UIUC, a long-standing top-ranked institution in the field of computer science in the U.S., offers not only abundant academic resources but also an exceptional campus environment. “Although Urbana-Champaign is somewhat remote, its serene academic atmosphere and well-equipped facilities allowed me to fully focus on my studies,” he shared. He enrolled in three advanced courses—Database Systems, Computer Security, and IoT & Wireless Networks—and especially appreciated UIUC's self-developed SQL grading system, which provided immediate feedback and enhanced learning efficiency. He also gained valuable hands-on experience through a collaborative project on Roomba Wi-Fi.

Yi-Ruei Liu also joined UIUC in 2024, choosing four courses that covered parallel computing, computer vision, interactive graphics, and deep learning. He remarked that the course difficulty at UIUC was generally higher than at NYCU, with more assignments and projects requiring significant time and effort. Nevertheless, he highly recommended the course *Deep Learning for Computer Vision*, praising the professor's passion for teaching and the course's up-to-date content, including topics like Transformers and Diffusion Models. However, he also noted that the exams were quite challenging and required a deep understanding of the material. Outside of academics, he mentioned that while entertainment options at UIUC were limited, student organizations and international events still provided great opportunities for building social connections.

Bo-Syuan Hou also participated in the 3+2 dual degree program, heading directly to UIUC for his master's after completing three years of undergraduate studies. He joked about Urbana-Champaign's nickname as “cornfield country,” but appreciated how its rural setting allowed for focused studying. He was especially impressed by two courses—Parallel Computing and Computer Vision. In Applied Parallel Programming, he learned GPU acceleration and CUDA implementation skills through a curriculum that balanced theory and practice and presented significant challenges. In Computer Vision, the professor used visual aids to explain complex image processing concepts, helping students grasp abstract ideas more easily. Beyond coursework, Bo-Syuan highlighted UIUC's highly digitized learning system, with most classes offering recorded lectures and subtitles—an especially friendly feature for non-native English speakers and international students new to the environment.

Looking at the exchange experiences of these three students, their enthusiasm for learning and willingness to challenge themselves are evident. These invaluable experiences not only enriched their academic journeys but also serve as meaningful references for future students who aspire to step beyond Taiwan and onto the international stage.

As NYCU continues to accelerate its push toward internationalization, the stories shared by Jian-Fong Yu, Yi-Ruei Liu, and Bo-Syuan Hou stand as persuasive testimony: only by stepping out of one's comfort zone can one truly broaden their global perspective. We hope that more students from the College of Computer Science will bravely embark on this challenging yet rewarding journey of global education, becoming vital bridges between Taiwan and the world.

# 探索智慧駕駛的安全邊界

## 陳奕廷老師與人本智慧系統實驗室的情境式視覺風險辨識與感知技術

文／杜懿洵

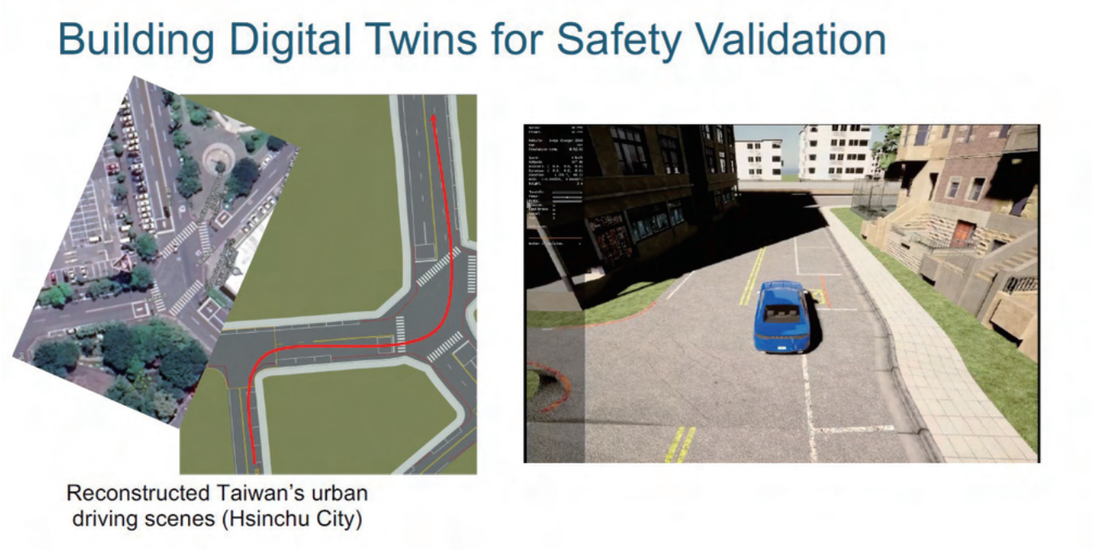
隨著智慧駕駛系統技術迅速發展，如何在多變且複雜的環境中確保系統能做出安全且合理的決策，已成為學界與產業界高度關注的核心議題。國立陽明交通大學資訊工程學系副教授陳奕廷長期專注於視覺風險物體辨識與其效能驗證的研究，並領導「人本智慧系統實驗室」，從人因視角出發，致力於發展具解釋性與實用性的創新架構，為智慧駕駛系統建立更加穩健的安全基石。

### 一、RiskBench: 情境式風險物體辨識驗證平台

過去針對視覺風險物體辨識的驗證方式多仰賴不同資料集，難以全面評估各種演算法的表現，且現有資料集多未依據實際道路情境進行情境化定義，限制了對方法效能與侷限的驗證。針對此挑戰，陳奕廷副教授團隊提出「RiskBench」，一套基於情境分類（Scenario Taxonomy）設計的全新風險物體辨識驗證平台，支援系統性測試與演算法評估。

RiskBench 將風險情境區分為四大類型：

- 互動型風險：需主動回應動態風險物體（如行人穿越馬路）。
- 碰撞型風險：存在實際或潛在的碰撞可能。
- 障礙型風險：例如施工區或靜態障礙物阻擋行車路徑。
- 非互動型情境：一般正常駕駛環境，無明顯風險。




為全面評估辨識演算法之效能，RiskBench 設計三項關鍵評估指標：

- 風險定位能力：是否能準確識別風險物體。
- 風險預測能力：能否及早發現潛在風險。
- 決策影響程度：該風險是否應影響駕駛決策。

此項研究成果已於國際頂尖機器人會議 International Conference on Robotics and Automation (ICRA) 2024 發表，並同步開放資料與工具，為全球學術與產業社群提供標準化的測試平台，促進風險辨識研究之發展與比較。

### 二、基於勢場表徵之視覺風險物體識別

針對以行為改變為基礎的風險物體識別演算法，目前存在兩大挑戰：其一，現有方法對場景語意與道路使用者的建模能力有限，難以有效理解複雜場景結構；其二，演算法的運算效率仍難以支援實時應用，限制其在實際場域的部署。為解決上述問題，陳奕廷副教授團隊提出全新風險識別架構——PF-BCP（Potential Field as Scene Affordance for Behavior Change-Based Visual Risk Object Identification）。

使架構的核心概念在於以勢場（Potential Field）建模場景可供性（Scene Affordance），針對場景中各物體（如行人、車輛），依其空間位置與語意標籤建立相對應的「吸引力」與「排斥力」，進而推估其對自車行進策略的潛在影響。系統運作流程如下：首先預測駕駛當下的行進目標，接著模擬「移除特定物體」後是否導致駕駛策略改變。若系統原判定需「停車」，但在移除某物體後轉為「前進」，則該物體即被視為真正影響決策的風險來源。此外，陳奕廷教授團隊採用鳥瞰圖（Bird's-Eye View）表徵作為勢場建模基礎，能有效支援勢場在空間上的平行化計算，顯著提升整體運算效率，使此架構具備即時應用的潛力。此研究成果已發表於 International Conference on Robotics and Automation (ICRA) 2025，並同步開放資料與工具，供國際社群使用與開發。

### 三、應用高斯潑濺法於鳥瞰圖語意分割的不確定性建模

將攝影機影像轉換為鳥瞰圖表徵，是智慧駕駛感知系統中的一大挑戰。現有如 Lift-Splat-Shoot（LSS）方法，藉由預測深度資訊進行轉換，然而該方法在深度預測準確度與運算效率上皆存在瓶頸，限制其於實務應用中的可行性。

為突破此限制，陳奕廷教授團隊提出新一代 BEV 感知框架 GaussianLSS（Gaussian Splatting for BEV Perception），不再對每個像素進行單點深度估算，而是為每個像素建立高斯分布，導入「不確定性建模」的概念，使系統在進行語意分割與空間建模時能兼顧準確性與穩健性。此成果已發表於國際頂尖電腦視覺會議 Computer Vision and Pattern Recognition (CVPR) 2025，並已公開相關資料與工具，進一步推動智慧駕駛感知技術的研究與實用化。

### 結語：邁向更安全且可解釋的智慧駕駛系統

從風險辨識、資料集建構，到深度感知建模，陳奕廷教授與其所領導的 人本智慧系統實驗室團隊深入聚焦於智慧駕駛系統安全的關鍵挑戰。他們所倡導的「情境導向」與「可解釋性」設計理念，不僅大幅提升演算法的實用性與穩定性，更強化智慧駕駛系統於實際道路情境中的可預測性與信賴度。

展望未來，陳教授團隊將持續推動開放資料、標準化測試平台與跨校跨國合作，致力於建構一個安全、透明且值得信賴的智慧交通生態系統。他們的研究成果不僅為台灣智慧駕駛技術注入關鍵動能，也正積極與國際接軌，為全球智慧交通的永續發展貢獻堅實力量。

# Exploring the Safety Boundaries of Intelligent Driving

## Professor Yi-Ting Chen's Research on Scenario-Based Visual Risk Identification and Perception Technologies

With the rapid development of intelligent driving technologies, ensuring that systems can make safe and reasonable decisions in complex and dynamic environments has become a key concern for both academia and industry. Professor Yi-Ting Chen, Associate Professor in the Department of Computer Science at National Yang Ming Chiao Tung University, has long focused on research in visual risk object identification and performance evaluation. Leading the Human-Centered Intelligent Systems Lab, he approaches these challenges from a human factors perspective, striving to develop innovative frameworks that are both interpretable and practical, and laying a solid safety foundation for intelligent driving systems.

### 1. RiskBench: A Scenario-based Risk Object Identification Benchmark

Existing methods for evaluating visual risk object identification algorithms often rely on the different datasets, making it difficult to comprehensively assess algorithmic performance. Moreover, most existing datasets lack scenario-based definitions grounded in real-world driving conditions, limiting the ability to verify algorithm efficacy and limitations.

To address these challenges, Professor Chen's team proposed RiskBench, a novel evaluation platform designed based on a scenario taxonomy. It supports systematic testing and algorithm benchmarking.

RiskBench categorizes risk scenarios into four major types:

- Interactive Risks: Situations requiring responses to dynamic risk objects (e.g., pedestrians crossing the street).
- Collision Risks: Scenarios where actual or potential collisions may occur.
- Obstacle Risks: Cases involving static obstacles or construction zones that block driving paths.
- Non-Interactive Scenarios: Normal driving conditions with no apparent risks.

To comprehensively evaluate algorithm performance, RiskBench introduces three key metrics:

- Risk Localization: Can the system accurately identify risk objects?
- Risk Anticipation: Can the system anticipate potential risks in advance?
- Planning Awareness: Can the identified risk facilitate decision-making?

This research was presented at the 2024 International Conference on Robotics and Automation (ICRA), along with the release of datasets and tools to the public. It provides a standardized testing platform for global academic and industrial communities, promoting research development and fair comparisons in risk recognition.

### 2. Visual Risk Object Identification with Potential Field

Current behavior-change-based visual risk identification algorithms face two major challenges: limited modeling of scene semantics and road user behaviors, and insufficient computational efficiency for real-time applications.

To tackle these issues, Professor Chen's team developed a novel risk identification framework called PF-BCP (Potential Field as Scene Affordance for Behavior Change-Based Visual Risk Object Identification). The core idea of the framework is to model scene affordances using potential fields. Each object in the scene (e.g., pedestrians, vehicles) is assigned "attractive" or "repulsive" forces based on its spatial position and semantic labels, allowing the system to estimate its potential influence on the ego vehicle's path planning.

The system workflow is as follows:

First, it predicts the current driving goal. Then, it simulates the outcome of removing a specific object. If this removal changes the decision (e.g., from "stop" to "proceed"), that object is deemed a key risk factor impacting the decision.

To enhance computational efficiency, the team employed Bird's-Eye View (BEV) representations as the basis for potential field modeling. This approach supports parallel computation, significantly improving real-time performance. The results were presented at the 2025 International Conference on Robotics and Automation (ICRA) and accompanied by the release of related datasets and tools for international use.

### 3. Uncertainty Modeling in BEV Semantic Segmentation via Gaussian Splatting

Transforming perspective-view images into BEV representations remains a challenge. Existing methods such as Lift-Splat-Shoot (LSS) rely on depth prediction for transformation, but face bottlenecks in both accuracy and computational efficiency, limiting their practical deployment.

To overcome these limitations, Professor Chen's team introduced a new BEV perception framework: GaussianLSS (Gaussian Splatting for BEV Perception). Instead of estimating a single depth point per pixel, the method assigns a Gaussian distribution to each pixel, incorporating uncertainty modeling. This approach enhances both the accuracy and robustness of spatial modeling.

The study was published at the 2025 IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), and the associated data and tools have been publicly released, advancing both research and practical applications in intelligent driving perception.

### Conclusion: Toward Safer and More Interpretable Intelligent Driving Systems

From risk identification and benchmark construction to risk perception modeling, Professor Yi-Ting Chen and the Human-Centered Intelligent Systems Lab have been deeply engaged in addressing the critical safety challenges of intelligent driving systems. Their focus on scenario-based and interpretable design significantly improves the practicality, stability, and trustworthiness of algorithms in real-world driving environments.

Looking ahead, Professor Chen's team is committed to promoting open data, standardized testing platforms, and cross-institutional, international collaborations. Their goal is to help build a safe, transparent, and trustworthy intelligent transportation ecosystem. Their research not only injects key momentum into Taiwan's intelligent driving development but also contributes significantly to the global advancement of sustainable smart mobility.

# 智慧運算 X 神經資訊

## 魏群樹教授以 AI 驅動智慧神經科技的跨域創新

文／杜懿洵

人工智慧正快速重塑我們對大腦的理解與應用。陽明交通大學資訊工程學系魏群樹教授自 2019 年加入本校以來，專注於「智慧運算 × 神經資訊」的跨域研究，結合人工智慧與腦機介面（BCI）技術，以深度學習為核心，透過對腦波（EEG）的精密分析，建立更有效率且精準的非侵入腦機介面和神經科技應用。

魏群樹教授在研究上有著傑出表現，加入本校至今，除了發表包括 7 篇 Q1 期刊、3 篇 Q2 期刊、1 篇頂尖國際會議、5 篇重要國際會議等研究論文之外，更受邀參與國際學術會議相關組織，像是 IEEE SMC Technical Committee on Brain-Machine Interface。此外，魏教授也積極推動國際合作，與史丹佛大學、UCSD、英國 Essex 大學、澳洲 UTS 等單位開展聯合研究與學生共同指導，並受邀參與 IEEE SMC 腦機介面技術委員會，持續拓展本校在智慧神經科技領域的國際能見度與影響力。

除了亮眼的研究表現，魏群樹教授所領導的研究團隊，也在推動 AI 精神醫學診斷、個人化治療與腦波分析上的創新應用等面向，展開與臨床單位的產學合作

### AI 判讀腦波，精神疾病診斷再進化

魏教授團隊與高雄醫學大學附設醫院合作，利用臨床腦波數據訓練「多分支深度神經網路」的創新 AI 模型，成功將思覺失調症診斷準確率提升至 84%，有效區分思覺失調症患者與健康族群，替臨床精神醫學的診斷開拓新途徑。診斷準確性之外，團隊更進一步導入「顯著圖」（Saliency Map）技術，將 AI 在判斷時所依據的腦波特徵視覺化，不但實現模型判斷透明化，讓 AI 診斷不再是黑盒子，直觀呈現疾病特徵的方式，更為臨床醫師提供客觀的生物標記（biomarker），有望成為新一代 AI 輔助診斷工具。

### 個人化 TMS 治療：突破憂鬱症療效瓶頸

除了精準診斷外，在精神疾病治療領域中，如何突破現行療法的療效瓶頸，也是魏群樹團隊研究專注的重點課題。團隊與振興醫院進行臨床合作，針對對抗抗藥性憂鬱症的有效非藥物療法 - 經顱磁刺激（Transcranial Magnetic Stimulation, TMS）研發出整合即時腦波監測的「腦波相位同步刺激」技術創新應用，能即時追蹤並分析患者的大腦活動狀態，改善傳統療程中的刺激參數缺乏個體化設計，精準掌握 TMS 施打時機與強度，提高憂鬱症患者的治療反應率與療效穩定性，為未來個人化精神醫療開創全新可能。

### 深度學習的新思維：幾何深度學習與跨域對齊模型的突破

魏群樹團隊亦於 AI 分析方法不斷創新，提出 MAtt（Manifold Attention Network）模型，透過幾何深度學習（Geometric Deep Learning）與 Riemannian 流形（manifold）上的注意力機制，提升 SSVEP 與動作想像腦波分類效能，成果獲 NeurIPS 2022 頂尖會議肯定。

此外，團隊更與美國神經科技公司 Arctop 合作，開發 SSVEP-DAN 模型，有效減少腦機介面應用中校正資料需求，並提升準確度 25%，技術成果發表於 2024 年 IEEE TNSRE 神經復健工程領域頂尖期刊，彰顯其在實際應用上的巨大潛力。

除了產學合作，為推動神經資訊研究民主化，魏群樹團隊也建置 XBrainLab 平台，整合深度學習、可解釋 AI 與代理式使用者介面，提供研究者一站式的腦波資料處理與模型分析工具，降低技術門檻、提升研究效率。

魏群樹教授以 AI 為核心，推動智慧神經科技的跨域創新，不僅在學術研究上成果豐碩，更積極將技術應用於臨床診斷與治療，展現人工智慧驅動未來精神醫療與腦機介面發展的無限可能。

# Intelligent Computing × Neuroinformatics

## Professor Chun-Shu Wei Leads Interdisciplinary Innovations in AI-Driven Neural Technologies

Artificial intelligence is rapidly reshaping our understanding and application of the human brain. Since joining the Department of Computer Science at National Yang Ming Chiao Tung University (NYCU) in 2019, Professor Chun-Shu Wei has been dedicated to interdisciplinary research that bridges intelligent computing and neuroinformatics. His work integrates AI and brain-computer interface (BCI) technologies, with deep learning at its core. By analyzing electroencephalogram (EEG) signals with precision, his research aims to develop more efficient and accurate non-invasive BCIs and neurotechnology applications.

Professor Wei has demonstrated outstanding research performance. Since joining NYCU, he has published seven Q1 journal articles, three Q2 journal articles, one paper at a top-tier international conference, and five other significant international conference papers. He has also been invited to contribute to the organization of international academic events, such as serving on the IEEE SMC Technical Committee on Brain-Machine Interface. In addition, Professor Wei actively promotes international collaboration, engaging in joint research and co-advising students with institutions such as Stanford University, UC San Diego, the University of Essex (UK), and the University of Technology Sydney (Australia). His involvement in the IEEE SMC Brain-Machine Interface Technical Committee continues to enhance NYCU's global visibility and influence in the field of intelligent neural technologies.

In addition to his remarkable research achievements, Professor Wei and his team are also pioneering applications in AI-assisted psychiatric diagnosis, personalized treatment, and EEG analysis through industry-academia partnerships with clinical institutions.

### AI Interprets Brainwaves: Revolutionizing Psychiatric Diagnosis

In collaboration with Kaohsiung Medical University Hospital, Professor Wei's team has trained an innovative AI model—a multi-branch deep neural network—using clinical EEG data. This model has successfully increased the diagnostic accuracy for schizophrenia to 84%, effectively distinguishing patients from healthy individuals and opening new avenues for psychiatric diagnosis. Beyond accuracy, the team has incorporated saliency map techniques to visualize the EEG features used by the AI in its decision-making process. This approach demystifies the AI's diagnostic rationale, making its judgments more transparent and understandable. By presenting disease-specific features intuitively, the system provides clinicians with objective biomarkers, showing strong potential as a next-generation AI-assisted diagnostic tool.

### Personalized TMS Therapy: Breaking Through Depression Treatment Barriers

In the realm of psychiatric treatment, Professor Wei's team is also focused on overcoming the limitations of current therapies. In partnership with Cheng Hsin General Hospital, the team is advancing non-pharmaceutical treatments for treatment-resistant depression—specifically Transcranial Magnetic Stimulation (TMS). They have developed a novel method called phase-synchronized TMS, which integrates real-time EEG monitoring to track and analyze patients' brain states. This innovation addresses the lack of individualized parameters in traditional TMS protocols, enabling personalized timing and intensity for stimulation. The result is improved treatment response and stability, paving the way for personalized mental healthcare.

### A New Era in Deep Learning: Breakthroughs in Geometric and Cross-Domain Alignment Models

Professor Wei's team continues to push the boundaries of AI methodologies. They proposed the MAtt (Manifold Attention Network) model, which leverages Geometric Deep Learning and attention mechanisms on Riemannian manifolds to enhance classification accuracy for SSVEP and motor imagery EEG signals. This work was recognized at NeurIPS 2022, one of the world's top AI conferences.

In collaboration with the U.S.-based neurotechnology company Arctop, the team also developed the SSVEP-DAN model, which significantly reduces the calibration data required for BCI applications while improving accuracy by 25%. This achievement was published in IEEE Transactions on Neural Systems and Rehabilitation Engineering (TNSRE) in 2024, underscoring its practical application potential.

### Democratizing Neuroinformatics Research: The XBrainLab Platform

To make neuroinformatics research more accessible, the team launched XBrainLab, a platform that integrates deep learning, explainable AI, and agent-based user interfaces. It offers researchers a one-stop solution for EEG data processing and model analysis, lowering the technical barrier and enhancing research efficiency.

Centered on AI, Professor Chun-Shu Wei's interdisciplinary innovations in intelligent neurotechnology not only yield prolific academic results but also actively drive clinical applications in diagnosis and treatment. His work exemplifies the boundless potential of AI to shape the future of mental health care and brain-computer interface development.

# 劉育綸老師：機會是留給勇於嘗試的人

文／胡翔祐

劉育綸老師目前於國立陽明交通大學資訊工程學系擔任助理教授，他在過去曾獲得玉山青年學者獎、更榮獲全球只有 70 位年輕學者獲獎的 2024 Google Research Scholar Award，這是 Google 開辦這個獎項以來，第一次有台灣學者獲獎！這次陽明交通大學很榮幸邀請到劉育綸教授來與同學們分享「學校與職場沒教我的事」，希望透過劉教授的親身經歷，引領莘莘學子們不再迷惘，勇敢逐夢踏實。

劉教授將自己的人生區分為五個階段，分別為在交大電子系讀學碩士、接著在聯發科工作、又前往台大資工系攻讀碩士，再到 Meta 實習，最後又回到母校－陽明交大任教。一如許多剛升上大學的新鮮人們，劉教授在大一時也將自己的時間投入在社團、梅竹賽中，直到大一下腿部骨折，迫使他長時間待在宿舍，這場意外意外地成為他人生轉折的起點。他逐漸將重心放回學業，在大三接觸到林奕成教授開設的「電腦視覺」課程後，終於燃起興趣，從此投入研究之路，最後，也成功推甄上了交大電子所。

進入交大電子所後，他積極參與專題研究與論文撰寫，多次代表學校出國參加國際研討會，甚至在 Picture Coding Symposium 2013 發表成果，每一次的經歷不僅累積了實力，也讓他更確信自己找對了方向。劉育綸說：「從大學到研究所，你們有至少四到六年的時間可以探索與犯錯，take your time ！」他認為，大學不只是拿好成績，更是探索自我與未來職涯的重要時機。即便不確定自己的熱情所在，至少可以先了解自己不喜歡什麼、不擅長什麼。

畢業後，劉育綸也與許多電子所畢業的同學們一樣進入了聯發科，在這裡，他第一次的體驗到「Work-Life Imbalance」，上下班永遠都在塞車、因為擔心自己的工作跟不上而時常自主加班，直到有一次，他不小心睡到中午才急忙趕到公司，卻發現整個部門跟本沒人發現他不在，此時他才領悟到「沒有人是不可取代的，相較於個人能力，團隊合作更重要」，尤其在面對自己不熟悉的工作時，應該要大膽地詢問，除了能增進效率外，也能強化同事之間的感情。

在工作之餘，劉教授也同時在職攻讀台大資工所博士班，然而，攻讀博士期間也並非一帆風順，多次遭遇論文被退、研究無進展的低潮。「有時候你覺得自己已經做到最好，但還是無法被接受。」在那段徬徨的時光，他選擇不斷與指導教授與同行交流，從他們的鼓勵中重新找回信心，更重要的是，在這段期間，他終於發現了自己喜歡且擅長的事－電腦視覺研究。學術界的壓力龐大，但他靠著堅持與自我調整走過低谷。他認為：「隨緣，並不是放棄，而是在盡力後不強求。」這份豁達，來自一次次真誠的努力後的釋然，也成為他面對人生困難時的重要信條。

畢業後，劉教授勇敢地挑戰自我。申請美國 Meta 公司的實習職位，即便背景與美國看似大相徑庭，仍然順利錄取並前往西雅圖展開嶄新旅程。在這段期間，他深刻體會到文化與生活上的衝擊，他認為美國的食物貴又不好吃，但辦公室文化相較台灣來說明顯更開放了許多，他也告誡同學們：「並不是所有在海外工作的台灣人都過得非常光鮮亮麗，也許是倖存者偏差，真正的努力與挑戰往往更加艱難。」即便如此，劉教授仍然鼓勵同學們有機會的話就到國外看看，開開眼界。

如今，劉育綸教授回到母校任教，除了開設自己專業領域的課程外，也廣育桃李，招收實驗室的學生並且陪伴他們做實驗、投稿論文，劉教授說：「人生永遠沒有準備好這回事，機會是留給勇於嘗試的人！」相信只要我們不斷嘗試、不斷跨出舒適圈，必定能找到兼具喜歡、擅長、能賺錢的事情，從而達到 Work-Life Balance!





# Professor Yu-Lun Liu: Opportunities Favor Those Who Dare to Try

Professor Yu-Lun Liu is currently an Assistant Professor in the Department of Computer Science and Engineering at National Yang Ming Chiao Tung University (NYCU). He is a recipient of the Yushan Young Scholar Award and, most notably, one of only 70 global recipients of the 2024 Google Research Scholar Award—the first Taiwanese scholar to ever receive this prestigious honor since the award's inception. NYCU is proud to invite Professor Liu to share his talk “What School and Work Never Taught Me,” aiming to inspire students to move beyond confusion, dream boldly, and pursue their goals with determination through his personal journey.

Professor Liu divides his life into five key stages: studying for his bachelor's and master’s degrees in the Department of Electronics at Chiao Tung University; working at MediaTek; pursuing a doctoral degree at National Taiwan University in the Department of Computer Science and Information Engineering; interning at Meta; and finally, returning to his alma mater, NYCU, as a faculty member. Like many freshmen, he initially immersed himself in extracurricular clubs and the annual Mei-Chu Games. However, a leg fracture in his second semester forced him to remain in the dorm for an extended period—an unexpected turning point in his life. Gradually shifting focus back to academics, he discovered his passion in his junior year through Professor I-Cheng Lin’s course on Computer Vision. This ignited a lasting interest in research, leading to his successful admission to the graduate program in electronics at Chiao Tung University.

During his time in graduate school, he actively engaged in research projects and academic writing, often representing the university at international conferences. Notably, he presented at the Picture Coding Symposium 2013, experiences that not only built his expertise but also confirmed his commitment to his chosen path. “From undergraduate to graduate school, you have four to six years to explore and make mistakes—take your time!” he says. Professor Liu believes that university is not just about grades, but a crucial period for self-discovery and career exploration. Even if students aren’t sure what they’re passionate about, it’s important to start by identifying what they don’t enjoy or aren’t good at.

After graduation, like many of his peers, Professor Liu joined MediaTek. It was there that he experienced the harsh reality of “Work-Life Imbalance”—constant traffic, frequent self-imposed overtime driven by fear of falling behind. One day, after accidentally oversleeping until noon, he rushed to the office only to realize no one had even noticed his absence. This moment of clarity taught him an important lesson: no one is irreplaceable, and collaboration is more important than individual prowess. Especially when facing unfamiliar tasks, he advises, one should ask questions boldly—not only to improve efficiency but also to build stronger connections with teammates.

While working, Professor Liu also pursued a Ph.D. at NTU. His doctoral journey, however, was far from smooth. He faced multiple rejections and periods of stagnation in his research. “Sometimes you feel like you've done your best, but it’s still not enough.” During this difficult phase, he constantly communicated with his advisor and peers, regaining his confidence through their encouragement. More importantly, it was during this time that he discovered what he both enjoyed and excelled at—research in computer vision. Though academia is filled with pressure, he overcame those challenges through persistence and self-adjustment. He reflects, “Letting things take their course isn’t giving up—it means not forcing things after you’ve done your best.” This mindset, born of sincere effort, has become a guiding principle in facing life’s difficulties.

After completing his doctorate, Professor Liu boldly applied for an internship at Meta in the U.S. Despite having a background quite different from the typical American candidate, he was accepted and began a new chapter in Seattle. The cultural and lifestyle shocks were profound. He found the food expensive and unpalatable, but appreciated the open and inclusive office culture compared to Taiwan. He reminds students: “Not all Taiwanese working overseas live glamorous lives—sometimes it’s a matter of survivor’s bias. The true effort and challenges are often far tougher than they appear.” Even so, he encourages students to seek international experiences if possible, to broaden their horizons.

Now back at NYCU as a faculty member, Professor Liu not only teaches courses in his area of expertise but also mentors students in his lab, guiding them through experiments and paper submissions. He shares this advice: “Life is never about being fully prepared—opportunities are reserved for those who dare to try.” He believes that as long as we keep trying and stepping outside our comfort zones, we will eventually find something we love, are good at, and can earn a living from—achieving a true work-life balance.

# 穿越科技浪潮
# 交大資工雙傑榮膺傑出校友

文／胡翔祐

在國立陽明交通大學 2025 年傑出校友頒獎典禮上，兩位來自交大資工背景的學長——蕭清志與卞志祥，以其在科技與企業領域中的傑出貢獻，獲選成為陽明交大引以為傲的傑出校友。他們一位引領資訊服務業邁向國際舞台，一位站在 AI 與雲端的最前線，以遠見、實踐與人文關懷，展現陽明交大校友們輝煌的成就。

## 從最後一名到世界頂尖：蕭清志的翻轉人生

蕭清志在 1975 年畢業於交大計算與控制工程學系，爾後赴美取得普渡大學電腦博士學位，曾在美國矽谷工作 18 年，擔任過 EDA 與嵌入式系統開發領導人、道瓊交易室系統總經理，奠定深厚的專業背景與國際視野。

2004 年，他毅然接掌連年虧損的士通資訊，並將之更名為緯創軟體，透過資訊委外服務轉型策略的推動，竟在短短兩年內就將營收轉虧為盈。經過 20 年的經營，蕭清志帶領公司成長超過 20 倍，海外業務比重高達 85%，使緯創成為台灣資訊服務業的領導品牌。

蕭清志深知，人才是企業長期發展的關鍵因子，因此積極推動產學合作，建立國際化的人才生態圈，並將企業社會責任與環境永續納入經營理念。他強調：「我們需要攜手下一代，建立更具影響力的國際科技生態。」這不僅是一個企業家的宣言，更是一位教育家的傳承。

他在致詞中回憶，自己當年以班上最後一名進入交大，但靠著不懈的努力與老師的指導，逐漸名列前茅，並獲得赴美深造的機會。他感性地說：「交大不只是知識的源頭，更是開啟我人生格局的起點。」他也特別感謝資訊學院師長與推薦他的學長姐們，包括林憲銘董事長、黃慧珠總經理、吳廣義理事長等，讓這份榮耀更加具有意義。

## 平凡中走出的非凡：卞志祥的科技願景與社會承擔

卞志祥在 1994 年畢業於交大資訊科學系，1996 年取得資訊管理研究所碩士學位，是現任台灣微軟總經理。他來自平凡的眷村家庭，將人生的巨大轉捩點歸功於交大的栽培與啟發。「交大給了我自信、知識、找答案的方法，更給了我人脈與視野。」這段話不僅道出了他個人的成長軌跡，也為他的領導風格與核心價值奠定了根基。

在微軟任內，他不僅積極推動 AI 產業聚落與 IoT 卓越中心，更創立「台灣氣候聯盟」，致力於實現淨零碳排的永續願景。同時，他也參與並打造了全台首座全數位原生醫院「竹銘醫院」，期望透過 AI 與雲端技術來推動醫療創新。此外，他領軍啟動「AI PLUS TAIWAN」計畫，推動資料中心在台落地，協助產業智慧升級，並與政府攜手強化資安防禦，協助建構台灣成為 AI 智慧島嶼。

為了以具體行動呼應淨零碳排的全球趨勢，卞志祥創立了「台灣氣候聯盟」，將數位科技與永續議題結合，展現企業領袖在環境議題上的高度格局。他說：「我們最重要的不是幫微軟做了什麼，而是我們如何影響這個平台，為台灣帶來多少資源。」

這樣的社會責任意識源於交大強大的校友文化，他說：「每當我看到有交大的名字出現在履歷上，我就知道，這是一位可以信賴的夥伴。」在這樣一個緊密的校友網絡中，卞志祥看見了傳承、建立了合作。這份信念，讓他願意用企業的力量回饋學界、扶植下一代的科技人才，推動台灣產業進入下一個黃金時代。

## 交大的交集：從個人成長到國家願景

儘管兩人所處領域不同，一位深耕本土產業數十載，一位身處外商巨擘的科技前線，但蕭清志與卞志祥都相信人才是最關鍵的投資，應以遠見與實踐連結產官學界。他們也都選擇在職涯高峰之際回饋母校、扶植後輩。更重要的是，他們的故事不僅關乎個人成就，更是台灣在全球數位競爭浪潮中找尋定位的縮影。

他們分別從資訊服務、國際企業經營，到 AI、雲端、資安等面向，為台灣企業打造韌性、為產業建立永續力，也為學界與年輕人才鋪設出更寬廣的未來之路。

陽明交通大學為這兩位校友頒發傑出校友的榮譽，不僅是對過去成就的肯定，更是對未來責任的期許。蕭清志以產業創新驅動台灣邁向全球，卞志祥則以雲端與 AI 建構數位島嶼的願景。他們的故事告訴我們，不論起點如何，只要敢夢、敢做，就能走出屬於自己的高峰，而這份榮耀也將透過每一位交大人，一代一代地繼續傳承下去。

# Riding the Wave of Technology: Two CS Alumni Honored as Outstanding Alumni of NYCU

At the 2025 Outstanding Alumni Awards Ceremony of National Yang Ming Chiao Tung University (NYCU), two alumni with backgrounds in computer science—Ching Hsiao and Sean Pien—were honored for their remarkable achievements in the fields of technology and business. One has elevated Taiwan's information services industry to the international stage, while the other leads at the forefront of AI and cloud technology. Their visionary leadership, commitment to action, and deep sense of social responsibility exemplify the extraordinary accomplishments of NYCU alumni.

## From Last in Class to Global Leader: The Remarkable Journey of Ching Hsiao

Ching Hsiao graduated from the Department of Control and Computer Engineering at Chiao Tung University in 1975, later earning a Ph.D. in Computer Science from Purdue University in the United States. He spent 18 years in Silicon Valley, holding key leadership positions in EDA and embedded systems development, and served as General Manager of Dow Jones trading systems, gaining solid technical expertise and a global perspective.

In 2004, he boldly took the helm of Syscom Group, a company suffering years of losses, and rebranded it as Wistron ITS. With strategic transformation toward IT outsourcing services, the company turned profitable within just two years. Over the next two decades, Hsiao led the company to more than 20-fold growth, with 85% of its business now overseas—establishing Wistron ITS as a leading brand in Taiwan's information services sector.

Recognizing that talent is the cornerstone of long-term development, Hsiao has actively fostered industry-academia collaboration and helped build a global talent ecosystem. He has also embedded corporate social responsibility and environmental sustainability into his company's mission. "We must work with the next generation to build a more impactful international tech ecosystem," he emphasized—not just as a business vision, but as a legacy of educational commitment.

In his speech, Hsiao recalled entering Chiao Tung University as the lowest-ranked student in his class. Through perseverance and mentorship, he steadily rose to the top and eventually earned the opportunity to study in the U.S. "Chiao Tung wasn't just a source of knowledge," he said with emotion, "it was the starting point of my broader worldview." He also expressed gratitude to mentors from the College of Information and the senior alumni who supported him—such as Chairman Hsien-Ming Lin, General Manager Hui-Chu Huang, and President Kuang-Yi Wu—who made this honor even more meaningful.

## From Humble Beginnings to Visionary Impact: Sean Pien and His Commitment to Technology and Society

Sean Pien graduated from the Department of Computer Science at Chiao Tung University in 1994 and earned his master's degree from the Institute of Information Management in 1996. He is now the General Manager of Microsoft Taiwan. Coming from a modest military dependents' village, he attributes the pivotal turning point in his life to the education and inspiration he received at Chiao Tung University. "The university gave me confidence, knowledge, the tools to seek answers, and, most importantly, a network and a broader vision," he reflected. This foundation shaped his leadership style and core values.

At Microsoft, Pien has been a driving force behind Taiwan's AI ecosystem and the IoT Excellence Center. He also founded the Taiwan Climate Partnership, aiming to realize a sustainable vision of net-zero emissions. Furthermore, he played a key role in developing Taiwan's first fully digital-native hospital, Chuming Hospital, leveraging AI and cloud technology to innovate in healthcare.

Pien also spearheaded the AI PLUS TAIWAN initiative, which established data centers in Taiwan to support industrial digital transformation. In collaboration with the government, he has strengthened cybersecurity defenses, helping to shape Taiwan into a smart island powered by AI.

To align with the global trend toward net-zero emissions, Pien founded the Taiwan Climate Partnership, integrating digital technologies with sustainability goals—a testament to his high-level perspective on environmental leadership. "What matters most isn't what we've done for Microsoft," he stated, "but how we've leveraged the platform to bring resources to Taiwan."

This sense of social responsibility stems from the strong alumni culture at Chiao Tung University. "Whenever I see 'Chiao Tung University' on a resume," he said, "I know this is someone I can trust." Within this close-knit alumni network, Pien sees legacy and collaboration. It's this conviction that drives him to give back to academia through corporate efforts, nurturing future tech talents and helping Taiwan's industries step into a new golden age.

## The Intersection of Personal Growth and National Vision

Though they have forged different paths—one rooted in domestic enterprise, the other in the global tech scene—Ching Hsiao and Sean Pien share a belief that talent is the most vital investment. They both advocate connecting government, industry, and academia through foresight and practical action. More than that, both have chosen to give back to their alma mater at the peak of their careers, mentoring the next generation.

Their stories go beyond individual accomplishments; they represent Taiwan's ongoing journey to carve out its place in the global digital landscape. Through information services, international business leadership, AI, cloud, and cybersecurity, they have built resilience into Taiwan's enterprises, sustainability into its industries, and broader pathways for future talent in academia.

By honoring these two alumni, NYCU not only celebrates their past achievements but also entrusts them with a vision for the future. Ching Hsiao leads with industrial innovation to take Taiwan global; Sean Pien builds a digital island through cloud and AI. Their stories prove that no matter where you start, if you dare to dream and act, you can reach your own summit—and this legacy will be passed on through every generation of NYCU alumni.

# 見證電腦時代的變遷—我的回顧與思索

文／杜敏文 退休教授暨前計科系主任

人類利用器械協助數字運算，雖然已有千百年歷史，但是真正能夠突飛猛進，則是在近百年，電子計算機發明以後。我們這一代人，躬逢其盛。常常想，在這一個演進過程中，我們經歷過的，見到的，想到的，雖然每個人會有其局限性，以管窺豹，只見一斑。但是集合眾人所見、應該也可以給計算機發展史一個很好的見證。

以下我將野人獻曝一番，談一談個人由電機轉入計算機領域的機緣，計算機行業大公司的起落，和對電腦中文輸入的一些想法。

## 一、由電機轉入計算機領域的機緣

我在台大電機系唸四年級的時候，台灣啟動了一個邀請國外學者來臺訪問教學的計畫，那是 1965 年。在這個計畫中，康乃爾大學的童華俊教授來到系上。我選了他的近代代數 (Modern Algebra)，一門計算機基礎數學課。由於以往並沒有接觸過計算機的領域，真是大開眼界，也引導了我後來選擇從事計算機相關研究的興趣。

服完預官役，我到新竹交大電子研究所讀了一年。那時交大在計算機方面有很強的師資陣容。我選了楊超植教授的自動機理論，Hoffman 教授的邏輯線路設計等等。也記得張澤仁教授帶領的團隊在完成他們 Fortran 編譯器的改進設計，大家高興慶祝，這在當時可是不容易的成就。

我在 1968 年到美國約翰霍普金斯大學 (Johns Hopkins) 的研究所讀博士班。該校和新竹交大類似，學校較小，但注重研究。那時美國各大學有如雨後春筍般，紛紛成立計算機系所，全美有計算機系所的大學卻仍不滿百家。我進入第一屆的計算機博士班，這屆同學連我總共只收了三人。

1972 年我拿到博士學位後，回台到新竹交大任教。交大也逐年成立計算機系和碩士班。那時系上老師都很年輕，平均不到 30 歲，生氣蓬勃。教學之餘還可以組隊和同學們賽籃球、足球，一樂也。

後來系上成立博士班，招收到全台各校才俊。能和同學們互相切磋，教學相長。日後也見到大家在學業，事業上都有所成，共同為台灣的電腦資訊業發展努力，深感與有榮焉，至樂也！

## 二、計算機行業大公司的起落

計算機各方面技術的進步大多是持續漸近的。但是這些技術的演進對許多大公司的興起和衰落有時卻是難以預見和預防。把時間軸拉長、可以看到滾滾長江東逝水，波濤洶湧，浪花淘盡英雄。我們來看幾個例子：

### 1. 電話公司的黃頁電話簿 (Yellow page ) 業務

早年電話公司的黃頁電話簿是一門利潤高的行業。當人們要買物品，常常先去翻看黃頁簿。於是中小企業都會很樂意，甚至於主動的，到黃頁上登廣告。但是自從網際網路興起，人們很容易從線上找資料，黃頁電話簿這門行業就很快地沒落了。

### 2. 貝爾實驗室 (Bell Laboratory)

貝爾實驗室是個百年老店，它是美國甚至可說是世界的研究重鎮。它的許多創新發明，導引出不少近代科技新的發展。在計算機、資訊領域，包括訊息理論、電晶體、Unix 操作系統、C 語言、等等，都替未來發展奠定了良好的基礎。

在 1996 年，貝爾實驗室從 ATT 分割出來，成立了 Lucent Technologies ，主要製售網路連結機器。從 1996 到 2000 年，適逢全世界網際網路應用的興起。網路連結機器的需求也呈等比級數增長。Lucent 的營業額在這 3、4 年間每年都快速成長。但是到了 2000 年，網路資訊業暴跌，Lucent 也很快在一兩年內隕落。這麼短時間內的暴起暴落，真有如驚濤駭浪。應該是擴充過速，遇到環境變化，轉身不易或是無力。想想貝爾實驗室以往的輝煌歷史，留下的卻是無盡的惋惜。

Lucent 的起落 William Lazonick and Edward March 在 “The Rise and Demise of Lucent Technologies” 中有很好的解析。

https://www.economicpolicyresearch.org/images/docs/SCEPA_blog/the_financial_crisis/lazonick_paper2_panel6.pdf

### 3. 計算機製造業

早年的計算機製造業，以 IBM 為主力，推出過許多受歡迎的大機器。早期交大計算機中心曾經引進 IBM 650， IBM 1620 兩機器。那時寫程式都靠打卡片，再送進中心的一個小窗口。 後來迷你電腦興起， 中心又從 DEC (Digital Equipment Corporation) 公司買進一套 PDP 11 迷你計算機，聯通 16 個螢幕端機，可從線上輸入程式或者是資料，極為方便。

到 1980 年代初期，IBM 推出個人電腦 (PC)，選擇英特爾 (Intel) 做硬體系統，配合微軟做軟體系統。往後計算機的性能逐年快速推進，個人電腦的價格也逐漸降低到非常大衆化。這個發展，對生產大計算機的公司，產生很大的壓力。以 IBM 為例，開始轉型做計算機軟體服務業，公司還能維持良好營運。假如轉型不成，例如 DEC，和一些迷你計算機製作公司，只有黯然收場。正是「青山依舊在，幾度夕陽紅」。

資訊業是個競爭相當激烈的行業。每個公司都需要練就一些獨門武功，才能夠穩定的發展。下面我們看一些例子。

### 微軟公司

開始靠著系統軟體起家，往後發展出視窗系統 (Windows)，用使用者傳給視窗的信號來設計程式，有別於傳統的連續性程式設計方式。微軟又提供設計完善的 IDA—Visual Studio，給程式設計者很容易上手，以設計視窗的應用程式。

微軟發展出另一個很好用的的辦公套裝軟體 Office。例如其中的應用軟體程式 Word，可以處理多種語言、科學公式、甚至於網路超連結，真是無所不能。視窗系統和辦公套裝軟體仍然是微軟的兩個主要收入來源。

### 谷歌公司

谷歌以網路資訊搜尋為主要業務。早年我們做學術研究，要蒐集資料，得上圖書館待個幾天，幾週，甚至於幾月，都是常事。不像現在線上搜尋，所費功夫只在彈指之間。

記得剛開始幾年，用谷歌搜尋，有些排在前端的資料，常發現並非相關對自己有用的。經過這些年的演進，谷歌搜尋結果的正確性已經獲得極大的改進。資訊搜尋系統在一開始時群雄並起。谷歌最後能脫穎而出，有他的道理。

### 蘋果公司

蘋果公司有如異軍突起般，在 2007 年推出智慧手機 iPhone，2010 年又推出平板電腦 iPad。完全不同於個人電腦，它們用觸控面板作為主要的使用者介面，可以寫，可以說，可以聽，可以看，更兼攜帶方便，價格一般，無怪乎一時之間大眾風靡。

蘋果的 Apple Store 也是一個很獨特的創新觀念。Store 協助代銷各種軟體應用程式 App，從中抽取 30% 的利潤。這樣形成一個很好的生態系統，吸引了成千上萬的設計者在 iPad、iPhone 上發展應用程式。往後谷歌的安卓系統學習這種生意經，也開設了 App 的店 -- Google Play。

對比之下，微軟公司沒有經營好這種生態系統。以至於無法挾其在個人電腦上的絕對優勢，推展 Windows 視窗系統到智慧手機和平板電腦市場上。

### 華為公司

最近中國大陸的華為公司，推出計算機軟體

交大計算機中心以 VAX 8800 建立校務行政電腦化系統，資工系則以較經濟的中階機種 VAX 11780 做教研用途，是當時國內使用 VAX 系列的先驅。

鴻蒙系統。鴻蒙有如浴火鳳凰，華麗地展翅在大眾面前。根據目前的態勢，在智慧手機，和平板電腦領域，蘋果的 iOS，谷歌的 Android，和華為的鴻蒙，將鼎足而三分天下。 在個人電腦領域，可能由微軟的 Windows，和華為的鴻蒙，來分庭抗禮。「請看明日之域中，竟是誰家之天下！」我們可拭目以待。

## 三 . 電腦中文輸入的一些想法

我到新竹交大任教後，曾經參與謝清俊教授領導的中文電腦研究。那時市面上並沒有方便好用的中文系統，要發展一個實用的中文系統，必須篳路藍縷，披荊斬棘，自行解決許多問題。舉例來說，那時英文螢幕端機已經漸漸普遍，要做一個中文螢幕端機，必須修改螢幕的控制，用較大的 24X24 或 32X32 點陣，來顯示中文字。如何用較小的鍵盤，輸入中文字，則更是一個困擾大家多年的問題。謝教授提出一個很好的解決方案。方法是統計解析近萬個中文字型，定出約 200 餘個中文字根。使得每一個字都能用橫連、直連、包含、三種簡單的組合方法用字根組成字。每個中文字對應一個單一的字根序列。如此發展出中文字根端機，往後更成功地應用到公路監理建教合作計畫中。

1975 年在台北圓山飯店舉行了一個「國際電子計算機會議」。新竹交大是主要的協辦單位。如何使電腦中文化則是其中一個主要議題。和眾多海內外朋友互相切磋，有如一場圓山論劍盛會。「有朋自遠方來，不亦樂乎 ！」。

記得早年在台北國科會，曾開過幾次會，討論電腦如何中文化的問題。有一位老先生每次不請自來，極力主張中文應該拉丁化，才能解決中文輸入的難題。由於這個問題的困難度，我們可以理解他的担憂，「知我者，謂我心憂」。然而，中文文字記錄的是中國幾千年的歷史，中文也承載著燦爛的中華文化的進展，豈可輕言拋棄！

到今天，半個世紀過去。很慶幸經過大家幾十年的努力，讓我們有能力編織好鞋給腳穿，而非勉強去削切腳來適應鞋子。

下面我們檢視三個可以在平板電腦上，很自然地輸入中文的方法。

### 語音識別

會說中國話，就可以用語音自然輸入。速度快，每分鐘大約 100 個字。準確率可達 90%。缺點在於，在有噪音的環境下，準確率會下降。聲音也會干擾別人，在有些場合不適用。另外，有些字句不會唸，或會唸錯，也不能用發聲音來輸入。

### 手寫識別

會寫中國字的人，就可以很自然的在觸控板上，用手寫來輸入中文。由於每個中文字平均大約 7 到 8 筆劃，手寫輸入的速度稍慢，估計約為每分鐘 20 到 40 個字。手寫識別準確率極高，將近百分百。當然，偶然也會有會唸卻不會寫的字。

### 音符輸入

用每個字的發音音符，不管是注音符號，或是漢語拼音，都是稍加學習，就很容易上手來輸入中文。音符輸入的準確率高，大於 90%，但是也有有些字會寫卻不會唸的問題。音符輸入有個特別的好處是輸入時不發聲音，不會吵人，「此時無聲勝有聲」。

音符輸入法用部分比對 (Partial Match) 和其他程式技巧，每個字只需要約在虛擬鍵盤上點一個鍵，輸入速度可以達到每分鐘 50 到 100 個字。

以上三種中文輸入法有很明顯的互補性。只要在它們間互相切換，就可以在各種情況下方便快速地輸入中文。

有一個值得探討的有趣問題，就是中文字的一字一音，實際上反而有利於輸入方法的設計。舉例來說，「床前明月光」的一個英文翻譯是 "The moonlight shines brightly upon my bed"。不管用語音，手寫，或者是用音符，輸入這句中文，不會比輸入這段英文翻譯更困難。

1973 交通大學資工系研發的全世界第一個中型中文鍵盤





# Witnessing the Evolution of the Computer Age — My Reflections and Thoughts

By Min-Wen Du, Retired Professor and Former Chair of the Department of Computer Science

Humanity has used tools to aid in numerical computation for thousands of years. However, it was only in the past century, following the invention of electronic computers, that this field advanced by leaps and bounds. Our generation has had the privilege of living through this era of rapid transformation. I often reflect that, while each of us experiences this evolution with our own limitations—seeing only a partial view of the whole—collectively, our observations can serve as a meaningful testimony to the history of computing.

What follows is a personal account—an offering from a humble perspective—of my journey from electrical engineering into the computer field, my views on the rise and fall of major companies in the industry, and some thoughts on Chinese input for computers.

## 1. From Electrical Engineering to Computer Science

When I was in my senior year at the Department of Electrical Engineering at National Taiwan University (NTU) in 1965, Taiwan launched a program to invite foreign scholars for teaching visits. Through this initiative, Professor Hua-Chun Tung from Cornell University came to our department. I enrolled in his course on Modern Algebra, which was foundational to computer science. Having had no prior exposure to this field, the class was a revelation to me. It sparked my interest and ultimately guided me toward a career in computing.

After completing my military service, I enrolled in the Graduate Institute of Electronics at National Chiao Tung University (NCTU, now NYCU) in Hsinchu for one year. At the time, the university had a strong faculty in computing. I took courses such as Automata Theory with Professor Chao-Chih Yang and Logic Circuit Design with Professor Hoffman. I also recall Professor Tze-Ren Chang leading a team in refining their Fortran compiler. When they completed the project, we all celebrated—it was a major accomplishment at the time.

In 1968, I began my doctoral studies at Johns Hopkins University in the U.S., which, like NCTU, was a smaller institution with a strong research focus. At that time, computer science departments were springing up across the U.S., though fewer than a hundred universities had them. I was admitted into the inaugural cohort of the computer science Ph.D. program—there were only three of us.

I earned my doctorate in 1972 and returned to teach at NCTU. Over the years, the university established its own Department of Computer Science and later a master's program. At that time, all the faculty were quite young—the average age was under 30—and the energy was palpable. We even played basketball and soccer with the students outside of class, which was great fun.

Later, a Ph.D. program was established, attracting top students from across Taiwan. It was a joy to learn alongside them and to see them later achieve great things in academia and industry. Working together to advance Taiwan's computing and information sector has been a tremendous honor and a true source of happiness.

## 2. The Rise and Fall of Major Companies in the Computing Industry

While the evolution of computer technologies has mostly been a steady, incremental process, this same progress has sometimes led to dramatic, unpredictable shifts in the fortunes of major companies. Looking across the decades, one can see the relentless tides of change, sweeping away even the mightiest. Let's look at a few examples:

### 1. The Yellow Pages Business of Telephone Companies

In earlier times, the Yellow Pages were a highly profitable business. When people needed to buy something, they often consulted the Yellow Pages first. Small and medium-sized businesses were eager to advertise there. But with the rise of the internet, people found it easier to search online, and the Yellow Pages quickly became obsolete.

### 2. Bell Laboratories

Bell Labs was a legendary institution, a research powerhouse in the U.S. and globally. Its innovations laid the groundwork for modern technology: information theory, the transistor, the Unix operating system, the C programming language, and more.

In 1996, Bell Labs was spun off from AT&T to form Lucent Technologies, which manufactured networking equipment. From 1996 to 2000, during the explosive growth of internet applications, demand for networking hardware surged. Lucent's revenue soared for several years. But in 2000, the tech bubble burst, and Lucent collapsed within a year or two. The rise and fall were as dramatic as

a tidal wave. Overexpansion, coupled with sudden market shifts, left the company unable to pivot. Looking back at Bell Labs' glorious history, one can't help but feel regret.

A detailed analysis of Lucent's rise and fall can be found in The Rise and Demise of Lucent Technologies by William Lazonick and Edward March:

https://www.economicpolicyresearch.org/images/docs/SCEPA_blog/the_financial_crisis/lazonick_paper2_panel6.pdf

**3. The Computer Manufacturing Industry**

Early computer manufacturing was dominated by IBM, which released many popular mainframes. NCTU once acquired both the IBM 650 and IBM 1620 for its computer center. Programs were written using punch cards, submitted through a small window. Later, with the advent of minicomputers, the center acquired a PDP-11 from Digital Equipment Corporation (DEC), which could connect to 16 terminals and allow online input—a major improvement.

In the early 1980s, IBM launched the personal computer (PC), partnering with Intel for hardware and Microsoft for software. Computer performance improved rapidly, while costs decreased, bringing PCs into mainstream use. This shift put tremendous pressure on mainframe manufacturers. IBM transitioned into software and services and managed to remain viable. DEC, however, and many other minicomputer makers, failed to adapt and quietly faded away. Truly, "the green hills remain, but how many sunsets have passed?"

The information industry is fiercely competitive. Every company must develop unique strengths to survive. Let's look at a few standout cases:

**Microsoft**

Started with system software and went on to develop the Windows platform, which used event-driven programming—a break from traditional sequential programming. Microsoft also offered a powerful and user-friendly development tool, Visual Studio, making it easier to design Windows applications.

Its Office suite, especially Word, could handle multiple languages, scientific formulas, and even web links—truly versatile tools. Windows and Office remain Microsoft's two core revenue sources.

**Google**

Google began as a search engine. In the past, academic research required days or even months in libraries. Today, with a few keystrokes, we can retrieve the same information in seconds.

In its early years, Google's top search results were sometimes irrelevant, but its algorithms have improved significantly over time. Many competitors once vied for dominance in search, but Google emerged on top for good reason.

**Apple**

Apple made a stunning breakthrough with the iPhone in 2007 and the iPad in 2010. Unlike traditional PCs, these devices used touchscreens as the primary interface—enabling writing, speaking, listening, and viewing. They were portable and affordable, quickly winning over the public.

The Apple Store was another innovative concept, taking a 30% cut from app sales and creating a thriving ecosystem that attracted countless developers. Google later followed suit with Google Play for Android.

Microsoft, by contrast, failed to establish a similar ecosystem and thus could not extend its dominance in the PC market to smartphones and tablets.

**Huawei**

Recently, Huawei launched its HarmonyOS, a bold new operating system that dazzled like a phoenix rising from the ashes. In mobile and tablet computing, Apple's iOS, Google's Android, and Huawei's HarmonyOS may form a three-way balance of power. In the PC realm, we might see a rivalry between Microsoft's Windows and HarmonyOS.

"Let us see whose domain it will be tomorrow!"

## 3. Thoughts on Chinese Input Methods for Computers

After I joined NCTU, I participated in Chinese computing research led by Professor Hsieh Ching-Chun. At the time, there were no convenient Chinese systems available. Developing one involved overcoming numerous challenges. For instance, English terminals were becoming common, but displaying Chinese characters required larger dot matrices (24x24 or 32x32) and modified screen controls. Entering Chinese characters with a small keyboard was another major hurdle.

Professor Hsieh proposed an excellent solution: by analyzing nearly ten thousand Chinese characters, he identified around 200 character components or radicals. Each character could be constructed using combinations of these components via horizontal linking, vertical linking, or enclosure. This allowed each character to be mapped to a unique root sequence, leading to the creation of a root-based Chinese input terminal. This system was later successfully applied in a collaborative project with the Highway Bureau.

In 1975, an "International Conference on Electronic Computing" was held at the Grand Hotel in Taipei, with NCTU as a major co-organizer. One key topic was how to sinicize computers. Engaging with experts from around the world felt like a martial arts tournament of minds at Yuanshan—"What a joy to have friends visiting from afar!"

I also recall several meetings held at the National Science Council in Taipei to discuss Chinese computing. An elderly gentleman would always attend uninvited, passionately advocating for the Latinization of Chinese to solve the input problem. Given the difficulty of the task, we could understand his concern—"Those who understand me know my worries."

However, Chinese characters carry millennia of history and culture. They cannot be discarded lightly.

Now, after fifty years of effort, we're fortunate to have shaped our tools to fit our needs, rather than forcing ourselves to conform.

Let me describe three intuitive Chinese input methods for tablet devices:

**1. Speech Recognition**

If you can speak Chinese, you can input text naturally. It's fast—around 100 characters per minute—with about 90% accuracy. However, noisy environments reduce effectiveness, and speaking aloud can disturb others. Also, you can't speak characters you don't know how to pronounce.

**2. Handwriting Recognition**

If you can write Chinese, you can input it by writing on a touchscreen. Each character averages 7–8 strokes, so speed is slower—about 20 to 40 characters per minute—but accuracy is nearly 100%. Of course, some characters are easier to pronounce than write.

**3. Phonetic Input**

Using phonetic symbols (Zhuyin or Pinyin), users can input text after minimal learning. Accuracy exceeds 90%, but some characters may be easier to write than to pronounce.

A major advantage is that it's silent—"Sometimes silence speaks louder than words." With techniques like partial matching, each character can be input by pressing only one virtual key, enabling speeds of 50–100 characters per minute.

These three methods complement one another. By switching among them, users can efficiently input Chinese in any situation.

An interesting point worth discussing is how Chinese characters each have a unique pronunciation, which actually benefits input method design. For example, the famous line "床前明月光" (Moonlight before my bed) translates as "The moonlight shines brightly upon my bed."

No matter which input method—speech, handwriting, or phonetic—you use, entering the original Chinese is no harder than entering the English translation.

Second from the left in the front row is Professor Min-Wen Du.

# 義大利人的通信革命

文／林一平 講座教授

當義大利軍事天才加里波底（Giuseppe Garibaldi; 1807—1882）遇到發明家梅烏奇（Antonio Meucci; 1808—1889），會對歷史產生何種潛在影響？我們有無限想像的空間。

加里波底（Giuseppe Garibaldi; 1807—1882）。
圖 / 林一平繪

1850 年 7 月，加里波底由義大利流亡抵達紐約，尋求當地的義大利朋友的庇護。他結識了發明家梅烏奇。梅烏奇邀請加里波底在他在史泰登島的蠟燭廠工作。

加里波底和梅烏奇建立了深厚的關係。梅烏奇正在研發一種革命性的通訊設備，亦即今日的電話。在某個寧靜的夜晚，梅烏奇向加里波底展示了他正在開發的電話技術。加里波底被這個設備的潛在用途所震驚，他迅速看到了將其應用於戰爭的可能性。梅烏奇告知加里波底快速架設電話的方法，而加里波底想出戰爭通訊的應用。

在加里波底的督促下，梅烏奇在他的蠟燭廠進行實驗和改進電話技術。這不僅是一項科技的挑戰，也是一項時間的挑戰。在短短的幾個月內，梅烏奇成功地改進了電話的性能，使其更適合在戰場上使用。加里波底進行了一系列測試，確保這種新的通信方式在戰場上足夠穩定和可靠。

1859 年 4 月，加里波底回到義大利。當時奧地利人對薩丁王國宣戰。加里波底召集了「卡恰托里」（Cacciatori）志願軍，牽制奧地利軍隊。他將梅烏奇的電話技術引入了他的指揮系統，迅速地展示了其優勢。通過電話，他能夠迅速下達命令，適應快速變化的戰場情勢，並在敵軍之間迅速傳遞情報。

奧地利人在 5 月 10 日開始撤退至倫巴第，電話即時告知加里波底，讓他指揮的卡恰托里志願軍能快速轉移，緊隨其後。卡恰托里的戰略使奧地利倍感壓力，迫使奧地利軍隊分散兵力，應對倫巴第城市可能爆發的起義。5 月 27 日，在斥候以電話回報敵人動向後，志願軍在聖費爾莫（San Fermo）與烏爾班的部隊交戰，取得了決定性的勝利。之後，加里波底於 5 月 27 日進入倫巴第，宣告其併入薩丁王國。

烏奇（Antonio Meucci; 1808—1889）。
圖 / 林一平繪

這場戰役展示了加里波底志願者的勇氣和效率。他的軍隊迅速獲得了一系列的勝利，歸功於他們能夠有效地組織和協調。他們的電話網絡不僅在指揮部和各單位之間發揮作用，還在各個戰場上建立了更加靈活的溝通鏈接，為後來的義大利復興運動（Risorgimento）奠定了基礎。在這段期間，梅烏奇一直保持聯繫，為加里波底貢獻通信技術方面的獨到見解。

1861 年美國南北戰爭爆發，加里波底自願為林肯總統 (Abraham Lincoln， 1809—1865) 效力。1861 年 7 月 17 日，加里波底在北軍中獲授少將階級。他告訴林肯如何運用電話通訊，以電報指揮北軍，成為戰爭成敗的關鍵。梅烏奇的通訊技術，在加里波底的巧妙運用下，成為一個傳奇性的軍事發明，不僅改變了戰爭的動態，還在未來的時代對通信產生了深遠的影響。





# The Italian Communication Revolution

What impact might history have witnessed if the Italian military genius Giuseppe Garibaldi (1807–1882) had encountered the inventor Antonio Meucci (1808–1889)? The possibilities are limitless.

In July 1850, Garibaldi arrived in New York as an Italian exile, seeking refuge with fellow Italians. There, he met inventor Meucci, who invited him to work at his candle factory on Staten Island.

Garibaldi and Meucci developed a strong friendship. Meucci was working on an innovative communication device that would later be known as the telephone. One quiet evening, he demonstrated this technology to Garibaldi, who was impressed by its potential. Garibaldi immediately recognized how it could be utilized in warfare. Meucci then explained how to set up the telephone quickly, prompting Garibaldi to brainstorm ways to use it for communication during wartime.

At Garibaldi's urging, Meucci conducted experiments and made improvements to telephone technology at his candle factory. This endeavor was not only a technological challenge but also a race against time. Within a few months, Meucci successfully enhanced the telephone's performance, adapting it for use on the battlefield. Garibaldi then carried out a series of tests to ensure that the new communication method was stable and reliable enough for wartime conditions.

In April 1859, Garibaldi returned to Italy just as the Austrians declared war on the Kingdom of Sardinia. He rallied the 'Cacciatori,' a volunteer army, to resist the Austrian forces and integrated Meucci's telephone technology into his command system, quickly demonstrating its advantages. With the telephone, he could issue orders swiftly, adapt to the rapidly changing battlefield, and transmit intelligence between his troops in real-time.

On May 10, the Austrians began their retreat toward Lombardy. The telephone alert quickly informed Garibaldi, enabling his Cacciatori volunteer army to reposition and follow closely behind. This strategy exerted tremendous pressure on the Austrians, forcing them to stretch their forces thin to address potential uprisings in the Lombard towns. On May 27, after scouts reported enemy movements via telephone, the volunteer army engaged the Austrian troops at San Fermo and achieved a decisive victory. Following this success, Garibaldi entered Lombardy on May 27 and announced its annexation to the Kingdom of Sardinia.

The battle showcased the bravery and effectiveness of Garibaldi's volunteers. His army quickly achieved a series of victories due to their strong organization and coordination. Their telephone network was crucial in connecting the command center with various units and establishing flexible communication links across different battlefields. This laid the groundwork for the future Italian unification movement, known as the Risorgimento. During this time, Meucci maintained contact with Garibaldi, providing him with valuable insights into communication technology.

When the American Civil War began in 1861, Giuseppe Garibaldi volunteered to serve under President Abraham Lincoln (1809–1865). On July 17, 1861, he was appointed as a major general in the Union Army. Garibaldi advised Lincoln on how to utilize telephone communication to direct Union forces via telegraph, which became a crucial component in the war's outcome. Through Garibaldi's innovative use of this technology, Antonio Meucci's communication inventions gained recognition as legendary military advancements. These innovations not only changed the dynamics of warfare but also had a lasting impact on communication in the years that followed.

# AI 知識幻覺

**文／林一平 講座教授**

布爾斯汀（Daniel J. Boorstin; 1914-2004）。
圖 / 林一平繪

哈佛前校長 Bok 有一句名言常被學校用來說服學生繳納學費：「如果你覺得教育昂貴，那就試試無知吧（If you think education is expensive, try ignorance）。」這樣的說法真能反映現實嗎？這是個值得深入探討的問題。美國國會圖書館前館長布爾斯汀（Daniel J. Boorstin）則認為，「無知」並非進步的最大阻礙，「知識的幻覺」才是人類探索和創新活動的主要障礙。他說：「過去一些偉大的發現者都與現有已知的事實和學過的知識作鬥爭。要突破這種知識的幻覺，不僅需要深厚的學識，更需要極大的想像力來超越現有框架。」

隨著 AI 技術在各行各業中的廣泛應用，最令人擔憂的是陷入「AI 知識幻覺」的陷阱。今日我們常用的 AI 技術，不論是分析型（Analytic）AI 或生成式（Generative）AI，都依賴正確標註的數據進行訓練。然而，許多學校在教授 AI 時往往忽略了數據本身的重要性。結果，學生們常常不清楚輸入數據的特性，甚至標註錯誤，未經驗證就急於將數據投入 AI 模型，導致「垃圾進，垃圾出」（Garbage in, Garbage out）的現象。這種不適當的 AI 發展不僅浪費了大量的算力和電力，還助長了「AI 知識幻覺」。結果是，教育成本隨之增加。因此，學生學習如何理解和使用正確的數據（包括質與量）才是台灣是否能 AI 大躍進的關鍵。

台灣可用於 AI 訓練的數據量遠少於美國和中國。而數據格式的混亂及不互通更成為阻礙 AI 技術發展的重要挑戰。農業部洞悉此一問題，在發展智慧農業時特別重視數據格式的標準化，讓各種農業物聯網設備能互通，這是一個具有遠見的舉措。在業界，不少公司早已注重數據科學（Data Science），例如華邦電子在其新進員工訓練中加入了數據科學相關內容，讓他們了解能處理公司數據的重要性，我也有幸曾受邀擔任相關課程的講師。

經濟部中小企業署最近積極規畫培訓傳統企業導入 AI，並邀請專家學者編撰教學教材。署方在檢視初版授課大綱後，發現教材偏重於資訊專業論述，不適合其他非資訊領域的學員。經過多次討論後，我們認為課程重點應該是讓學員了解數據，而非專注於學習 AI 模型的原理。例如在紡織廠，員工需要學習的是了解紡織機生成的數據代表什麼意義、如何正確標註這些數據，並知道如何找到對應的 AI 工具來解決問題。在運用 AI 工具時，講師不應要求紡織員工學習電腦語言、修改ＡＩ模型或填寫超參數，因為這樣會增加學習難度。正確的方法是找到友善的 AI 工具，學員只需通過圖形化介面輸入專業數據即可獲得結果，無需編寫程式。

我的結論是，非資訊領域的百工百業要實現 AI 賦能，應培訓員工了解其專業數據，並提供不需編寫程式的 AI 工具。而 AI 專家的責任則在於開發這樣的無碼工具，最好能如 ChatGPT 這般親民。只有百工百業的員工了解自己專業的數據，運用 AI 時才不會造成知識的幻覺。

**林一平**
**國立陽明交通大學資工系終身講座教授暨華邦電子講座**

現為國立陽明交通大學資工系終身講座 教授暨華邦電子講座，曾任科技部次長，為 ACM Fellow、IEEE Fellow、AAAS Fellow 及 IET Fellow。研究興趣為物聯網、行動計算及系統模擬，發展出一套物聯網系統 IoTtalk，廣泛應用於智慧農業、智慧教育、智慧校園等領域 / 場域。興趣多元，喜好藝術、繪畫、寫作，遨遊於科技與人文間自得其樂，著有 < 閃文集 >、< 大橋驟雨 >。






# AI Hallucinations

Former Harvard President Derek Bok is often quoted by universities trying to justify the cost of tuition: "*If you think education is expensive, try ignorance.*" But does that statement really hold up? It's a question worth exploring. Daniel J. Boorstin, former Librarian of Congress, offered a different perspective. He argued that the greatest barrier to discovery is not ignorance — it is the illusion of knowledge. As he put it: "*Some of history's greatest discoverers struggled against what was already 'known.' Overcoming this illusion of knowledge requires not only profound understanding but also immense imagination to break free from existing frameworks.*"

As AI technology continues to expand across industries, one of the growing concerns is the increasing risk of falling into the trap of "*AI hallucinations*." Today's widely used AI models, whether analytic or generative, rely heavily on accurately labeled data for training. Yet, many educational institutions still overlook the foundational importance of data when teaching AI. As a result, students often lack a clear understanding of the data they use. In some cases, they mislabel it or skip proper validation altogether, rushing to feed flawed inputs into AI models. This leads to the well-known issue of "garbage in, garbage out." Such careless practices not only waste computing power and energy but also reinforce false confidence in AI-generated results—deepening the problem of AI hallucinations. Over time, this contributes to rising educational costs. The key to unlocking Taiwan's potential for a breakthrough in AI lies in equipping students with the skills to understand, evaluate, and appropriately utilize accurate data—both qualitative and quantitative.

Taiwan possesses significantly less data available for AI training compared to countries like the United States and China. On top of that, inconsistent data formats and limited interoperability pose major challenges to the advancement of AI technologies. In response, the Ministry of Agriculture has made standardization of data formats a key priority in its efforts to advance smart agriculture—enabling seamless communication between various agricultural IoT devices. It's a forward-looking initiative that shows real foresight. In the private sector, many companies are also placing greater emphasis on data science. For example, Winbond Electronics has incorporated data science into its onboarding program for new employees, helping them understand the importance of effectively managing and utilizing company data. I was honored to be invited as a guest lecturer for one of these sessions.

The Small and Medium Enterprise Administration (SMEA) under the Ministry of Economic Affairs has recently taken proactive steps to support traditional industries in adopting AI by launching training programs and inviting experts and scholars to develop the course materials. However, after reviewing the initial curriculum draft, the administration found it too heavily focused on technical computer science concepts, making it difficult for participants without an IT background to engage with. After multiple rounds of discussion, we concluded that the course should focus primarily on helping participants understand data rather than diving into the technical foundations of AI models. Take a textile factory, for example—what employees need is the ability to interpret data generated by machines, annotate it accurately, and identify the right AI tools to address practical, real-world challenges. When introducing these tools, instructors shouldn't expect workers to learn programming, fine-tune AI models, or adjust complex settings like hyperparameters—doing so would only create unnecessary barriers. Instead, the course should focus on intuitive, user-friendly AI tools that let participants input domain-specific data through simple interfaces and get meaningful results, all without writing a single line of code.

In conclusion, for AI empowerment to take root across diverse non-IT industries, employees must be trained to understand the data relevant to their field and equipped with AI tools that require no programming skills. It's the responsibility of AI experts to create these no-code solutions—ideally as intuitive and easy to use as ChatGPT. Only when professionals in various industries truly understand their own data can AI be applied effectively, without falling into the illusion of knowledge.


**Dr. Jason Yi-Bing Lin**

**Lifetime Chair Professor of the Department of Computer Science at National Yang Ming Chiao Tung University and Winbond Chair Professor**

Dr. Lin is currently a lifetime chair professor of the Department of Computer Science at National Yang Ming Chiao Tung University and Winbond chair professor. He is an ACM Fellow, IEEE Fellow, AAAS Fellow and IET Fellow. His research interests include Internet of Things, mobile computing, and system simulation. He has developed an Internet of Things system called IoTtalk, which is widely used in smart agriculture, smart education, smart campus, and other fields. He has a variety of interests, such as art, painting, and writing, as well as voyaging through science, technology, and humanities.

# 陽明交大林奇宏校長與 YouTube 創辦人陳士駿 Steve Chen 對談

## 從矽谷到台灣：以二十年矽谷經歷 助力台灣新創躍上國際舞台

文／杜懿洵

國立陽明交通大學資訊學院陳志成院長邀請 YouTube 創辦人陳士駿先生（Steve Chen）於 11 月 13 日至本校演講，全程由林奇宏校長主持、對談。身為獲得台灣政府頒發第一張就業金卡的海外人才，Steve 也分享了自身在矽谷從員工到創業的 20 年經歷，並比較自疫情停留在台灣的五年期間，對於台灣新創的觀察與建議。

### 從 PayPal 到 YouTube：Steve 分享從員工到創業的兩次矽谷經歷

2005 年 2 月，Steve 以 CTO 的身份成為 YouTube 的共同創辦人，隔年 10 月，YouTube 以 16.5 億美元的價格出售給 Google，此段至今讓人津津樂道的成就，源自於 Steve 在大四那年決定輟學加入 Paypal 的經歷。而針對「輟學加入 PayPal」，以及大膽創業 YouTube，林校長也好奇 Steve 的「冒險精神」從何而來？Steve表示，決策沒有百分之百的確定性，風險主要歸結於概率和計算。

### 給台灣新創的建議：國際化眼光的市場思維與以色列的混合工作模式

而對於這幾年回到台灣之後，對於台灣創業機會的看法，Steve 則表示，因為疫情之故，至今已留在台灣五年，而在他意識到將會長期待在台灣的時候，他便開始探索在台灣創建一家成功公司的條件，並試著像在矽谷一樣，籌資並招聘人才；然而，他發現了幾件具有挑戰性的事情：一是必須更專注於國際市場，而不僅僅只是針對台灣 2300 萬的人口而已。Steve 表示，他常常看到即使是市場的主導者，也很容易將國際化視為是一件「翻譯」的事情，認為如果第一版發布得好的話，第二版就可以將產品翻譯、推向國際，但事實上，一個產品如果要在全球市場運作的話，它的第一次發布就得直接瞄準全球市場，而不是將在地市場的產品進行翻譯而已，此外，除了產品之外，還有很多其他問題，像是時機等等。

第二件 Steve 觀察到的事情則是「台灣創業公司的文化差異」。在矽谷，大部分的員工會想要公司的股票選擇權，這使得矽谷的生態系統是公司與員工的利益一致，如果公司失敗、大家都會失敗，你不是在為員工的薪水籌款，是在為公司本身籌款。而在台灣，這樣的情況比較是相反的。所以，如果考量國際化、語言、文化等因素，如果要做全球市場，目前可能香港或新加坡還是會相對容易一些。不過，Steve 也指出，他人目前還待在台灣，並且非常投入台灣的新創，甚至與通過金卡計畫、來自世界各地的許多企業家也都定期聚會、在台灣創辦公司，甚至創辦基金幫助當地初創公司，主要的原因除了是以上這些挑戰都可以克服之外，他認為台灣的工程師品質，即使與矽谷相比，也是非常好的，而這樣的狀況也讓他覺得或許台灣可以思考像是以色列的混合模式，即共同創辦人在矽谷，但主要團隊仍然在以色列。

Steve 認為，AI 所帶來的將是一個有趣的時代，即使有些事情會消失，也或許 AI 會走向失控，但也許大家還是可以思考比較一下，AI能做什麼、不能做什麼，以及什麼可以做得更好。Steve 也以自己的小孩舉例，表示他至今仍舊不同意他的小孩下載 TikTok，也不喜歡他看YouTube 短片，然而，當他去小孩的學校演講時，卻發現大家長大後都想成為 YouTuber，因此，他覺得這是一個有趣的現象，無論內容好壞，市場有它的發展方向，所以他也建議現場的學生們，不要去複製矽谷的公式，而是去回想做事情所面臨的障礙和挑戰，然後儘量冒險，以及如果確實有一個想法，請在了解嘗試的機會與成本之後，就去測試，至少給他第一次嘗試，並希望大家在結婚或是有小孩之前，無論成功與否，都可以至少給自己一次機會去創立一家創業公司！

# A Conversation Between Dr. Chi-Hung Lin, President of National Yang Ming Chiao Tung University, and YouTube Co-Founder Steve Chen

## From Silicon Valley to Taiwan: Drawing on Two Decades of Experience to Drive Taiwan's Startups onto the Global Stage

Dr. Jyh-Cheng Chen, Dean of the College of Computer Science at National Yang Ming Chiao Tung University, invited YouTube co-founder Steve Chen to lecture on November 13. The event was hosted and moderated by President Chi-Hung Lin. As the first overseas talent to receive Taiwan's Employment Gold Card, Steve shared his 20-year journey from employee to entrepreneur in Silicon Valley. He also reflected on his five years in Taiwan since the pandemic, offering valuable insights and advice on the local startup ecosystem.

### From Paypal to YouTube: Steve Reflects on His Two Silicon Valley Journeys from Employee to Entrepreneur

In February 2005, Steve co-founded YouTube as its CTO. By the following October, the platform was sold to Google for $1.65 billion—an iconic achievement that continues to capture attention today. This success can be traced back to Steve's bold decision to drop out of college during his senior year and join PayPal. When President Lin expressed curiosity about the source of Steve's "adventurous spirit" and his willingness to take such risks, Steve explained that decisions are never completely certain and that risk is largely a matter of probability and careful calculation.

### Advice for Taiwanese Startups: Adopting a Global Market Perspective and Israel's Hybrid Work Model

Reflecting on his experience with startup opportunities in Taiwan since his return, Steve shared that, due to the pandemic, he has now been in Taiwan for five years. Once he realized he would be staying long-term, he began exploring what it would take to build a successful company in Taiwan, focusing on fundraising and talent recruitment, just as he had in Silicon Valley. However, he encountered several challenges. One key insight was the importance of focusing on international markets rather than limiting attention to Taiwan's 23 million people. Steve pointed out that even top companies may mistakenly see internationalization as simply a "translation" task. They assume that if a product's initial release is successful, the next version only needs to be translated and can then be launched globally. However, for a product to succeed in international markets, its initial release must be specifically tailored for those markets rather than being a modified version of a local product. Additionally, factors like timing and strategy are crucial for achieving success.

Steve's next observation was the "cultural differences in Taiwan startups." In Silicon Valley, most employees seek stock options, aligning their interests with the company's. If the company fails, everyone fails together—fundraising is focused on the company's growth, not employee salaries. In contrast, the situation in Taiwan tends to be quite different. As a result, factors such as internationalization, language, and culture make it relatively easier to expand into global markets from places like Hong Kong or Singapore. However, Steve emphasized that he is still based in Taiwan and highly engaged in the local startup ecosystem. He frequently meets with entrepreneurs worldwide through the Golden Card Program, establishes companies, and even sets up funds to support local startups. Despite the challenges, Steve believes the high quality of engineers in Taiwan—on par with Silicon Valley—is a key factor. This, in turn, leads him to consider that Taiwan could adopt a hybrid model like Israel's, where the co-founders are in Silicon Valley, but the main team remains in Israel.

Steve believes that AI will bring about an exciting new era. While some things may fade away and AI might become uncontrollable, it still allows people to consider what it can and can't do and where it can be improved. He shared an example involving his own children, saying that he still disagrees with them downloading TikTok and dislikes their habit of watching YouTube shorts. However, when he gave a talk at their school, he was surprised to learn that many students aspired to become YouTubers. He found this phenomenon fascinating—regardless of the quality of content, the market clearly has its own direction. Steve advised the students not to imitate Silicon Valley's approach blindly but to reflect on the challenges they face, take risks, and, if they have a strong idea, test it after considering the potential opportunities and costs. At the very least, he encouraged them to give it a try. He hopes that, before they settle down with marriage or children, everyone will take the chance to start a company—whether it succeeds or not.

# Google DeepMind 傑出科學家 紀懷新博士演講：The Future of Discovery Assistance

文／趙林緯 智能系統研究所碩士生

紀懷新博士是人工智慧領域中備受推崇的研究者，他的一篇關於「Chain-of-Thought 提示語在大型語言模型中的效用」的論文被引用次數超過八千次。他目前擔任 Google DeepMind 的研究副總裁，並在過去十年中深度參與推薦系統的發展，涵蓋 YouTube、廣告、新聞以及其他 Google 搜尋相關功能，因此對推薦系統的未來有許多見解可分享。

演講一開始，他介紹了推薦系統的三大組成要素：使用者、情境與物品。當這三者中的任何一項或全部被移除時，就會產生不同的推薦情境。例如，若三者皆無，那就屬於「大眾行銷」的範疇，也就是不考慮誰接收資訊、推薦什麼給誰，而是對所有人推薦相同的內容。

目前，上述各種推薦情境皆已使用神經網路處理，且每次皆使用相同的模型。紀懷新博士強調這種推薦方式的重要性，但他隨即提出一種顛覆性的轉變：由大型語言模型（LLMs）所帶來的新時代。他提到 Transformers 正是這場變革的核心技術，驅動著 Google 的 Project Astra ——一個能夠辨識情境的多模態助理。演講中展示了該系統的實時操作影片，能夠辨識使用者所處位置、手繪草圖，並記得之前看過物品的位置。他稱這是推薦系統的下一世代技術，能夠辨識你附近的餐廳、營業時間，甚至依照你最近的搜尋紀錄判斷你是否有特定口味偏好等。

當這種概念應用在如 YouTube 這樣的平台時，推薦系統將不再只是預測你最可能觀看的影片並推送，而是每部影片都會反映出你當下的心理與情境狀態，並即時調整推薦內容。雖然從傳統推薦系統轉向基於大型語言模型的推薦系統會需要一段時間適應與不斷調整，紀懷新博士認為最終它會大幅提升系統的效能與準確度。

在演講的結尾，紀博士以一段令人感同身受的話語收尾：他指出台灣年輕人對於提出新想法普遍較為保守，也許與我們教育體系過度強調「正確答案」而非「創新思維」有關。在整場演講中，他多次鼓勵學生發言，並發送貼紙作為互動的獎勵。他也提到，儘管台灣目前缺乏從事大型語言模型推薦系統研發的環境，他仍希望大家對未來充滿信心。

演講結束後，許多學生圍上講台，詢問關於大型語言模型現況的問題，特別是關於「人工通用智慧」（AGI）的相關議題。紀懷新博士的回應是：專注於創造出一個優秀的產品，其餘的交由時間與社會共識去定義。作為一名研究者，這樣的思維相當值得學習，因為歷史的演進需要時間與集體的共識，而非單靠個人之力。或許有一天，我們回顧人工智慧的歷程時，會驚覺我們早已達成當初所追尋的目標。

# Speech by Dr. Ed. H. (VP of Research at Google DeepMind) The Future of Discovery Assistance

Ed H. Chi is a renowned researcher in the world of Artificial Intelligence, with citations over 8000 on a single paper focusing on the usefulness of Chain-of-Thought prompting in Large Language Models. He is currently the VP of Research at Google DeepMind, and has much to share on the future of Recommendation Systems, a topic in which he has played an integral part for the past decade, relating to YouTube, Ads, News and other Google search functionalities.

He starts the talk by introducing the three components of recommendation: user, context and item. By removing any one or all components, different scenarios arise. For example, without any components, the recommendation would be categorized as mass marketing, recommending to all without caring who or what receives it.

It is revealed that neural networks are currently used for all recommendations scenarios above, using the exact same model each time. Ed Chi emphasizes the importance of this mode of recommendation, only to break it all down by introducing the new wave of Large Language Model innovation. Transformers sit at the forefront of the new era, powering Google's Project Astra, a multi-modal assistant capable of recognizing context. Demo videos were shown of the system running in real-time, recognizing location, sketches and remembering the position of previously viewed items. He lauds this as the next generation of recommendation, being able to recognize the closest restaurant near you, their opening times, whether you're in the mood for certain foods based on your recent searches, etc.

Transferring this concept over to recommendation platforms like YouTube, they will no longer just predict the most likely video you'll watch and serve it, but every video as a reflection of your current state, and make changes accordingly in real-time. The transition to a Large Language Model based recommendation system might take some getting used to, and many tweaks until Google gets it right, but will ultimately become much superior at their given task.

Ending on a relatable note, Ed Chi points out the hesitance in Taiwan's youth to speak out about new ideas, perhaps due to our education system's emphasis on correct answers rather than innovative ones. Throughout the talk, he gives many chances for students to respond, and award stickers to those who do, promoting interaction. While Taiwan lacks the environment for Large Language Model recommendation research and development, he hopes that we all have a bright future ahead of us.

After the talk, many students approached the podium to ask questions regarding the current state of Large Language Models, especially the notion of Artificial General Intelligence. The reply was to focus on creating a great product, and let others worry about the definition. As a researcher, this is a great mindset to have, as general consensus has to be formed over time, and there's not much one individual can do about it. We might eventually look back on the history of Artificial Intelligence, and realized we had already achieved what we were searching for all along.

# 美國萊斯大學 Joseph R. Cavallaro 教授演講：Advances in Wireless Communication for 6G Systems: Algorithms, Architectures, and Testbeds

文／曹咏萱 資科工碩士生

講者 Joseph R. Cavallaro 來自於美國的萊斯大學 (Rice University)，現在是電腦工程 (Electrical and Computer Engineering) 學系的教授和副主任。他的研究領域主要涵蓋了計算機算數 (Computer Arithmetic) 及 DSP, GPU, VLSI 等架構在無線通訊上的應用。

本次演講的主題是關於無線通訊在 6G 網路系統上的進階應用，從架構設計、面臨的挑戰，一路到他們最新的研究方向。6G 無線通信系統包括多種先進的算法，以提供高速數據傳輸和更高的效率。所有這些無線算法在實現實時性能時，都會面臨不同的挑戰，包括計算、通信和 I/O 瓶頸，以及面積、時間和效能之間的權衡等。

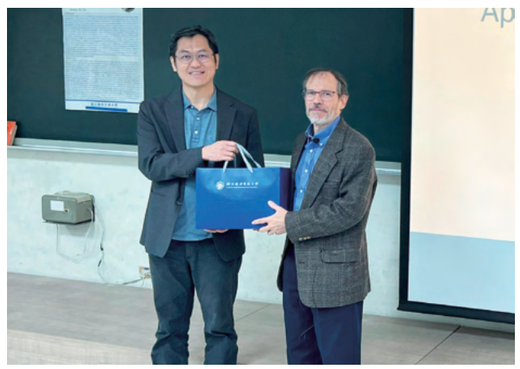
大規模 MIMO 系統隨著基站天線數量的增加，對高速數據、低延遲和擴展性需求的也隨之上漲，基帶處理的分散化 (Baseband processing decentralized) 就成了當中很重要的技術，將巨大的計算任務分配到多個節點或單元，而不是集中在單一的實體中來處理。Prof. Cavallaro 的團隊設計了一系列的算法來保證這些節點的計算結果在合成的時候能夠盡可能減少資訊的損失，並在分散式處理單元之間保持精確的同步。

此外，射頻功率放大器 (power amplifier, PA) 是 MIMO 系統中一個很重要的核心元件，確保發射信號具有足夠的功率來克服路徑損耗並到達目標用戶或接收端。PA 在非線性區域工作時效率最高，但非線性會降低波束形成的準確性並引入用戶間干擾，使得使用者無法得到最佳的服務，因此需要通過數字預失真 (DPD) 技術進行補償。在 Prof. Cavallaro 的研究中，他們將 DPD 放置在射頻功率放大器之前並設計 DPD 的核心組成來解決這個問題，並透過相鄰信道泄漏比 (Adjacent Channel Leakage Ratio, ACLR) 的數據來驗證他們的研究結果。

同時，Prof. Cavallaro 也介紹了幾個無線網路的測試平台。3DML CCRI Project 是一個無線領域中的機器學習平台，能夠自動收集使用者自定義的資料集。POWDER-RENEW 提供最先進的無線電、計算、存儲和雲資源，讓研究人員可以在規模化的現實環境中，獲得有價值的無線基礎設施進行實驗。

他們結合了這些現有平台的經驗，在今年夏天開始了設立一個新測試平台的計畫。在這個項目中，Houdini 是一個支持新頻段的軟件定義無線電系統，能夠同時訪問多個頻段，並生成多樣化的數據集，以支持先進的 AI/ML 研究。同時，這個平台也支援一些顛覆性的服務，例如無線感知 (Wireless Sensing) 和無線成像 (Wireless Imaging)。它們擴展了傳統通信系統的應用範疇，提供了新的功能和應用場景。這些技術不僅限於通信和數據傳輸，還能使無線設備進行環境監測、物體檢測、定位追蹤等多種感知任務。

Prof. Cavallaro 在這場演講中介紹了一系列自己的研究，很感謝能有這個機會見識到一流大學學者的研究成果，大開眼界的同時也收穫了許多心得。







# Speech by Dr. Joseph R. Cavallaro: Advances in Wireless Communication for 6G Systems: Algorithms, Architectures, and Testbeds

The speaker, Professor Joseph R. Cavallaro, is from Rice University in the United States, where he serves as a Professor and Associate Chair in the Department of Electrical and Computer Engineering. His research primarily focuses on computer arithmetic, and the application of DSP, GPU, and VLSI architectures in wireless communications.

The topic of his lecture was the advanced applications of wireless communication in 6G network systems, covering system architecture design, challenges, and his team's most recent research directions. 6G wireless communication systems involve a wide array of advanced algorithms designed to deliver high-speed data transmission and improved efficiency. However, achieving real-time performance with these algorithms poses significant challenges, including computational, communication, and I/O bottlenecks, as well as trade-offs between area, latency, and performance.

In large-scale MIMO systems, as the number of base station antennas increases, so do the demands for high-speed data, low latency, and scalability. This has made decentralized baseband processing a key technology — distributing the intensive computational tasks across multiple nodes or units rather than relying on a single centralized entity. Professor Cavallaro's team has developed a series of algorithms to ensure that the results computed by these distributed nodes can be synthesized with minimal information loss, while maintaining precise synchronization across the distributed processing units.

Another critical component in MIMO systems is the power amplifier (PA), which ensures that transmitted signals have sufficient power to overcome path loss and reach the intended users or receivers. PAs operate most efficiently in their nonlinear regions, but this nonlinearity can reduce the accuracy of beamforming and introduce inter-user interference, degrading the quality of service. To address this, digital predistortion (DPD) is used for compensation. In Professor Cavallaro's research, DPD modules are placed ahead of the PAs, and they designed core components of the DPD to address these issues. Their results were validated using Adjacent Channel Leakage Ratio (ACLR) measurements.

Professor Cavallaro also introduced several wireless network test platforms. The 3DML CCRI Project is a machine learning platform in the wireless domain that can automatically collect user-defined datasets. POWDER-RENEW offers state-of-the-art resources for radio, computation, storage, and cloud access, enabling researchers to conduct experiments with scalable and realistic wireless infrastructure.

Building on the experience from these platforms, his team launched a new testbed project this summer. In this project, Houdini is a software-defined radio system that supports emerging frequency bands, enabling access to multiple bands simultaneously and generating diverse datasets to support advanced AI/ML research. The platform also supports disruptive services such as wireless sensing and wireless imaging, which extend the capabilities of traditional communication systems by introducing new functions and applications. These technologies go beyond basic communication and data transmission, enabling wireless devices to perform environmental monitoring, object detection, location tracking, and various other sensing tasks.

In this lecture, Professor Cavallaro presented a broad range of his own research. It was a great privilege to learn from a scholar at a leading university, and the experience was both eye-opening and enriching.

# 美國東北大學 Tommaso Melodia 教授演講

## Open 6G: Towards Open, Programmable, and AI-Powered NextG Wireless System

文／林揚哲　網路工程研究所碩士生

Tommaso Melodia 教授是美國 Northeastern University 電機與電腦工程系 William Lincoln Smith Chair 教授，同時擔任該校 Institute for the Wireless Internet of Things（WIoT）創所所長，以及美國國家無線研究計畫「PAWR Project Office」的研究總監。他於羅馬大學 La Sapienza 完成整合式學碩學位（Laurea），並於 2007 年獲得 Georgia Institute of Technology 電機與電腦工程博士學位。Melodia 教授是 IEEE Fellow、國家科學基金會 CAREER Award 得主，並曾於 2018 年獲頒 Northeastern 工學院最高榮譽的 Søren Buus 傑出研究獎。他在無線網路與物聯網系統的建模、最佳化與實驗驗證方面具有深厚研究基礎，研究成果獲得美國 NSF、空軍研究室、海軍研究辦公室、DARPA 與陸軍研究所等單位長期支持。此外，他亦積極參與學術社群發展，曾擔任 IEEE Infocom 2018 程式委員會主席、IEEE SECON 2019、ACM Nanocom 2019、WUWNet 2014 等國際會議總主席，並曾任《IEEE Wireless Communications》、《IEEE Transactions on Mobile Computing》等期刊編輯。

在本次演講中，Melodia 教授深入剖析了 6G 的技術挑戰與研究方向，強調未來的無線系統將朝向開放（Open）、可程式（Programmable）與 AI 驅動（AI-Powered）的架構演進。他指出，現有的網路架構高度集中且封閉，由少數大型設備商主導，不僅限制創新，亦具有「供應商鎖定（Vendor Lock-in）」帶來的升級門檻過高的問題。封閉架構的網路使網路內部行為難以觀察、無法快速適應服務需求，導致網路部署與新服務變現的彈性大幅受限。

為因應日益複雜的無線環境與應用需求，Melodia 教授介紹了「Open RAN」與「Open 6G」架構，將 RAN 功能模組化，分離為 Radio Unit、Distributed Unit、Centralized Unit， 並虛擬化至邊緣或雲端平台。透過開放介面與軟體定義網路（SDN）理念，讓網路功能能被觀察、控制並自動化部署。他進一步介紹了由 O-RAN Alliance 所推動的 xApps（近即時控制應用）與 rApps（非即時策略應用）架構，以及 dApps（Distributed Apps），透過 dApps，用戶可以將自己定義的邏輯部屬於實體基地台上，實現低延遲的即時控制。

演講亦涵蓋了 AI 與無線網路融合的三種方向，包括 AI for RAN（以 AI 優化 RAN 行為）、AI in RAN（AI 與 RAN 共用運算平台）、以及 AI on RAN（在 Edge 執行 AI 應用，如 LLM 推論、視覺分析等）。Melodia 教授認為，AI 不僅是增進效能的工具，更是邊緣計算（Edge Computing）的關鍵推手，透過 AI 的幫助，未來的行動網路將有更多的應用場警。

為支撐開放架構與 AI 開發，Northeastern 團隊建立了多個實驗平台，包括具備 256 個可程式化軟體無線電的無線通訊模擬平台 Colosseum、開放的無線測試平台 Arena，以及結合 GPU 加速與商業設備的 X5G 測試場域。這些平台支援從模擬到實測、從建模到推論的完整實驗流程，可實現 Digital Twin 的端到端測試與 AI 模型訓練。Melodia 教授展示了透過 Colosseum 模擬環境下訓練的 AI 模型可以直接被使用於 OTA（Over-the-Air）傳輸，也就是可以在真實的無線通訊環境下進行。這些研究驗證了 AI 控制模組對於開放無線網路的可行性與潛力。透過這樣的架構，我們將能夠在不受限於任何硬體或特定環境的前提下，更加靈活的面對實際系統中的各種需求。





# Speech by Dr. Tommaso Melodia:

## Open 6G: Towards Open, Programmable, and AI–Powered NextG Wireless System

Professor Tommaso Melodia is the William Lincoln Smith Chair Professor in the Department of Electrical and Computer Engineering at Northeastern University, USA. He is the founding director of the university's Institute for the Wireless Internet of Things (WIoT) and serves as the Director of Research for the PAWR Project Office, which oversees the U.S. national wireless research initiative. He earned an integrated Bachelor's and Master's degree (Laurea) from the University of Rome La Sapienza and received his Ph.D. in Electrical and Computer Engineering from the Georgia Institute of Technology in 2007.

Professor Melodia is an IEEE Fellow and recipient of the NSF CAREER Award. In 2018, he was honored with the Søren Buus Outstanding Research Award, the highest recognition from Northeastern's College of Engineering. His research has a strong foundation in modeling, optimizing, and experimentally validating wireless networks and IoT systems, and has been consistently supported by institutions such as the U.S. NSF, Air Force Research Lab, Office of Naval Research, DARPA, and Army Research Lab. He is also deeply involved in the academic community, having served as Technical Program Chair of IEEE INFOCOM 2018, General Chair of IEEE SECON 2019, ACM Nanocom 2019, and WUWNet 2014, as well as an editor for journals including IEEE Wireless Communications and IEEE Transactions on Mobile Computing.

In this lecture, Professor Melodia provided an in-depth analysis of the technological challenges and research directions of 6G, emphasizing that future wireless systems will evolve toward open, programmable, and AI-powered architectures. He pointed out that the current network architectures are highly centralized and closed, dominated by a few large equipment vendors. This not only stifles innovation but also creates significant barriers to upgrading due to vendor lock-in. Closed architectures hinder observability within networks and prevent rapid adaptation to service demands, significantly limiting flexibility in network deployment and monetization of new services.

To address the increasing complexity of wireless environments and application demands, Professor Melodia introduced the concepts of Open RAN and Open 6G architectures. These involve modularizing the RAN into Radio Unit, Distributed Unit, and Centralized Unit, and virtualizing them onto edge or cloud platforms. By adopting open interfaces and Software Defined Networking (SDN) principles, network functions become observable, controllable, and automatically deployable. He further elaborated on the O-RAN Alliance's introduction of xApps (near-real-time control applications), rApps (non-real-time policy applications), and dApps (Distributed Applications). Through dApps, users can deploy custom-defined logic directly onto physical base stations, enabling low-latency real-time control.

The talk also covered three key paradigms of AI integration with wireless networks: AI for RAN (optimizing RAN behavior using AI), AI in RAN (AI sharing the same computing platform with RAN), and AI on RAN (running AI applications such as LLM inference or visual analytics at the edge). Professor Melodia emphasized that AI is not just a performance enhancement tool but a driving force for edge computing, enabling broader applications in future mobile networks.

To support open architectures and AI development, the Northeastern team has built several experimental platforms, including Colosseum, a wireless communication emulator with 256 programmable software-defined radios; Arena, an open wireless testbed; and the X5G test environment, which combines GPU acceleration with commercial hardware. These platforms enable a full experimental pipeline from simulation to real-world testing and from modeling to inference, supporting end-to-end Digital Twin testing and AI model training. Professor Melodia demonstrated how AI models trained in the Colosseum simulated environment can be directly deployed in Over-the-Air (OTA) transmission in real-world wireless scenarios. These experiments validated the feasibility and potential of AI control modules for open wireless networks. With this architecture, we can flexibly meet diverse demands in real-world systems without being constrained by specific hardware or environments.

# 2025 年 院長畢業典禮致詞：走出自己的路

**文／陳志成院長口述，陳平然整理**

首先恭喜各位畢業生，終於順利完成在陽明交大的學業，祝大家畢業快樂！趁這個機會，我想和大家分享三個小故事。

## 成敗之間

首先，在幾個月之前，有位記者到資訊學院訪問我，只是記者之所以要訪問我，並不是因為我有什麼豐功偉績，而是因為資訊學院的學生，還有已經畢業的學長姐們都太過優秀。

根據統計，竹科裡面有 65% 的 CEO 是交大校友（也許各位身邊的同學，未來就有人會成為竹科的 CEO），因此記者認為我們院內學生畢業後，一定有很多人選擇創業，所以才來訪問我。我對記者說：「我在交大當教授將近十五年以來，幾乎不曾聽過有學生畢業之後選擇創業。」他非常驚訝地問我：「為什麼？」

大家應該還記得，清朝科舉制度分為童試、鄉試、會試、殿試，學生要從秀才、舉人、進士一路考上去。清朝國祚大約 270 年，平均每三年舉辦一次殿試，也就是皇帝在紫禁城太和殿中親自主持的考試，每次殿試平均會選取約 200 位進士，整個清朝共約 2 萬 4 千位進士。進士裡的第一到三名依序是狀元、榜眼、探花，清朝共有 114 位狀元。

這些「人中龍鳳」的進士們，幾乎都在幫清朝的皇帝服務，結果 114 位狀元的名字，記者先生一位都沒聽過，反而是創立太平天國的洪秀全，幾乎無人不曉。洪秀全曾參加四次鄉試卻全部落榜，但是連秀才都沒考上的洪秀全後來稱帝，幾乎快讓清朝滅亡，連八旗軍都不是他的對手；後來是因為清廷重用漢人，例如曾國藩的湘軍和李鴻章的淮軍，才平定了太平天國。

又比如清朝北洋新軍統帥兼內閣總理大臣的袁世凱，軍事實力強大到足以和革命軍抗衡，辛亥革命後孫文甚至必須和袁世凱議和：若清帝願意退位，就讓袁世凱擔任民國大總統。最後在袁世凱的「逼宮」下，清帝溥儀遜位，所以清朝的氣數可說是結束在袁世凱的手裡。實際上，袁世凱曾參加過兩次鄉試，都沒有考上秀才，後來他不僅擔任大總統，甚至還稱帝！

最後我對記者先生說：「我們學院的學生都太會念書了，如果在清朝，大家都可以考到進士，甚至狀元、榜眼、探花，為什麼還要出來革命推翻皇帝？可能一不小心就會被殺頭，對不對？這就是我們現在的學生，很少人出來創業的原因之一。」

## 得失之間

第一個小故事結束了，第二個故事則跟我有關。在美國攻讀博士期間，1997 年暑假我曾經到美國 Bell Labs 實習。Bell Labs 以前非常有名，至 1997 年已出過五位諾貝爾獎得主（到 2024 年則共有十一位）！後來因為 AT&T 規模太過龐大，1984 年被美國政府依據反托拉斯法強制分割，Bell Labs 也因此分割出 Bellcore。實習結束後，我老闆對我還算滿意，她希望我畢業之後能到 Bell Labs 工作。隔年我快畢業的時候，她已經改到 Bellcore 服務，她就給了我 Bellcore 的 offer。

當時我還是想自己先去找找其他工作，不要馬上就答應她，就找了一家叫做 Qualcomm 公司，中文叫高通。現在有誰沒聽過 Qualcomm ？但是在 1998 年，我向同學、家人提起 Qualcomm，很多人都沒聽過。同學跟我講：每一個做通訊、做網路的畢業生，都想去 Bell Labs、Bellcore，你怎麼會想去那個 Qualcomm ？

後來 Qualcomm 幫我支付機票和旅館費用，讓我從東岸飛到聖地牙哥面談，也願意給我 offer，並給我一些股份。但是後來我告訴他們：「我要去 Bellcore。」他們的 HR 立刻打電話給我說：「馬上把給你的股份加倍！」當時 Qualcomm 已經股票上市，股價好一陣子都只維持在兩、三塊美金。我想了一下，去 Bellcore 就像是現在到 Google 工作的意思，大家都聽過。Qualcomm 既沒人聽過，幾年以來股票都只有兩、三塊，會不會變壁紙？所以 1998 年博士畢業後，8 月我就加入了 Bellcore。

後來發生什麼事？ Qualcomm 股價開始大漲，2000 年 1 月股價已經漲到 70 美元，中間又分割了數次。我算了一下，他們承諾給我的股份在一年四個月裡大漲了 220 倍，之後還繼續漲。我不知道現在股價多少錢，我也不想看，要不然看了會傷心。我不只失去一點財富，而是失去一大筆財富！如果當年去了 Qualcomm，不僅這輩子不愁吃穿，連下一輩子都不愁吃穿！

我去 Qualcomm 面談時曾遇到一位台灣人，五、六年前我在交大碰到他，他說自己早就退休了，還在加州灣區買了一間很大的房子。去年 9 月我到 Qualcomm 的聖地牙哥總部訪問，這是睽違 26 年後我再次踏進 Qualcomm 總部，我跟他們的高階主管說：「1998 年我有拿到你們的 offer，但是我沒有來。」他說公司裡西元 2000 年以前到職的早期員工幾乎都退休了，現在的高階主管，大都是 2000 年之後才到職的新員工。

故事到這裡，有人可能認為我希望大家去創業，或者去加入新創公司。其實，這不是我想要傳達的訊息，大家不妨先聽完第三個故事。

## 高薪，不是唯一選項

大概十年前我在交大指導過一位非常優秀的碩士生，他不僅研究做得非常好，甚至有能力發表期刊論文，那可是博士班在做的事情。他是位非常聰明的學生，高中時就參加奧林匹克物理和資訊競賽，我在念高中的時候，哪有辦法像他一樣？可能連邊都沾不上！

他碩士快畢業時主動跟我說：「老師，我想要念博士班。」他的意思是問我要不要收他？當時我心中非常高興，當然贊同他的想法。結果隔一個禮拜跟他 meeting 的時候，他卻告訴我自己已經決定不念博士班了。我問他為什麼？他支支吾吾地，也沒有講原因，只是說：「反正不念了！」

後來我問其他學生：「某某某上禮拜跟我見面，不是說要念博士班嗎？為什麼才過一個禮拜，他就說不念了？」其他學生跟我說：「老師，他上禮拜跟你見完面後，回到實驗室跟大家宣布：『我要念博士班，老師也決定要收我了！』結果所有人都在笑他：『你為什麼要念博士班？沒有人要念博士班啊！我們所有人畢業後都到園區那家 M 開頭的公司上班。』」那時候我實驗室裡五到八成的學生，畢業後都到那家公司服務。

其他學生還笑他說：「我們碩士一畢業，就算沒有工作經驗，那家公司給的薪水就比助理教授還高！做個幾年，薪水就比我們老師還高（就是指我啦！），你為什麼還要去念博士？當教授賺不了什麼錢。」因為每一位同學都笑他，所以這位學生就決定不念博士班了。

其實那位學生應該要念博士班，因為他是很喜歡挑戰和學習新東西的人。因為我知道他有這兩項特質，當他跟我說不念博士班的時候，我就跟他說：「你去那家公司工作，保證三年內一定後悔！」後來他和那家公司簽了三年研發替代役，一年後有一天他傳 E-mail 給我，說他下班之後要來找我聊聊，他想要重新思考他人生未來的方向。

學生畢業了，老師還是得要好好地「售後服務」！有一天晚上七點多，我就在實驗室跟他聊了大概一小時。簡單來說，他應該要走學術界，但是因為同學都在笑他，所以他就走了一條跟大家一樣的路，最後痛苦的是他自己！

## 不怕被嘲笑的勇氣

這三個故事，我真正想傳達給各位的訊息是什麼？我想送給各位的話就是：「不要人云亦云！」

雖然你們大部分的人都想進入園區去賺大錢，但不是每個人都適合做這件事。當然，也不是每個人都適合創業，或者去加入新創公司。每個人的家庭背景不同，例如有人的家裡需要你趕

快去賺錢，但有些人並不需要。也不是每個人都具有創新的人格特質，而且大家的專業能力也不一樣。所以我還想要送給各位的另一句話就是：「想清楚什麼事情適合你，找到最適合你的路，然後不要怕同學笑你，就去做那件事！」

我再舉一個例子：有部 YouTube 影片，畫面中間有一條馬路，兩側是草地，一群羚羊要過馬路，所有的車都停下來等待。因為馬路上沒有障礙物，羚羊們都是很快地奔跑衝過馬路，其中有一隻羚羊不知道為什麼，跑到馬路中央突然跳了一下，然後再繼續向前跑。結果後面每一隻羚羊衝到馬路上的時候，就算不知道原因，也都跟著跳一下再跑。

如果不跳那一下，整個羚羊隊伍可以更快衝過馬路，但是後面每一隻羚羊都跳一下，不只拖慢了隊伍速度，甚至有一隻羚羊跳一下後還跌倒摔了一跤，可能還因此受傷。後面所有羚羊跟著多跳那一下，就像很多人並不知道為什麼要進園區工作，只因為每個人都是這樣說、這樣做。所以我建議，每個人一定要想清楚自己要做什麼，以及為什麼要這麼做。

我當教授二十幾年，我觀察到現在的學生，尤其是交大資工的學生，「同質性」似乎愈來愈高，也就是大家幾乎都走一樣的路：不管學士或碩士，畢業後就進了園區，從教育者的角度來看，這對整個國家和社會是一件很危險的事情。我一直強調，我們不需要每個人都創業，也不需要每個人都念博士，但如果你適合做這件事情，你就應該去做，不要大家都做一樣的事情。

另外，各位應該都知道，在學院行政團隊的努力下，我們終於突破困難、爭取到光復校區的一塊校地用來興建資訊二館，預計 2027 年完工。只是單單建築物就需要 6 億台幣經費，以前國內的高科技公司不多，幸好我們以前有很多自行創業的學長、姊，其中特別感謝我們的系友—緯創資通董事長林憲銘，林學長個人就捐了 3 億元給學院！當年我如果去了 Qualcomm，另外 3 億我就捐了！很抱歉，我現在只能講大話。假使你們以後沒有人去創業或加入新創公司，學院建設要募款，只會愈來愈困難，這是大家未來必須面對的隱憂，所以我們畢業生一定要有人去創業啊！

## 多樣性，讓未來更多可能性

我之前還看過一篇報導，作者認為今天人類文明能如此地多彩多姿，很重要的原因之一就是「多樣性」，也就是英文的 Diversity。就是因為有不同專業能力的人、不同性格的人、不同文化背景的人共同激盪，才有我們今日人類社會高度發展的文明。我們的社會需要各種人，我們不需要大家都去打天下、當皇帝，但是現在你們應該要創業的不去創業，應該出國的不出國，應該念博士的不念博士。交大資工畢業生現在同質性過高，當大家都走同樣一條路時，對你個人或許並不危險，但是如同我前面所說，對國家、社會長遠而言，是一件很危險的事情。

在我的年代，很多人會選擇出國念書，但是現在的學生幾乎都不出國留學了。所以我在院長任內非常努力做的一件事，就是跟國外多所大學簽訂 dual degree programs（如 3+X 雙聯學位計畫），希望讓本來該出國的人一定要出國。除了美國伊利諾大學香檳分校（UIUC）和萊斯大學（Rice University），接下來我們還會跟華盛頓大學和西北大學簽約，未來各位如果申請西北大學，甚至有機會同時拿到西北大學和陽明交大的碩士或博士學位。我之所以這麼努力，就是要降低學生的同質化程度，進一步提升 Diversity。

有些學生曾跟我說：「我很想出國唸書，但是沒有錢怎麼去？」所以我也非常努力跟系友募款，現在院內除了有獎助學金以外，我們還和一家銀行合作推出低利留學貸款方案，利息由學院向系友募集資金，以獎學金形式提供補助。此外，就學期間到就業初期都不用償還本金，等工作穩定後再開始攤還，希望能降低社會新鮮人的經濟壓力。所以還是同樣的一句老話，如果大家每個人學士、碩士畢業就去園區工作，沒有人創業，以後我們就很難募款了。

最後雖然不免俗地，要祝福各位畢業之後「鵬程萬里，一帆風順！」但是我要告訴各位，絕大部分的人其實都不會一帆風順。這並不是在「唱衰」各位，而是事實。各位可以問問老師和父母，有誰大學畢業後的人生都是一帆風順？真的非常非常少！各位畢業後一定會遇到很多挫折和挑戰，但是當各位遇到挫折、挑戰的時候，要如何克服它，這才是最重要的。

各位在這裡學習了四年，學校傳授了很多專業知識，幫助各位克服未來在專業領域遇到的挫折與挑戰。但是一個人的能力有限，這個時候就需要有不同背景的人來一起幫忙解決，這又回應到我前面講的多樣性！趕快觀察你的同學，誰跟你的差距性愈大，以後就愈有可能幫助到你。





# 2025 Dean's Commencement Speech: Paving Your Own Path

First and foremost, congratulations to all of you on successfully completing your studies at NYCU. Wishing you a very happy graduation! On this special occasion, I'd like to share three short stories with you.

## Between Success and Loss

A few months ago, a journalist visited the College of Computer Science to interview me, not because of any personal achievements of mine, but because our students and alumni are truly exceptional.

According to statistics, 65% of the CEOs in Hsinchu Science Park are alumni of National Chiao Tung University. (Some of your classmates may one day join their ranks!) The journalist assumed that many of our students had gone on to start their own companies after graduation, which is why he wanted to interview me. But I told him, "In my nearly 15 years as a professor at NYCU, I've rarely heard of students launching their own startups after graduation. "He was genuinely surprised and asked, "Why is that?"

Let me explain. You might recall the civil examination system during the Qing dynasty, which included multiple levels: county, provincial, metropolitan, and finally, the palace exam. Candidates progressed through ranks—starting as *xiucai* (licentiates), advancing to *juren* (recommended men), and ultimately striving to become *jinshi* (presented scholars). Over the Qing dynasty's 270-year reign, the palace examination was held approximately once every three years, with the emperor himself presiding over the final round in the Hall of Supreme Harmony. On average, about 200 candidates passed each time, producing a total of roughly 24,000 *jinshi* throughout the dynasty. Among them, the top three scorers received special honors: *zhuangyuan* (first place), *bangyan* (second place), and *tanhua* (third place). Only 114 individuals ever earned the title of *zhuangyuan*—the highest academic distinction of the era.

These *jinshi*, the elite scholars of their time, almost all went on to serve the emperor. Yet when I asked the journalist to name one *zhuangyuan* (first-place winner), he couldn't think of a single one. In contrast, nearly everyone has heard of Hong Xiuquan, the leader of the Taiping Rebellion. He failed the provincial exam four times and never even achieved the rank of *xiucai*. And yet, he later declared himself emperor and came close to toppling the Qing dynasty. Even the Qing's elite Eight Banners troops couldn't defeat him. It was only through the efforts of regional armies led by Han Chinese generals such as Zeng Guofan and Li Hongzhang that the rebellion was eventually suppressed.

Another example is Yuan Shikai, the powerful leader of the Qing dynasty's Beiyang Army who later became Premier of the Cabinet. He held such influence that Sun Yat-sen had to negotiate with him: if the emperor agreed to abdicate, Yuan would be named president of the Republic of China. In the end, under Yuan's pressure, the last emperor, Puyi, stepped down—bringing the Qing dynasty to a formal close. Ironically, Yuan himself had failed the provincial exam twice and had never even qualified as a *xiucai*. Yet he not only became president, he eventually went so far as to declare himself emperor.

I told the journalist, "Our students are simply too good at studying. If this were the Qing dynasty, many of them would have become *jinshi*, some might even have ranked as *zhuangyuan* or *bangyan*. Why would they want to start a revolution and overthrow the emperor? That's a dangerous path. What if they lost their heads in the process? That's one of the reasons why so few of our students choose to become entrepreneurs."

## Between Choices and Regrets

Let me share a second story. This one is about myself. In the summer of 1997, while I was pursuing my Ph.D. in the United States, I interned at Bell Labs. At the time, it was a highly prestigious institution, renowned for having produced five Nobel laureates by 1997 (and eleven by 2024). Back in 1984, due to antitrust regulations, AT&T was forced to break up, and Bell Labs was split—one part eventually became Bellcore.

At the end of my internship, my supervisor was very pleased with my performance and expressed interest in having me join Bell Labs after graduation. The following year, she moved to Bellcore and offered me a position there. However, I wanted to explore other opportunities before deciding. I applied to a relatively unknown company at the time, Qualcomm. In 1998, not many people had heard of it. My classmates and family were puzzled. "Everyone in communications and networking wants to go to Bell

Labs or Bellcore," they said. "Why would you even consider Qualcomm?"

Qualcomm flew me out to San Diego for interviews, covered my travel and lodging, and offered me a job—complete with stock options. In the end, though, I decided to turn them down and accept the offer from Bellcore instead. When I informed Qualcomm of my decision, their HR team called back almost immediately to double the number of shares in their offer. At the time, Qualcomm's stock had been hovering around $2 to $3 for years. I thought, "Everyone's heard of Bellcore. But Qualcomm? What if those shares end up as nothing more than wallpaper?" And so, in August 1998, after completing my Ph.D., I joined Bellcore.

What happened next? Qualcomm's stock skyrocketed. By January 2000, it had reached $70 and had split multiple times. I did the math—the stock options I had turned down had grown 220-fold in just 16 months… and they kept climbing. To this day, I try not to think about what they'd be worth now—it's just too painful. I didn't just miss out on some extra income; I missed out on a fortune. If I had joined Qualcomm back then, I probably wouldn't have had to worry about money in this life… or even the next!

During my interview trip to Qualcomm, I met another Taiwanese. About five or six years ago, I happened to run into him at NYCU. He told me he had already retired and had bought a large house in the Bay Area. Then, in September of last year, I visited Qualcomm's San Diego headquarters for the first time in 26 years. I told their senior executives, "I was offered a job here back in 1998, but I didn't take it." They smiled and said that nearly all employees who had joined before 2000 had already retired. Most of today's executives only came on board after 2000.

You might think I'm trying to encourage you to start your own company or join a startup. But that's not quite the message I'm trying to convey. Please stay with me for one more story: my third and final one.

## High Salary Isn't the Only Goal

About ten years ago, I supervised an exceptionally talented master's student. He wasn't just strong in research—he was publishing in academic journals, something typically expected of Ph.D. students. He was incredibly smart and had competed in both the Physics and Informatics Olympiads during high school. When I was his age, I couldn't have come anywhere close to that level.

As his master's thesis was wrapping up, he came to me and said, "Professor, I want to pursue a Ph.D." Naturally, I was thrilled and happy to accept him. But a week later, during our next meeting, he told me he had changed his mind. When I asked why, he hesitated and didn't offer much of an explanation. He just said he wasn't going to continue.

Later, I asked some of my other students what had happened. They told me, "Right after meeting with you, he came back to the lab and proudly announced, 'I'm going to do a Ph.D., and the professor agreed to take me!' Everyone laughed and said, 'Why would you want to do that? Nobody wants to do a Ph.D.! We're all heading to work at that company in the Science Park, the one that starts with M.'" At the time, 50 to 80 percent of the students in my lab were going to work for that company after graduation.

They also told him, "We'll be earning more than assistant professors, even without any industrial experience. Give it a few years, and we'll be making more than our professors—that means me!" Because of all the teasing, he ended up giving up on pursuing a Ph.D.

He truly should have pursued a Ph.D., as he loved challenges and learning new things. Knowing this, I told him, "If you take that job, I guarantee you'll regret it within three years." About a year into that company, he reached out to me and asked to talk. He said he wanted to rethink the direction of his life. Even after graduation, professors often find themselves providing a kind of "after-sales service." One evening around 7 p.m., we had a long conversation in my lab. Simply put, he should have pursued a career in academia, but because his classmates made fun of him, he chose to follow the same path as everyone else. In the end, he was the one who suffered.

## The Courage Not to Follow the Crowd

So, what's the real message behind these three stories? It's simple: don't just follow the crowd.

Most of you may be aiming to work in the Science Park and earn a big paycheck, but that path isn't right for everyone. Entrepreneurship and startups aren't for everyone either. People's family situations differ—some need to start earning immediately, while others have more flexibility. Not everyone has an entrepreneurial spirit, and professional strengths vary widely. That's why I want to leave you with this second piece of advice: Find what's right for you. Discover your own path. And don't be afraid of being laughed at—just go for it.

Let me share one last example. In a YouTube video, a group of antelopes is crossing a road. All the cars have stopped to let them pass, so the road is clear, and the antelopes run quickly across. Suddenly, one antelope in the middle jumps for no apparent reason—but keeps running. The others behind, unsure why, all jump too. One of them stumbles and falls, possibly getting hurt.

That one random jump slowed down the entire herd. It's like many people choosing to work in the Science Park without really knowing why, just because everyone else is doing it. So, my advice to each of you is this: figure out what you truly want, and why.

In my 20+ years as a professor, I've noticed a trend: today's students, especially CS students at NYCU, are becoming increasingly similar in the paths they choose. Almost everyone follows the same route: earn a bachelor's or master's degree, then head straight to the Science Park. From an educator's perspective, that kind of uniformity is risky for both individuals and society. I'm not saying everyone should start a company or pursue a Ph.D. But if that's what truly suits you, you should go for it. Don't just follow the crowd. Do what's right for you.

You may know that our administrative team at the College has been working hard to secure land on the Guangfu campus for a new Computer Science Building, which is scheduled for completion in 2027. The construction alone will cost NT$600 million.

In the early days, when there weren't many tech companies in Taiwan, we were fortunate to have alumni who ventured out and started their own businesses. A special thank-you goes to our distinguished alumnus, Simon Lin, Chairman of Wistron, who generously donated NT$300 million to the college. If I had joined Qualcomm back then, I might have been the one donating the other NT$300 million! But alas, now all I can do is talk big. The truth is, if none of you start companies or join startups, raising funds for future developments will only become more difficult. That's a real concern. So yes—we really do need some of you to pursue entrepreneurship!

## Diversity Brings Possibilities

I once read an article that said one of the key reasons human civilization has become so rich and vibrant is "diversity." It's because people with different skills, personalities, and cultural backgrounds have come together that we've been able to reach this level of civilization. Society needs all kinds of people. Not everyone needs to fight wars or become an emperor. But these days, those who should be starting companies aren't, those who should be going abroad aren't, and those who should be pursuing Ph.D.s aren't. NYCU CS graduates have become too homogeneous. That may not seem dangerous to you as an individual, but it's a real risk for society.

In my generation, many students chose to study abroad. But today, far fewer do. That's why, during my time as dean, I've made it a priority to establish dual degree programs with universities overseas, such as the 3+X programs. In addition to partnerships with UIUC and Rice University, we're also signing agreements with Washington University in St. Louis and Northwestern University. In the future, those of you who apply to Northwestern University may have the opportunity to earn dual degrees—a master's or Ph.D. from both Northwestern and NYCU. Why have I put so much effort into this? To reduce homogeneity and foster greater diversity.

Some students have told me, "I'd love to study abroad, but I just can't afford it." That's why I've also worked to raise donations from our alumni. Today, in addition to scholarships, we offer low-interest student loans through a partner bank. The interest is subsidized by alumni donations, and repayment doesn't begin until students have secured stable jobs. But once again, if everyone simply goes to work in the Science Park after graduation and no one pursues entrepreneurship, raising future funds like these will only become more difficult.

Finally, I want to wish you all the very best—may you have boundless prospects and smooth sailing ahead! But let me be honest with you: for most of you, the journey won't always be smooth. I don't say this to discourage you—it's simply the reality. Just ask your teachers or parents: how many people have had a perfectly smooth path after college? Very few. You will face setbacks and challenges. But what truly matters is how you respond to them and how you rise above them.

Over the past four years, you've gained a wealth of professional knowledge to help you tackle technical challenges in your field. But no one can do everything alone. That's why diversity is so important. People with different backgrounds can work together to solve problems more effectively. So, take a moment to really get to know your classmates—the ones who seem most different from you may one day become your greatest allies.

Congratulations once again, and best of luck on the journey ahead!

# 經驗與傳承：資工系學生異國交換分享

文／胡翔祐

在這個資訊流通瞬息萬變的時代，陽明交通大學的學子們往往為了增廣見聞、成為與國際接軌的人才而積極尋求到海外交換的機會。2024年的資工系也不例外，由邱奕庭及張可晴兩位同學，分別前往蘇黎世聯邦理工學院（ETHZ）及普渡大學展開為期半年的異國深造之旅。帶著豐富的閱歷歸國後，他們毫無保留地將自己的寶貴經驗分享給後進們，期許能為懷有「交換夢」之人提供幫助。

資工系 113 級的邱奕庭在 2024 前往瑞士的蘇黎世聯邦理工大學交換，之所以會選擇這所大學是因為它不但在各科系的世界排名都名列前茅，在歷屆校友、教授及研究人員中，更有包括愛因斯坦在內的 32 位諾貝爾獎得主！在這所人才輩出的學校中，邱奕庭選擇修習了三門資工領域的課程，包括虛擬實境、嚴謹軟體工程及形狀建模與幾何處理，由於課程設計得十分扎實，即便已經有些許先備知識的他，仍然付出了許多的心力參與課堂、準備考試。值得一提的是，這裡的成績計算方式與台灣大不相同，例如虛擬實境這堂課是以期末考 100% 來計算學習成績，而嚴謹軟體工程則是期末考佔了 80%，這樣的計分方式對於學生們自律的要求較高。

除了課程內容本身以外，課堂上的風氣也與台灣大相徑庭，邱奕庭提到，這裡每上完一堂課，學生們就會敲桌子或拍手以示感謝，除此之外，幾乎所有的教室都有上課錄影的設備，除了基本的投影機外，還會有攝影機，機器旁還有螢幕讓教授隨時監看，講台有平板可以控制開始 / 結束錄影、切換投影和錄影的畫面，甚至可以控制教室燈光，這讓上課錄影這件事變得很直覺很方便，因此大部分的課程就算是實體授課也都會有上課錄影。

張可晴也同樣在 2024 年出國交換，為了想了解出國讀書的感覺，他前往位於美國印第安納州的普渡大學，對於選擇普渡大學的原因，他表示因為陽明交通大學在美國地區提供交換的學校中，普渡大學同時兼具了不錯的美國 CS 大學排名及不需要自付學費兩大優勢，因此最後選擇前往普渡大學進行為期一學期的交換。

由於聯邦的規定，前往該校交換的學生至少要修 16 學分的課程，因此張可晴選擇了 4 堂課，分別為兩堂資工領域的專門課，及兩堂通識課，在資工領域的部分，他認為課程難易度算是適中，都不會到太困難，由於普渡大學的太空領域非常出名，畢業校友中就包含了廣為世人所知的阿姆斯壯，因此他選擇了一堂與太空相關的通識課，另一堂則是資訊素養的課程，不同於許多人對於國外大學點名的認知，上述四堂課的出缺席都記錄的蠻詳細的。

除了學業上的收穫，張可晴也與我們分享了他在普渡大學的生活，在甫抵達學校時，他參加了由國際學生社群所舉辦的 Orientation 活動，不但了解了許多學校的社團、資源，更在其中認識了許多同為國際學生的朋友，另外，張可晴也推薦所有即將去普渡大學交換的學弟妹們，一定要去現場體驗看看大學籃球聯賽的刺激與熱血。若覺得光待在印第安納州不夠過癮的話，張可晴也建議可以趁著期中考後為期一個禮拜的假期去美國的其他地區觀光，更深入體驗美國不同區域的風情與樣貌。

為了因應全球化、國與國之間交流越趨頻仍，陽明交通大學提供了許多讓莘莘學子們出國交換的機會，以期拓展學生之國際視野，而今天與我們分享的邱奕庭及張可晴兩位資工系的同學，不僅把握住前往國際交換的機會，為他們帶來難能可貴的學習歷程及生活體驗，也將自己在他國的所見所聞化做文字，分享給所有追隨前輩步伐的後輩們。透過這些分享，我們期許未來能有更多陽明交大的學生勇敢踏出舒適圈，前往陌生的國度磨練並獲取更多養分，相信當累積的養分足夠時，必定能開花結果，成為讓母校引以為傲的國際人才。





# Experience and Legacy: NYCU CS Students Share Their Overseas Exchange Journeys

In this fast-paced digital age, students of National Yang Ming Chiao Tung University (NYCU) actively seek opportunities to study abroad to broaden their horizons and become globally connected talents. The Department of Computer Science was no exception in 2024, with two students, Chiu, Yi-Ting and Chang, Ke-Ching, embarking on six-month exchange programs at ETH Zurich and Purdue University, respectively. Upon returning home with a wealth of experience, they generously shared their insights in hopes of inspiring and assisting others with similar dreams.

Chiu, Yi-Ting, Class of 2025 in the Department of Computer Science, spent his exchange semester at ETH Zurich in Switzerland. His choice was driven by ETH Zurich's outstanding global academic reputation—consistently ranking among the world's best across disciplines—and its impressive roster of alumni, which includes 32 Nobel laureates, notably Albert Einstein. While at ETH, Chiu took three computer science courses: Virtual Reality, Rigorous Software Engineering, and Shape Modeling and Geometry Processing. Despite having some background knowledge, he found the coursework challenging and demanding, requiring considerable effort to keep up with classes and exams due to the rigorous curriculum.

He also noted the grading system at ETH differs significantly from Taiwan's. For instance, the Virtual Reality course was graded entirely based on the final exam (100%), and Rigorous Software Engineering had the final exam count for 80% of the grade. Such a system demands a high level of self-discipline from students.

In terms of classroom culture, Chiu observed some notable differences. After each class, students would knock on desks or clap to show appreciation. Most classrooms were also equipped with video recording systems beyond standard projectors, including cameras, screens for the professor to monitor recordings in real time, tablets at the podium to control recordings and projections, and even classroom lighting. This setup made lecture recording intuitive and seamless, so most in-person classes were also recorded.

In the same year, Chang, Ke-Ching also embarked on an overseas exchange program. Curious about what it would be like to study abroad, he chose to attend Purdue University in Indiana, USA. His decision was based on two major advantages: Purdue's strong standing in U.S. computer science rankings, and the fact that no additional tuition was required under NYCU's exchange agreements in the region.

Due to federal regulations, exchange students at Purdue are required to take at least 16 credit hours, so Chang enrolled in four courses—two in computer science and two general education classes. He found the CS courses moderately challenging, but manageable. Given Purdue's reputation in aerospace (famed alumnus Neil Armstrong being one example), he opted for a space-themed general education course, along with another course on digital literacy. Contrary to the popular belief that U.S. professors rarely take attendance, Chang found that all four courses maintained detailed attendance records.

Outside academics, Chang shared highlights from his life at Purdue. Upon arrival, he joined an orientation event for international students, where he learned about campus resources and met fellow students from around the world. One of his top recommendations for future Purdue exchange students is to attend a college basketball game in person—an electrifying and unforgettable experience. He also suggested taking advantage of the one-week break after midterms to travel around the U.S., explore other regions, and immerse oneself in the diverse culture and landscapes the country has to offer.

In response to increasing globalization and international engagement, NYCU has provided ample opportunities for students to study abroad and gain international exposure. Students like Chiu, Yi-Ting and Chang, Ke-Ching have seized these opportunities, enriching their academic and personal lives while transforming their experiences into stories to inspire their juniors. Through these shared reflections, we hope that more NYCU students will step out of their comfort zones, embrace new challenges abroad, and gather the nutrients needed for personal and professional growth. When the time is right, these seeds will surely blossom—nurturing future global talents that NYCU can proudly call its own.

# 陳尚仁學長捐贈
## 資工系資訊技術中心雲端機房管理設備

文／胡翔祐

隨著人工智慧（AI）和高效能運算的需求不斷提升，陽明交通大學資訊學院於 2017 年首次提出伺服器集中管理的概念，進而啟動共管機房的建設計畫。在歷經多次討論後，終於在 2017 年 7 月通過審核，2018 年 7 月正式啟動施工。在建設過程中，陽明交大獲得了校友的大力支持，尤其是 79 級學長的慷慨捐贈，提供關鍵資金，確保機房得以順利完工並於 2018 年 12 月正式啟用。

共管機房的設立，大幅提升了伺服器的管理效率與資源利用率，為學術研究提供了穩定、安全的計算與存儲環境。然而，隨著近年 AI 研究的發展突飛猛進，機房內高效能伺服器數量也與日俱增，這使得共管機房承受的電力負載與散熱挑戰越來越嚴峻，結果最終於 2024 年 3 月 6 日凌晨，機房發生電力異常事故。

這起事故導因於 UPS（不斷電系統）長期處於高負載狀態，使得 220V 轉 380V 變壓器的絕緣凡立水溶解並揮發，釋放出大量異味，甚至影響機房內設備的正常運行，在事件發生後，學校立即啟動緊急應變機制，聯絡 24 小時高壓機電維護廠商進行勘查，經專家建議後決定暫時關機以釐清問題。經過多日的搶修，機房管理團隊陸續完成恢復資訊系統、清查高負載設備並進行降載處理、以及更換冷氣室外機，最終於 12 天後的 3 月 18 日才全面恢復運作。雖然這起事件以恢復運作圓滿落幕，卻仍突顯了現有機房其實不敷使用的事實，必須進一步升級，才得以確保未來運算需求的穩定運作。

面對機房的電力與管理挑戰，本校傑出校友、計工系 70 級的陳尚仁學長對此深感關切，決定捐贈 48 組 16/20A 計量排插與溫濕度監控模組，幫助機房提升用電監控能力。該設備不但可以即時監測電力使用狀況，避免機房因過載而發生突發事故。還能進行環境監控（溫度、濕度），確保機房內部運作環境穩定，減少因過熱導致的設備故障風險。這讓機房具備更完善的管理能力，不僅提升了能源管理效率，還能減少不必要的電力消耗，降低運營成本。除此之外，這套監控模組也能夠提前預測潛在風險並進行適當調整，避免再次發生類似事故。

陳尚仁學長的慷慨捐贈，為機房的未來發展奠定了堅實的基礎，也為學弟妹們創造了更優質的學習與研究環境。在學校與企業的共同努力下，這座機房將持續進化，成為支撐台灣科技發展的關鍵基石。





# Alumnus Sunny Chen Donates Cloud Data Center Management Equipment to the Department of Computer Science

As the demand for artificial intelligence (AI) and high-performance computing continues to rise, the College of Information at National Yang Ming Chiao Tung University (NYCU) first proposed the idea of centralized server management in 2017, which led to the launch of a co-managed data center construction project. After numerous discussions, the project was approved in July 2017 and officially began construction in July 2018. During this process, NYCU received strong support from alumni, especially the generous donations from the Class of 1990, which provided crucial funding to ensure the smooth completion of the data center, officially launched in December 2018.

The establishment of the co-managed data center significantly improved server management efficiency and resource utilization, providing a stable and secure computing and storage environment for academic research. However, with the rapid advancement of AI research in recent years, the number of high-performance servers in the facility has grown rapidly. This has led to increasing challenges in terms of power load and heat dissipation. Eventually, in the early hours of March 6, 2024, a power anomaly occurred in the data center.

The incident was caused by the uninterruptible power supply (UPS) system operating under high load for an extended period, which led to the breakdown of insulation varnish in the 220V to 380V transformer. This breakdown released a strong odor and interfered with the normal operation of equipment in the facility. Following the incident, the university immediately activated its emergency response mechanism and contacted a 24-hour high-voltage electrical maintenance provider for inspection. Based on expert recommendations, the data center was temporarily shut down to identify the root cause. Over the following days, the data center management team worked intensively to restore information systems, identify and reduce high-load equipment, and replace the external air conditioning unit. Full operations were successfully restored 12 days later on March 18.

Although the facility resumed operations smoothly, the incident highlighted the fact that the current infrastructure is no longer adequate to meet growing demands and must be upgraded to ensure reliable performance in the future.

In response to the challenges in power supply and management, outstanding alumnus Mr. Sunny Chen, Class of 1981 from the Department of Computer Engineering, expressed deep concern and decided to donate 48 sets of 16/20A metered power distribution units and temperature/humidity monitoring modules. These devices enhance the data center's ability to monitor power usage in real time, preventing overload-related incidents. Additionally, they enable environmental monitoring (temperature and humidity) to ensure a stable operating environment within the facility, reducing the risk of equipment failure due to overheating. This improved infrastructure significantly enhances management capabilities, boosts energy efficiency, minimizes unnecessary power consumption, and lowers operating costs. Moreover, the monitoring system can also help predict potential risks and allow for timely adjustments, thereby preventing similar incidents in the future.

Mr. Sunny Chen's generous donation has laid a solid foundation for the future development of the data center and has created a better learning and research environment for future generations. With the joint efforts of the university and industry partners, this facility will continue to evolve and serve as a vital cornerstone for the advancement of technology in Taiwan.

# NYCU SDC 軟體開發社 對資訊與軟體工程充滿熱情

文／胡翔祐

陽明交通大學軟體開發社（NYCU Software Development Club, SDC）成立於 2024 年 8 月，旨在聚集交清人才，加速推動兩校在資訊領域的發展，同時引領更多的新人成為人才並不斷循環。

雖然成立的時間不長，但軟體開發社已開始積極規劃、參與許多活動了！例如在 2024 年 11 月，軟體開發社的 HPC Team 就參與了由國家高速網路與計算中心（NCHC）與 NVIDIA 合作舉辦的 NCHC Open Hackathon 2024。這次活動是以線上的形式進行，透過 MS Teams、Slack 和電子郵件作為主要溝通工具。在這次的黑客松中，軟體開發社專注於加速開源模型 NVIDIA Vision Language Model（NVLM）解碼器的推理計算。最主要的目標是提升 NVLM 的推理速度，減少延遲，並提高效能與資源利用率，同時探索高效演算法以降低運算成本。經過了重重的努力及思索，軟體開發社團隊最終達成了 3.3 倍的推理加速、開發可擴展的 GPU 平行處理管線，並學習了 Nsight Profiling 工具及多種加速方法，在高效能運算領域累積了寶貴的實戰經驗。

除了參與競賽增進實力外，軟體開發社也主動找尋與企業合作的機會，在 113-1 學期，軟體開發社便與 Kronos Research 合作舉辦「Kronos Research x NYCU SDC Quant. Training Program」，旨在培養量化交易人才。該計畫包含 10 堂課，每堂 2 小時，由 Kronos Research 提供講師與專業內容，不僅如此，Kronos Research 也為表現優異的學生提供 TWD 150,000/ 月的高薪實習機會。至於要如何爭取機會呢？ Kronos Research 將課程作為長期面試的機制，以此為依據篩選高潛力學生，因此只要認真上課，用心聽講就有機會啦！該計劃最終錄取了 39 人，其中又有 8 個人獲得面試機會，其中 2 人脫穎而出，得到了實習職缺。這次合作不僅提升學生的專業技能，也讓 Kronos Research 在 NYCU 與 NTHU 校園建立影響力，實現產學雙贏。

軟體開發社也計畫將於 113-2 學期開始，與全球半導體巨擘超微（AMD） 展開一系列密切合作。其中包含了 GPU Programming 訓練計畫，旨在強化學生在高效能運算（HPC）、人工智慧（AI）與 GPU 平行運算領域的能力。本計畫將由 AMD 提供 ROCm 硬體與技術支援，讓學生學習 GPU 並行計算、HIP Programming 與效能優化，再透過實際專案驗證技術應用。透過本次合作，社員們將能接觸產業前端技術，累積實作經驗，進一步縮短學術與產業間的技術落差，為未來職涯發展奠定堅實基礎。

自成立以來，軟體開發社已逐步發展為校內最具影響力的技術社團之一。未來，軟體開發社將積極尋求更多國際企業的合作，進一步提供更豐富的學習資源與產業對接機會，讓社員們在學習的過程中不斷拓展視野，成為台灣高科技產業人才。

# NYCU SDC: Passionate About Information and Software Engineering

The NYCU Software Development Club (SDC), established in August 2024, is dedicated to bringing together talented individuals from the merged National Yang Ming Chiao Tung University, accelerating advancements in the field of information technology, and fostering a cycle where newcomers grow into future leaders.

Though newly founded, SDC has already begun actively planning and participating in various initiatives. For instance, in November 2024, the club's HPC Team participated in the NCHC Open Hackathon 2024, co-organized by the National Center for High-performance Computing (NCHC) and NVIDIA. Conducted online through platforms like MS Teams, Slack, and email, the hackathon saw the SDC team focus on accelerating inference computations of the NVIDIA Vision Language Model (NVLM) decoder. The main goals were to improve inference speed, reduce latency, enhance performance and resource efficiency, and explore optimized algorithms to lower computational costs. After extensive experimentation and refinement, the team successfully achieved a 3.3x inference speed-up, developed a scalable GPU parallel pipeline, and gained hands-on experience with tools like Nsight Profiling and various acceleration techniques—solidifying their expertise in high-performance computing.

Beyond competitions, SDC actively seeks collaboration opportunities with industry. In the first semester of the 2024–25 academic year, SDC partnered with Kronos Research to launch the "Kronos Research x NYCU SDC Quantitative Training Program," aimed at nurturing talents in quantitative trading. The program consisted of ten 2-hour lectures delivered by Kronos Research professionals, offering both expert knowledge and the opportunity to secure high-paying internships worth TWD 150,000/month. The program functioned as a long-term interview process, where students were evaluated based on their participation and engagement. Ultimately, 39 students were selected, with 8 receiving interview invitations and 2 successfully landing internship positions. This collaboration not only enhanced students' professional skills but also strengthened Kronos Research's presence on both the NYCU and NTHU campuses—achieving a true win-win for academia and industry.

Looking ahead, SDC plans to launch an in-depth collaboration with global semiconductor leader AMD in the second semester of 2024–25. The partnership will include a GPU programming training program designed to equip students with skills in high-performance computing (HPC), artificial intelligence (AI), and GPU parallel processing. Supported by AMD's ROCm hardware and technical resources, the program will cover GPU parallel computing, HIP programming, and performance optimization—culminating in hands-on projects to validate their technical learning. This partnership will provide members with direct exposure to cutting-edge industry technologies and real-world applications, helping bridge the gap between academia and industry and laying a strong foundation for future careers.

Since its founding, the NYCU Software Development Club has rapidly grown into one of the university's most influential tech communities. Moving forward, SDC will continue to seek more partnerships with international tech companies to offer members richer learning opportunities and stronger industry connections—empowering them to become future leaders in Taiwan's high-tech sector.

# CS X TESOL
# 推動研究生英語溝通表達圓桌活動

文／陳柏丞 英教所碩士生

因應高等教育國際化的趨勢，並提升資訊學院的學生在 EMI (English as a Medium of Instruction) 全英課室中的英語溝通能力，資訊學院與英語教學研究所於 113 學年度下學期合作舉辦了《研究生英語溝通表達圓桌活動》。此活動旨在提供學生實際練習英語口說的機會，並透過創新的教學方法，幫助學生提升英語溝通的自信心與能力。

本次英語圓桌活動由陽交大英語教學所暨國際高教培訓中心主任林律君教授與修讀 TETE (Teaching English Through English) 課程的英教所研究生共同設計，專為資訊學院研究生量身打造。英語圓桌活動以實驗室為單位報名，並以主題式課程呈現，確保學習內容與學生興趣、日常生活相關。課程採用林律君教授設計的相互教學法 (Reciprocal Group Discussion) 進行，學生將選擇四個角色之一：詞彙大師 (Word Master)、提問者 (Questioner)、連結者 (Connector) 和總結者 (Summarizer)，藉由明確的角色分工與相對應的任務，例如詞彙大師負責解釋 TED Talks 影片中的單字片語、提問者負責引導小組討論、連結者將影片內容與個人經驗連結、總結者負責總結討論內容，讓每位參與者皆有均等的機會練習口說，進而促進深度討論。

根據問卷統計結果，共計四場的英語圓桌成功吸引了 32 人參與。學生對於本次活動的整體滿意度平均為 5.13 分 ( 滿分 6 分 )。學生普遍認為課程主題有趣，並能滿足英語學習需求；學生也表示課程有助於提升英語溝通的流暢度，並增加開口說英文的意願。此外，學生認為講者英文清晰易懂，指令明確，並能引導同學參與討論。許多學生分享，此活動不僅能練習口說，也提供了一個輕鬆交談的機會，有助於建立自信。

參與者在回饋中也分享了許多心得。有學生提到在實驗室常用英文討論學術，但很少有機會用英文輕鬆聊天，因此非常推薦此活動。也有學生認為，此活動不僅能練習英文，還能認識新朋友，是一個有趣的體驗。更有學生提到，每位同學都有機會開口說話，不用擔心犯錯，且助教們都很有耐心、教學者也很有熱情。大多數的參與者認為實際口說經驗非常寶貴，希望更多人能體驗此活動。

整體而言，本次《研究生英語溝通表達圓桌活動》為資訊學院研究生提供了寶貴的英語口說練習機會，並獲得了學生們的高度肯定。此活動不僅提升了學生的英語溝通能力，也讓他們在輕鬆愉快的氛圍中結交新朋友，並學習如何更自信地用英語表達。未來將會參考學生的建議，持續優化課程內容與活動方式，以提供更優質的英語學習環境，培養更多具國際競爭力的資訊人才。

# CSxTESOL
# English Roundtable for Graduate Students

In response to the trend of internationalization in higher education and to enhance the English communication skills of students in EMI (English as a Medium of Instruction) classrooms, the College of Computer Science and the Institute of Teaching English to Speakers of Other Languages jointly organized the "CSxTESOL English Roundtable for Graduate Students" during the first semester of the 113th academic year. This initiative aimed to provide students with practical opportunities to practice spoken English and to boost their confidence and communication skills through innovative teaching methods.

The "CSxTESOL English Roundtable for Graduate Students" was designed collaboratively by Professor Lu-Chun Lin, the professor at the Institute of Teaching English to Speakers of Other Languages (TESOL) and the director of the Higher Education Accreditation for Teaching (HEAT), along with TESOL graduate students enrolled in the TETE (Teaching English Through English) course. Four English Roundtable sessions were tailored specifically for graduate students of the College of Computer Science. Laboratories that were interested in this activity could submit their registration. The activity was structured around thematic courses to ensure the learning content aligned with their interests and daily lives. The sessions employed a Reciprocal Group Discussion method designed by Professor Lin. Participants assumed one of four clearly defined roles: Word Master, Questioner, Connector, or Summarizer. Tasks were aligned with these roles—for instance, the Word Master explained vocabulary and phrases from TED Talks videos, the Questioner guided group discussions, the Connector linked the video content to personal experiences, and the Summarizer synthesized the discussion content. This structured approach ensured equal opportunities for participants to practice spoken English and fostered in-depth discussions.

According to the results of the survey, the four sessions of the English Roundtable attracted a total of 32 participants, with an average satisfaction rating of 5.13 out of 6. Students generally found the course topics engaging and aligned with their English learning needs. They reported that the activity improved their fluency in English communication and increased their willingness to speak in English. Additionally, students appreciated the speakers' clear and comprehensible English, the precise instructions, and the encouragement to invite the participants to actively engage in discussions. Many participants remarked that the activity not only provided valuable speaking practice but also created a relaxed conversational environment that helped build confidence.

Participants also shared various reflections in their feedback. Some noted that while they frequently used English for academic discussions in their laboratories, they rarely had opportunities for casual English conversations, making this activity particularly valuable. Others commented on how the activity offered a chance to practice English while meeting new friends, describing it as a fun and enriching experience. Several participants highlighted that everyone had a chance to speak without fear of making mistakes, commending the patience of the teaching assistants and the passion of the instructors. Most participants agreed that the practical speaking experience was invaluable and expressed a desire for more people to join such activities.

Overall, the "CSxTESOL English Roundtable for Graduate Students" provided graduate students of the College of Computer Science with a precious opportunity to practice spoken English, earning high praise from the participants. The activity not only enhanced their English communication skills but also allowed them to make new friends and learn to express themselves in English with greater confidence in a relaxed and enjoyable atmosphere. Moving forward, the program will incorporate student feedback to continue refining the course content and activity format, aiming to provide an even better English learning environment and cultivate internationally competitive talent in the field of computer science.

# 彭文孝教授榮獲 IEEE Fellow

## 因對視訊編碼演算法與標準之設計與實作的貢獻而獲獎

**本文節錄轉載自《IEEE Circuits and Systems Magazine》，2025 年第二季號**

彭文孝於 1997 年、1999 年及 2005 年分別自國立陽明交通大學（NYCU）電子工程學系取得學士、碩士與博士學位。他曾於 2000 至 2001 年間在美國加州聖塔克拉拉的英特爾微處理器研究實驗室工作，參與國際標準化組織（ISO）動態影像專家小組（MPEG）MPEG-4 細粒度可調式編碼（Fine Granularity Scalability）及其於 3D 點對點視訊會議中的應用開發工作。自 2003 年起，他積極參與 ISO MPEG 數位視訊編碼標準制定，對 H.264/AVC 可擴充修正案、H.265/HEVC、H.265/HEVC 畫面內容編碼擴充（SCC）、H.266/VVC 與 JPEG AI 等標準之發展做出貢獻，並持有 15 項以上與這些標準相關的美國及台灣專利。目前，他為 NYCU 資訊工程學系教授。2015 至 2016 年間，他曾任美國 IBM 托馬斯·華森研究中心訪問學者。他在視訊 / 影像處理與通訊領域發表超過 120 篇技術論文，並有超過 60 項標準貢獻。他的研究興趣包括基於神經網路的影像 / 視訊編碼、ISO/IEC 與 ITU-T 視訊編碼標準、視覺訊號處理及電腦視覺。

### 對 ISO/IEC 與 ITU-T 視訊編碼標準發展的貢獻：

彭博士對 ISO/IEC 與 ITU-T 視訊編碼標準的制定具有重大貢獻，涵蓋 H.264/AVC 可擴充標準、H.265/HEVC、畫面內容編碼（SCC）、H.266/VVC 與 JPEG AI 等，技術貢獻累計超過 60 項。他是 27 位最初參與 H.265/HEVC 編碼架構設計的專家之一，也是 7 位最初參與 SCC 架構設計的專家之一。他曾擔任標準委員會中的核心實驗協調人（Core Experiment Coordinator），主導多項技術發展，包括解碼端運動向量推導、運動分割與 OBMC（重疊式區塊運動補償）、區塊內複製精煉等，推動 H.265/HEVC 與 SCC 的完成。核心實驗協調人負責定義測試條件與標準化技術，是標準制定中極具關鍵性的角色。他亦積極推廣這些標準，擔任 IEEE 期刊專題主編、策劃 IEEE 與 APSIPA 會議的專題場次，並多次進行教學演講。

### 對影像 / 視訊編碼技術進展的貢獻：

彭博士於國際知名期刊與會議發表逾 120 篇論文，對傳統與深度學習式影像 / 視訊編碼均有創新貢獻，包括：基於 DCT 的層級式可擴充視訊編碼、參數化模板匹配預測、區塊內線複製、基於強化學習的視訊編碼器控制、基於增強正規化流（ANF）的影像 / 視訊編碼，以及用於視覺訊號處理的領域適應技術。他的多項研究成果曾在 H.264/AVC、H.265/HEVC、SCC 與 JPEG AI 標準的徵證 / 徵案階段經過嚴謹測試，其中數項創新已納入正式標準的規範編碼工具。他在推動現代深度學習式影像 / 視訊編碼領域上扮演關鍵角色，特別是在以強化學習應用於視訊編碼器控制的研究方面，引領編碼器最佳化的新典範。他另一項開創性的成果——基於 ANF 的條件式視訊編碼，顛覆了傳統殘差式編碼架構，並於 IEEE ISCAS Grand Challenges 競賽中獲得最佳表現與最佳創意獎。





# Professor Wen-Hsiao Peng Elevated to IEEE Fellow For contributions to the design and implementation of video coding algorithms and standards

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Wen-Hsiao Peng received the B.S., M.S., and Ph.D. degrees from National Yang Ming Chiao Tung University (NYCU), Hsinchu, Taiwan, in 1997, 1999, and 2005, respectively, all in electronics engineering. He was with the Intel Microprocessor Research Laboratory, Santa Clara, CA, USA, from 2000 to 2001, where he was involved in the development of the International Organization for Standardization (ISO) Moving Picture Experts Group (MPEG)-4 fine granularity scalability and its application in 3-D peer-to-peer video conferencing. Since 2003, he has actively participated in the ISO MPEG digital video coding standardization process and contributed to the development of H.264/AVC Scalable Amendment, H.265/HEVC, H.265/HEVC Screen Content Coding Extensions (SCC), H.266/VVC, and JPEG AI. He holds 15+ US/TW patents related to these standards. He is currently a Professor with the Computer Science Department, NYCU. He was a Visiting Scholar with the IBM Thomas J. Watson Research Center, Yorktown Heights, NY, USA, from 2015 to 2016. He has authored over 120 technical articles in the field of video/image processing and communications and over 60 standards contributions. His research interests include neural network-based image/video coding, ISO/IEC & ITU-T video coding standards, visual signal processing, and computer vision.

### Contributions to Development of ISO/IEC and ITU-T Video Coding Standards:

Dr. Peng contributed significantly to the development of ISO/IEC and ITU-T video coding standards, including H.264/AVC scalable extension, H.265/HEVC, Screen Con-tent Video Coding (SCC), H.266/VVC, and JPEG AI, with over 60 technical contributions. He was one of the twenty-seven contributors that created the very first coding framework for H.265/HEVC and one of the seven for that of SCC. He led as the Core Experiment Coordinator in the standards committee, driving the developments of the decoder-side motion vector derivation, motion partitioning and OBMC, intra block copy refinement, etc. towards the completion of H.265/HEVC and SCC. The Core Experiment Coordinator has a unique lead role in defining test conditions and technologies to be standardized. He was active in promoting these standards, serving as Lead Guest Editor in IEEE journals, organizing special sessions in IEEE/APSIPA conferences, and giving tutorials.

### Contributions to the Advancement of Image/Video Coding Technology:

With over 120 refereed papers in esteemed publications, Dr. Peng's notable inventions span traditional and learned image/video coding. These include DCT-based layered scalable video coding, parametric template matching prediction, intra line copy, reinforcement learning-based video encoder control, augmented normalized flow (ANF)-based image/video coding, and do-main adaptation for visual signal processing. Many of Dr. Peng's works underwent rigorous testing in the Call-for-Evidence/Call-for-Proposals of H.264/AVC, H.265/HEVC, SCC, and JPEG AI standards. Several of his innovations are now integrated into standard normative coding tools. He has played a pivotal role in driving modern learned image/video coding. He has led research on ap-plications of reinforcement learning to video encoder control, marking a paradigm shift in encoder optimization. His another pioneering contribution, ANF-based conditional video coding, revolutionized the traditional residual-based coding architecture, receiving the top-performance and top-creativity awards in IEEE ISCAS Grand Challenges.

# 緯創軟體董事長蕭清志專訪：從矽谷到台灣的技術服務創新之路

**文／資訊工程學系學會資訊組**

陽明交大資工系培育了無數在全球科技產業中發光發熱的校友，系學會為強化與校友連結，於 113 年 12 月 27 日至緯創軟體進行企業參訪，並專訪緯創軟體董事長暨執行長蕭清志先生。蕭清志學長的職涯橫跨美國與台灣，深耕技術與管理領域，見證並參與了科技產業的發展與變革。透過他的故事，我們將一窺科技產業的脈絡，並探索他如何靈活轉換角色，最終選擇回台，推動台灣軟體產業的發展。

## 矽谷歷練：從交大到世界級企業

蕭清志先生畢業於交通大學計算與控制工程學系 64 級 ( 資訊工程學系前身 )。憑藉優異表現與自身努力，赴美攻讀普渡大學資訊科學 (Computer Sciences) 碩士與博士學位，開拓學術與專業視野。

取得博士學位後，他進入 AT&T 普林斯頓研發中心，專注於資料庫與複雜問題的演算法研究。期間亦在其教育中心進修管理與商業課程，這場「意外」不僅擴展了他的視野，也成為職涯關鍵的轉捩點。

其後，陸續於 Valid Logic Systems、Integrated Systems 擔任高階管理職，涉足電子設計自動化（EDA）與嵌入式系統等領域。加入 Telerate（Dow Jones Telerate Systems）後，負責金融交易系統開發，結合即時數據處理、系統架構與商業思維，打造高效金融資訊平台。這些矽谷公司，在當時都是其領域的全球領先者。

蕭先生具備深厚的跨領域專業素養，能以工程視角解決技術挑戰，亦能以管理思維創造市場價值。從台灣到美國、從技術研發到管理決策，奠定其日後發展的堅實基礎。

## 回台發展：建立軟體服務與人才培育生態系

在矽谷任職時，蕭清志先生收到多個重要邀請——其中包括蔣經國總統發起的國家建設計畫及中山大學資訊工程學系的籌備邀約。在 Dot-com 浪潮席捲全球之際，蕭清志先生毅然返台創業，投身網路證券交易服務，推動軟體技術於金融領域的創新應用。

2004 年，他接受緯創集團董事長林憲銘先生的邀請，正式加入緯創軟體，當時公司已連年虧損。在他的帶領下，短短兩年成功轉虧為盈，並迅速躍升為海外營收占比逾八成的國際企業。

與台灣多數專注於硬體製造與產品研發的企業不同，蕭清志先生為緯創軟體明確定位——聚焦資訊技術服務（IT Services），透過專業 IT 人才與技術支援，為全球企業提供高品質、穩定可靠的服務。

在人才策略上，不同於傳統的「台幹模式」，他採取暨國際化又在地化模式，確保團隊能在全球各地深耕佈局，提供穩定且即時的技術支援。在服務模式上，緯創軟體是以客戶為核心的技術夥伴，根據客戶需求組建專業團隊，提供涵蓋雲端運算與 AI 應用等整合型服務。

「台灣在硬體製造領域已具全球競爭優勢，但真正以軟體為核心的創新服務尚未成形。」蕭清志先生期許緯創軟體發揮創新科技實力，深入關鍵產業鏈，推動台灣軟體產業升級，打造具國際競爭力的軟體服務型企業。

## 給學弟妹的建議：量才適性，享受解決問題的過程

經歷多元的國際職涯後，蕭清志先生也積極將寶貴經驗回饋給學弟妹。他坦言，求學時期對未來並無明確方向，只是模糊地希望「做點有意義的事」。隨著視野拓展、持續探索，他逐步發掘自身興趣與潛力，找到最適合的發展道路。

「量才適性——唯有勇於探索、認識自己，才能真正享受擅長的工作。」

他回憶，在 AT&T 任職期間，善用空閒時間學習管理與商業知識，讓自己不僅具備技術能力，也能深入理解企業經營模式與決策邏輯。他強調：「技術是基礎，而真正的價值來自於解決問題的能力。」

初入矽谷工作時，華人少有機會擔任管理職。他以新人之姿，在短時間內解決公司技術瓶頸及產品管理問題，獲得高度肯定，從創辦人手中接下產品研發的管理職責。

除了技術能力，他也提醒學弟妹溝通與團隊合作同樣重要。他曾收到一位職涯顧問的建議：

"You are smart, but you need to work with people."（你很聰明，但你需要學會與人合作。）

這句話讓他深刻體悟，科技產業不只是個人能力的競爭，更需要團隊合作，才能真正發揮影響力。他鼓勵學弟妹勇於嘗試、持續學習，享受解決問題的過程，你就能找到自己的舞台。





# Exclusive Interview: WITS Chairman Ching-Chih Hsiao on His Trailblazing Journey from Silicon Valley to Taiwan

The Department of Computer Science at NYCU has cultivated numerous alumni who have made meaningful contributions to the global tech industry. To foster stronger connections with its alumni network, the department's alumni association organized a corporate visit to WITS (Wistron Information Technology & Services) on December 27, 2024, featuring an exclusive interview with Mr. Ching-Chih Hsiao, Chairman and CEO of WITS. Mr. Hsiao's career bridges both the U.S. and Taiwan, built on a solid foundation in technology and management. Having witnessed and contributed to key developments in the tech industry, he offers unique insights into its evolution. His journey highlights an ability to adapt across roles and regions, ultimately leading him back to Taiwan, where he is now helping to drive innovation and growth in the local software industry.

## Silicon Valley Experience: From NYCU to World-Class Companies

Mr. Ching-Chih Hsiao graduated from the Department of Computer and Control Engineering (now known as the Department of Computer Science) at National Chiao Tung University, Class of 1964. Due to his exceptional performance and dedication, he earned both his Master's and Ph.D. degrees in Computer Science from Purdue University in the United States, which broadened his academic and professional horizons.

After earning his Ph.D., he joined AT&T's Princeton Research Center, specializing in database systems and algorithms for complex problems. During his time there, he also pursued management and business courses at their education center. This unexpected opportunity not only expanded his perspective but also became a significant turning point in his career.

He later took on senior management roles at Valid Logic Systems and Integrated Systems, where he worked extensively in electronic design automation (EDA) and embedded systems. He then joined Telerate, a division of Dow Jones, where he led the development of financial trading systems—bringing together real-time data processing, system architecture, and business strategy to build a high-performance financial information platform. At the time, these Silicon Valley firms were among the global leaders in their respective industries.

Mr. Hsiao possesses a unique combination of technical and managerial skills, enabling him to tackle challenges from an engineering perspective while also generating market value through strategic management. His career journey, which spans from Taiwan to the United States, has included positions in both technical research and development as well as management decision-making. This diverse experience has provided him with a solid foundation for future success.

## Returning to Taiwan: Building a Software Service and Talent Development Ecosystem

While working in Silicon Valley, Mr. Hsiao received several notable invitations. One of these was to join a national development initiative launched by President Chiang Ching-kuo. He also had the opportunity to help establish the Department of Computer Science and Engineering at National Sun Yat-sen University. During the peak of the Dot-com boom, he made the bold decision to return to Taiwan and launch his own venture. His focus was on providing online securities trading services and advancing innovative software technology applications in the financial sector.

In 2004, he accepted an invitation from Mr. Simon Lin, Chairman of Wistron Group, to join Wistron Software. At the time, the company had been struggling with consecutive years of losses. However, under his leadership, Wistron Software turned profitable within just two years and quickly evolved into an international company, with more than 80% of its revenue coming from overseas.

Unlike many Taiwanese companies that concentrate on hardware manufacturing and product development, Mr. Hsiao has strategically positioned Wistron ITS to focus on Information Technology Services (IT Services). By harnessing skilled IT professionals and robust technical support, the company provides high-quality, stable, and dependable services to businesses worldwide.

When it comes to talent strategy, Mr. Hsiao takes a dual approach that blends internationalization with localization, moving away from the traditional model of deploying Taiwanese managers abroad. This approach enables Wistron ITS to build strong, locally rooted teams around the world, ensuring consistent and responsive technical support. On the service side, Wistron ITS positions itself as a customer-centric technology partner, forming specialized teams tailored to each client's needs and delivering integrated solutions that span cloud computing and AI applications.

"Taiwan has already established a strong global edge in hardware manufacturing," says Mr. Hsiao, "but truly innovative, software-driven services have yet to fully emerge." He envisions Wistron ITS leveraging its technological strengths to deepen its role in key industry value chains, accelerate the advancement of Taiwan's software sector, and build a software services company with global competitiveness.

## Advice to Younger Students: Find Your Strengths and Enjoy the Journey of Problem-Solving

After building a diverse international career, Mr. Ching-Chih Hsiao is now committed to sharing his valuable experiences with younger students. He admits that during his academic years, he had no clear direction for the future—just a vague desire to "do something meaningful." However, as he broadened his perspective and explored various opportunities, he gradually discovered his interests and potential, ultimately finding the path that best aligned with his career development.

"Find the right fit for your talents — only by being open to exploration and understanding yourself can you truly enjoy the work you're best at."

He recalls that during his time at AT&T, he made the most of his free time to learn about management and business principles. This allowed him to not only develop technical skills but also gain a deeper understanding of business models and decision-making processes. He emphasizes, "Technology is the foundation, but true value comes from the ability to solve problems."

When he first began working in Silicon Valley, it was uncommon for Chinese professionals to hold management positions. As a newcomer, he swiftly tackled the company's technical bottlenecks and product management challenges, earning high praise for his efforts. As a result, he was entrusted with the responsibility of directly managing product development by the company's founder.

In addition to technical skills, he emphasizes the importance of communication and teamwork to younger students. He once received advice from a career consultant: “You are smart, but you need to work with people.” This advice had a profound impact on him. He realized that success in the tech industry depends not only on individual abilities but also on the teamwork that truly drives progress. He encourages younger students to be bold in trying new things, to keep learning, and to enjoy the process of problem-solving. By doing so, they will uncover their potential and find their place in the industry.

# 教學分享 謝秉均與李奇育老師的教學實踐

文／杜懿洵

陽明交通大學每年皆辦理優良與傑出教學獎遴選，肯定教師在課堂教學、教材設計及學生互動等各方面的努力與貢獻。本院謝秉均老師榮獲 112 學年度校級傑出教學獎及英語教學獎，亦曾於 110 學年度獲得優良教學獎；李奇育老師則連續兩年（111 與 112 學年度）榮獲院英語教學獎。以下整理兩位老師的教學理念與實踐經驗，分享他們如何透過創新教學策略激發學生學習動力與研究潛能。

## 喚起學生的研究魂——謝秉均老師的教學實踐

現任資訊工程學系副教授的謝秉均老師在教學上極具熱情與創新，以「喚起學生的研究魂」作為核心教學目標，透過改變學生對「自我身份」的認同，引導學生自然融入學術社群，進而培養自我驅動的學習態度。

謝老師借用《原子習慣》的觀點，設計三大教學策略——Inspiration、Participation、Foundation，並將其落實於三門核心課程：「機率」、「強化學習原理」與「最佳化演算法」。

在 Inspiration 階段，謝老師不僅以自編教材帶領學生探索最前沿的理論，也穿插研究社群故事，如「強化學習」如何成就 ChatGPT，以及 Linear Programming 背後的學術背景與電影〈心靈捕手〉的連結，提升學生與學術世界的連結感。

Participation 階段，則設計如 RL Reproducibility Challenge 等期末專題，讓學生實作頂尖論文中的演算法並開源成果，成為研究社群的一份子；同時透過舉辦 Mini-Conference，讓學生練習 peer review 與回饋撰寫，自然地成為研究社群一份子。

至於 Foundation 部分，主要是將教學內容規劃為「連結基礎學科與前沿研究」的方式，讓學生體認「基礎學理具有指導意義」。例如將生活化的例子（如擲筊）與理論（如 Concentration Inequalities）連結，再引導學生了解 ChatGPT 於「強化學習」訓練中的應用。此外，謝老師也設計有趣且有用的實作作業，幫助學生深化推理與實作能力。除課堂內容外，謝老師也加入 EMI（英語授課）課程，並自 2024 年起參與 NVIDIA 課程計畫，開設深度學習前沿課程並取得講師認證。

而在英語教學方面，延續「身份認同」的教學策略，謝老師以課堂前五分鐘的英語科學小聊、熱門影集討論等方式，提升語感與增進學生表達興趣；英文寫作則透過 handout 編寫，訓練學生從「教」的角度來重新學習知識並練習寫作。

## 強化課堂互動與英語學習：李奇育老師的教學理念

連續兩年榮獲英語教學獎的李奇育教授，目前於資訊工程學系主持「網路與行動系統實驗室（NEMS）」，他所教授的大學部與研究所課程皆以英語進行，包括排隊理論、電腦安全總整與實作，以及行動網路安全等。

李奇育教授的教學理念聚焦在四大方向：

1. 掌握學習重點、適時引導思考：課堂講授時強調重點整理與即時互動。
2. 連結實務應用、激發學習興趣：透過實際案例讓學生理解理論如何運作於現實情境。
3. 融入專題研究、培養實作與應用能力：讓課程與研究結合，增強學生的實作經驗。
4. 即時回饋與關心學生學習狀況：積極回應問題並提供課後輔助。

在英語授課方面，李老師也採取多種策略協助學生適應：

- 提供詳盡講義：彌補學生聽力落差，提升課後複習效率。
- 重複講解關鍵概念：透過不同方式強化理解，幫助學生克服語言障礙。
- 課堂錄影供複習：影片觀看次數的明顯上升，顯示此方法對學生幫助極大。

透過謝秉均與李奇育老師的教學分享，我們看見優秀教師如何以熱情與創新打造高互動、深連結的學習環境，不僅提升學生的知識掌握，更激發他們對研究與跨域發展的熱忱，實踐教學與學術的雙重價值。





# Teaching Insights: The Pedagogical Practices of Professors Ping-Chun Hsieh and Chi-Yu Li

Each year, National Yang Ming Chiao Tung University recognizes outstanding educators through its Distinguished and Excellent Teaching Awards, honoring faculty members' efforts and contributions in classroom instruction, curriculum design, and student engagement. Professor Ping-Chun Hsieh from the College of Computer Science received both the University-Level Distinguished Teaching Award and the English-Medium Instruction (EMI) Teaching Award for the 2023–2024 academic year. He also won the Excellent Teaching Award in 2021. Meanwhile, Professor Chi-Yu Li has been honored with the College EMI Teaching Award for two consecutive years (2022 and 2023). Below, we present a summary of both professors' teaching philosophies and practical approaches, highlighting how their innovative strategies inspire students' motivation for learning and research.

## Awakening the Research Spirit in Students: Professor Ping-Chun Hsieh's Teaching Practice

Professor Ping-Chun Hsieh, currently an Associate Professor in the Department of Computer Science, is known for his passion and innovation in teaching. His core teaching goal is to "awaken the research spirit in students." By encouraging students to reframe their self-identities, he helps them naturally integrate into the academic community and develop a self-driven attitude toward learning.

Drawing inspiration from the book Atomic Habits, Professor Hsieh designed a three-pronged teaching strategy—Inspiration, Participation, and Foundation—and applied it across three key courses: Probability, Principles of Reinforcement Learning, and Optimization Algorithms.

In the Inspiration phase, Professor Hsieh leads students to explore cutting-edge theories using his own course materials. He also incorporates stories from the research community—for example, how reinforcement learning contributes to ChatGPT or the academic roots of linear programming as seen in the movie Good Will Hunting—to strengthen students' sense of connection to the scholarly world.

During the Participation phase, students engage in semester-end projects such as the RL Reproducibility Challenge, where they reproduce algorithms from top-tier papers and open-source their results, becoming contributors to the research community. He also organizes mini-conferences, giving students opportunities to practice peer reviewing and feedback writing, further immersing them in the research ecosystem.

The Foundation component involves linking fundamental concepts with frontier research. For instance, he connects everyday examples like divination (using moon blocks) to theoretical ideas such as concentration inequalities, then guides students to see their application in reinforcement learning models used in ChatGPT. He also designs engaging and practical assignments that enhance both reasoning and implementation skills.

In addition to course content, Professor Hsieh teaches EMI courses and, since 2024, has joined NVIDIA's course initiative to offer advanced deep learning classes. He has also obtained instructor certification through this program.

In EMI teaching, continuing his identity-based strategy, Professor Hsieh starts each class with a five-minute "English science chat" or discussion on trending shows to improve students' language intuition and foster interest in expression. For English writing, he provides detailed handouts that guide students to re-learn content from a teaching perspective while developing their writing skills.

## Enhancing Classroom Interaction and English Learning: Professor Chi-Yu Li's Teaching Philosophy

Professor Chi-Yu Li, who leads the Network and Mobile Systems Laboratory (NEMS) in the Department of Computer Science, has received the EMI Teaching Award for two consecutive years. He teaches both undergraduate and graduate courses entirely in English, including Queueing Theory, Computer Security Integration and Practice, and Mobile Network Security.

Professor Li's teaching philosophy centers around four key principles:

1. Clarifying Key Points and Guiding Thinking: Emphasizing structured summaries and real-time interaction during lectures.
2. Connecting to Real-World Applications: Using practical case studies to illustrate how theories apply in real-world contexts.
3. Integrating Research Projects: Aligning coursework with research to enhance hands-on and applied skills.
4. Providing Timely Feedback and Support: Actively responding to questions and offering after-class assistance.

To support students in EMI settings, Professor Li adopts various strategies:

- Detailed Lecture Notes: To compensate for potential gaps in listening comprehension and enhance review effectiveness.
- Repetition of Key Concepts: Explaining crucial ideas in multiple ways to deepen understanding and help overcome language barriers.
- Class Recordings for Review: The noticeable increase in video views shows how helpful this resource is for students.

Through the teaching practices of Professors Ping-Chun Hsieh and Chi-Yu Li, we witness how passionate and innovative educators can foster interactive and meaningful learning environments. Their approaches not only strengthen students' academic foundations but also ignite enthusiasm for research and interdisciplinary exploration, fulfilling both educational and scholarly missions.

# 資訊學院學生於國際頂尖會議嶄露頭角

**文稿整理／林珮雯**

國立陽明交通大學資訊學院師生近年持續於國際舞台發光發熱，多項研究成果在 AI、嵌入式系統、人機互動與運動科技等領域獲得國際頂級學術會議的肯定。以下為近期幾位學生於重要國際會議的發表成果與參與心得：

**發表論文：**CoachAI+ Badminton Environment: Realistic Badminton Game Simulator for Enhancing Player Performance

**作者：**Peng, Wen-Chih; Wang, Kuang-Da; Chien, Yen-Che; Xie, Bo-Zhou; Chen, Yu-An; Tsai, Cheng-Shiuan; Doong, Shao-Jyun; Hung, Jun-Chen

**指導教授：**彭文志老師

**國際會議名稱：**MIT Sloan Sports Analytics Conference (SSAC)

**該會議重要性：**

MIT Sloan Sports Analytics Conference（SSAC）是全球運動分析最具影響力的國際會議之一，由麻省理工學院與 42 Analytics 主辦，ESPN 協辦。每年吸引來自 NBA、NFL、MLB 等領域的數據科學家、教練與產業專家，探討運動科技與 AI 應用。能入選 SSAC Research Paper Competition 決賽，不僅代表研究具備高度實務價值，更是一個能在國際舞台上與頂尖專家交流的重要機會。

**王廣達同學心得：**

很榮幸我們的研究論文入選 2025 年 SSAC 決賽，並於波士頓 Hynes Convention Center 進行口頭發表與海報展示。這是我們首次將羽球 AI 研究，從過去的 KDD、AAAI 等學術場域，推向更聚焦應用落地與產業連結的運動科技國際會議。

CoachAI+ 是一套可模擬羽球單打比賽並進行戰術與表現分析的 AI 系統，核心為升級版模仿學習模型 RallyNetv2，模擬選手擊球互動更加自然，並結合 ShuttleSet 資料集中真實限制（如球種、落點、移動行為），提升模擬逼真度。我們也設計了戰術分析模組，涵蓋主／被動關係、體力消耗、球種分佈與擊球影響力等，協助教練與選手策略決策。

參與 SSAC 讓我深刻感受到這是一個結合運動、科技與商業的國際創新舞台。來自 NBA、MLB、新創公司的專業觀眾對應用潛力提出許多實務建議，也讓我開始思考系統在即時預測與實戰輔助方面的延伸可能。在 Poster Session 中，與來自英國、美國等地的研究者深入交流，討論如何引入大型語言模型強化模擬泛化能力，甚至延伸到雙打模擬，讓我更深刻感受到：我們的研究正走在「技術轉譯」的路上。

感謝精準運動計畫的支持與團隊夥伴的努力，這次經驗不僅讓我學會如何用英文溝通技術價值，更讓我體會研究的意義：是讓 AI 真正進入場上、協助選手發揮潛能，實現運動科技的未來願景。

**發表論文：**Pinning, Sorting, and Categorizing Notifications: A Mixed-methods Usage and Experience Study of Mobile Notification-management Features

**作者：**Yong-Han Lin, Li-Ting Su, Uei-Dar Chen, Yi-Chi Lee, Peng-Jui Wang, Yung-Ju Chang

**指導教授：**張永儒老師

**國際會議名稱：**ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp 2024)

**該會議重要性：**

UbiComp 是人機互動和普及運算領域的國際頂尖會議。該會議涵蓋互動設計、行動運算、穿戴式技術、和感測系統等前沿技術與研究領域。作為全球研究人員、設計師與開發者交流與合作的重要平台，UbiComp 不僅展示最新的研究成果和技術創新應用，也深入探討這些研究和技術對使用者行為和社會產生的影響，持續拓展科技在人類日常生活中的角色與價值。

**林詠涵同學心得：**

非常感謝張永儒老師的悉心指導與持續鼓勵，也謝謝與我共同努力完成研究的同學，讓我有機會站上國際舞台分享研究成果。這項研究中，我們開發了新的手機通知系統，透過更符合使用者需求的管理功能，幫助使用者有效的處理通知。我很榮幸這項研究能被 UbiComp 接受，給自己的努力一個肯定，也鼓勵我持續投入研究。 在會議中，我從世界各地的頂尖學者中，學習到了最新的知識與技術，也透過交流收穫到研究上的回饋，對我未來的研究帶來許多啟發。



**發表論文：**iFKVS: Lightweight Key-Value Store for Flash-Based Intermittently Computing Devices

**作者：**Yen-Hsun Chen, Ting-En Liao, Li-Pin Chang

**指導教授：**張立平老師

**國際會議名稱：**EMSOFT: International Conference on Embedded Software (EMSOFT 2024)

**該會議重要性：**

EMSOFT 是 ACM 嵌入式系統特別興趣小組（SIGBED）旗下的旗艦會議，致力於推動嵌入式軟體與系統的科學與工程發展。自 2001 年以來，EMSOFT 匯聚來自學術界、產業界與政府的研究人員與開發者，發表設計與分析數位與物理世界互動軟體的最先進研究成果，特別關注於網實體系統中運算、網路與物理動態的整合。EMSOFT 為嵌入式系統社群年度盛會 ESWEEK 的核心會議之一，與 CASES 與 CODES+ISSS 並列，形成涵蓋軟硬體協同設計的完整論壇。

**廖廷恩同學心得：**

我十分榮幸能夠參與 2024 年的 ACM SIGBED 國際嵌入式軟體會議（EMSOFT），這是嵌入式系統領域的重要國際學術盛會，能夠在此發表研究成果，對我來說是一個極具意義的里程碑。首先，我要誠摯感謝張立平教授的耐心指導與支持，讓我有機會將這項研究推向國際舞台。在 EMSOFT 的會議期間，特別令我印象深刻的是，與其他與會學者的面對面交流過程中，我得以針對自己的研究主題與他們深入討論。他們提出了許多獨到的觀點與建議，從不同的研究角度切入，啟發我思考潛在的改進方向。其中，有幾位學者對我的方法特別感興趣，也分享了他們獨到的見解，這讓我大開眼界。

**發表論文：**NaRCan: Natural Refined Canonical Image with Integration of Diffusion Prior for Video Editing

**作者：**Ting-Hsuan Chen, Jiewen Chan, Hau-Shiang Shiu, Shih-Han Yen, Chang-Han Yeh, Yu-Lun Liu

**指導教授：** 劉育綸老師

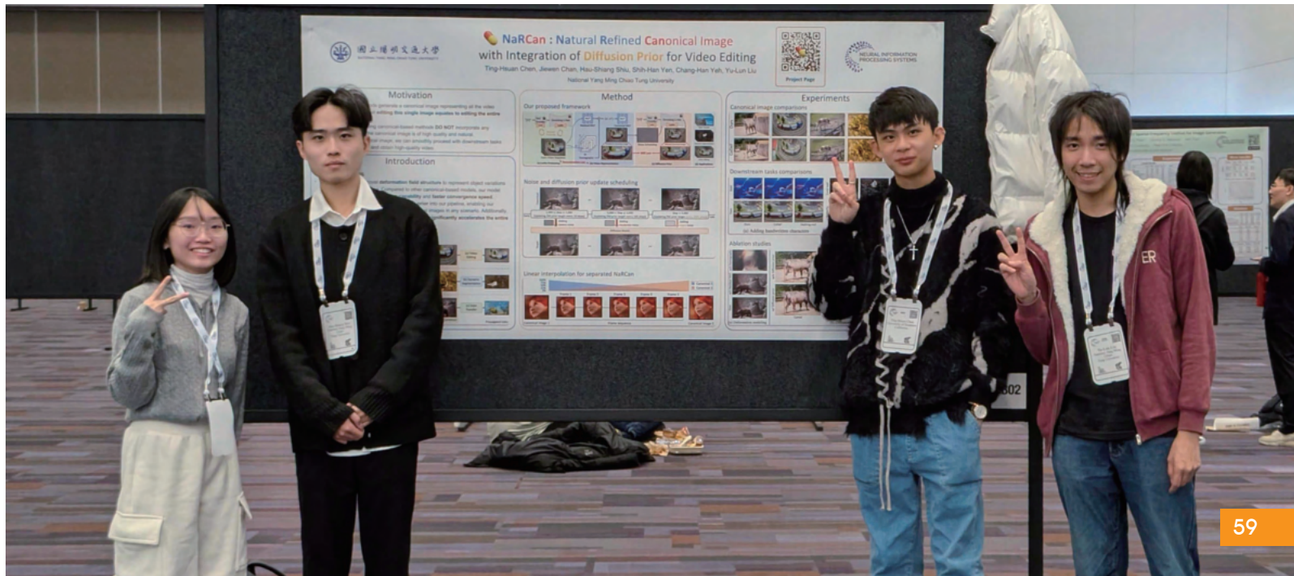
**國際會議名稱：**Conference on Neural Information Processing Systems (NeurIPS 2024)

**該會議重要性：**

NeurIPS 是人工智慧和機器學習領域最具影響力的頂級學術會議之一，每年吸引全球頂尖研究者參與，論文接受率通常較低，競爭激烈。會議涵蓋了從理論基礎到應用實踐的廣泛研究，為人工智慧前沿技術提供重要交流平台。

**陳霆軒同學心得：**

人生如 Diffusion——初始全是噪聲，所幸遇見育綸，去噪我的人生。感謝劉育綸老師的悉心指導與組員們的通力合作，我們的研究成功將擴散模型先驗整合到視頻編輯框架中，解決了現有 canonical-based methods 在處理複雜視頻動態時的局限性。透過混合變形場和擴散先驗的創新設計，我們不僅提高了 canonical image 的自然度和品質，還通過優化的噪聲調度技術將訓練時間縮短了 14 倍。參與 NeurIPS 會議的經歷令人難忘，與來自全球的研究者交流討論，讓我對未來研究充滿新的靈感和動力。



# CCS Students Shine at Prestigious International Conferences

In recent years, students and faculty from the College of Information at National Yang Ming Chiao Tung University (NYCU) have consistently excelled on the global stage. Their research has gained recognition at top-tier international conferences in AI, embedded systems, human-computer interaction, and sports technology. Below are highlights of recent student achievements and reflections from major international conferences:

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**Title:** CoachAI+ Badminton Environment: Realistic Badminton Game Simulator for Enhancing Player Performance

**Authors:** Peng, Wen-Chih; Wang, Kuang-Da; Chien, Yen-Che; Xie, Bo-Zhou; Chen, Yu-An; Tsai, Cheng-Shiuan; Doong, Shao-Jyun; Hung, Jun-Chen

**Advisor:** Prof. Wen-Chih Peng

**Conference:** MIT Sloan Sports Analytics Conference (SSAC)

**Significance:**

The MIT Sloan Sports Analytics Conference (SSAC) is one of the world's most influential forums in sports analytics, co-hosted by MIT and 42 Analytics, with ESPN as a partner. It brings together data scientists, coaches, and industry experts from organizations such as the NBA, NFL, and MLB to explore innovations in sports technology and AI applications. Being selected for the SSAC Research Paper Competition finals indicates both practical impact and an opportunity to engage with global experts.

**The experience of Kuang-Da Wang:**

We were honored to present our paper at SSAC 2025, held at the Hynes Convention Center in Boston. This marked our first time presenting our badminton AI research—previously featured at academic venues like KDD and AAAI—at a more application-focused conference deeply connected with industry.

CoachAI+ is a system designed to simulate realistic badminton singles matches and analyze player performance and tactics. At its core is RallyNetv2, an upgraded imitation learning model that enables natural shot exchanges. By integrating the ShuttleSet dataset with real-world constraints (such as shot types, landing points, and movement behavior), the simulation closely mirrors real matches. Our tactical analysis module includes indicators such as dominance patterns, stamina consumption, shot distribution, and shot impact to support coach-player decision-making.

SSAC offered a unique intersection of sports, technology, and business. Professionals from the NBA, MLB, and startups provided valuable feedback on potential applications, sparking ideas on real-time prediction and practical support tools. During the poster session, I had insightful exchanges with researchers from the UK and US on integrating large language models for better generalization and expanding into doubles simulation. I realized our work is actively bridging research and real-world application.

Thanks to the Precision Sports Project and our dedicated team, this experience not only enhanced my ability to communicate the technical value of our work in English but also deepened my understanding of research as a way to bring AI onto the court and help athletes reach their full potential.

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**Title:** Pinning, Sorting, and Categorizing Notifications: A Mixed-methods Usage and Experience Study of Mobile Notification-management Features

**Authors:** Yong-Han Lin, Li-Ting Su, Uei-Dar Chen, Yi-Chi Lee, Peng-Jui Wang, Yung-Ju Chang

**Advisor:** Prof. Yung-Ju Chang

**Conference:** ACM International Joint Conference on Pervasive and Ubiquitous Computing (UbiComp 2024)

**Significance:**

UbiComp is a premier conference in the fields of ubiquitous computing and human-computer interaction. It covers cutting-edge areas such as interaction design, mobile computing, wearable technologies, and sensing systems. As a global hub for researchers, designers, and developers, UbiComp not only showcases state-of-the-art research but also delves into its societal impacts, continuously redefining technology's role in everyday life.

**The experience of Yong-Han Lin:**

I am deeply grateful to Prof. Chang for his guidance and encouragement, and to my fellow team members for their collaboration, which gave me the opportunity to share our work on an international stage. Our research developed a new mobile notification system with user-centric management features to help people better handle notifications. I'm honored that this work was accepted at UbiComp, which validates our efforts and inspires me to continue pursuing research. The conference provided valuable insights through interaction with leading scholars worldwide and offered feedback that will shape my future research direction.

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**Title:** iFKVS: Lightweight Key-Value Store for Flash-Based Intermittently Computing Devices

**Authors:** Yen-Hsun Chen, Ting-En Liao, Li-Pin Chang

**Advisor:** Prof. Li-Pin Chang

**Conference:** EMSOFT: International Conference on Embedded Software (EMSOFT 2024)

**Significance:**

EMSOFT is a flagship conference under ACM SIGBED, advancing the science and engineering of embedded software and systems. Since 2001, it has served as a leading venue for presenting cutting-edge research on software interacting with the physical world, especially in cyber-physical systems. EMSOFT is a core part of ESWEEK, alongside CASES and CODES+ISSS, covering the full spectrum of hardware-software co-design.

**The experience of Ting-En Liao:**

It was a great honor to participate in EMSOFT 2024, one of the top international conferences in embedded systems. I am sincerely thankful to Prof. Chang for his mentorship, which enabled me to bring our research to this global platform. What stood out to me was the in-depth discussions with other scholars during the conference. Their perspectives opened new angles for improving our work, and several researchers expressed strong interest in our method. These exchanges broadened my horizons and inspired further research ideas.

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**Title:** NaRCan: Natural Refined Canonical Image with Integration of Diffusion Prior for Video Editing

**Authors:** Ting-Hsuan Chen, Jiewen Chan, Hau-Shiang Shiu, Shih-Han Yen, Chang-Han Yeh, Yu-Lun Liu

**Advisor:** Prof. Yu-Lun Liu

**Conference:** Conference on Neural Information Processing Systems (NeurIPS 2024)

**Significance:**

NeurIPS is one of the most prestigious conferences in AI and machine learning, drawing top researchers globally with a highly competitive acceptance rate. It spans from theoretical advancements to applied innovations, serving as a key forum for leading-edge developments in AI.

**The experience of Ting-Hsuan Chen:**

Life is like diffusion—full of noise at the start. Fortunately, I met Prof. Liu, who helped denoise my journey. With his guidance and teamwork, we successfully integrated diffusion priors into a video editing framework, overcoming limitations of existing canonical-based methods for complex video dynamics. Our novel design combining deformation fields and diffusion priors improved the naturalness and quality of canonical images while reducing training time by 14x through optimized noise scheduling.

Attending NeurIPS was unforgettable. Engaging with researchers from around the world sparked new ideas and motivation for future work.

**本刊每學期發刊一期，做為本院師生與系友、 家長、院友的溝通橋樑。每期報導本院近期研究現況，內容包括人事動態、國際交流、師生獲獎等。期能經由本刊使讀者掌握資訊學院最 新動態，促進彼此互動。**

Published twice per year, this periodical, as a bridge between faculty, students, alumni, parents and friends of the college, is dedicated to the latest research updates, including personnel changes, international collaboration, faculty & students honors, etc., in order to assist readers to keep update of the latest developments of the College of Computer Science (CCS) and encourage mutual interaction.

## 一、人事動態

◇ 自 113 年 12 月起，蔡孟勳教授擔任國網中心副主任。

◇ 自 114 年 8 月起，謝續平教授榮任資訊學院新任院長。

◇ 自 114 年 8 月起，張立平教授擔任新任資訊工程學系系主任。

◇ 自 114 年 8 月起，吳毅成教授擔任副院長、黃俊龍教授擔任副院長、嚴力行教授擔任副院長。

◇ 自 114 年 8 月起，吳凱強教授擔任資科工所所長、李奇育教授擔任網工所所長、黃春融教授擔任多工所所長、王昱舜教授擔任數據所所長。

◇ 自 114 年 8 月起，張永儒教授擔任新任電機學院 / 資訊學院碩士在職專班班主任。

◇ 自 114 年 8 月起，吳育松教授續任資訊學院科技犯罪偵查資通訊碩士在職專班班主任。

◇ 曾建超教授續任跨校區合作推動辦公室主任、吳育松教授續任資安所所長、黃敬群教授續任國際資訊碩士班主任、林奕成教授續任國防資安管理碩士在職專班班主任。

◇ 本院資訊工程學系張明峰教授、曾文貴教授、胡毓志教授於 114 年 8 月退休，感謝老師們致力教學作育英才無數。

## 二、國際交流

◇ 韓國亞洲大學 (Ajou University) Myung Hoon Sunwoo 教授於 2024 年 11 月 6 日至本系演講，講題為：「HOW CAN AI AND DL HELP DIGITAL HEALTHCARE?」。

◇ 美國萊斯大學 (Rice University) Joseph R. Cavallaro 教授於 2024 年 12 月 4 日至本院演講，講題為：「Advances in AI and Digital Health with Applications to Cardiac Disease」。

◇ 美國加州大學 (University of California) Mani Srivastava 教授於 2024 年 12 月 4 日至本院演講，講題為：「Sensing in the Era of AI – Challenges & Opportunities from Foundation Models and LLMs」。

◇ 韓國首爾大學 (Seoul National University) Jonghyun Choi 博士於 2024 年 11 月 6 日至本系演講，講題為：「Understanding Sequences of Visual Data」。

◇ 日本高知工科大學於 2024 年 11 月 21 日至 12 月 5 日，選送 4 位碩士生至本院進行短期研究交換。

◇ 美國東北大學 (Northeastern University) Tommaso Melodia 教授於 2025 年 2 月 17 日至本系演講，講題為：「Open 6G: Toward Open, Programmable, and AI-Powered nextG Wireless Systems」。

◇ 美國加州大學 (University of California) 楊明玄教授於 2025 年 3 月 26 日至至本院演講，講題為：「Recent Results on 3D Vision in Dynamic Scenes」。

◇ 越南河內大學來訪 (VNU)Le Quan 校長帶領參訪團於 2025 年 4 月 11 日來訪本校進行學術交流討論。

◇ 美國伊利諾大學香檳分校 (University of Illinois Urbana-Champaign) 汪洋教授於 2025 年 4 月 23 日至至本院演講，講題為：「Towards Ethical AI: Democratic AI Governance & AI Safety for Youth」。

## 三 . 教師榮譽

◇ 彭文孝教授榮獲 IEEE Fellow ！

◇ 高孟駿教授榮獲 Humboldt Research Fellowship for Experienced Researchers ！

◇ 李奇育教授榮獲中國電機工程學會 113 年度傑出電機工程教授獎！

◇ 吳俊峯教授榮獲 2025 TSIA 半導體獎！

◇ 吳俊峯教授榮獲中華民國資訊學會 2024 年李國鼎青年研究獎！

◇ 劉育綸教授榮獲中華民國資訊學會 2024 年李國鼎青年研究獎！

◇ 吳毅成教授、王協源教授、葉宗泰教授、陳奕廷教授榮獲資策會軟體院前瞻技術獎！

◇ 伍紹勳、趙禧綠、邱新栗、柯俊先老師榮獲 Mobileheroes 2024 通訊創新節能大賽亞軍！

◇ 黃俊穎教授榮獲 113 年度資訊工程學門優良計畫執行成果獎！

◇ 張立平教授榮獲 113 年度資訊工程學門優良計畫執行成果獎！

◇ 高孟駿教授榮獲 113 年度資訊工程學門優良計畫執行成果獎！

◇ 李奇育教授榮獲 113 年度資訊工程學門優良計畫執行成果獎！

◇ 陳奕廷、劉育綸教授榮獲第二屆資訊年輕學者卓越貢獻獎！

◇ 高孟駿教授榮獲 2024 第十屆電機資訊年輕學者卓越貢獻獎！

## 四、學生榮譽

◇ 袁賢銘教授指導賴炯翰、高振群、林耕霈、楊舜宇、謝宇恆同學參與 AI CUP 2024【AI 驅動出行未來：跨相機多目標車輛追蹤競賽】榮獲競賽金牌！

◇ 袁賢銘教授指導蔡佩芬同學榮獲 2024 年 TOEFL ITP 高等教育研究獎學金！

◇ 謝旻錚教授指導官霆軒、歐育淇、范釗維同學榮獲 2024 ICPC 國際大學生程式設計競賽台中區域賽榮獲金牌第三名！雅加達區域賽榮獲銀牌第五名！

◇ 謝旻錚教授指導李慕庭、黃惟、蔣昀成同學榮獲 2024 ICPC 國際大學生程式設計競賽雅加達區域賽榮獲銀牌第六名！

◇ 謝旻錚教授指導霍朝元、周宜勳、洪翌洋同學榮獲 2024 ICPC 國際大學生程式設計競賽台中區域賽榮獲金牌第九名！

◇ 李奇育教授指導曾睿銓、林峻賢、許仁杰同學榮獲 Mobileheros 2024 通訊創新節能大賽優勝！

◇ 魏群樹教授指導黃羿寧、張芩、張棋閔、王泊善、張硯菡、陳昱喬同學榮獲 2024 BR41N.IO Hackathon 競賽 GAMING PROJECTS 組第二名！

◇ 郭權瑋、王威堯、施仲晉、吳佳豪、鄭伯俞、歐亭昀同學榮獲 TAAI 2024 Best Paper Award 及 113 年度碩博士論文獎！

◇ 吳俊峯教授指導林哲維同學榮獲 2024 年中華民國資訊學會碩士論文佳作獎！

◇ 李奇育教授指導李茵淇同學榮獲 2024 年中華民國資訊學會碩士論文佳作獎！

◇ 曾意儒教授指導劉冠慧同學榮獲 2024 年中華民國資訊學會碩士論文佳作獎！

◇ 高孟駿教授指導張書維同學榮獲 2024 年中華民國資訊學會碩士論文佳作獎！

◇ 彭文志教授指導王威堯同學榮獲 2024 年中華民國資訊學會博士論文優等獎！

◇ 李奇育教授指導楊崴翔、潘成泰、陳宥安、林峻賢同學榮獲 ICS 2024 Best Paper Award!

## 1. Personnel Changes

· Dr. Meng-Hsun Tsai has been appointed Deputy Director of the National Center for High-performance Computing, effective December 1st, 2024.

· Dr. Hsu-Ping Hsieh has been named Dean of the College of Computer Science, effective August 1st, 2025.

· Dr. Li-Ping Chang has been appointed Chair of the Department of Computer Science, effective August 1st, 2025.

· Dr. I-Chen Wu, Dr. Jiun-Long Huang, and Dr. Li-Hsing Yen have been appointed Associate Deans of the College of Computer Science, effective August 1st, 2025.

· Dr. Kai-Chiang Wu has been appointed Director of the Institute of Computer Science and Engineering, Dr. Chi-Yu Li has been appointed Director of the Institute of Network Engineering, Dr. Chun-Rong Huang has been appointed Director of the Institute of Multimedia Engineering, and Dr. Yu-Shuen Wang has been appointed Director of the Institute of Data Science and Engineering, all effective August 1st, 2025.

· Dr. Yung-Ju Chang has been appointed Director of the Degree Program of ECE and CS Colleges, effective August 1st, 2025.

· Dr. Yu-Sung Wu has been reappointed Director of the Degree Program of Information and Communication for Technology Crime Investigation in the College of Computer Science, effective August 1st, 2025.

· Dr. Chien-Chao Tseng will continue serving as Director of the CCS Promotional Office for Cross-Campus Collaboration; Dr. Yu-Sung Wu will remain as Director of the Institute of Computer and Communications Security; Dr. Ching-Chun will continue in his role as Director of the International Graduate Program of the College of Computer Science.

· Professors Ming-Feng Chang, Wen-Guey Tzeng, and Yuh-Jyh Hu from the Department of Computer Science are set to retire in August 2025. We extend our heartfelt thanks for their invaluable contributions in mentoring and inspiring generations of students.

## 2. International Collaboration

· Professor Myung Hoon Sunwoo from Ajou University, Korea, gave a lecture at our department on November 6, 2024. The topic was “HOW CAN AI AND DL HELP DIGITAL HEALTHCARE?”

· Professor Joseph R. Cavallaro from Rice University, USA, gave a lecture at our college on December 4, 2024. The topic was “Advances in AI and Digital Health with Applications to Cardiac Disease.”

· Professor Mani Srivastava from the University of California, USA, gave a lecture at our college on December 4, 2024. The topic was “Sensing in the Era of AI – Challenges & Opportunities from Foundation Models and LLMs.”

· Dr. Jonghyun Choi from Seoul National University, Korea, gave a lecture at our department on November 6, 2024. The topic was “Understanding Sequences of Visual Data.”

· Four master’s students from Kochi University of Technology, Japan, conducted a short-term research exchange at our college from November 21 to December 5, 2024.

· Professor Tommaso Melodia from Northeastern University, USA, gave a lecture at our department on February 17, 2025. The topic was “Open 6G: Toward Open, Programmable, and AI-Powered nextG Wireless Systems.”

· Professor Ming-Hsuan Yang from the University of California, USA, gave a lecture at our college on March 26, 2025. The topic was “Recent Results on 3D Vision in Dynamic Scenes.”

· President Le Quan of Vietnam National University, Hanoi, led a delegation to visit our university on April 11, 2025, for academic exchange and discussion.

· Professor Yang Wang from the University of Illinois at Urbana-Champaign, USA, gave a lecture at our college on April 23, 2025. The topic was “Towards Ethical AI: Democratic AI Governance & AI Safety for Youth.”

## 3. Faculty Honors

· Dr. Wen-Hsiao Peng has been named an IEEE Fellow.

· Dr. Meng-Jiun Gao received the Humboldt Research Fellowship for Experienced Researchers.

· Dr. Chi-Yu Li received the 2024 Outstanding Electrical Engineering Professor Award from the Chinese Institute of Electrical Engineering.

· Dr. Chun-Feng Wu received the 2025 TSIA Semiconductor Award.

· Dr. Chun-Feng Wu also received the 2024 Kuo-Ting Li Young Researcher Award from the Institute of Information and Computing Machinery, ROC.

· Dr. Yu-Lun Liu received the 2024 Kuo-Ting Li Young Researcher Award from the Institute of Information and Computing Machinery, ROC.

· Dr. I-Chen Wu, Dr. Shie-Yuan Wang, Dr. Tsung-Tai Yeh, and Dr. Yi-Ting Chen received the Advanced Technology Award from the Institute for Information Industry, Software Technology Institute.

· Professors Sau-Hsuan Wu, Hsi-Lu Chao, Hsin-Li Chiu, and Chun-Hsien Ko won second place in the Mobileheroes 2024 Communication Innovation and Energy Saving Competition.

· Dr. Chun-Ying Huang received the 2024 Outstanding Project Execution Award in the Computer Science Program.

· Dr. Li-Ping Chang received the 2024 Outstanding Project Execution Award in the Computer Science Program.

· Dr. Mong-Jen Kao received the 2024 Outstanding Project Execution Award in the Computer Science Program.

· Dr. Chi-Yu Li received the 2024 Outstanding Project Execution Award in the Computer Science Program.

· Dr. Yi-Ting Chen and Dr. Yu-Lun Liu received the 2nd Distinguished Contribution Award for Young Scholars in Information Science.

· Dr. Mong-Jen Kao received the 2024 10th Distinguished Contribution Award for Young Scholars in Electrical Engineering and Computer Science.

## 4. Student Honors

· Chiunghan Lai, Chen-Chun Kao, Geng-Pei Lin, Shun-Yu Yang, and Hsieh-Yu-Heng, guided by Professor Shyan-Ming Yuan, participated in AI CUP 2024 – AI-Driven Future Mobility: Multi-Camera Multi-Object Vehicle Tracking Challenge – and won the Gold Medal.

· Pei-Fen Tsai, guided by Professor Shyan-Ming Yuan, received the 2024 TOEFL ITP Higher Education Research Grant.

· Ting-Shiuan Guan, Yu-Chi Ou, and Jhao-Wei Fan, guided by Professor Min-Zheng Shieh, received the Gold Medal and placed 3rd at the 2024 ICPC Asia Taichung Regional Contest, and won the Silver Medal (5th place) at the Jakarta Regional Contest.

· Mu-Ting Lee, Yui Huang, and Chiang Yun-Cheng, guided by Professor Min-Zheng Shieh, won the Silver Medal (6th place) at the 2024 ICPC Asia Jakarta Regional Contest.

· Chao-Yuan Huo, Yi-Shiun Chou, and Yiyang Hung, guided by Professor Min-Zheng Shieh, received the Gold Medal and placed 9th at the 2024 ICPC Asia Taichung Regional Contest.

· Rui-Quan Zeng, Chun-Hsien Lin, and Ren Chieh Hsu, guided by Professor Chi-Yu Li, received the Merit Award at the Mobileheroes 2024 Communication Innovation and Energy Saving Competition.

· Yih-Ning Huang, Chin Chang, Chi-Min Chang, Bo-Shan Wang, Yan-Han Chang, and Yu Chiao Chen, guided by Professor Chun-Shu Wei, won Second Place in the GAMING PROJECTS category at the 2024 BR41N.IO Hackathon.

· Chuan-Wei Kuo, Wei-Yao Wang, Chung Chin Shih, Jia-Hao Wu, Bo-Yu Cheng, and Ting-Yun Ou received the Best Paper Award at TAAI 2024 and were also awarded the 2024 Master's and Doctoral Thesis Award.

· Che-Wei Lin, guided by Professor Chun-Feng Wu, received the Honorable Mention Award for Master's Thesis at the 2024 Institute of Information and Computing Machinery, ROC.

· Yin-Chi Li, guided by Professors Chi-Yu Li, received the Honorable Mention Award for Master's Thesis at the 2024 Institute of Information and Computing Machinery, ROC.

· Kuan-Hui Liu, guided by Professor Yi-Ju Tseng, received the Honorable Mention Award for Master's Thesis at the 2024 Institute of Information and Computing Machinery, ROC.

· Shu-Wei Chang, guided by Professor Mong-Jen Kao, received the Honorable Mention Award for Master's Thesis at the 2024 Institute of Information and Computing Machinery, ROC.

· Wei-Yao Wang, guided by Professor Wen-Chih Peng, received the Outstanding Doctoral Dissertation Award at the 2024 Institute of Information and Computing Machinery, ROC.

· Wei-Hsiang Yang, Tan Tai Phan, Yu-An Chen, and Chun-Hsien Lin, guided by Professor Chi-Yu Li, received the Best Paper Award at ICS 2024.

# 攜手共育未來菁英 — 資訊二館啟航計畫

資訊二館模擬圖（陳柏宏建築師著作）

交大資訊自博愛校區奠基在光復校區茁壯，走過半世紀風華，培育無數資訊菁英，見證並引領台灣科技的蓬勃發展。從人工智慧、資安到雲端運算、半導體，我們的師生與系友屢創高峰，讓交大資訊成為亞洲頂尖、享譽國際的學術殿堂。

如今隨著資訊技術的突飛猛進，我們需肩負更大的使命，致力培育引領未來的科技人才。然而，我們的館舍仍停留在過去，難以承載蓬勃發展的研究與教學需求，限制了無限可能。為迎接挑戰，我們規劃興建全新大樓，打造跨領域合作、產學共創與創新研發的基地–資訊二館。這個新的大樓將成為提升學術研究、促進技術交流與應用落地的搖籃，並讓未來的工程師、科學家與創業家擁有更卓越的學習與成長環境，勇敢迎向科技新浪潮。

我們誠摯邀請您共襄盛舉，以熱忱支持資訊系邁向新高峰，為台灣乃至全球科技發展注入無限可能！

您的每一份心意，都是奠定未來的基石。讓我們共創卓越，點亮科技新未來！

**捐款網址：https://cs2-fundraising.cs.nycu.edu.tw/**

## 募款計畫 資心專案／出國交換獎學金

本院肩負培育國內外資訊領域一流人才重任，全球競爭日趨白熱，若在學生時期及早培養國際觀與視野，更能提升未來的競爭力。是以本院積極推動「資心專案/交換生募款計畫」，校友慷慨溫暖捐款，期能提升在校學子國際化競爭力，燃起更多學生參與國際舞台並貢獻台灣的想法。自2014年起已有近78位學生受惠於本募款計畫，2023至2024年間目前共有15位學生至瑞士蘇黎世聯邦理工學院、捷克布拉格捷克理工大學、德國慕尼黑工業大學、阿亨工業大學、美國伊利諾大學香檳分校、卡內基美隆大學等姐妹校交換。

## 募款計畫 資訊學院企業講座

資通訊產業是台灣高科技發展的核心支柱，而科技人才則是推動產業升級與創新的關鍵引擎。然而，大學目前正面臨多重挑戰。在資訊領域，教授的起薪普遍低於其所培育的碩士畢業新鮮人，使得碩士生進一步攻讀博士的意願降低，博士生投入教職的比例也呈現逐年下降的趨勢。另一方面，全台約三分之一的大學專任教師即將屆齡退休，師資斷層的風險日益浮現，對高階科技人才的培育品質與產量皆構成潛在影響。

為積極延攬並留住優秀青年學者投入教學與研究工作，本院特別推動「企業講座獎勵計畫」。本計畫透過企業捐款設置獎助金，不僅協助新進教師發展其學術職涯與穩定留任，同時也獎勵現職表現卓越的教授。獲獎教師將冠以企業名稱，以彰顯產學攜手培育人才的象徵意義。

本院期盼藉由企業的長期參與與支持，激勵優秀師資持續投入教學與研究，共同培育下一代科技領導人才，強化我國高等教育體系的永續發展與全球競爭力。

## 捐款帳號

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