國立陽明交通大學 資訊學院 2024.06
College of Computer Science,
National Yang Ming Chiao Tung University

陽明交大資訊人
NYCU CCS MAGAZINE

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以 AI 領航國際

隨著半導體產業與 AI 熱潮的延燒，本院新的一年也有許多相關的精彩表現，除了畢業校友們在產業上的傑出成績，院內師生們的表現也不遑多讓，而近 70 位、全國最多的堅強師資，也使得本院今年研究所招生受到學子們的青睞，報考率持續攀升。此外，美國名校耶魯大學二十多位師生在今年三月份參訪台灣的代表團，也在 3 月 15 日特別蒞臨陽明交通大學，與本院師生就人工智慧等相關議題進行深度且具有洞察力的討論，並展開後續相關合作與夥伴關係建立。期待在校友、師生以及與優秀國際人才交互相長學習之下，本院能為社會培育更多優秀人才，替台灣在國際產業市場上，繼續保持領先位置。

今年上半年，在陽明交大舉行了兩場榮譽博士頒授典禮，除了電子工程學系畢業的校友 - 台積電總裁魏哲家之外，本院校友 - 緯創董事長林憲銘便因提早佈局 AI 與相關應用產業之投資與研發，不但帶領緯創創下總市值超過新台幣 8,000 億元的成績，更讓台灣在國際 AI 產業鏈上，擁有舉足輕重的地位。此外，本院今年也有兩位校友獲得陽明交大第三屆傑出校友：奧圖碼科技董事長陳士元與羅昇企業獨立董事、北祥科技董事李良猷。陳士元為中強光電的創始成員之一，後來奧圖碼獨立為中光電集團品牌，在陳士元帶領下，成為全球數位投影及影像解決方案領導品牌，服務遍及全球 150 多個國家。而 1982 年創立中華民國資訊經理人協會的李良猷，則是在推廣企業資訊交流應用和數位轉型做出重大貢獻，近年成為經管著作等顧問、作家與導師，輔導企業建置 AI 大數據智慧應用系統。

校友之外，本院年輕教授的表現也十分突出！恭喜本院邱維辰教授，榮獲中央研究院 2023 年「年輕學者研究成果獎。而本院顏安孜博士，則獲得 ACLCLP（計算語言學協會 - 中文處理）博士論文獎的榮譽提名。至於曾新穆教授團隊在智慧醫療領域所開發的「多目標時間序列早期預測技術，及急重症預警應用系統，不僅獲得 2023 未來科技獎，也通過臨床試驗證明了在實際醫療場域中的可行性。

在本院優秀教授的帶領下，學生們的表現也不遑多讓！林宇翔、尤理衡同學在黃俊穎教授的指導下，榮獲第四十七屆國際技能競賽青年組網路安全職類正取國手資格。而由本校教學發展中心於年初所舉辦的「是日未來：跨域實作成果展」，則展現了本院教授帶領學生們通過跨領域協作的創新成果！透過「智慧生活」、「未來肉身」及「明日視界」三大展區，展示了機器人、虛擬實境、物聯網、數位製造、生醫與健康科學等未來科技主題在提升生活質量上的發展潛力。

展望未來，又到了入學報名的時間，本校今年研究所報考人數激增，在 AI 與半導體的報考增幅達 12% 與 15%，其中，又以本院的資工領域系所最為熱門，使得資訊聯招碩士生的錄取率僅有 5.56%。此外，本院過去透過特殊選才，已招收到實戰力強與多面向的學生，今年資訊工程學系也提供了「資訊專長」與「資安專長」兩個特殊選才的入學管道，歡迎對資訊與資安領域有熱忱的高中生們，把握機會推薦自己！

最後，由本校人工智慧系統檢測中心與國家高速網路與計算中心、台灣人工智慧協會共同合辦的「2023 LLM 產學技術交流會」，達成若要發展屬於台灣人使用習慣的 AI 平台，必須推動產學整合的共識。而由本院副院長陳添福教授擔任主任的人工智慧系統檢測中心，更倡議成立「大型模型產學小聯盟」，並邀請企業界共同參與，讓大型語言模型從普適性的通用模組進入特定領域的產業，提供企業訓練出自己的「企業大腦」，為未來開發出更多產業新機會。

資訊學院院長

陳志成

2024.06

Lead Globally with AI

Amidst the ongoing excitement surrounding the semiconductor industry and AI, our college has witnessed numerous exciting advancements in the brand-new year. In addition to the impressive accomplishments of our alumni in the industry, the performance of both faculty and students from our college has been exceptional. With nearly 70 dedicated faculty members, the highest number nationwide, our college has experienced a continuous rise in application rate for graduate programs, underscoring students' preference for our college. Additionally, in March 2024, a delegation comprising over twenty faculty and students from the esteemed Yale University in the United States visited Taiwan. On March 15th, they paid a special visit to College of Computer Science, National Yang Ming Chiao Tung University (NYCU), engaging in profound and insightful discussions with faculty and students on topics such as artificial intelligence. This visit laid the groundwork for subsequent collaborations and the establishment of partnerships. With keen anticipation of ongoing learning and exchange among alumni, faculty, students, and exceptional international talents, our college is committed to nurturing more outstanding individuals for society, thereby upholding Taiwan's prominent position in the global industrial market.

In the first half of this year, NYCU held two ceremonies to award honorary doctorates. C.C. Wei, the CEO of TSMC and an alumnus of the Department of Electronics Engineering, and Simon Lin, the Chairman of Wistron and a graduate of our college, were honored. Lin's early investments and research in AI and related fields not only helped Wistron achieve a total market value exceeding NT$800 billion but also positioned Taiwan as a significant player in the global AI industry. Additionally, two alumni of our college were recognized as distinguished alumni of NYCU during the university's third Outstanding Alumni Award: Shi-Yuan Chen, the chairperson of Optoma, and Liang-You Lee, an independent director of ACE PILLAR and a director of PTSC. Mr. Chen, a founding member of Coretronic Corporation, later led Optoma as an independent brand under Coretronic. Optoma became a global leader in digital projection and imaging solutions, serving over 150 countries worldwide. Mr. Lee, who established the Information Management Association of the Republic of China in 1982, has played a pivotal role in promoting corporate information exchange applications and digital transformation. In recent years, he has served as a consultant, author, and mentor in management, guiding companies in implementing AI big data smart application systems.

Our college is proud to acknowledge the outstanding performance of our young professors. We would like to extend our congratulations to Professor Wei-Chen Chiu for being honored with the 2023 Academia Sinica Early-Career Investigator Research Achievement Award. Additionally, Dr. An-Zi Yen has received a prestigious nomination for the ACLCLP (Association for Computational Linguistics and Chinese Language Processing) Doctoral Dissertation Award. Furthermore, the team led by Professor Vincent S. Tseng has developed "Multi-Objective Series Early Prediction Technologies and the Alarm System for Critical Care" in smart healthcare. This groundbreaking innovation not only earned the 2023 Future Technology Award but also successfully passed clinical trials, demonstrating its practical feasibility in real medical settings.

With the guidance of our exceptional professors, students have demonstrated commendable performances. Yu-Hsiang Lin and Jasper Yu, advised by Professor Chun-Ying Huang, have earned positions to represent Taiwan in the Youth Category for Network Security at the 47th WorldSkills Competition. Furthermore, the "Future Today: Cross-Domain Practical Achievement Exhibition," hosted by our Teaching Development Center earlier this year, presented innovative accomplishments led by our professors and students in cross-disciplinary practical courses. Organized into three main sections – Smart Living, Future Embodiment, and Tomorrow's Vision – the exhibition illustrated how themes of future technology, including robotics, virtual reality, the Internet of Things, digital manufacturing, biomedicine, and health sciences, contribute to enhancing the quality of life.

As we look ahead, it's time to apply for graduate programs. This year, NYCU's master's programs saw a significant surge in applicants, with increases of 12% in AI and 15% in semiconductor fields. Our computer science department has become the most popular choice, leading to an acceptance rate of only 5.56% for admission into master's programs in Computer Science. The College of Computer Science has previously admitted students with strong practical skills and diverse talents through special selection processes. This year, the Department of Computer Science further offers two special admission tracks: "Computer Science" and "Cybersecurity." We encourage passionate high school students interested in these areas to take advantage of this opportunity and apply!

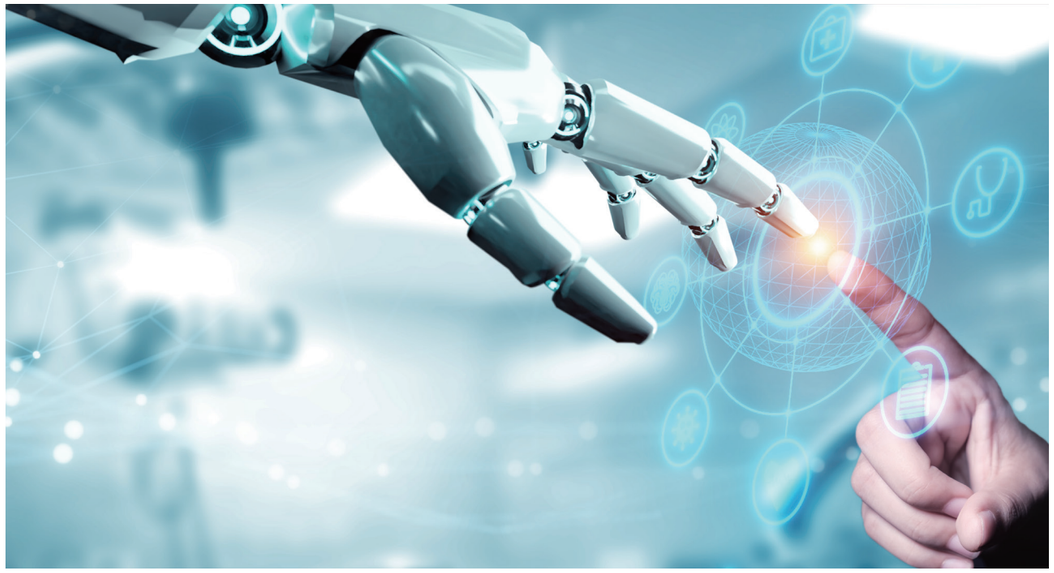
Finally, the "2023 LLM Technology Exchange Conference'' was held on August 18, 2023, jointly organized by the AI System Benchmarking and Tuning Lab at NYCU, the National High-Speed Network and Computing Center, and the Taiwan Artificial Intelligence Association. The conference concluded that developing an AI platform tailored to Taiwanese user habits requires collaboration between industry and academia. Professor Tien-Fu Chen, Associate Dean of the College of Computer Science and Director of the AI System Benchmarking and Tuning Lab at NYCU, proposed to establish the "Large Model Industry-Academia Small Alliance." This initiative encourages industry participation to adapt large language models from general-purpose modules to specific industry domains, allowing enterprises to develop their own "enterprise brains'' and paving the way for new industrial opportunities.

Dean of the College of Computer Science

2024.06

AI 資訊學群超夯 碩士班報考人數激增

文／秘書處公共關係組



資訊電子與半導體領域持續是年輕學子競相投入的領域，甫結束報名的陽明交大碩士班，本院研究所報考人數激增，不但凸顯出當今的就學趨勢，也顯示在這波 AI 與半導體浪潮下，陽明交大持續在該領域中領先並受學生青睞。

陽明交大教務長陳永昇教授說明，113 學年度碩士班甄試入學報名人次由 112 學年的 11890 人增加至 13319 人，增幅達 12%，為頂尖大學之冠；考試入學報名人次由 112 學年的 7916 人增加至 9156 人，增幅更是高達 15.66%。進一步分析，最為熱門的資工領域系所增加人數尤其顯著，資訊聯招的錄取率僅有 5.56%，競爭非常激烈。

陳永昇教務長進一步指出，104 人力銀行本月 2 日甫發布《2024 景氣展望大調查》。受調查的企業中有 58.4% 最看好 AI 題材。此外，AI 資訊領域平均月薪最高，近 5 年工作機會成長 29%，其中又以軟體設計、演算法開發、韌體設計工程師為需求大宗。以上調查反映出在當今 AI 時代，與資訊科技相關的職業在就業市場中需求旺盛。除資訊領域外，電機、電子、電控，以及半導體領域研究所報名也廣受學生喜愛，原因可能為陽明交大相關領域研究所數量多，量體大、招生名額多，造成群聚效應，也提高考生報名多個研究所的意願。

陽明交大資訊學院陳志成院長表示，資訊領域涵蓋非常廣，有些領域需要很好的數學基礎，有些則需要動手做的能力，除了皆須具備良好的邏輯思考能力，更重要的是要具備熱愛學習新事物的人格特質。陽明交大資訊領域擁有全國最多、超過 70 名的師資，研究方向涵蓋各領域，不管是修課或研究指導，都可以找到最適合自己的方向。

Surging Interest in AI Information Science Cluster Fuels Master's Program Applications at NYCU

Translated by Haydn Chen

The National Yang Ming Chiao Tung University (NYCU) in Taiwan is experiencing a remarkable surge in applications for its master's programs, particularly within the AI Information Science Cluster. The university's recent enrollment period witnessed a significant uptick in interest across various fields such as electrical engineering, electronics, electrical control, computer science, intelligent systems, and frontier semiconductor research institutes. This surge not only reflects current educational trends but also underscores NYCU's leadership in the face of advancing AI and semiconductor technologies, making it a top choice among students.

Professor Chen Yong-sheng, the Vice President of Academic Affairs at NYCU, explained that the two-stage admission process for the master's program has shown impressive growth. The first stage, involving applications, experienced a 12% increase, solidifying NYCU's standing as a leading institution in Taiwan. The second stage, by entrance examination, witnessed an even more substantial growth of 15.66%. Notably, the field of computer science stood out with a highly competitive admission rate of only 5.56%.

Chen Yong-sheng highlighted the findings from the "2024 Economic Outlook Major Survey" released by the "104 Job Bank." Among the surveyed companies, 58.4% expressed optimism towards AI-related topics. The AI information sector stands out with the highest salary, and job opportunities in this sector have grown by 29% over the past five years. In-demand roles include software design, algorithm development, and firmware design engineers.

This survey underscores the high demand for professions related to information technology in the current AI era. Beyond the information sector, enrollment in research institutes related to electrical engineering, electronics, electrical control, and semiconductor fields is also popular among students. The abundance of research institutes at NYCU, offering a multitude of positions, has created a clustering effect, increasing candidates' willingness to apply to multiple research institutes.

Professor Chen Jyh-cheng, Dean of the College of Computer Science at NYCU, was very pleased to see the strong admission standards. He emphasized the diversity of the information technology field covers some areas requiring a strong foundation in mathematics, while others demand hands-on skills. Beyond technical expertise, a passion for learning new things is crucial. NYCU's information technology field boasts the largest faculty in the country covering various research directions. This ensures that students can find the most suitable direction for their coursework or research guidance.

資訊工程學系「特殊選才」：
「資訊專長組」以創新與研發能力為主，「資安組」著重在相關的成就、興趣以及潛力

文／杜懿洵

大學升學管道多元，除了需採計學測的繁星、分發與個人申請之外，為了適性揚才，教育部自 107 年起，將「特殊選才」納入正式升學管道，提供各校系依據自身所需，自訂選才徵選辦法，徵選具有特殊成就的專才或偏才學生，以及上進的弱勢學生。雖然截至去年（113 年度）為止，全台僅有 59 所大專院校釋出 1781 個招生名額，約只佔 1%~2% 的總入學名額，但「特殊選才」不需採計學測分數，也不限定報考家數，對於大學或是學生來說，是個找到適合彼此的絕佳機會！

國立陽明交通大學資訊工程學系洪瑞鴻教授表示，資訊工程學系提供特殊選才二個不同性質的入學管道：資訊專長的「資訊工程學系」與資安專長的「資訊工程學系 (資安組)」，相較於傳統入學管道的學生，期待特殊選才進入資訊工程學系的學生，更能展現多元能力的獨特性和特殊性，與本系學生激盪出創新的火花。而去年首次才新增的「資安組」，就招收到了就讀技職體系的資安高材生：蔡語宸。

父親是軟體工程師、母親是國小特教老師的蔡語宸，從小就熟悉 3C，國中時期因玩遊戲而開始自學架設伺服器，曾用 Google 雲端修改寶可夢模組，讓一百多位玩家一起玩。因為興趣，蔡語宸國中畢業之後，選擇就讀台中高工資訊科，除了在高一時就開始參與教育部資安人才培育計畫之外，經歷高職三年有系統地學習程式和網路架構基礎，並使用學校二十多萬伺服器設備不斷練習之後，蔡語宸也繳出亮眼的成績；不但和夥伴組隊參賽，奪得 111 年行政院數位發展部金盾獎資安競賽亞軍，更拿下勞動部第五十二屆全國技能賽網路安全職業類金牌，也因此獲得資訊工程學系資安組首屆特殊選才唯三名名額中的一名入學生。

由此也可看出，特殊選才管道在徵選時的特殊標準。洪瑞鴻教授表示，申請資安專長的學生，會著重在「資安領域」是否展現相關的成就、興趣以及潛力，至於申請資訊專長的學生，則希望能看見連結資訊領域科技之「創新」與「研發」所需的能力。整個評選過程主要以學生所呈現的申請資料以及口試的表現做綜合評估，評估學生在主動求知、自學能力、發現問題、解決問題、表達呈現、團隊合作、實務經驗、資訊領域專業知識技能、社群貢獻、外語能力以及國際觀等等面相的程度以及潛力。

洪瑞鴻教授也提供有意申請的學生一些準備的建議：在競賽與課外活動參與方面，儘量以政府單位或是學校舉辦的大型競賽或活動為主；而撰寫申請資料時，以明確條列可佐證之特殊表現或是具體成果，呈現高資訊密度的簡扼篇幅，讓評選委員能夠對能力與表現進行正確評估。此外，同學也需要對自己所提供的審查資料熟悉，並對於自己特殊表現相關的基礎知識、參與經驗、能力強項和個人特質多加準備，這樣在短暫的口試時間裡，才不會因過去表現紀錄或是基本原理等關鍵問題上回答出錯，對錄取造成影響。

資訊工程學系特殊選才時間落在每年的九月至十月，歡迎此些領域的專才與偏才學生前來申請，加入國立陽明交通大學一起交流！

CS Special Talent Admission:
"Computer Science Group" – Focuses on Innovation and R&D Capabilities
"Cyber Security Group" – Emphasizes Relevant Achievements, Interests, and Potential.

There are various avenues for college admission, such as the Star Plan, admission distribution, and individual applications. These methods require students to take the General Scholastic Ability Test (GSAT). Since the 107th academic year, the Ministry of Education has introduced "Special Talent Admission" as part of the formal admission process, which allows colleges to tailor their selection criteria to attract students with exceptional achievements, unique talents, and those who come from disadvantaged backgrounds but show potential. Before the last academic year (113), only 59 universities in Taiwan offered 1,781 admission slots, representing just 1% to 2% of the total enrollment slots. However, with the introduction of the "Special Talent Admission" program, GSAT scores are no longer considered, and there are no restrictions on the number of applications an individual can submit, creating an excellent opportunity for both universities and students to find a mutually beneficial match.

Professor Jui-Hung Hung from the Department of Computer Science at National Yang Ming Chiao Tung University has emphasized the availability of two distinct admission pathways for students possessing special talents. These pathways encompass the "Computer Science Group," which focuses on computer science expertise, and the "Cyber Security Group," dedicated to cybersecurity. The intention behind these specialized routes is to attract students with a broader spectrum of skills and unique attributes compared to those admitted through conventional means. This diverse student body is expected to spark innovation through collaborative endeavors within the department. Notably, the recently introduced "Cyber Security Group" enrolled an exceptional talent, Yu-Chen Tsai, from vocational education systems last year.

Yu-Chen Tsai, whose father is a software engineer and his mother is an elementary school special education teacher, has been immersed in 3C since his early years. In junior high, he developed a passion for gaming and began self-learning server setup. One of his notable achievements was modifying Pokémon modules on Google Cloud to enable multiplayer gaming for over a hundred participants. Driven by his interests, he pursued further studies in the Department of Computer Science at Taichung Municipal Taichung Industrial Senior High School after completing junior high. Throughout his high school years, he actively participated in the Ministry of Education's cybersecurity talent development program, focusing on programming and network architecture. He consistently practiced using the school's server infrastructure valued at over two hundred thousand. Tsai's outstanding skills led him to secure second place with his team in the 2023 Cyber Security Competition by the Ministry of Digital Affairs. Additionally, he won the gold medal in the 52nd National Skills Competition – Cyber Security, organized by the Ministry of Labor. Consequently, he earned one of the three special admission slots in the Cyber Security group of the Department of Computer Science.

Tsai's story highlights the unique standards for recruiting talented individuals throughout the selection process. Professor Hung emphasizes that candidates focusing on cybersecurity must demonstrate their achievements, passion, and potential in the field. In contrast, candidates with a background in computer science are evaluated based on their ability for 'innovation' and 'research and development,' ensuring alignment with advancements in the field. The selection process rigorously assesses each candidate's application and interview performance, offering a holistic evaluation of their abilities. This evaluation includes their capacity for active inquiry, self-learning, problem identification and solving, effective communication and presentation, teamwork, practical experience, mastery of computer science knowledge and skills, community engagement, language proficiency, and global perspective.

Professor Hung also offers guidance for applicants, emphasizing the importance of participating in major competitions or events hosted by government bodies or academic institutions. When preparing application documents, it's crucial for students to succinctly highlight their achievements, ensuring that the information presented is dense yet clear, allowing the selection committee to accurately assess their capabilities and accomplishments. Furthermore, applicants must have a deep understanding of the materials they submit and should be well-prepared to discuss their specialized knowledge, participation in significant events, strengths, and personal characteristics in depth. This comprehensive preparation significantly reduces the chance of mistakes during brief interview sessions, thus avoiding potential setbacks in admission caused by inaccuracies in discussing past achievements or fundamental concepts.

Annually, from September to October, the Department of Computer Science at National Yang Ming Chiao Tung University proudly organizes its CS Special Talent Admission program. This initiative warmly welcomes students who possess unique skills and specializations in the field of computer science and cybersecurity to apply and join our dynamic community, fostering mutual exchange and growth.

跨越虛實：吳毅成教授團隊自動駕駛技術創新

文／鍾乙君

自動駕駛技術為當今熱門議題，而實現自動駕駛的方法多種多樣，近來有許多運用深度強化式學習 (Deep Reinforcement Learning; DRL) 來進行車輛控制的方法，獲致優異成果。而在自動駕駛技術的研究領域中，陽明交通大學資訊工程學系的吳毅成教授與其團隊的貢獻不容小覷。他們開發的「具動作平滑化之深度強化式學習技術」不僅在自駕模型賽車中取得了突破性進展，更在 2023 年榮獲未來科技獎，顯示了其技術的創新性和實用性。

「具動作平滑化之深度強化式學習技術與運用於自駕模型賽車駕駛應用」是一套基於影像的虛實轉移技術 (sim-to-real transfer)，它可以有效縮減強化學習模型由虛擬環境轉移至真實環境之效能損失，提升純視覺影像神經網路模型在真實環境中的表現。此新技術除了發表於 ICRA 2022 以及 IJCAI 2022 頂尖會議的 Workshop，並於 2022 年底，由 Amazon 公司主辦的 AWS DeepRacer 全球自動駕駛賽車聯盟競賽，獲得包辦全球前三名的殊榮，並獲得總獎金 USD$18,000。

吳毅成教授團隊採用生成對抗模型架構 CycleGAN，將模擬器中之影像從虛擬風格轉換為真實世界風格，並以轉換過後的影像進行訓練，有效縮減純視覺模型的虛實差異 (sim-to-real gap)，大幅提升自駕賽車於實體賽道中的適應性。為了提高自駕車的駕駛穩定度，團隊更進一步研究確認了在實體車控制平滑性方面的重要性，並提出新的平滑化技術。在過去，許多傳統的 DRL 方法著重於最大化累積回報，導致車輛控制動作的不穩定性。因此，吳毅成教授團隊透過損失函數限制神經網路做出劇烈變化之動作，提高時序相鄰動作之連續性，實現 DRL 模型輸出動作的平滑化 (action smoothness)，並大幅提高自駕車的控制穩定度；吳毅成教授團隊的研究也觀察到動作平滑化，同時也會增快賽車的速度。克服以上挑戰，團隊研究出有效且穩定的強化學習策略，能夠有效地提高實體車的完圈率並降低完圈時間。

吳毅成教授團隊提及採用 DRL 之自動駕駛賽車，通常需要透過大量與環境的互動過程，以逐步調整駕駛規則與技巧。由於不易在真實世界中重現數以萬計的精確反饋，訓練過程通常在模擬環境中進行，於真實世界中部署測試。然而，模擬器難以重現複雜多變的真實世界影像，導致未看過真實影像的模型移轉時，容易產生效果不佳的現象。針對這個問題，發展基於影像的虛實轉移技術 (sim-to-real transfer)，為了有效縮減強化學習模型由虛擬環境轉移至真實環境之效能損失，吳毅成教授團隊採用生成對抗模型架構 CycleGAN，將模擬器中影像從虛擬風格轉換為真實風格並進行模型訓練。團隊透過損失函數限制神經網路的動作輸出，提高時序相鄰動作之連續性，結合團隊目前的 muzero 軟體框架，實現 DRL 模型輸出動作的平滑化 (action smoothness)。在吳毅成教授團隊的測試當中，使用此方法的模型，未出界的情況下完成一圈之成功率，從原本得僅僅 42.8% 提升至將近 100%，完圈秒數 也從原本的 22.03 秒降至 19.54 秒，實為全方位的提升。

在這個科技日新月異的時代，我們見證了虛實轉移技術的強大潛力，此虛實轉移技術不只能用於自駕模型賽車，也可以應用於其他基於影像的深度強化式學習模型，幫助解決虛實環境差異的問題，提高深度強化式學習於解決真實問題的可行性並促進強化學習模型在機器人、機器手臂和無人機等領域的實際應用。在此，本院要向吳毅成教授與其團隊表示最深的敬意與感謝。他們的辛勤工作和創新思維為台灣乃至全球的科技發展做出了重大貢獻。我們也期待陽明交通大學的科研團隊能夠繼續以其前瞻性的技術，為世界帶來更多正面的影響，並在自動駕駛技術的道路上，為台灣爭光，並成功為我們的生活帶來更多便利與安全，且為未來的科技創新開啟新的篇章。

Dr. I-Chen Wu's Team: Sim-to-Real Transfer – Innovations in Autonomous Driving Technology

Autonomous driving technology is a hot topic today, and various approaches are explored to achieve it. One method that has gained popularity is Deep Reinforcement Learning (DRL), which has shown impressive results for vehicle control. Notably, Professor I-Chen Wu and his team at the Department of Computer Science at Yang Ming Chiao Tung University have made significant contributions to autonomous driving technology. Their innovation, "Deep Reinforcement Learning with Action Smoothness," has not only made breakthrough progress in autonomous miniature car racing but also won the prestigious Future Technology Award in 2023, highlighting the ingenuity and practicality of its technology.

"Deep Reinforcement Learning with Action Smoothness and Its Application to Autonomous Miniature Car Racing" is a system that utilizes image-based sim-to-real transfer technology. This system effectively reduces the performance degradation of reinforcement learning models during the transfer from virtual to natural environments, improving the performance of pure visual image neural network models in real-world settings. This innovative approach gained attention at workshops of the ICRA 2022 and IJCAI 2022 conferences and achieved notable success in the AWS DeepRacer League competition hosted by Amazon at the end of 2022. It secured the top three positions worldwide and earned a total prize of USD 18,000.

Professor Wu's team adopts the CycleGAN architecture, a generative adversarial model, to convert images from the simulator's virtual style to the real-world style. Training the models with these transformed images effectively narrowed the gap between simulation and reality for pure visual models, significantly enhancing the adaptability of autonomous miniature cars on physical tracks. Furthermore, to improve autonomous miniature car stability, the team focused on the importance of smoothness in physical car control and proposed novel smoothing techniques. Unlike traditional DRL methods prioritizing maximizing cumulative rewards, which may lead to unstable vehicle control, Professor Wu's team utilized loss functions to constrain neural networks from making drastic changes. This approach enhanced the continuity of sequential actions, achieving smoother outputs in DRL models and greatly enhancing autonomous miniature car stability. Additionally, the team observed that smoother actions also accelerated racing car speed. Tackling these challenges head-on, the team developed effective and stable reinforcement learning strategies to boost the completion rate of physical cars and reduce lap times.

Professor Wu's team mentions that employing Deep Reinforcement Learning (DRL) in autonomous miniature racing cars typically involves extensive environmental interaction to refine driving strategies over time. Due to the difficulty of replicating precise real-world feedback, training usually takes place in a simulated environment before testing in the real world. However, simulators struggle to accurately replicate the complex visual landscapes of reality, which leads to performance degradation when models are transferred from virtual to natural environments without exposure to real-world imagery. To address this issue, the team developed an image-based sim-to-real transfer technique to mitigate performance losses during this transition. Using the CycleGAN architecture, a generative adversarial model, Professor Wu's team transformed simulated images from a virtual style to a real-world style for model training. They design loss functions to regulate the neural network's action outputs, enhancing the continuity of actions over consecutive time steps. This approach facilitated the smoothing of DRL model output actions. According to their tests, the success rate of completing a lap without going off-track increased from a mere 42.8% to nearly 100%, and lap times decreased from 22.03 seconds to 19.54 seconds, representing a comprehensive enhancement.

In this era of technological advancement, we have witnessed the potential of sim-to-real transfer technology. This innovation not only improves autonomous miniature car racing but also extends to various image-based deep reinforcement learning models. By bridging the gap between virtual and real worlds, this technology enhances the viability of deep reinforcement learning in addressing real-world challenges. Moreover, it facilitates the practical deployment of reinforcement learning models across domains such as robotics, robotic arms, and drones. Our college would like to express profound appreciation to Professor I-Chen Wu and his team for their diligent efforts and innovative thinking, which have significantly contributed to the technological development of Taiwan and the world. We eagerly anticipate the research teams at Yang Ming Chiao Tung University persisting in leveraging their forward-looking technology to generate further positive outcomes worldwide. May they illuminate Taiwan's path in autonomous driving technology, enhancing convenience and safety in our lives, while pioneering new frontiers in technology and innovation.

陽明交大曾新穆教授團隊：數據驅動的救命技術

文／鍾乙君

近年來，全球疫情的爆發加速了智慧醫療的發展。根據 Grand View Research 的報告，2022 年全球智慧健康照護市場規模已達到 1494 億美元，預計到 2030 年將增長至 3852 億美元，年複合成長率達 12.8%。在這樣的背景下，急重症照護的需求日益迫切，尤其是心律不整、敗血症、心跳驟停等病症的早期預警和預測。

曾新穆教授團隊的突破性技術

曾新穆教授團隊開發的多目標時間序列早期預測技術及急重症預警應用系統，能夠有效地預測急重症的發生，並及時提供預警，這項技術不僅在學術界獲得認可，獲得了 2023 未來科技獎，更在實際醫療場域中展現了其價值。這項技術結合了人工智慧、醫學和資料科學的專業知識，透過深度強化學習和多目標優化演算法，利用心電圖等生理訊號資料，建立了高精準度的預測模型。

曾新穆教授團隊發展出多目標時間序列早期預測技術及急重症預警應用系統，包含一系列基於深度強化學習及多目標優化等技術之創新性早期預測演算法，其突破性特色包含曾新穆教授團隊所設計之片段政策網路 (Snippet Policy Network)、膝引導神經進化演算法 (Knee-Guided Neuroevolution Algorithm, KGNA)、控制代理人模組 (Co ntrolling Agent) 及鑑別器 (Discriminator)，能由所輸入之各類生理訊號所對應之時間序列中萃取出時序片段 (Snippet) 細微特徵，結合深度學習網路技術建構出具高精準度之預測模型，並運用智慧型代理人 (Intelligent Agent) 控制決策流程，及多目標優化技術於及早時間輸出兼顧準確性與及早性之最佳預測結果；同時，透過約束性 KGNA 並可讓使用者依各種應用場域之需求，對重要預測目標進行個別化優先度設定。基於技術之特性以及各項突出之效能驗證結果，此系統除了可運用於急重症領域之早期預警，未來將也可拓展至其它智慧醫療與智慧感測領域之異常預測。

關於 Benchmark 量化說明，曾新穆教授團隊提出技術所建立之早期預測模型以準確度 (Accuracy)、及早性 (Earliness)、召回率 (Recall)、精確度 (Precision)、F1-score、調和平均 (Harmonic Mean)、AUC(A rea Under ROC Curve) 等指標進行評估。其中調和平均為同時考慮到準確度與及 早性之指標。透過在多個公開大型心電圖資料集之測試，分別針對心律不整和敗血症早期預測之平均準確度可達 0.82 和 0.90 以上，並具最佳之及早性，顯示此技術於多項指標中皆遠優於其它最前沿之技術。

技術的實際應用與未來展望

團隊與聯新國際醫院進行產學合作，通過臨床試驗證明了其在實際醫療場域中的可行性，其中 AUC 達到 0.914。曾新穆教授團隊證明這項技術不僅能夠提升醫療照護品質，降低醫護人員的工作負擔，還能提高急重症患者的生存率和康復率，減輕患者和家庭的身心及經濟壓力。此外，這項技術的應用範圍非常廣泛，不僅限於醫療院所，還可以結合 AIoT 技術，如智慧病房，以及擴展到製造業等其他時間序列相關領域，進行早期異常預測和預警。

曾新穆教授團隊的技術在智慧醫療領域的應用，為急重症照護帶來了革命性的改變。隨著技術的不斷發展和應用，本院期待它能夠為全球醫療健康產業帶來更多的創新和進步。這不僅是一項科技成就，更是對人類健康和福祉的重大貢獻。隨著這項技術的進一步推廣和應用，我們有理由相信，智慧醫療將為未來的醫療照護開啟新的篇章。

NYCU Dr. Tseng's Data Intelligence Lab: Data-Driven Life-Saving Technology

In recent years, the global outbreak of the pandemic led to the growth of smart healthcare. According to a report by Grand View Research, the global smart healthcare market reached $149.4 billion in 2022 and is projected to grow to $385.2 billion by 2030, with a compound annual growth rate of 12.8%. In this context, the demand for critical care is increasingly urgent, particularly in the early warning and prediction of medical conditions such as arrhythmias, sepsis, and cardiac arrest.

The breakthrough technology developed by Professor Tseng's team

Professor Vincent S. Tseng's team has developed "Multi-Objective Series Early Prediction Technologies and the Alarm System for Critical Care" that can predict the onset of critical illnesses and issue timely warnings. Combining expertise in artificial intelligence, medicine, and data science, this technology utilizes deep reinforcement learning and multi-objective optimization algorithms and physiological signal datasets such as electrocardiograms to establish a highly accurate prediction model for critical illnesses. It has not only gained recognition in academia but also won the 2023 Future Technology Award, demonstrating its value in practical medical settings.

Professor Tseng and his team have developed the "Multi-Objective Series Early Prediction Technologies and Alarm System for Critical Care," which utilizes advanced early prediction algorithms based on deep reinforcement learning and multi-objective optimization. The system comprises several innovative components, including the Snippet Policy Network, Knee-Guided Neuro-evolution Algorithm (KGNA), Controlling Agent, and Discriminator, which can extract snippet features from various physiological signals corresponding to the input time series and fuse deep learning technologies to construct highly accurate predictive models. This system utilizes intelligent agents to control decision-making processes and multi-objective optimization techniques to achieve the best prediction results that maintain a balance between accuracy and timeliness in early output. Additionally, the constrained KGNA enables users to prioritize specific prediction targets based on their application requirements. The system has undergone extensive performance validation. It serves not only as a reliable early warning tool for critical illnesses but also has the potential to expand into other areas, such as smart healthcare and abnormal prediction in smart sensing across various domains.

Professor Vincent S. Tseng's team provides a quantitative explanation regarding Benchmarking, wherein the early prediction models established by their technology are evaluated using metrics such as Accuracy, Earliness, Recall, Precision, F1-score, Harmonic Mean, and AUC (Area Under ROC Curve). The harmonic mean, in particular, serves as an indicator that simultaneously considers accuracy and earliness. Through tests on various large publicly available electrocardiography datasets, the average accuracy in predicting arrhythmia and early sepsis surpasses 0.82 and 0.90, respectively, achieving optimal earliness. The result illustrates that this technique significantly outperforms other cutting-edge methods across multiple metrics.

Applications and Future Prospects of the Technology

The industry-academia collaboration between Professor Tseng's team and Landseed International Hospital demonstrates the feasibility of their application in actual medical environments, validated through clinical trials with an AUC of 0.914. The team's technology not only enhances the quality of medical care and reduces staff workload but also improves survival and recovery rates of critically ill patients, thus alleviating the physical, mental, and financial burdens on patients and their families. Moreover, the application of their technology can extend far beyond medical facilities to integrate AIoT technologies like smart wards and branch out into other time-series-related sectors such as manufacturing for early anomaly prediction and warning.

The technology developed by Professor Tseng's team has sparked a revolution in smart healthcare, substantially improving emergency and critical care. As this technology continues to evolve and be applied, our college anticipates its capacity to catalyze further innovation and advancement within the global healthcare sector. This achievement is not only a technological feat but also a profound contribution to human health and welfare. With the ongoing promotion and utilization of this technology, we are confident that smart healthcare will usher in a new era of medical care.

數位再轉型：用客製化大模型解決科技問題

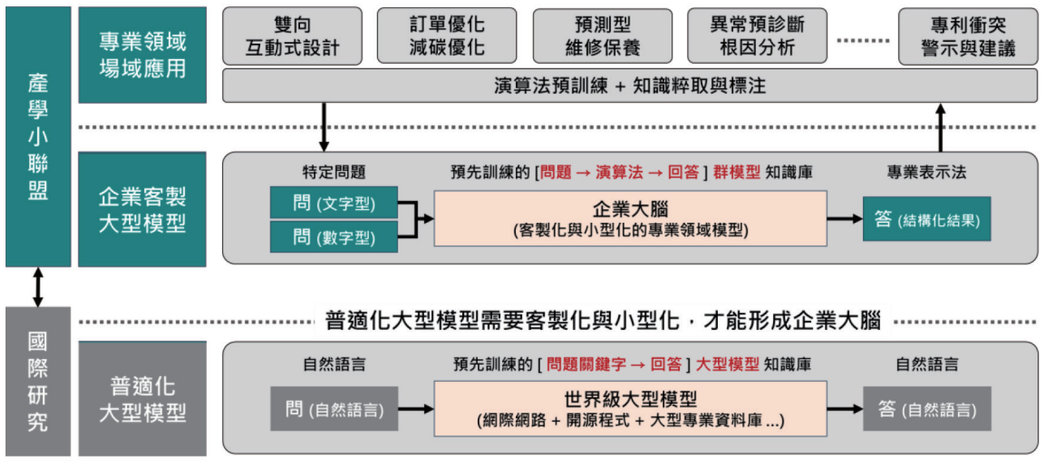
文／杜懿洵

自 2022 年底 OpenAI 發布 GPT-3.5 後，因為能夠對話與更能夠接近人類思考方式等特性，正式引爆大型語言模型 AI 熱潮；然而，GPT-3.5 之所以能引發熱議，在於從第一代開始不斷砸下的重金與資源，除了演算資源之外，GPT-3 模型參數已高達 1750 億，而這也是自 GPT3.5 開始，能將訓練從單向的資料提供，轉向對話模式的關鍵。2023 年 3 月，OpenAI 緊接著發布 GPT-4，更支援視覺輸入、圖像辨識，在強大的參數訓練之後，AI 的重點也快速的轉向提升利用現有數據的能力上，而各種企業應用研發也如雨後春筍般興起。

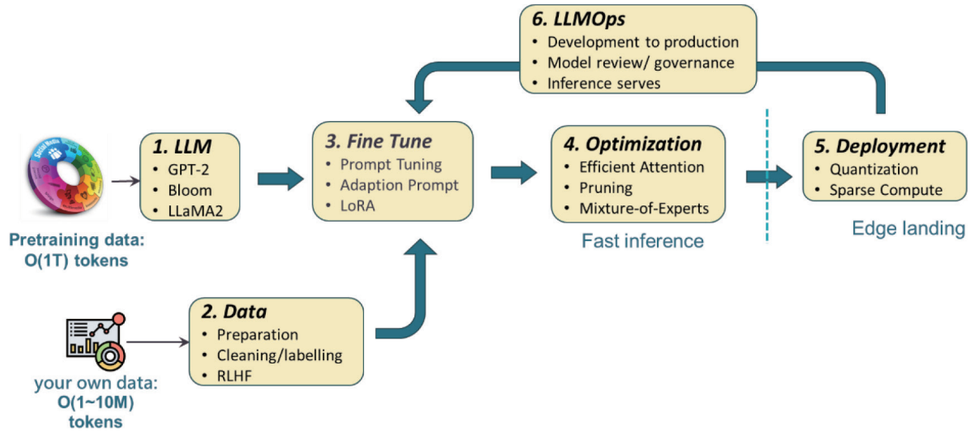
隨著 GPT 的應用風起雲湧，AI 技術中的大型語言模型（LLM）不僅提供了強大的自然語言處理能力，更潛在地改變了各個產業，從智慧製造到永續發展，從知識管理到企業大腦的構建。為了分享國內產、學、研專家在大型模型的研究成果以及目前標竿企業實際的落地應用，國立陽明交通大學人工智慧系統檢測中心與國家高速網路與計算中心、台灣人工智慧協會共同合作，於 2003 年 8 月 18 日聯合主辦「2023 LLM 產學技術交流會」，以「AI 大型模型趨勢發展探討」、「永續經營與智慧製造」、「AI 落地應用分享」三大主題，邀請近 30 位產、學、研的領先專家分享見解和經驗，現場並有 27 項技術實體的展示攤位，期待透過產、學、研的分享與交流，一起攜手為開發出台灣自己的 GPT 而努力。

然而，發展台灣大型語言模型雖已成共識，但訓練一個客製化大型生成式 AI 模型，不但需要大量時間與金錢成本，更需要來自產學研的三大核心能力：「學術界的演算法發展能力」、「企業的知識庫整合能力」，以及「專業研究機構的高效計算能」，才能與國際巨頭競爭。有鑑於此，陽明交大倡議成立「大型模型產學小聯盟」，共同建立一個可分享又具有私有化保密機制的大型模型。

「大型模型產學小聯盟」的成立，除了在打造更符合台灣人使用習慣的 AI 平台之外，更期待能讓大型語言模型從普適性的通用模組進入特定領域的產業，進行客製化的應用，以及讓企業能以大型模型的縮小版，做出自己的客製化知識管理系統，訓練出自己的「企業大腦」，為未來開發出更多產業新機會（圖一）。



資料來源：陽明交通大學 陳添福教授



圖二 有效率的大型語言模型開發流程

然而，若要達成「大型模型產學小聯盟」的目標，亟待企業界在資深專家結構化與非結構化知識萃取與標注、私有資料、大型模型合成數據 (synthetic data) 等知識庫的整合，讓模型能在企業落地實踐中學習。

私有資料的清理與整合是大型模型成功的基礎

陳添福教授表示，要做出一個有效率的模型運用，一定要做好私有資料的清理與整合 (步驟 2)，接著才是模型的預訓練 (Pre-trained)、微調 (Fine Tune) 以及優化 (Optimization)，但目前 LLM 存在著「缺乏企業私有化的資料」，尤其是技術資料，以及預訓練資料過時的缺點，因此，期待能與企業合作，進行私有資料的清理與整合，讓 LLM 能得到正確、專業的互動結果。

應用 Retrieval-based 的大型語言模型框架整合私有資料

而在大型模型合成數據部分，目前主要是以 Retrieval-based 的大型語言模型框架，進行企業私有知識庫檢索與生成式模型整合。Retrieval-based 框架的檢索擴增生成理論 (Retrieval-Augmented Generation, RAG)，不但能夠快速且精準地從資料庫中檢索相關的參考文獻、提供簡潔和易於理解的答案，也能考量資料安全和權限管理的問題，針對不同權限層級的資料進行隔離和分類，讓使企業能夠保護機密信息。交流會中，陽明交大也展示 Retrieval-based 框架應用的 RISC-V 知識小助手作為實際參考。

老師傅經驗的萃取與標注與 AI 客製化插件

至於如何將資深專家 / 老師傅的經驗與智慧，進行結構化與非結構化知識的萃取與標注，向來是所有 AI 關注的重點，而此次交流會中，中研院孔祥重院士也分享了從影像語言模型萃取老師傅經驗的案例。而針對客製化經驗萃取開發專業插件，也是針對已經有一定發展程度的 AI，一個值得關注的議題與相對務實的做法。交流會中，優智能吳浩平技術長以及多位專家也分享了面對企業生產情境多樣，以客製化的經驗萃取插件，將企業員工的個人知識轉化為組織可以再利用的 AI 工具的選擇與應用，提供大家進一步思考。

「2023 LLM 產學技術交流會」不僅有產學研的專家給予技術知識，現場也聚集了許多尋求解決方法的產業人士，多元化的參與組成，豐富了活動的內容並促進跨領域的交流。總體而言，除了期許 LLM 的發展上，能打造更符合台灣人使用習慣的平台，更希望是在企業可以負擔的情況下，打造一個兼顧資安與智慧的知識庫，為未來的 LLM 發展和應用打下了堅實的基礎。如欲詢更詳細資訊，請洽 myLLM.tw 網站。

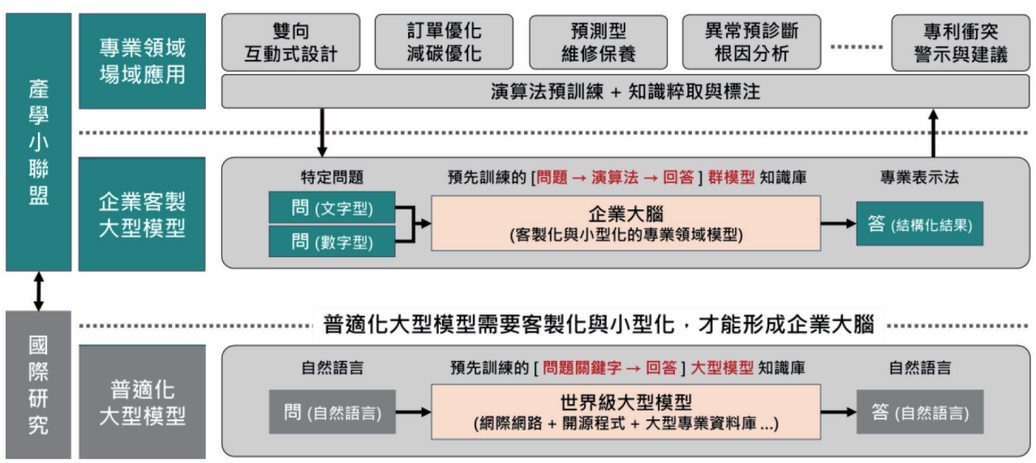
Digital Transformation: New Approach for Problem–Solving with Custom Large Models

OpenAI's release of GPT-3.5 at the end of 2022 has sparked a surge in the popularity of large-scale language models for generative AI, thanks to its ability to engage in conversations and closely approximate human thought processes. The fervor around GPT-3.5 arose from the significant investment of resources poured into its development, since the first generation. GPT-3 boasts 175 billion parameters, which played a key role in shifting the training focus from unidirectional data provision to dialogue mode. In March 2023, OpenAI quickly followed up with the release of GPT-4, which supported visual input and image recognition. After intensive parameter training, AI shifted its focus towards enhancing its ability to utilize existing data, resulting in the proliferation of diverse enterprise applications and research developments.

The use of Large Language Models (LLMs) in generative AI is rapidly expanding. These models possess powerful natural language processing capabilities and have the potential to revolutionize various industries. They are utilized in smart manufacturing, sustainable development, knowledge management, and corporate intelligence. To disseminate the findings of domestic industry, academia, and research experts in large-scale models, the AI System Benchmarking and Tuning Lab at National Yang Ming Chiao Tung University, in collaboration with the National High-Speed Network and Computing Center and the Taiwan Artificial Intelligence Association, jointly hosted the "2023 LLM Technology Exchange Conference" on August 18, 2023. The conference had three main themes: "Exploring the Latest Trends in AI Large Models Development," "Sustainable Operations and Smart Manufacturing," and "Sharing the Deployment of Artificial Intelligence in Real-World Practice." About 30 renowned experts from industry, academia, and research were invited to share their insights and experiences, along with 27 show booths on-site. The goal was to collaboratively share and exchange knowledge among industry, academia, and research communities to coordinate efforts toward developing Taiwan's indigenous GPT.

There is a consensus in Taiwan about the development of large language models. However, creating a customized large-scale AI model requires considerable time and financial investment, as well as three core capabilities from academia, industry, and research: “the academic community must have algorithm development skills”, “the enterprises must have the capacity to integrate knowledge”, and “the professional research institutions must have efficient computing capabilities”, which are crucial for competing with international leaders in this field. Therefore, National Yang Ming Chiao Tung University proposes the formation of the "Large Model Industry-Academia Small Alliance" to collaboratively build a large model that features both shareable mechanisms and privacy protection.

The establishment of the 'Large Model Industry-Academia Small Alliance' not only aims to develop AI platforms catering to the preferences of Taiwanese users but also intends to facilitate the evolution of large language models from universal, general-purpose modules to industry-specific applications. This evolution enables enterprises to develop their customized knowledge management systems using scaled-down versions of large models. By training their own 'enterprise brains,' this initiative sets the stage for the emergence of numerous industrial prospects in the future, as depicted in Figure 1.



Source: Professor Tien-Fu Chen, National Yang Ming Chiao Tung University.

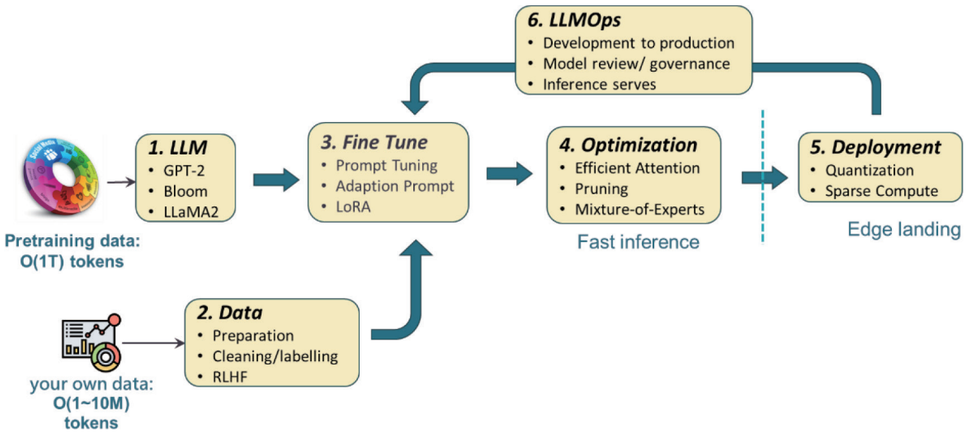


Figure 2 Efficient Development Process of Large Language Models.

To achieve the goals of the 'Large Model Industry-Academia Small Alliance,' it is crucial that businesses promptly integrate annotated information derived from both structured and unstructured data by experienced professionals, private data, and synthetic data for large-scale models into knowledge bases to facilitate model learning during practical deployment in enterprises.

Private data cleaning and integration is the foundation of the success of large-scale models

Professor Tien-Fu Chen has highlighted the significance of data cleaning and integration as a crucial step toward creating an efficient model. This process comes as Step 2, followed by pre-training, fine-tuning, and model optimization. However, the current Large Language Models (LLMs) suffer from the lack of privatized enterprise data, specifically technical data, and the issue of outmoded pre-training data. Therefore, there is growing anticipation for collaborative efforts with enterprises toward private data cleaning and integration, ensuring that LLMs can deliver precise and professional interactive outcomes.

Figure 2 Efficient Development Process of Large Language Models.

Integrating private data using Retrieval-based large language model frameworks

In terms of data synthesis with large-scale models, the retrieval-based framework of large language models is primarily utilized to integrate enterprise private knowledge retrieval with generative models. The Retrieval-Augmented Generation (RAG) framework within the retrieval-based framework enables quick and accurate retrieval of relevant references from databases to provide concise and understandable responses. Furthermore, it addresses concerns regarding data security and access control management by dividing and categorizing data based on different authorization levels, empowering enterprises to safeguard confidential information. At the conference, a practical application of the retrieval-based framework was presented by NYCU as a RISC-V knowledge assistant for reference.

Tacit knowledge extraction, annotation, and AI-customized plugins

The focus of all AI attention has traditionally been on harnessing the experience and wisdom of senior experts or mentors to retrieve and annotate both structured and unstructured knowledge. At the meeting, Academician Dr. Hsiang-Tsung Kung from Academia Sinica presented cases illustrating such information extraction using image-language models. The development of plugins based on customized experience is a valuable and practical strategy for AI systems that have reached a certain level of advancement. During the meeting, Dr. Haopin Wu, Chief Technology Officer of Goedge.ai Inc., and other experts shared insights on addressing various corporate production scenarios. They discussed the selection and application of customized experience extraction plugins to convert employees' knowledge into reusable AI tools for organizations, which can stimulate further reflection.

The '2023 LLM Technology Exchange Conference' not only offered invaluable insights from industry experts but also attracted a significant number of professionals actively seeking solutions. The diverse participation enriched the event's content and fostered interdisciplinary exchanges. Essentially, beyond aligning LLM development with Taiwanese usage patterns, there exists an expectation that enterprises are capable of building a financially viable knowledge base while striking a delicate balance between information security and intelligence, laying a solid foundation for the future advancement and utilization of LLMs. For further details, please visit myLLM.tw.

顏安孜老師：探索自然語言處理的前沿

文／鍾乙君

在資訊科技的黃金時代，顏安孜博士的研究成果在自然語言處理（NLP）和資訊檢索（IR）領域引人注目。作為國立陽明交通大學資訊工程學系的助理教授，她不僅豐富了學術界的知識庫，也為學生們提供了寶貴的學習機會。

顏博士的學術之旅始於對資訊技術的熱愛。她回憶道：「大學時期，我覺得自己還需要精進資訊領域技術，所以選擇唸研究所。」在侯文娟教授的指導下，她發現了對實驗研究的熱情，這最終促使她決定攻讀博士學位。在陳信希教授的實驗室，她發現了學術研究的樂趣：「每完成一個階段的成果都相當有成就感，於是更加堅定投入學術研究工作。」

顏博士的成就包括在 AAAI、EMNLP、WWW、SIGIR 等國際知名會議上發表論文，以及獲得 ACLCLP（計算語言學協會 - 中文處理）博士論文獎的榮譽提名。她在 IJCAI（人工智能國際聯合會議）擔任傑出 PC 會員，並在 CIKM（資訊與知識管理會議）和 EACL（歐洲計算語言學會）等會議中擔任程序委員。

在教學理念方面，顏博士強調尊重和傾聽：「在互相尊重前提下，傾聽與理解學生的意見和感受，並且盡可能協助學生獲得學習與研究資源。」她也引用大谷翔平的話，「應該先成為人再成為棒球員，希望自己作為一個人，能被社會認為可信賴」。顏博士相信只要能朝著自己所想的方向努力，這個社會就會有更多美好的一面，期許學生們都能夠成為「值得信賴」的人，並強調成為一個可信賴的人的重要性，鼓勵學生朝著自己理想的方向努力。

「隨遇而安」則是顏博士的人生座右銘，她解釋說：「因為人生無常，我希望自己在面臨困難與無可奈何的事情時，都能夠保持內心的平靜，不受外境影響。」

對於目前正在從事研究或是想要走上研究之路的學生們，顏博士在採訪中說道從事學術研究最重要是對探究問題的好奇心，如果沒有好奇心，就無法訂定要探討對於目前正在從事研究或是想要走上研究之路的學生們，顏博士在採訪中說道從事學術研究最重要是對探究問題的好奇心，如果沒有好奇心，就無法訂定要探討什麼樣研究問題，所以她認為好奇心是學術研究最重要的能力，並鼓勵學生自訂研究問題並尋求解答，從而培養他們的研究能力。

隨著 AI 時代的到來，顏博士和她的團隊無疑將繼續在自然語言處理領域探索新的前沿。這次專訪不僅是對過去努力的回顧，更是對未來無限可能的期待。我們期待顏博士能夠帶領資訊學院的學生完成更多優秀的實驗與成果，為學術研究和社會進步做出更大的貢獻。顏博士的領導和創新精神將繼續引領學術界走向新的高峰。這是一次學術與創新的盛會，也是一次對未來的承諾。

此外，我們也期待顏博士能夠繼續培養學生的研究能力，鼓勵他們自訂研究問題並尋求解答。好奇心是學術研究最重要的能力之一，而顏博士的教學理念中強調尊重和傾聽，也將為學生提供更好的學習與研究資源。而顏博士的人生座右銘“隨遇而安”也值得我們深思。在這個充滿變數的世界中，保持內心平靜並不受外境影響，是一種珍貴的品質。我們期待顏博士能夠繼續以這種平靜的心態面對未來的挑戰，繼續為科學研究和社會進步做出卓越的貢獻。

Dr. An-Zi Yen: Exploring the Frontiers of Natural Language Processing

In the golden age of information technology, the work of Dr. An-Zi Yen in the fields of Natural Language Processing (NLP) and Information Retrieval (IR) has attracted considerable attention. As an assistant professor in the Department of Computer Science at National Yang Ming Chiao Tung University, Dr. Yen has made notable contributions to the body of academic knowledge and has provided exceptional educational opportunities for her students.

Dr. Yen's academic journey was fueled by an enduring passion for information technology. Reflecting on her early years, she shared, "During my undergraduate studies, I identified a strong desire to enhance my proficiency in the field of information, thus electing to pursue graduate studies." Under the guidance of Professor Wen-Juan Hou, she developed a keen interest in experimental research, a discovery that propelled her toward pursuing a PhD. Immersed in the vibrant research environment of Professor Hsin-Hsi Chen's lab, Dr. Yen found profound joy and satisfaction in academic research. "Each milestone achieved instilled a profound sense of fulfillment, reinforcing my unwavering commitment to academic exploration," she remarked.

Dr. Yen's achievements include publishing papers at internationally renowned conferences such as AAAI, EMNLP, WWW, and SIGIR. Additionally, she received an esteemed nomination for the ACLCLP (Association for Computational Linguistics and Chinese Language Processing) Doctoral Dissertation Award. Her contributions extend further as she serves as a distinguished PC member at IJCAI (International Joint Conference on Artificial Intelligence) and as a program committee member at conferences like CIKM (The Conference on Information and Knowledge Management) and EACL (European Chapter of the Association for Computational Linguistics).

In her teaching philosophy, Dr. Yen places significant emphasis on the principles of respect and attentive listening. She advocates for creating an educational space infused with respect, where students' perspectives and emotions are not just acknowledged but deeply valued. Her commitment extends to ensuring that students have full access to educational and research opportunities, empowering them to make the most of their learning experiences. Dr. Yen also draws inspiration from Shohei Ohtani's words: "One should become a good person before becoming a baseball player, hoping to be considered trustworthy by society." She firmly believes that society can evolve positively as individuals relentlessly follow their chosen paths with integrity. Her ultimate goal is to instill a deep sense of trustworthiness in all her students, emphasizing its critical importance and inspiring them to strive towards their highest ideals with unwavering commitment.

Dr. Yen adopts the motto "Take things as they come," explaining, "Given life's unpredictability, I hope to preserve inner tranquility and resilience amidst challenges and circumstances beyond my control."

During the interview, Dr. Yen stressed the importance of curiosity, especially for students who are either currently involved in research or looking to embark on a research journey. She pointed out that without a keen sense of curiosity, it becomes difficult to identify worthwhile research questions to explore. As such, she considers curiosity to be the most critical skill in academic research. Dr. Yen encourages students to enhance their research skills by crafting their unique research questions and diligently searching for answers, thereby fostering a deeper engagement with their chosen fields of study.

With the advent of the AI era, it is undeniable that Dr. Yen and her team will continue to explore the limits of natural language processing. This interview not only reflects on their past achievements but also looks forward with great anticipation to the vast possibilities that lie ahead. We are eager to witness Dr. Yen's mentorship of the students at the College of Computer Science, where her guidance is sure to inspire groundbreaking experiments and remarkable contributions to both academic research and societal progress. Under Dr. Yen's visionary leadership and innovative spirit, the academic community is set to soar to new heights, marking a celebration of scholarly pursuit and creativity, all while maintaining a deep commitment to shaping the future.

Furthermore, we eagerly anticipate Dr. Yen's efforts to develop students' research skills and encourage them to explore research questions and solutions independently. In academic research, curiosity is crucial, and Dr. Yen's teaching philosophy emphasizes the importance of respect and attentive listening, which provides students with better access to resources for learning and research. Her guiding principle, "Take things as they come," encourages reflection. In a world characterized by unpredictability, inner calm and resistance to external influences are invaluable. We are looking forward to Dr. Yen's continued demonstration of this composed mindset as she faces future challenges, and we expect her to continue making remarkable contributions to scientific research and societal advancement.

傑出校友陳士元：從陽明交大走向世界的投影科技先驅

文／鍾乙君

陳士元學長，一位具有深厚實力和豐富經驗的資深企業家，目前擔任奧圖碼董事長。畢業於國立交通大學計算機工程系，是系上 73 級的優秀學長。在他的職業生涯中，他曾先後擔任過中強光電、琉璃奧圖碼科技、奧圖碼歐洲區以及中強光電歐洲區的總經理一職。這些豐富的經歷使他在企業管理和國際市場開拓方面具有卓越的能力和見識。

今年本校第三屆傑出校友獲選名單中，陳士元學長名列其中。這五位優秀的校友們，憑藉著他們長期深耕於各自專業領域，奠定了堅實的基礎，累積了豐富的經驗與資歷。他們不僅在自身事業上有所建樹，更積極回饋國家社會，對環境保護、公益事業、以及發揚大愛等方面作出了重要貢獻。這些傑出校友們的光輝成就不僅為母校帶來了榮耀，也樹立了一個優秀的典範，成為在校學弟妹學習的榜樣。而為了表揚他們的杰出成就與特殊貢獻，本校於 113 年 2 月 28 日舉辦了第三屆傑出校友頒獎典禮，以表達對他們的敬意與褒揚。

陽明交大引以為傲的傑出校友陳士元學長，他的故事就像一部閃耀著勇氣與智慧的傳奇。自民國七十三年畢業於國立交通大學計算機工程學系起，他便踏上了一段光輝之路。如今，作為奧圖碼股份有限公司董事長和中光電的創始成員，他不僅塑造了自己的事業，更在行業中獨樹一幟，成為全球投影機領域的領導者之一。陳學長在民國八十六年前往歐洲創立中光電子公司，之後在民國九十一年成立了奧圖碼品牌公司。他也曾擔任中光電總經理多年，目前專責奧圖碼事業發展，並籌設英國總部。陳校友以中光電的硬技術開發軟體創新，拓展全球布局及在地經營之品牌策略。他主導發展投影機產品，建立市場區隔並靈活行銷，使奧圖碼成為全球領導先驅之一。尤其在 DLP 數位投影技術方面，奧圖碼名列世界第一，服務遍及一百五十個國家，並以綠色環保的產品設計獲得多項國際大獎肯定。

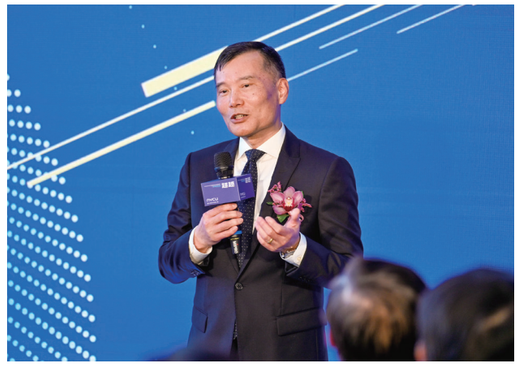
因為卓越表現而獲獎回到母校，陳學長於頒獎典禮的致詞中，他對母校與系所的感激溢於言表。他說：「感謝交大與資工系的培育與推薦，在大學的時候時常看到學長帶著太太光榮地回到母校，今天我也成功做到了。」 這句話不僅是對母校的感謝，更是對自己一路奮鬥的肯定。在交大求學期間，陳士元不僅學到了硬體與軟體平衡發展的系統思考，還鍛煉了團隊合作與拼搏精神，這些在他日後的事業中發揮了重要作用。

陳士元回憶起在交大棒球隊的時光時說道：「大學對我未來的生涯影響很大，在交大棒球隊也學會了團隊合作與運動家的精神，尤其是在梅竹賽的震撼教育。」這種團隊精神與勇往直前的態度，成為了他日後在創業路上的堅實支撐。他還感謝了許多交大校友在他職業生涯初期給予的幫助，特別提到了初入職場時受到的照顧，以及棒球隊的學弟引薦給他加入中光電的機會。

在他的職業生涯中，陳士元多次面對挑戰，但他始終憑借著交大的訓練與自身的努力，迎難而上。他分享了一次在歐洲設立子公司的經歷，當時會計部門結帳電腦出現問題，他依靠自己的工程師背景和交大的培訓，在不到一個小時內就解決了問題。這個小故事展現了交大培養學生綜合能力的重要性，以及具備的解決問題的能力。

如今，陳學長不僅是一位成功的企業家，更是一位回饋母校的熱心校友。他與陽明交大合作成立了「AI 暨虛實互動研發中心」，為培養未來人才和推動產業發展貢獻自己的力量。他期待著交大能夠繼續培養更多的人才，不僅造福台灣，更是全世界。他的故事，是陽明交大的驕傲，更是無數學子的榜樣。他用自己的努力與智慧，書寫著屬於自己的傳奇，為交大增光添彩，為社會作出了卓越貢獻。願陳學長的故事激勵著更多的學子，勇敢前行，追逐自己的夢想。

Outstanding Alumnus Shih-Yuan Chen: A Pioneer of Projection Technology Going from NYCU to the World



Shih-Yuan Chen is an experienced entrepreneur with deep expertise and currently holds the position of chairperson at Optoma Corporation. He earned his degree from the Department of Computer Engineering at National Chiao Tung University (NCTU) and is an outstanding student of the class of 73. Throughout his career, he has held the role of President at Coretronic Corporation, Optoma Group, Optoma Europe, and Coretronic Europe in succession. These diverse experiences have equipped him with exceptional skills and insights in corporate management and international market expansion.

This year, Chen is among the five outstanding alumni from the third class of National Yang Ming Chiao Tung University (NYCU). These alumni have built strong foundations, amassed extensive experiences and credentials, and shown steadfast commitment to their respective fields. They have not only excelled in their careers but have also actively contributed to the nation and society, making significant impacts in areas such as environmental protection, public welfare, and the promotion of universal compassion. The remarkable accomplishments of these outstanding alumni have not only brought prestige to our alma mater but have also set a commendable precedent, serving as inspirational figures for younger students. To acknowledge their exceptional achievements and notable contributions, NYCU hosted the third Outstanding Alumni Awards Ceremony on February 28, 2024, as a gesture of respect and commendation.

Chen, a distinguished graduate of National Yang Ming Chiao Tung University, has a remarkable story of courage and wisdom. After completing his degree in Computer Engineering at NCTU in 1984, he embarked on an illustrious journey. Today, as the chairman of Optoma Corporation and a founding member of Coretronic, he has not only paved his way but has also emerged as a leader in the global projector industry. In 1997, Chen ventured to Europe to establish Coretronic's subsidiary, and in 2002, he co-founded Optoma. Despite his previous role as the President of Coretronic Corporation, his current focus is on developing Optoma and establishing its UK headquarters. Chen has utilized Coretronic's hardware technology to drive software innovations and expand global reach and local operations through strategic branding. Leading the development of projector products, he has implemented market segmentation and dynamic marketing strategies, propelling Optoma to the forefront of global innovation. Especially in terms of DLP digital projection technology, Optoma ranks first in the world, serving 150 countries and earning numerous international awards for its environmentally sustainable product design.

Chen's exceptional performance led him back to his alma mater. During his acceptance speech at the ceremony, he conveyed deep appreciation for his alma mater and the Department of Computer Science. He remarked, "I'm grateful for the support and endorsement from NYCU and the Computer Science Department. During my college years, I often saw seniors proudly returning to campus with their spouses. Today, I have achieved the same success." This statement not only demonstrates gratitude towards his alma mater but also affirms his journey of challenges and accomplishments. During his time at NCTU, Chen gained insights into the systematic balance between hardware and software development and honed his teamwork and perseverance, significantly contributing to his future career.

Looking back on his time with the NCTU baseball team, Chen said, "My university experience had a significant impact on my future career. Being part of the NCTU baseball team taught me the values of teamwork and sportsmanship, especially during the impactful Meichu Game." This feeling of unity and determination laid a strong foundation for him throughout his entrepreneurial journey. He also expressed his gratitude to the NCTU alumni who supported him in the early stages of his career. He specifically mentioned the assistance he received when entering the workforce and the opportunity to join Coretronic, which came about through a recommendation from a fellow baseball team member.

Throughout his career, Chen has faced numerous challenges. However, he consistently tackled them directly with the knowledge he gained at NCTU and his efforts. He shared an experience from when he was establishing a European subsidiary, during which the accounting department encountered computer glitches while closing procedures were underway. Leveraging his engineering background and the skills he acquired at NCTU, he quickly resolved the issue within an hour. This incident highlights the importance of NCTU in fostering students' comprehensive abilities and problem-solving skills.

Today, Chen is a successful entrepreneur and a dedicated alumnus who generously supports his alma mater. In collaboration with National Yang Ming Chiao Tung University, he has founded the "NYCU-Optoma AI and Virtual Reality Research and Design Center'' to nurture future talent and advance industry development. He looks forward to NYCU's ongoing efforts in cultivating more talent, benefiting not only Taiwan but also the global community. His story fills NYCU with pride and ignites the aspirations of countless students. Through his commitment and wisdom, he is creating a lasting legacy, bringing honor to NYCU, and making significant contributions to society. May Shih-Yuan Chen's journey serves as a beacon, inspiring more students to pursue their ambitions boldly.

傑出校友李良猷：榮譽與使命的共鳴

文／鍾乙君

2024 年二月國立陽明交通大學宣布，第三屆傑出校友名單中李良猷脫穎而出，成為眾望所歸的傑出校友。此次共有五位傑出校友獲得此殊榮，這些校友們長期在各自專業領域精益求精，凝聚了無數汗水與智慧，同時也秉持著回饋社會的使命，成為社會的中堅力量。他們的傑出表現不僅為母校帶來了榮耀，更是為後輩樹立了優秀的典範。

李良猷為本屆傑出校友之一，他於民國六十一年畢業於國立交通大學計算與控制工程學系。在校期間，他不僅學業優異，更是校園生活的活躍分子。曾擔任星聲社第二屆社長，組團 semiconductor 赴東海大學表演，同時也是交大溜冰社的社長。這些經歷豐富了他的大學生活，為他未來的發展打下了堅實的基礎。畢業後，李學長投身於資通訊、電機與控制領域，成為業界的頂尖專家。他先後在羅昇企業、北祥科技等多家公司擔任獨立董事和顧問，並在國內外多家上市公司提供專業指導。他的專業知識和豐富經驗使他成為了業界的權威人士，並在數位轉型和企業資訊應用方面做出了巨大貢獻。

他的成就不僅在於專業領域的探索，更在於他對社會的貢獻。李學長於民國七十一年創立中華民國資訊經理人協會，並擔任第一任理事長，致力於推廣企業資訊應用交流和數位轉型。他不僅挑戰各種職涯，從傳產到高科技，更是不懈地追求著創新和突破。

不僅如此，李學長的專業知識和豐富經驗也激發了他對教育的熱情。他將自己在科技趨勢、高階經營、創新研發、策略規劃等方面的豐富經驗，帶給了一代又一代的學生以及高階主管們，深入了解行業動態和未來趨勢。他出版了一系列的書本，涵蓋科技趨勢、高階經營、創新研發和策略規劃等多個領域。這些課程不僅在學術上具有前瞻性，更著重於實踐應用，為學生提供了豐富的知識和寶貴的經驗。科技趨勢課程包括《科技大未來》、《雲端大數據》、《智慧物聯網》等，通過深入研究當前科技的發展趨勢，幫助學生把握未來發展的方向。高階經營課程則涵蓋了《戰略思維》、《數位轉型》、《競爭力提升》等，幫助學生在激烈的市場競爭中保持領先地位。創新研發課程則通過《創新方法論》、《產業創新成敗實例》等，激發學生的創造力和創新精神。策略規劃課程則涵蓋了《變中制勝的策略》、《Dynamic Strategic Planning》等，幫助學生制定長遠發展規劃，應對市場變化。

在獲得傑出校友殊榮後，李學長發表了感言，他表示：「感謝母校給我的榮譽，也很感謝推薦人與委員的抬愛。」他回憶起自己在交通大學的求學時光，稱讚學校對他的培育和教育。

而對於三年前成立陽明交通大學，李學長從陽明一詞聯想到王陽明的學說兩個重要特點，認為科學與技術的探索就是「格物致知」，而「知行合一」更是對於實踐的要求，所以兩校的結合對他來說是陽明交大的絕佳機會，在 BIO ICT 生技的資通訊，未來的工業 4.0 上會有極大的優勢。他表示將繼續致力於資通訊領域，並期許母校能夠全面利用自身的優勢培養出更多世界一流的人才，成為世界頂尖的大學。

學長的豐富經驗和卓越成就不僅體現在專業領域，更體現在他對教育的貢獻和影響。他將自己的知識和經驗傳授給下一代，培養了一大批優秀人才，為行業的發展和社會的進步做出了積極貢獻。對於李良猷先生來說，獲得國立陽明交通大學第三屆傑出校友殊榮，不僅是對他個人的肯定，更是對他多年來努力的最好回報。他將繼續以榮譽校友的身份，為母校的發展和社會的進步貢獻自己的力量。

在這樣一位傑出校友的身上，我們看到了陽明交通大學的光輝歷程和無限潛能。他的成就不僅彰顯了學校的優秀教育資源和學術氛圍，更為學校的未來發展指明了方向。而陽明交通大學作為一所傳統與現代相結合的頂尖學府，在這個充滿挑戰和機遇的時代裡，更應該保持開放的姿態，積極探索創新的教學模式和科研方向，培養更多具有國際競爭力的優秀人才。

Outstanding Alumnus
Liang-Yoo Lee: Resonance of Honor and Mission

In February 2024, National Yang Ming Chiao Tung University (NYCU) announced Liang-Yoo Lee as one of the recipients of the 2024 Outstanding Alumni Awards. Five outstanding alumni were honored, each having excelled in their respective domains, investing numerous efforts and wisdom, while embracing the mission of contributing to society and becoming cornerstones of the community. Their remarkable achievements not only bring glory to their alma mater but also establish remarkable precedents for future generations.

Liang-Yoo Lee graduated from the Department of Computer Science and Control Engineering at National Chiao Tung University (NCTU) in 1972. During his college years, he excelled academically and actively participated in campus activities. He served as the president of the Star Voice club, formed a rock and roll band named Semiconductor to perform at Tunghai and Providence University in Taichung , and served as the president of the NCTU roller skating club. These experiences enriched his college life and provided a strong foundation for his future development. Following graduation, Lee pursued a career spanning information technology, electrical engineering, and control engineering, emerging as a prominent figure in the field. He has served as an independent board director and consultant to various listed companies, including Ace Pillar and PTSC, offering professional guidance to numerous companies both domestically and internationally. His extensive knowledge and experience have made him an authority in the industry, with significant contributions to digital transformation and enterprise information applications.

His accomplishments extend beyond his endeavors in the professional domain to encompass his contributions to society. In 1982, Lee established the Information Management Association of the Republic of China and became its first chairman. He dedicated himself to advancing enterprise information applications and facilitating digital transformation. Throughout his career, he has tackled a wide range of challenges in traditional and high-tech industries, always striving for innovation and breakthroughs.

Additionally, Lee's expertise and extensive background have ignited his passion for education. He imparts his wealth of experience in technology trends, upper management, innovative research and development, and strategic planning to successive groups of students and senior executives. These courses enrich their understanding of industry dynamics and future paths. Courses on technology trends cover topics such as "The Future of Advanced Technology," "Cloud based Big Data Analytics ," and "AIoT technologies and smart application ," helping students understand upcoming developments by exploring future technological trends. Senior executives and management courses explore "Strategic Thinking and problem solving ," "Digital Transformation," and "Generative AI 2.0 ," aiding students in maintaining a competitive edge in the market. Research and development courses foster students' creativity and innovative spirit through avenues such as "Innovation Methodologies" and "Success and Failure in Industrial Innovation: Case Studies." Strategic planning courses include "Change management " and "Problem analysis and solving methodology, " assisting students in crafting long-term development strategies to adapt to dynamic market trend.

Expressing his gratitude for the recognition, Lee stated: "I am thankful for the honor bestowed upon me by my alma mater, and I deeply appreciate the support and recognition from the nominators and committee members." Reflecting on his years at NCTU, he commended the institution for nurturing and educating him.

Regarding the establishment of NYCU three years ago, Lee associated the term "Yangming" with two key aspects of Wang Yangming's philosophy. He views the pursuit of science and technology as embodying the principle of "Investigate things to gain knowledge," while the concept of "Unity of knowledge and action" emphasizes the necessity of practical application. Therefore, the merger of the two universities presents an exceptional opportunity. In the field of biotechnology and information and communications technology (BioICT), as well as the incoming Industry 4.0, there will be significant advantages. Lee affirmed his dedication to continue contributing to the field of information and communications technology and expressed his hope that his alma mater could leverage its strengths to nurture more world-class talents, thereby ascending to the ranks of the world's top universities.

Lee has a wealth of experience and exceptional accomplishments, evident not only within his professional domain but also through his significant contributions and influence in education. He has shared his knowledge and expertise with the younger generation, fostering numerous outstanding talents and making positive strides towards the advancement of both the industry and societal progress. For Lee, receiving the 2024 Outstanding Alumni Award not only validates his endeavors but also stands as the ultimate recognition for his years of dedication. He remains committed to furthering the development of his alma mater and contributing to societal advancement as an esteemed alumnus.

The remarkable achievements of an outstanding alumnus exemplify the impressive journey and limitless potential of NYCU. These accomplishments not only showcase the institution's exceptional educational resources and academic environment but also offer guidance for its future development. National Yang Ming Chiao Tung University, as a leading university that combines tradition with modernity, should adopt an open-minded approach in this challenging yet opportunistic era. It should actively pursue innovative teaching methods and research pathways to nurture exceptional talents with international competitiveness.

緯創資通董事長林憲銘獲頒國立陽明交通大學榮譽工學博士

文／杜懿洵

國立陽明交通大學於 3 月 28 日頒發名譽工學博士學位予緯創資通股份有限公司董事長暨策略長林憲銘先生，頒授典禮當天，同樣身為交大榮譽博士的前老闆 - 宏碁創辦人施振榮先生，也親臨會場致詞恭賀;除了肯定林憲銘先生的成就，稱其為宏碁第二個重要人物之外，更讚許其提早佈局 AI 的眼光與執行力，帶領分家後不被看好的緯創，創下市值八千億的佳績，並透露林憲銘也是宏碁的共同創辦人之一，而宏碁當年啟動再造所提出的企業競爭戰略「微笑曲線」一詞，更是由林憲銘所命名的。而除了事業成就之外，林憲銘對於回饋母校與公益也是不遺餘力。

林憲銘當天也以「You Raise Me Up」為結論，感恩一路上支持他的貴人們，並以「外圓內方」的人生價值與「誠懇、熱忱、謙虛、利他」四個建議，與大家分享他經營企業與人生的心得。典禮當天，除了仿若陽明交大與宏碁的同樂會，許多科技巨頭也到場祝賀，包括宣明智、緯穎董事長洪麗甯、緯創總經理林建勳、啟碁總經理高健榮，以及從事公益的夥伴嚴長壽先生。

林憲銘先生名譽博士由資訊與電機兩大學院共同推薦，典禮當天，由陽明交大校長林奇宏宣讀表彰詞並進行撥穗儀式，林奇宏校長表示，林憲銘先生畢業於陽明交大計算與控制工程學系，1979 年加入宏碁、1998 年升任總經理，因啟動再造，於 2001 年 7 月帶領研製服務事業自宏碁電腦分割並成立緯創資通。藉由在 OEM ／ ODM 產品開發的豐富經驗，帶領緯創八年獲得《財星》（Fortune）全球 500 大企業榮譽、2018 年榮獲湯森路透（Thomson Reuters）全球科技百強（Top 100 Global Technology Leaders），也連續 15 年獲得富比士（Forbes）全球 2,000 大企業。如今，緯創資通已建立起分布於亞洲、歐洲及北美各地的營運據點，包含十個製造基地、十一個研發及技術支援中心，與十四個客戶服務中心，至 2023 年集團總市值已超過新台幣 8,000 億元。

除緯創外，林憲銘也曾擔任緯創集團旗下三家上市 / 櫃公司：啟碁科技、緯創軟體與緯穎科技的董事長。啟碁科技是無線通訊產品的領導者、緯創軟體是亞太地區少數具有全球交付能力的專業軟體及資訊委外服務公司，而 2012 年成立的緯穎科技，則在 AI 熱潮爆發前已把握住時機，專注於提供超大型資料中心 (Hyperscale Data Center) 及雲端基礎架構 (Cloud Infrastructure) 各項產品及系統的解決方案。緯穎在 2019 年 3 月 27 日正式掛牌上市後屢屢繳出亮麗的成績，每股盈餘從 2020、2021 約 50 元，快速推升至 2022 的 81.07 元。在緯穎股價仟元之上、營收與市值屢創新高之際，林憲銘於 2023 年 7 月 13 日卸下董事長之職並圓滿交棒，完成所有上市子公司傳承新世代之規劃。

林憲銘相當重視專利投資及累積專利組合規模，持續擴大尖端科技研發的投資，布局涵蓋醫療保健、元宇宙、人工智慧、工業 4.0、自駕及電動車等新興科技，並已投入超過新台幣 100 億元。而面對快速變化的科技競局與智能革命下的商業模式及產業變革，緯創也從 2017 年開始導入數位轉型，成立專責數位轉型辦公室以有效地驅動和落實從製造，乃至公司整體的數位及 AI 整合。林憲銘於頒授典禮中表示，2011 年時緯創集團營收約 5000 至 6000 億台幣、員工總數約 15 萬人，但受惠於 AI 的幫忙，在目前員工數不到 7 萬人的狀況下，卻創造了約一兆的營收！儘管如此，林憲銘仍一再強調與呼籲，人才的稀缺與多樣化，是未來台灣能否繼續站穩世界優勢位置的關鍵。

有鑒於人才的稀缺與回饋母校，除了捐贈 4,000 多萬元予陽明交通大學臺南分校工程，緯創也投入近 10 億元資金，捐建臺南分部同行樓預定地新建工程，期許帶動及強化臺南的產學研究聚落效應，創造一個真正培育人才的平台。自 2019 年起，林憲銘更每年捐贈 180 萬元，成立「緯創業界講座」，希望藉由全球知名人工智慧領域專家學者來臺講學，培育業界實務經驗之產業人才，也以個人捐款 1.5 億元予陽明交大成立「華仁全球講座」，規劃邀請國際諾貝爾等級的學者、大師來臺擔任客座，加速臺灣學子與國際接軌，強化重點趨勢人才的扎根與研究交流。此外，緯創本身雖已具有二座獲世界經濟論壇認證的燈塔工廠，2023 年 6 月仍與陽明交大合作成立「智慧與綠能產業創新聯合研發中心」，期待透過思考下一代智慧製造的定義與智慧綠能的議題，解構一個真正先進 ICT 產業智慧工廠的定義，創造臺灣領域典範。

頒授榮譽博士典禮當天，林憲銘致詞表示，在學時並非一個好學生，翹課、辦舞會樣樣來，但因為老師提出「為何唸大學」的問題啟發，以及當時接觸佛法，因此立定了「外圓內方」- 圓融行事與堅定良知的人生價值觀，從而也使得他能夠因為處理好與「人」的關係，而一路上受惠於長輩、學長學弟、事業夥伴等貴人相助，才能有今日的佳績。而在回應學弟妹的提問時，林憲銘也勉勵在學的大家，若要創業，得先判斷自己是否有不安於室的個性 DNA，以及智慧地處理人際關係的能力，而一個科技人除了專業知識之外，更需要對於文學、音樂、歷史、哲學等人文涵養的探索，開啟更多元的思維。對於大家最關注的 AI 議題，林憲銘也表示，的確已經在公司治理上看到 AI 的必要性，但本身並非 AI 專家，只是很幸運地抓住 AI 的尾巴飛了一陣子，未來必須要持續找到對的合作夥伴。最後，也呼應黃仁勳於史丹佛大學的演說，建議學弟妹們要跳出舒適圈，提高接受挫折的能力，增加韌性，才能勇於挑戰未來。

Wistron's Chairman Simon Lin Awarded Honorary Doctorate in Engineering by NYCU

National Yang Ming Chiao Tung University granted an honorary Doctorate of Engineering to Simon Lin, Wistron Corporation's Chairman and Chief Strategy Officer, on March 28th. During the ceremony, Stan Shih, founder of Acer Inc. and an honorary doctorate recipient from NYCU, delivered a congratulatory speech. Shih recognized Lin's achievements and positioned him as the second most significant figure in Acer. He also commended Lin's innovative approach and effective implementation of AI that propelled Wistron Corporation, initially underestimated after its spin-off, to achieve a remarkable market value of 800 billion. Moreover, Shih disclosed Lin's role as one of Acer's co-founders and his contribution to the "Smiling Curve," a corporate competitive strategy proposed during Acer's restructuring. Apart from his professional achievements, Simon Lin has actively contributed to his alma mater and engaged in philanthropic initiatives.

Simon Lin concluded his acceptance speech with "You Raise Me Up" as a way to express gratitude to the supporters who had helped him throughout his journey. He also shared insights on managing both business and life, highlighting the importance of being 'outwardly gentle but inwardly stern' and advocating for sincerity, enthusiasm, humility, and altruism. The ceremony exuded festivity as Yang Ming Chiao Tung University and Acer collaborated. Several tech industry leaders, including John Hsuan; Emily Hong, Chair of Wiwynn Corporation; Jeff Lin, CEO of Wistron Corporation; Jeffrey Gau, CEO of Wistron NeWeb Corp; and philanthropic partner Stanley Yen, attended to offer their congratulations.

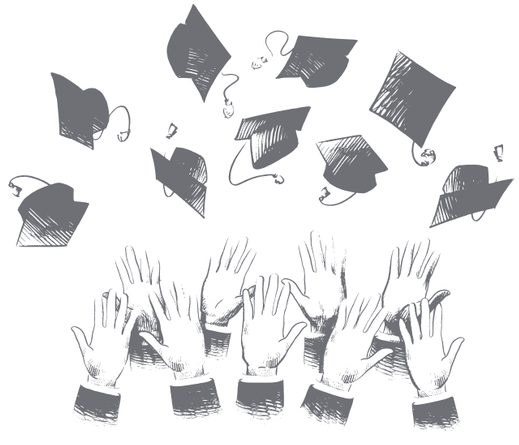
Lin received a recommendation for an honorary doctorate from the College of Computer Science and the College of Electrical and Computer Engineering. During the ceremony, President Chi-Hung Lin of NYCU made the recommendation and conducted the tassel-turning. President Lin noted that Simon Lin graduated from the Department of Computing and Control Engineering at NYCU. He began his career at Acer in 1979 and was promoted to the position of general manager in 1998. Lin led the establishment of Wistron Corporation after it separated from Acer in July 2001, as part of Acer's restructuring. Lin's extensive experience in OEM/ODM product development helped Wistron, under his leadership, become one of the Fortune Global 500 companies for eight years. In 2018, it was recognized as one of the Thomson Reuters Top 100 Global Technology Leaders. Additionally, it has maintained its position among the Forbes Global 2000 companies for 15 consecutive years. Currently, Wistron Corporation has ten manufacturing sites, eleven research and technical support centers, and fourteen customer service centers across Asia, Europe, and North America. By 2023, the business conglomerate's total market value surpassed NT$800 billion.

Apart from Wistron Corporation, Lin has also held the position of chairman in three listed companies within the Wistron Group: Wistron NeWeb Corp, Wistron ITS, and Wiwynn Corporation. Wistron NeWeb Corp specializes in wireless communication products, while Wistron ITS is a professional software and information outsourcing service firm with global delivery capabilities in the Asia-Pacific region. Wiwynn Corporation, established in 2012, focuses on delivering solutions for products and systems in hyperscale data centers and cloud infrastructure. Since its official listing on March 27, 2019, Wiwynn Corporation has consistently performed well, with earnings per share rising from around NT$50 in 2020 and 2021 to NT$81.07 in 2022. With Wiwynn's stock price surging to NT$1000 and its revenue and market value continuously reaching new peaks, Lin resigned from his position as Chairman on July 13, 2023, finalizing the succession plan for all listed subsidiaries to transition to the new generation.

Lin believes that it is essential to invest in patents and build patent portfolios. The company is continuously expanding its investments in cutting-edge research and technology development. Wistron's focus extends to emerging fields such as healthcare, the metaverse, artificial intelligence, Industry 4.0, autonomous and electric vehicles. The investment in these areas exceeds NT$10 billion. Wistron acknowledges the rapidly evolving landscape of technology and the transformations in business models spurred by the intelligence revolution. Since 2017, the company has been actively implementing digital transformation. They established a specialized office for digital transformation to effectively steer and execute digital and AI integration across manufacturing and the entire company. During the ceremony, Lin mentioned that in 2011, Wistron Group's revenue range was from NT$500 to 600 billion, employing approximately 150,000 people. However, with the aid of AI, the company now generates around NT$1 trillion in revenue with fewer than 70,000 employees. Despite this remarkable achievement, Lin consistently stresses the importance of valuing scarce and diverse talents as crucial to Taiwan's ability to maintain its leading global position.

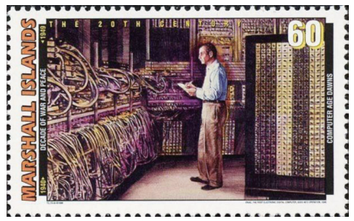
Wistron Corporation has made a significant donation to the NYCU Tainan Campus. They have donated over NT$40 million and have pledged an additional nearly NT$1 billion for the construction of a new building on the Tainan campus. This initiative aims to strengthen collaboration between industry and academia, creating an environment conducive to talent development. Since 2019, Lin has annually contributed NT$1.8 million to establish the "Wistron Junior Chair." This program invites globally renowned experts and scholars in the field of artificial intelligence to deliver lectures in Taiwan, fostering industry professionals with practical experience. Lin has also personally donated NT$150 million to National Yang Ming Chiao Tung University, resulting in the establishment of the "H&J Global Chair." This project aims to attract Nobel Prize-winning scholars to Taiwan as visiting professors, aiding Taiwanese students in integrating into the international arena and reinforcing the establishment and exchange of research among key talents. Furthermore, Wistron Corporation, which owns two factories that joined Lighthouse Network of World Economic Forum, collaborated with NYCU to establish the "Joint Industrial Innovation Center for AI and Green Energy (JCAG)" in June 2023. This collaboration aims to redefine the concept of an advanced ICT smart factory by exploring the upcoming era of smart manufacturing and the challenges of smart green energy. It seeks to establish a model for Taiwan's industry.

During his honorary doctorate ceremony, Lin gave a speech in which he reminisced about his student days when he was not very diligent, often skipping classes and organizing dance parties. However, he was prompted by an instructor's question, "What's your purpose in attending college?" and his exposure to Buddhism at the time. This led him to adopt the principle of "outwardly gentle but inwardly stern." This principle emphasized the importance of harmonious conduct and a strong conscience, which helped him navigate interpersonal relationships effectively and gain the support of mentors, peers, and business associates, ultimately contributing to his present achievements. When asked by younger students, Lin encouraged them to pursue their academic goals and advised aspiring entrepreneurs to first evaluate whether they possess the innate inclination to challenge the status quo and possess the interpersonal skills necessary for success. Lin also emphasized the importance of exploring the humanities, including literature, music, history, and philosophy, to foster diverse thinking. Regarding the most concerning AI issues, Lin recognized the indispensable role of AI in corporate governance. Although not an AI expert himself, he acknowledged the good timing of aligning with the AI trend and stressed the ongoing need to seek suitable collaboration partners. Lastly, echoing Jensen Huang's address at Stanford University, Lin urged younger students to step out of their comfort zones, develop resilience in the face of adversity, and bravely confront the challenges of the future.



第一部實用的電子計算機

文／林一平 講座教授



Herman Goldstein 設定 ENIAC 功能表的開關。

我擔任國立陽明交通大學資訊學院院長時，學院有不少老舊的大型電腦設備。根據學校流程，這些舊設備應該報廢，以免佔據空間。我當時覺得這些電腦代表計算機科學的演進，應該予以保存，而有了成立電腦歷史博物館的念頭。

經過十幾年後，這個構想才由彭文志系主任實現，在資訊學院的地下室成立博物館。

當初我擔任院長時，國外友人願意捐出一部 ENIAC（Electronic Numerical Integrator And Computer；ENIA）部分零件，然而物換星移，最後沒成功，相當可惜。

ENIAC 是首部實用的電子計算機。第二次世界大戰時，美國陸軍軍械部（Army Ordnance Department）為了量測槍砲的彈道，出資給賓州大學的摩爾學院（Moore School of Electrical Engineering），研製能進行大量計算的機器，以填寫彈道表格。

當時軍方的聯絡人是 Herman Goldstine 少尉，而賓州大學計畫主持人是 John Brainerd 教授，團隊成員包括 2 位學生 John Mauchly，以及 Presper Eckert。關於 Brainerd 對 ENIAC 的貢獻，鮮少人提及。IEEE 有文章溢美 Brainerd，說：「Under Dr. Brainerd's inspiration, leadership, and supervision the ENIAC was conceived and built.」。但是，其他文件卻顯示 Brainerd 曾阻撓 ENIAC 的發展。

Mauchly 首先於 1942 年提出程式（Program）這個名詞，並寫了一份 7 頁的提案《The Use of High-Speed Vacuum Tube Devices for Calculation》，建議發展電子設備（Electronic Device）取代機械式計算設備（Mechanical Calculation Device），認為可藉此大幅加速計算。然而 Brainerd 懷疑其可行性，將之存檔，束之高閣。幸好 Goldstine 看到這份報告，直接要求 Mauchly 正式提案，由軍方提供經費。

1943 年，發展 ENIAC 的計畫由 Mauchly 主導觀念性的設計，Eckert 負責硬體工程。這個計畫被列為最高機密，代號為「PX」。ENIAC 由 18,000 個真空管及 1,500 個繼電器組成，重量約 30 公噸，佔地 1,500 平方呎，消耗 140 千瓦電力，需要 2 部 12 匹馬力的吹風機散熱。ENIAC 程式設定為外接式，全由手工在接線板上設定完成之。

ENIAC 的高速計算能力遠勝於過去機械方式，可以在一秒鐘內做 5,000 個加法或 357 個十位數的乘法運算。除了用來計算彈道外，ENIAC 也用於發展原子彈的計算。傳說這部機器一運轉，費城（Philadelphia）西區的燈光會變暗。維持此機器正常連轉著實不易，大約每 2 天就有 1 個真空管故障。

ENIAC 服役 10 年後，於 1955 年 10 日月 2 日正式退役。

1945 年，ENIAC 升級改善，增加程式儲存的功能（Stored-Program），命名為 EDVAC。

Eckert 發明一種特殊記憶體「水銀音波延遲線」（Mercury Delay Line Memory），同時儲存數據（Data）及程式（Program）。這是一個創新做法。此時數學奇才 John von Neumann 正於賓州大學擔任顧問，參與 EDVAC 計畫的相關討論。von Neumann 寫了一份 EDVAC 的內部報告《First Draft of a Report on the EDVAC》。因為 von Neumann 是超級大牌人物，Goldstein 將這份報告送到和 von Neumann 往來的軍事單位，以宣傳 EDVAC 計畫的卓越。

問題是，Goldstein 刻意將報告中提到 Mauchly 和 Eckert 的部分刪除（大概嫌他們不夠大牌）。讀到這份 von Neumann 報告的人，對於報告中 EDVAC 這種創新的計算機架構都大感驚豔，稱之為「von Neumann Architecture」。現代計算機的設計幾乎都遵循 von Neumann Architecture。例如劍橋大學的 Maurice Vincent Wilkes，根據這份報告造出第一部儲存程式的計算機 EDSAC（Electronic Delay Storage Automatic Calculator）。Mauchly 和 Eckert 吃了悶虧，未能得到應有的功勞。

von Neumann 非掠奪之人，從未宣稱他是這個架構的發明人。

Mauchly 一直活躍於電腦界，是 ACM（Association for Computing Machinery）共同發起人，後來並成為 ACM 的總裁。我因為資訊技術（Information Technology）貢獻，有幸於 2003 年被選為 ACM 會士（Fellow），為全球第十七位華人獲此殊榮者，深感榮幸。

John Mauchly（1907～1980）。

Presper Eckert（1919～1995）。

The First Practical Electronic Computer

When I served as the Dean of the College of Computer Science at National Yang Ming Chiao Tung University, the college housed numerous outdated and sizable computer systems. According to the university's protocols, these aging devices should have been scrapped to free up space. However, I believed that these computers symbolized the evolution of computer science and, therefore, deserved to be preserved. This conviction inspired the concept of establishing a Computer History Museum.

Over a decade later, Chairman Wen-Hsiao Peng of the Department of Computer Science realized this idea, and the museum was established in the basement of the College of Computer Science.

During my tenure as the dean, there was a period when foreign friends expressed their willingness to donate some parts of the ENIAC (Electronic Numerical Integrator And Computer). Unfortunately, as time passed, the endeavor did not materialize, which is regrettable.

ENIAC was the first practical electronic computer. During World War II, the United States Army Ordnance Department funded the Moore School of Electrical Engineering at the University of Pennsylvania to create a machine capable of conducting intricate calculations, specifically for gauging the ballistics of artillery to complete ballistic tables.

Lieutenant Herman Goldstine served as the military liaison during that timeframe, with Professor John Brainerd overseeing the project at the University of Pennsylvania. The team consisted of two students, John Mauchly and Presper Eckert. Despite little mention of Brainerd's contributions to ENIAC, an IEEE article commends him, stating, 'Under Dr. Brainerd's inspiration, leadership, and supervision, the ENIAC was conceived and built.' Nonetheless, contrasting documents suggest that Brainerd impeded the progress of ENIAC.

In 1942, Mauchly introduced the term 'program' and authored a 7-page proposal titled 'The Use of High-Speed Vacuum Tube Devices for Calculation.' Within this proposal, he advocated for the development of electronic devices to replace mechanical calculation devices, foreseeing a significant acceleration of computations. Although Brainerd initially expressed skepticism about its feasibility and archived the proposal, Goldstine later discovered the report. He directly urged Mauchly to formally propose the idea, ultimately securing military funding support.

In 1943, Mauchly spearheaded the conceptual design for the development of ENIAC, with Eckert overseeing hardware engineering. This top-secret initiative was classified under the codename 'PX.' ENIAC, equipped with 18,000 vacuum tubes and 1,500 relays, weighed approximately 30 tons and occupied 1,500 square feet. Consuming 140 kW of electricity, it required two 12-horsepower blowers for cooling. The programming of ENIAC was exclusively configured through manual processes on wiring boards.

ENIAC's high-speed computing capacity significantly surpassed earlier mechanical methods, allowing it to perform 5,000 additions or 357 multiplications of ten-digit numbers within one second. Beyond its application in ballistic calculations, ENIAC played a crucial role in computations related to the development of atomic bombs. Legend has it that the lights in the western part of Philadelphia would dim when the machine was in operation. Maintaining optimal operation for this machine proved challenging, with approximately one vacuum tube failure occurring every two days.

After ten years of service, ENIAC was officially retired on October 2, 1955.

In 1945, ENIAC underwent an upgrade and enhancement, acquiring the capability to store programs, which became known as Stored-Program, and was subsequently named EDVAC (Electronic Discrete Variable Automatic Computer).

Eckert devised a unique memory system known as the 'Mercury Delay Line Memory,' capable of concurrently storing data and programs—an innovative solution. During this period, the renowned mathematician John von Neumann served as a consultant at the University of Pennsylvania, actively participating in discussions on the EDVAC project. Von Neumann authored an internal report on EDVAC titled 'First Draft of a Report on the EDVAC.' Given von Neumann's significant stature, Goldstein distributed this report to military entities associated with him, aiming to promote the excellence of the EDVAC project.

The problem stems from Goldstein's deliberate omission of references to Mauchly and Eckert in the report, possibly due to considering them insufficiently prestigious. Readers of von Neumann's report were highly impressed by the innovative computer architecture described in it, later known as the 'von Neumann Architecture.' Almost all modern computers adhere to the von Neumann Architecture in their design. For example, inspired by this report, Maurice Vincent Wilkes at the University of Cambridge constructed the first stored-program computer named EDSAC (Electronic Delay Storage Automatic Calculator). Unfortunately, Mauchly and Eckert faced setbacks and did not receive the credit they deserved for their contributions.

Von Neumann did not appropriate the accomplishments of others. He never claimed to be the inventor of this architectural framework.

Mauchly played an active role in the computer field and co-founded the Association for Computing Machinery (ACM). Subsequently, he assumed the role of ACM's president. Due to my contributions to information technology, I was named an ACM Fellow in 2003. I feel a profound sense of honor as the seventeenth Chinese individual globally to receive this prestigious recognition.

深度偽造技術

文／林一平 講座教授

Nikola Tesla。

Nikola Tesla（1856 ～ 1943）在 1890 年代預言「21 世紀時，機器人將取代古代文明中奴隸勞動所佔據的位置。」

這項預言在當今的人工智慧（AI）技術的發展下似乎正在實現。早期的 AI 技術已經能夠大致準確地分辨狗和貓的圖片，隨著生成式人工智慧（generative AI）的突破性發展，它逐漸深入我們的生活並引領著社會變革。當 AI 技術進入深度偽造（DeepFake）的層次，將會加速我們進入元宇宙世界，實現 Tesla 的預言。

深度偽造是一種透過電腦生成的影片技術，用於創造看似真實的虛假影像。它使用 AI 技術將一個人的臉替換為另一個人的臉，同時匹配微小的面部表情，從說話到皺眉都能保持一致。

這項技術利用深度學習算法和大量訓練數據生成逼真的影片，使觀眾難以區分真實和偽造的影像。製作一個臉部交換的視頻通常需要以下步驟：首先，使用編碼器處理 2 個人數百萬張的照片。編碼器是一個 AI 系統，用於尋找並學習 2 個臉部之間的相似之處，並將這些相似之處簡化為共同的特徵，並壓縮圖像。

然後，使用一個名為解碼器的第二個 AI 系統，從壓縮的照片中恢復出臉部。你訓練一個解碼器來恢復第一個人的臉部，另一個解碼器來恢復第二個人的臉部，因為這兩張臉是不同的。當需要進行臉部交換時，只需將編碼的照片輸入「另一個」解碼器。

例如，將某甲的臉部壓縮圖像輸入已經訓練過某乙的解碼器。然後，解碼器使用某甲的表情和面部定位來重建某乙的臉部。為了製作逼真的影片，這個步驟必須處理每一幀畫面。

現今，訓練某甲與某乙臉部的模型，以及在影片中合併臉部的過程，幾乎可以即時完成。

早期有名的深度偽造例子包括 2 個假影片：美國前總統 Barack Obama 稱呼川普（Donald Trump）為「完全蠢貨」和 Mark Zuckerberg 吹噓對數十億人的被盜數據擁有絕對控制。我們在烏克蘭的戰爭中也見證假影片的應用，以及使用知名人物臉孔的成人內容。

然而，深度偽造技術也可能被用於音頻和圖像，大部分國家禁止未經同意且具有邪惡目的的深度偽造使用。

不過，除了潛在危險性，深度偽造技術在一些有趣且輕鬆的應用中也顯示出潛力。例如，將深度偽造應用於教育領域，可以使課堂更有趣。想像一下，在英文課堂上，可以邀請虛構的名人來講解課程，例如劉德華。雖然使用真實人物的深度偽造可能會被視為非法，但是使用不存在的人物則可以避免法律問題。企業也開發並銷售深度偽造服務，以實現自動化新聞播報，甚至減少演員的參與，節省成本。例如，TikTok 上就有一個深度偽造的阿諾史瓦辛格（Arnold Schwarzenegger），使用俄語講話，省去了他學習俄文的功夫。

深度偽造技術的應用範圍廣泛且多樣，但我們必須謹慎使用，以避免濫用和潛在的負面影響。只有在合法、道德且有創意的方式下，才能充分發揮深度偽造技術的潛力。

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 >。

Deepfake Technology

Nikola Tesla (1856–1943) prophesied in the 1890s, "In the twenty-first century, robots will take the place that slave labor occupied in ancient civilization."

This prophecy is being realized through the continuous advancements in artificial intelligence (AI) technology. Initial AI technologies have successfully achieved a reasonably accurate distinction between images of dogs and cats. The breakthroughs and developments in generative artificial intelligence (generative AI) are increasingly infiltrating our daily lives, steering societal transformations. As AI technology delves deeper into deepfakes, it is poised to accelerate our immersion into the metaverse, ultimately bringing Tesla's prophecy to fruition.

Deepfake involves the computer-generated manipulation of videos to create deceptively realistic images. Utilizing AI technology, it seamlessly substitutes one individual's face with another's while maintaining consistency in subtle facial expressions, spanning from talking to frowning.

This technology employs deep learning algorithms and extensive training data to produce realistic videos, challenging viewers to distinguish between authentic and manipulated images. The process of crafting a face-swapping video includes the following stages: Initially, millions of photos featuring two individuals are analyzed using an encoder. This encoder, functioning as an AI system, is specifically designed to recognize and comprehend similarities between the two faces, streamlining these resemblances into shared features, and compressing the images.

Afterward, a second AI system, called a decoder, is employed to restore faces from the compressed images. You train one decoder to restore the face of the first person and another decoder to retrieve the face of the second person since these two faces differ. When face swapping is required, simply input the encoded images into the 'other' decoder.

To illustrate, compressed facial images of person A are fed into a decoder previously trained on person B. Subsequently, the decoder utilizes the facial expressions and features of person A to reconstruct the face of person B. To achieve realistic videos, this process needs to be applied to every frame in the footage.

Currently, training models for the facial features of Person A and Person B, as well as the process of blending faces in videos, can be accomplished almost instantly.

Early well-known examples of deepfakes include two fake videos: one depicting former U.S. President Barack Obama calling Donald Trump 'a total and complete dipshit,' and another featuring Mark Zuckerberg bragging about having complete control over stolen data from billions of individuals. Furthermore, deepfake videos have been observed in the Ukraine conflict, and there has also been the creation of adult content incorporating the faces of well-known celebrities.

Furthermore, deepfake technology can also be applied to manipulate both audio and images. The majority of countries prohibit its unauthorized and malicious use without consent.

Nevertheless, deepfake technology exhibits promise beyond potential risks in various intriguing and playful applications. For instance, integrating deepfakes into the education field could enhance classroom engagement. Envision a scenario in an English class where a fictitious celebrity, such as 'Andy Lau,' is invited to lecture. While the use of deepfakes featuring real individuals may be deemed unlawful, employing non-existent personas can prevent legal complications. Moreover, businesses are involved in developing and selling deepfake services not only for automated news reporting but also to reduce costs by minimizing the involvement of actors. A case in point is a TikTok video featuring a deepfake of Arnold Schwarzenegger speaking in Russian, eliminating the need for him to try learning the Russian language.

While deepfake technology has a broad and varied range of applications, its usage should be approached cautiously to prevent misuse and potential adverse impacts. Employing it in legal, ethical, and creative manners is essential to unlock the complete potential of deepfake technology.

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.

亥姆霍茲資訊安全中心 Dr. Mario Fritz 演講
Trustworthy AI and A Cybersecurity Perspective on Large Language Models

文／秦紫頤 研究助理

Mario Fritz 教授是 CISPA Helmholtz 資訊安全中心的成員，同時也是 Saarland University 的名譽教授。在此之前，他曾領導 Max Planck Institute 資訊科學研究所的研究小組。他擁有廣泛的學術背景，包括作為 TPAMI 的副編輯、Trustworthy Federated Data Analytics 計畫的統籌人，以及 100 多篇科學文章的作者，他在 trustworthy AI 的研究方面做出了重要的貢獻。

在演講中，Fritz 博士強調了網路安全和機器學習相互交織的本質，指出它們已經無法分割。這種交織增加了網路安全的複雜性，使我們在使用服務時難以建立信任。解決這些網路安全和可信度的問題變得至關重要，特別是在潛在的崩潰或災難性事件發生之前。他特別提到人工智慧的迅速演進，尤其是 Generative AI 的出現，以及它對隱私、安全和信任的影響。Fritz 博士呼籲在 Generative AI 開發過程中應提供使用者保證，確保新技術符合我們的期望。

演講的前半部分聚焦於網路隱私的問題，特別是機密性的議題。Fritz 博士首先介紹了 membership inference attack，該攻擊試圖從給定的數據中判斷它是否屬於模型的訓練集。攻擊的成功可能導致攻擊者還原模型的訓練數據，對於本來就訓練在含有隱私資訊的數據上的模型造成嚴重安全風險。Fritz 博士接著提到了 differential privacy 的概念，它一種對抗 membership inference attack 的機制，可以通過在模型算法中引入亂數擾動，使攻擊者難以推斷出個體資訊，進而避免數據泄露的風險。此外，他還討論了 evasion attack，這是一種最常見且容易應用的攻擊方式，攻擊者希望通過微調輸入數據來誤導模型的預測。最後，Fritz 博士探討了提升模型強韌性的一些策略，包

括 certification、Lipschitz bounds 和 randomized smoothing，以確保模型有足夠的信心能夠抵禦對抗性的攻擊。

演講的後半部分轉向人工智慧對社會的更廣泛影響，探討了深度偽造檢測和打擊虛假信息等挑戰。在這一部分，演講者指出隨著人工智慧擔任解釋者的角色，信任和誤解的問題變得更加突出，這與前半部分探討的網路安全問題形成呼應。Fritz 博士強調了事實檢查方法的重要性，但也承認評估 Generative AI 生成內容的困難性，尤其是考慮到人為操縱的可能性。此外，他探討了大型語言模型（LLM）對通用和可轉移的對抗攻擊的問題，引發對這些人工智慧代理進行系統的 prompt discussion，用來發現和檢測問題，這是 trustworthy AI 研究重要的議題之一。

演講的最後，Fritz 博士總結時強調了 LLM 應用安全性研究的重要性。他提到各種攻擊形式的潛在威脅，強調在不斷演變的 LLM 生態系統中理解網路安全威脅是必要的。在追求負責任的人工智慧發展過程中，Fritz 博士的見解為研究人員、實踐者和政策制定者提供了重要的指南。

非常感謝 Mario Fritz 博士能夠來到交大演講，同時我們實驗室也很榮幸能在演講前有機會與 Fritz 博士進行經驗交流。在這次交流中，他不僅給予了我們對於已完成和進行中研究提供了許多有益的反饋，這些意見對於我們未來的研究方向提供了清晰的指引，更是激發了我們對於研究的熱忱。

Speech by Dr. Mario Fritz:
Trustworthy AI and A Cybersecurity Perspective on Large Language Models

Professor Mario Fritz is a faculty at the CISPA Helmholtz Center for Information Security and an honorary professor at Saarland University. He previously led a research group at the Max Planck Institute for Informatics. With a diverse academic background, encompassing roles such as the associate editor of the journal "IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)," the coordinator of the Helmholtz project "Trustworthy Federated Data Analytics," and the author of over 100 scientific articles, Dr. Fritz has made significant contributions to research in trustworthy AI.

During the speech, Dr. Fritz underscored the intertwined nature of cybersecurity and machine learning, emphasizing their inseparability. This interconnection increases the complexity of cybersecurity, posing challenges in establishing trust when utilizing services. Resolving these cybersecurity and trust-related issues becomes paramount, particularly before potential breakdowns or catastrophic events occur. Dr. Fritz highlighted the swift evolution of artificial intelligence, notably the emergence of Generative AI, and its impact on privacy, security, and trust. He advocated for implementing user assurances throughout the development of Generative AI to guarantee that emerging technologies align with our expectations.

The initial portion of the speech delves into the realm of network privacy, explicitly addressing the aspect of confidentiality. Dr. Fritz initiated the discussion by presenting the notion of a membership inference attack aimed at discerning whether given data is part of the model's training set. The success of such an attack poses a significant security threat, potentially enabling the attacker to reconstruct the model's training data, which is particularly risky for models trained on data containing private information. Dr. Fritz subsequently discussed differential privacy, a mechanism to thwart membership inference attacks. This is achieved by introducing random perturbations into the model algorithm, complicating the inference of individual information by attackers and mitigating the risk of data leakage. Additionally, he explored evasion attacks, the most prevalent and easily applicable method wherein attackers seek to manipulate the model's predictions by adjusting input data. Lastly, Dr. Fritz delved into various strategies to bolster model robustness, including certification, Lipschitz bounds, and randomized smoothing to ensure the model can withstand adversarial attacks.

The latter portion of the speech shifted toward the broader impact of artificial intelligence on society, addressing challenges such as identifying deepfakes and combating misinformation. During this segment, the speaker highlighted that as artificial intelligence assumes the role of an interpreter, concerns related to trust and misunderstanding become more pronounced, aligning with the earlier examination of cybersecurity issues. Dr. Fritz emphasized the importance of fact-checking methods while acknowledging the complexities in assessing content generated by Generative AI, particularly in light of potential manipulation. Furthermore, he explored the challenges of large language models (LLMs) dealing with general and transferable adversarial attacks, initiating discussions on system prompts for these AI agents to uncover and address issues—an essential aspect of trustworthy AI research.

In his conclusion, Dr. Fritz emphasized the significance of conducting security research on LLM applications. He discussed the possible threats of different attacks and stressed the need to understand network security threats within the ever-evolving LLM ecosystem. Dr. Fritz's insights provide essential guidance for researchers, practitioners, and policymakers involved in the responsible development of artificial intelligence.

We are deeply grateful for Dr. Mario Fritz's speech at National Yang Ming Chiao Tung University, and our laboratory members feel privileged to have had the opportunity to exchange ideas and experiences with Dr. Fritz before the speech. During this interaction, he furnished us with valuable feedback on both completed and ongoing research projects and imparted clear guidance for our future research endeavors. His suggestions not only made a valuable contribution to our academic pursuits but also reignited our enthusiasm for research.

KDDI 創辦人 Sachio Semmoto 博士演講
The Way of Life as a Serial Entrepreneur

文／陳煜盛　網路工程研究所碩士生

今天的講者是 Sachio Semmoto 先生，生於 1942 年，畢業於日本京都大學電子工程系。他於 1966 年加入 NTT，當時 NTT 已有 30 萬名員工。在 1967 年，他赴美留學，深受美國價值觀影響。他於 1984 年 (42 歲) 創立 DDI (現為 KDDI)。1996 年成為慶應大學教授，並在 1999 年成立 eAccess，起初只有 3 名成員，提供 ADSL 服務。當時的網際網路費用為每月 18080 日圓，而在 2006 年，ADSL 服務費用降至每月 2880 日圓。2005 年，他再次創立 eMobile。隨後，於 2014 年成為 Renova 的外部董事，並在 2015 年擔任 Renova 的董事長和代表董事。Sachio Semmoto 以其在電信和網路領域的卓越成就，成為一位成功的企業家和業界領袖。

在這次的演講中，講者分享了許多關於創業和生活的寶貴經驗。他強調了一個重要的觀點：不要只停留在台灣，因為那樣可能會使我們過於舒適，而錯失了世界其他地方的機會。儘管台灣在半導體領域非常發達，但其他產業在別的國家仍有很多值得探索的地方。旅行被視為一種探索世界的方式，可以讓我們了解不同的文化、生活方式和創意，並抓住世界趨勢。在創業的過程中，講者提到了兩個重要的議題：錢和管理哲學。他指出，要成為世界上的重要人物，需要克服這兩個問題。與人交流學習也是相當重要的，可以增廣見聞。

講者分享了他創業的經歷，提到在美國時期的室友告訴他，日本的 NTT 缺乏創新，這促使他在 1984 年成立公司來對抗 NTT。設定遠大的目標是成功的一個關鍵，這可以推動我們不斷進步，逐步實現階段性目標。就像爬山一樣，一開始可能會迷路、體力透支，但不要因此氣餒，而是要從中學習，最終登頂時你將會看到美麗的風景。在講者看來，「不嘗試犯險」本身就是最危險的事情。遇到問題時，應該嘗試想方設法解決，實際行動是最重要的。他舉例說，當時的行動網路被 NTT 壟斷，如果有其他創業家願意冒風險跳出來做，就能降低整體價格。在創業的 CEO 中，超過 90% 會失敗，特別是在管理方面，所以吸引技術人才至關重要。

講者也提到心存感激的重要性，這可以讓我們意識到自己處於一個良好的環境中。他鼓勵我們表達感謝之情，尤其是對父母的感謝。講者呼籲在演講結束後，大家可以打通電話表達感激之情。最後，講者強調了台灣和日本的友好關係，並認為在台灣遇到兩岸問題時，日本應該伸出援手。他預測半導體產業將取代石油產業成為最賺錢的產業。

在提問與回答環節中，講者分享了一些關於創業的建議。在選擇合作夥伴時，需要花一點時間篩選並調查對方的能力、個性和行事風格，來選擇是否要與之合作。在說服大眾創業前景有前瞻性時，重要的是擁有遠大的目標和視野，並能將這種遠大的理念傳達給大眾或潛在客戶。講者指出，在創業中，九成會失敗，但不要放棄，每天進步一點，幾年後就能聚沙成塔。當面臨失敗時，他建議通過睡覺來沈澱情緒，必要時小酌一下也無仿。對於想在日本工作的人，講者提到日本對台灣人持有友好態度，建議多多探索日本社會。

這次的演講為我們提供了許多寶貴的啟示，讓我們更好地理解創業的挑戰和成功的關鍵。並且要保持著感激的心態，每天持續學習與進步。

Speech by Dr. Sachio Semmoto:
The Way of Life as a Serial Entrepreneur

The speaker for today is Dr. Sachio Semmoto, who was born in 1942 and is a graduate of Kyoto University's Faculty of Engineering in Japan. In 1966, he joined Nippon Telegraph and Telephone Public Corporation (NTT), when NTT already had 300,000 employees. In 1967, he pursued advanced studies in the United States, where the prevailing American values significantly influenced him. In 1984, at 42, he founded DDI, which subsequently evolved into KDDI Corporation. By 1996, he became a professor at Keio University. In 1999, he ventured into entrepreneurship once again, establishing eAccess with just three members, initially focusing on providing ADSL services. At that time, the monthly internet plan cost was 18,080 Japanese Yen, yet by the advent of 2006, the cost of ADSL services dwindled to a mere 2,880 Japanese Yen per month. In 2005, he initiated eMobile. In subsequent years, he assumed the role of an external director at Renova in 2014 and became Renova's Chairman and Representative Director in 2015. Dr. Semmoto is acknowledged for his remarkable accomplishments in telecommunications and networking, establishing him as a prosperous entrepreneur and influential figure in the industry.

Dr. Semmoto shared numerous valuable insights regarding entrepreneurship and life in this speech. He emphasized a vital perspective: do not stay in Taiwan, as such a choice might breed excessive comfort and result in missed opportunities elsewhere. Even though Taiwan excels in the semiconductor industry, numerous aspects of various industries in other countries are still worth exploring. Travel is regarded as a means of worldly exploration, offering opportunities to comprehend diverse cultures, lifestyles, and creative endeavors and discern global trends. He delved into two pivotal themes within the entrepreneurial journey: finance and management philosophy. He underscored the importance of overcoming these challenges to establish a noteworthy presence on the global stage. Additionally, Dr. Semmoto emphasized the significance of learning through effective interpersonal communication, facilitating the broadening of horizons and the acquisition of invaluable insights.

Dr. Semmoto recounted his entrepreneurial journey, highlighting that his roommate remarked on the lack of innovation in Japan's NTT during his time in the United States. This revelation inspired him to establish a company in 1984 to challenge NTT. Setting ambitious goals is the key to success, propelling us forward to steadily achieve milestones. Like climbing a mountain, the initial phases might involve confusion and physical exertion. However, instead of becoming disheartened, learning lessons from these experiences is crucial. Ultimately, upon reaching the summit, a breathtaking landscape awaits. Dr. Semmoto emphasizes that "not taking risks" is perilous. When faced with challenges, one should actively seek solutions and take pragmatic steps. He illustrated that NTT held a monopoly over the mobile network during that period, suggesting that the entry of other entrepreneurs willing to take risks into the market could drive down overall prices. Within the realm of entrepreneurial leadership, the sobering statistic reveals that over 90% failed, particularly in matters of management. Thus, the imperative of attracting technical talent assumes paramount importance.

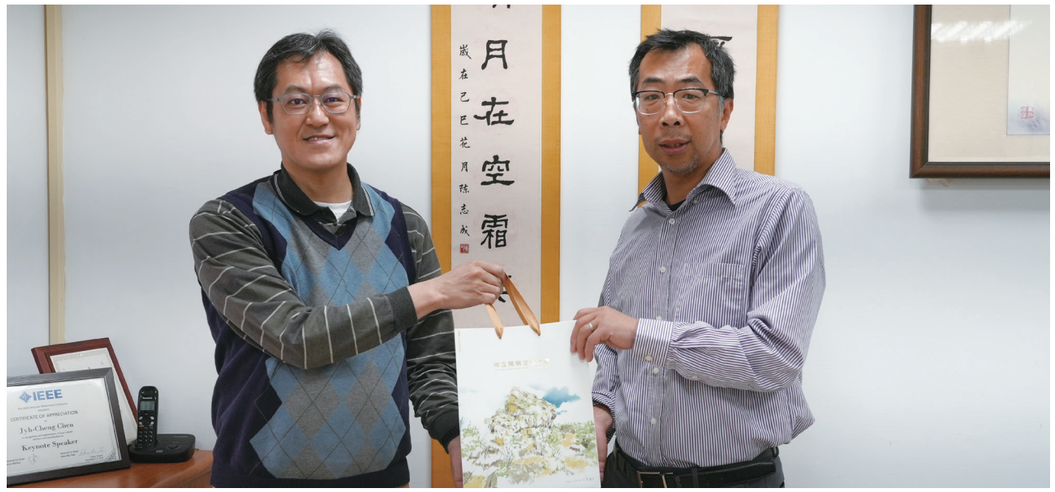
Dr. Semmoto highlighted the importance of cultivating gratitude, emphasizing its ability to foster awareness of our favorable surroundings. He motivated us to convey our appreciation, particularly towards our parents. Dr. Semmoto advocated expressing gratitude through phone calls after this speech. Lastly, he underscored the amicable ties between Taiwan and Japan, proposing that Japan should offer assistance when Taiwan encounters cross-strait issues. Additionally, he foresaw that the semiconductor industry would surpass the petroleum industry to become the most lucrative sector.

During the Q&A session, Dr. Semmoto provided insights into entrepreneurship. When selecting partners, it's crucial to take some time to scrutinize their abilities, personality, and working styles to determine if collaboration is viable. When presenting the prospective success of entrepreneurship to the public, it's essential to possess ambitious goals and vision, effectively conveying the idea to the audience or potential clients. Dr. Semmoto pointed out that in entrepreneurship, 90% fail, but persistence is vital; steady progress each day can build a substantial foundation over time. When encountering setbacks, he advised allowing emotions to settle through sleep and, if needed, indulging in a small drink. Regarding those interested in working in Japan, Dr. Semmoto highlighted Japan's favorable attitude towards individuals from Taiwan and recommended exploring Japanese society.

This speech has given us numerous valuable insights, enhancing our comprehension of the hurdles in entrepreneurship and the critical elements of success. Furthermore, it emphasizes the significance of cultivating a grateful mindset and consistently engaging in daily learning and self-improvement.

德州奧斯丁大學 Chen Yu 教授演講
Learning in Humans and Machines: Two Sides of the Same Coin or Not

文／孔啟熙 研究助理



Chen Yu 教授在羅徹斯特大學 (University of Rochester) 獲得博士學位，目前德州奧斯丁 (The University of Texas at Austin) 心理系教授以及在該校的神經科學系中的感知系統中心的教授。

Chen 曾獲得了認知科學 (Cognitive science) 中的 馬爾獎 (David Marr)。Chen 首先介紹了自己的背景，為何一個受電腦科學訓練的學者會轉向往人類發展研究。受啟發於電腦之父 Alan Turing 的圖靈測試即是模仿人類的運算、也曾是心理學背景 Jeff Hinton 透過人類神經傳遞方式而設計了神經網路。也包含幾年前的對於 Alpha GO 的觀察，電腦很擅長預測下一步棋該如何走但卻很難做出對應的下棋動作，而這樣的動作對於人類來說卻是輕而易舉。受到這些啟發，Chen Yu 教授便投入在研究人類與電腦在學習上的關係，以及是否能透過人類學習的方式來教會電腦學習。

電腦和人類在學習上的幾個最大的差別是：人類只需要少量的經驗就可以學習一個任務，而在學的過程是不斷的用全身感知環境並與環境互動，相反的，電腦需要大量的靜態訓練集資料，且只透過模型及演算法 (類比於大腦) 被動的學習。因此電腦在學習的方式上還有很大的進步空間，而我們討論能不能透過人類的智能發展得到啟發。

為了更好的捕捉到人類發展學習的特徵，Chen 的實驗室建立了一個模擬居家的空間，裡頭設置了許多相機及感應器，並蒐集大量家長與小孩在互動以及摸索玩具的過程。在測試之後也大量標記物體、人體動作支架、以及重建 3D 環境。這些蒐集到的資料便可以用 AI 的技術加以分析得到人類學習的特徵集結論，也能更進一步的將其結論帶回到機器學習領域，探討是否能幫助電腦學習。

演講中，Chen 透過三個層面來介紹人類學習中有哪些觀察是能夠引進機器學習的：（一）感知智能：第一人稱視覺是透過的動作得來的。人類的注意力可以分為兩種：從下而上 (Bottom up)，透過刺激轉移注意力以及從上而下 (Top down)，根據人類意圖而主動去注意感興趣的物體。而這兩種機制是獨立、互相競爭、且互相協助的系統。（二）認知智能：人類如何透過少量經驗學習。人是如何選擇經驗來學習，該選擇注意哪裡以及如何透過選擇的資料來學習進而有效率的學習。和機器學習最大的差別是人類除了會選擇正確的資訊也會選擇錯誤的資訊並加以矯正。（三）社交智能：人類如何透過身體動作完成日常多模態的互動。和目前機器學習最大的差別是人類會透過不同的感官不斷找尋更好的注意力去完成任務。

Chen 介紹許多認知發展心理學與電腦科學的結合，如何使用機器學習來幫助尋找人類的學習特徵，從人類學習上觀察到有趣的結論又該如何引進回機器學習的設計。其兩者應是緊密相合且互利互惠，未來仍有許多尚待探討的議題。

Speech by Dr. Chen Yu:
Learning in Humans and Machines: Two Sides of the Same Coin or Not

Professor Chen Yu earned his doctoral degree at the University of Rochester. Currently, he is a professor in both the Department of Psychology and the Center for Perceptual Systems at The University of Texas at Austin.

Dr. Yu has been awarded the Marr Prize in Cognitive Science. During his presentation, he shared his academic background and explained why he shifted from computer science to human development research. Notably, he mentioned that Alan Turing, the pioneer of computers, developed the Turing test to simulate human computation, while Jeff Hinton, who was initially rooted in psychology, developed neural networks inspired by human neural transmission. A few years ago, he scrutinized AlphaGo and found that computers excel at predicting upcoming moves in a game but struggle with executing corresponding physical actions, which humans can do effortlessly. Dr. Yu was motivated by these insights and investigated the relationship between humans and computers in learning, and explored the possibility of teaching computers through human learning methodologies.

The primary distinction in the learning process between computers and humans lies in the fact that humans can become skilled at a task with little experience. They learn through continuous perception and interaction with their environment. In contrast, computers necessitate extensive static training datasets and passively learn through models and algorithms, resembling the functioning of the human brain. Therefore, there is still room for improvement in computer learning. People are discussing whether we can learn from how humans evolved intelligence to enhance computer learning.

Dr. Yu's research team has established a simulated domestic environment with multiple cameras and sensors to better capture the features of human development and learning. They have extensively collected data on parent-child interactions and toy exploration. After the experiments, the team annotated objects and human body movements and reconstructed 3D environments. The gathered data can now be analyzed using AI to conclude human learning characteristics. These insights can be further used for machine learning to improve computer-based learning.

During the speech, Dr. Yu discussed three perspectives on how to integrate insights from human learning into machine learning: 1. Perceptual Intelligence: The acquisition of first-person vision is linked to movement. Human attention can be categorized into two forms. The first form is known as bottom-up, where attention responds to stimuli. The second form is top-down, where attention is actively directed to objects of interest based on human intent. These two mechanisms operate as independent, competitive, and collaborative systems. 2. Cognitive Intelligence: Human learning with limited experiences involves selecting which experiences to prioritize for learning, where to focus attention, and how to learn from chosen data effectively. The primary distinction from machine learning lies in humans' ability to identify and select accurate information and recognize and rectify inaccurate information. 3. Social Intelligence: Investigating how humans engage in daily multimodal interactions through body movements. A significant difference between humans and current machine learning is that humans utilize various senses to improve their attention when accomplishing tasks.

Dr. Yu delivers a presentation that explores the integration of cognitive developmental psychology and computer science. This integration can help us understand human learning characteristics by utilizing machine learning. Additionally, it is remarkable how the interesting discoveries obtained from observing human learning can be incorporated into the framework of machine learning design. The interdependent relationship between these two fields is closely interwoven, providing reciprocal benefits, and there are many unexplored topics to be investigated in the future.

印第安納大學 David Crandall 教授演講
Egocentric Computer Vision, for Fun and for Science

文／孔啟熙 研究助理

David Crandall 教授在康乃爾大學 (Cornell University) 獲得博士學位後於印第安納大學 (Indiana University Bloomington) 任教並主導 Luddy Center for AI。David 研究以人為本且第一人稱的電腦視覺也包含導入觀察人類發展學習的機制進電腦視覺，其應用包含 AR/VR、自駕車、智能助理、。David 的研究也探討了人類在早年時，如嬰兒，和成人的第一人稱視覺上的差異，並探討為何嬰兒能快速學習而能否用其原理來改善電腦視覺。

David 介紹了第一人稱視覺的獨特性：與靜態資料集相比，第一人稱視覺可以捕捉到與環境互動的資料，例如透過移動來捕捉到感興趣的畫面。David 也介紹了嬰兒的視覺：透過人體實驗觀察發現了嬰兒配戴的相機可以捕捉到更動態的場景，例如嬰兒會更靠近物體而捕捉到更清晰且更大的物體畫面，更重要的是，嬰兒會透過移動身體和轉動物體以得到更多元的視角來觀察物體。David 的團隊將這樣的觀察導入物體偵測，重新設計了具有嬰兒視覺特性的資料集並發現其表現均較以成人視覺特性的資料集還好。

第一人稱視覺也面臨了許多獨特的挑戰，如資料收集的困難、相機劇烈的晃動、隱私等等。其中 David 的團隊更特別為了解決自動偵測第一人稱視覺隱私，而展開了 40 人的實驗觀察日常生活中哪些畫面是受測者最不想要被公開的畫面，並可藉此來訓練自動偵測隱私畫面的模型。

David 又與 Meta 合作參與了大型的第一人稱視覺資料集收集，Ego4D，由超過三千小時的日常活動影片資料集組成，其中包含了各種模態的資料，如聲音、慣性測儀、眼球偵測，以及標記了大量的物體以及文字描述。這樣的標準化大型第一人稱視覺資料集可以幫助推動後續相關的研究發展，就像物體檢測中的 MS COCO 資料集一樣。然而這樣大型的資料集難以保有完好的結構化，如影片活動分類，因此團隊接著展開另一個大型資料搜集 Ego-exo4D，專注於八種日常活動，如烹飪、彈奏樂器、修腳踏車等等，蒐集了人類在第一人稱視角如何做出需要技術的活動。

現今的機器學習距離人類學習的能力還有很大的差距，如人類可以透過少量的經驗有效率的學習一項技術、人類可以解釋做出決定的理由等等，以及第一人稱電腦視覺仍有許多尚未被探討的地方，然而 David 相信這是未來電腦視覺的一個重大領域也是 AI 通往發展更高智能的路徑。

Speech by Dr. David Crandall:
Egocentric Computer Vision, for Fun and for Science

Professor David Crandall completed his doctoral degree at Cornell University and then taught at Indiana University Bloomington where he directed the Luddy Center for AI. His research focuses on human-centered and first-person computational vision, which involves integrating mechanisms observed in human developmental learning into computer vision applications in areas such as AR/VR, autonomous vehicles, and intelligent assistants. Dr. Crandall's work also explores the differences in first-person vision between humans at different stages of life, including infants and adults. He investigates whether the principles underlying infants' rapid learning can be utilized to enhance computer vision.

During the presentation, Dr. Crandall highlighted the uniqueness of first-person vision. Unlike static datasets, first-person vision captures data of human interaction with the environment, such as capturing interesting scenes through movement. Additionally, he introduced the concept of infant vision. Through human experiments, they discovered that cameras worn by infants can capture more dynamic scenes. Infants tend to get closer to objects to capture more accurate and larger images. They also move their bodies and rotate objects to obtain diverse perspectives when observing objects. Dr. Crandall's team incorporated these observations into object detection, redesigning datasets with infant vision characteristics. They found that the model performance improved compared to those trained on datasets based on adult vision characteristics.

The first-person perspective presents several challenges that are not present in other perspectives, such as difficulties in data collection, intense camera shaking, and privacy concerns. To find the automatic detection solution to privacy concerns of first-person vision, Dr. Crandall's team conducted a particular experiment with 40 individuals to identify which scenes in their daily lives they would least want to be publicly disclosed. Meanwhile, the data collected in the experiment can also be used to train a model that could detect private scenes in first-person visual data.

Dr. Crandall has teamed up with Meta to participate in gathering a large-scale first-person visual dataset called Ego4D, comprising over three thousand hours of daily activity video data. This dataset includes various types of data such as sound, inertial sensors, eye tracking, and annotations of numerous objects along with textual descriptions. These standardized large-scale first-person visual datasets can drive further research developments, similar to the MS COCO dataset in object detection. However, maintaining such large datasets in a structured manner, especially when it comes to video activity categorization, can be challenging. Therefore, the team embarked on another large-scale data collection effort called Ego-exo4D, which focuses on eight types of daily activities like cooking, playing musical instruments, and fixing bicycles, aiming to gather data on how humans perform technically intricate activities from a first-person perspective.

Machine learning technology still has a long way to go before it can match human learning capabilities. Humans can efficiently learn a new skill with minimal experience and provide logical reasons for their decisions. Moreover, numerous aspects of first-person computer vision remain unexplored. Nevertheless, Dr. Crandall believes this field holds great potential for the future of computer vision and paves a promising avenue for AI to advance toward higher levels of intelligence.

開闊視野：資工系學生異國交換學習洞見

文／鍾乙君

在追求學術卓越的道路上，陽明交通大學的學生們總是尋求機會，透過學校提供的豐富資源，赴海外交換以拓展自己的視野。然而這樣充滿挑戰與機遇的旅程，需要學生們的勇氣和前輩的智慧鋪路。2022 年，我們資工系的洪瑋廷與洪婕庭兩位學生，分別在英國南安普頓大學和日本大阪大學開始了他們的異國學習之旅。今年，他們與學弟妹們分享他們的心得，將自己的經驗轉化為後生的寶貴養分。

資工系 111 級洪瑋廷透過 OUSSEP 校級交換計畫在 2022 年前往大阪大學學習法律學院的教育課程。在課程方面，洪瑋廷選擇了法律學院 Elbalti 教授的課程，教授主要開設一些普通法、日本法、中東法、社會法以及伊斯蘭法等專業課程。他提到在這些課程中，教授更鼓勵學生多參與課堂，因此出席分數佔比較大，而出席方式也相當彈性。此外，每週還有三個早八的初中階日語課程或者每週一次的早八進階日語課程可供選擇。這些日語課程透過討論不同的社會議題，提高學生的日語表達能力。

洪瑋廷還參加了 OUSSEP 計畫中的「Internship」課程，與當地的居民以及不同的活動、機構進行交流互動，體驗了不同的文化和生活方式。在這個過程中，他們拜訪了不同的組織和機構，包括小學生課後活動的非營利組織、當地的農家老伯伯、在阪神大地震紀念儀式當點燈志工、大阪音樂大學、與和學校打官司的京大的吉田寮自治宿舍、農民基地、在澀谷公園圈地搭帳篷和警方抗爭的無家者談話等。這些實際體驗讓他更深入了解日本的文化、社會和生活方式。通過這次日本留學經歷，洪瑋廷對於不同學科的知識獲得了深入的了解和體驗，同時也對日本的文化和社會有了更好的理解。

洪婕庭同學則在 2022 年度獲得資訊學院學士班第一梯次出國交換獎助學金，前往南安普頓大學交流一年。在交換期間，洪婕庭發現南安普頓的教學方法和陽明交大並沒有太大的差異，但兩地上課的細節確實有所不同，例如講課的比例、同學的目標與想法。她在南安普頓上課時注意到講課比例相對較少，許多課程都會加入實際操作和增強互動性。特別是實驗課，強調同學間的討論交流，並鼓勵在線上討論區尋求解決問題的方法。部分老師也善於運用學校或線上提供的資源，如使用 Discord 進行課堂問答或線上答疑活動。洪婕庭表示，南安普頓大學的大二和大三學生普遍已有實習經驗或對暑假有較完整的規劃，許多人在大一和大二開始尋找與未來就業有關的資源，並積累相關經驗。經驗上與台灣環境不同之處讓她覺得非常有趣。

在南安普頓的學習中，洪婕庭提及第一學期的課程較多團體作業，如遊戲設計課程。每次作業都需要兩人組隊完成，且不得與同一人合作。在與同學合作的過程中，洪婕庭發現需要應用課堂學到的知識以外，還需要創意發想，因此良好的合作能夠發揮很大的效果，互相引導出有趣的想法並將預期的功能實際實現，帶來成就感。

此外，南安普頓大學的學生服務中心非常值得一提。它結合了教務處、學務處和諮商中心，為學生提供協助。這讓洪婕庭感覺到該校非常重視學生的心理健康，除了有導師式的 PAT，還有更高層級的老師進行面談。學生服務中心還設有 24 小時運行的專線，可以隨時提供幫助。

洪婕庭提到，交換經驗豐富了她的學術和社交生活，並為她提供了深入了解南安普頓大學教學方法和學生生活的機會。這些經驗對於未來計劃出國交換的學生來說，將是一份寶貴的參考資源，她也希望她的經歷將激勵後來者，為他們的國際學習之旅提供指引和靈感。

在陽明交通大學的學術追求中，海外交換是一個重要的里程碑。資工系的洪瑋廷與洪婕庭兩位學生的國際交換經驗，不僅為他們自己帶來了寶貴的學習與生活體驗，也為學弟妹們提供了靈感與指引。這些經驗故事不僅是個人成長的見證，更是未來學弟妹們的寶貴資源。透過這些分享，我們期待更多陽明交通大學的學生能夠勇敢地踏出舒適圈，開拓自己的國際視野，並在全球舞台上發光發熱。他們的故事，將會激勵著下一代學子，為他們的海外學習之旅點亮路標。

Expanding Horizons: Insights from Computer Science Students Studying Abroad

As part of their pursuit of academic excellence, students at National Yang Ming Chiao Tung University often seize the opportunity to participate in international exchange programs, aiming to broaden their horizons and gain valuable experience. These programs present a unique set of challenges and opportunities, requiring courage and insight from both the students and those who have embarked on similar journeys before them. In 2022, two students, Wei Ting Hung and Jie Ting Hong, from the Computer Science Department, embarked on study abroad programs at the University of Southampton in the UK and Osaka University in Japan, respectively. This year, they are sharing their insights with their juniors, offering valuable advice and wisdom to future students.

Wei Ting Hung, a computer science student from the Class of '111, participated in the OUSSEP (Osaka University Short-term Student Exchange Program). In 2022, he went to Osaka University to study at the Law School. Hung chose Professor Elbalti's courses at the Law School, where he studied specialized subjects such as common law, Japanese law, Middle Eastern law, social law, and Islamic law. He observed that Professor Elbalti encourages active participation in class discussions among students, making attendance a significant factor in grading. However, the attendance requirements are flexible. Additionally, students can choose to enroll in either three elementary Japanese courses held at 8 a.m. weekly or an advanced Japanese course offered once a week. These Japanese language classes are designed to improve students' ability to express themselves in Japanese by focusing on various social issues.

Hung participated in the "Internship" course of the OUSSEP program. This course allowed him to interact with residents and various organizations, which helped him experience different cultures and ways of life. During the course, students visited different organizations and institutions, engaging in dialogues with non-profit organizations for elementary school students' after-school activities, local senior farmers, volunteers lighting candles at the memorial ceremony for the Great Hanshin Earthquake, Osaka Music University, Kyoto University's Yoshida Dormitory where students were living in protest, farmer bases, homeless squatters protesting against police in Shibuya Park. These hands-on experiences helped him gain a better understanding of Japanese culture, society, and way of life. Overall, his study abroad experience in Japan allowed him to gain deeper insights into various disciplines while also developing a better understanding of Japanese culture and society.

Jie Ting Hong was among the first batch of undergraduate students awarded overseas exchange scholarships from the College of Computer Science in 2022. She attended the University of Southampton for a one-year exchange program. During her stay at Southampton, Hong observed that the teaching methods were not significantly different from those at the National Yang Ming Chiao Tung University. However, there were differences in the details of the courses, such as the proportion of lectures, goals, and students' approach to learning. While attending classes at Southampton, she noticed that the proportion of lectures was relatively low, and many courses incorporated practical exercises and enhanced interactivity. In laboratory classes, there was an emphasis on discussion and exchange among students, and they were encouraged to use online discussion forums to seek solutions to problems. Some teachers were also skilled in utilizing university-provided resources and online platforms like Discord for classroom Q&A and online tutoring activities. Hong mentioned that second and third-year students at the University of Southampton generally had internship experience or more comprehensive summer plans. They began seeking resources related to future employment in their first and second years, accumulating relevant experience. These experiences, different from those in Taiwan, fascinated her.

During her studies at Southampton, Hong observed that there were more group assignments in the first semester, particularly in the game design course. Each assignment required teams of two to complete, and they couldn't work with the same partner every time. By collaborating with her classmates, Hong discovered that besides applying knowledge learned in class, creativity was also essential. Therefore, effective collaboration could lead to significant outcomes, where each member could guide the other toward interesting ideas and implement the expected features, resulting in a sense of accomplishment.

The Student Services Center at the University of Southampton is a noteworthy facility that combines academic affairs, student affairs, and counseling services to provide support to students. Hong believes that the university places great importance on students' mental health by offering these services. The Personal Academic Tutor (PAT) program assigns a Personal Academic Tutor to each student, while senior tutors are available for counseling sessions. Furthermore, the Student Services Center operates a 24-hour hotline to assist students at any time.

Hong shared that studying abroad was a very enriching experience for her both academically and socially. She got to learn about the teaching methods and student life at the University of Southampton in-depth. Hong believes that her experiences will be a valuable reference for students who plan to study abroad in the future. She also hopes that her experience can inspire others to provide guidance and inspiration for their international learning journeys.

In pursuit of academic excellence, National Yang Ming Chiao Tung University considers overseas exchange a crucial milestone. Wei Ting Hung and Jie Ting Hong, two students from the Computer Science Department, have shared their international exchange experiences, which have not only enriched their own learning and life experiences but also inspired and guided their juniors. These experiential stories highlight personal growth and serve as valuable resources for future students. We hope that more students at National Yang Ming Chiao Tung University will be encouraged by these sharing sessions to step out of their comfort zones, broaden their international perspectives, and excel on the global stage. These inspiring stories will motivate future students and illuminate the path for their overseas learning journey.

探索教學之道
曾意儒老師與陳奕廷老師經驗分享

文／鍾乙君

國立陽明交通大學自2018年起與英國Advance HE合作，與英國Advance HE的合作，成立了國際高等教育培訓暨認證中心（Higher Education Accreditation for Teaching, HEAT）。中心旨在為教師提供了一個獲得國際認可的平台，能夠提升個人的教學能力和專業水平，提升高等教育的專業教學能力和技巧，使教學水平符合國際高等教育專業標準（Professional Standards Framework, UKPSF），同時協助教師申請或獲得國際高等教育專業認證（HEA Fellowship）。而本院已有10位教師獲得了國際高等教育專業認證，其中包括1位Senior Fellowship、8位Fellowship和1位Associate Fellowship。

此次分享會我們邀請到資訊學院的曾意儒副教授與陳奕廷助理教授來為了我們解惑國際高等教育培訓暨認證能夠帶給高教人員什麼樣的心得收穫，他們又在認證過後如何將課程內容應用到教學中。

曾意儒提到國際高等教育培訓暨認證課程結構安排緊湊，所以要求參與者必須保留足夠的時間參加課程，課程內容涵蓋了有關國際高等教育培訓和認證的相關資訊，以及教學技巧的培養。在課堂上，老師們將教學視為一種研究，評估並改進自己的教學方法，力求提出問題、定義問題，最終解決問題。課程還提供了不同學院的教授分享教學經驗並互相反饋的機會，這使得參與者能夠了解到不同學院教學方法的差異，並促進教學交流。

而陳奕廷在分享會上也提及，他了解高教人員在教學上與實務研究上的不平衡之處，並認為在場大部分參與者都是在各自領域非常優秀的專家，但教學和研究是兩個不同的專業領域，許多教授可能在教學方面缺乏相應的專業技能，因此參加國際高等教育培訓是非常必要的。他呼籲想要參與國際高等教育培訓的教師需要思考自己到底想要教給學生什麼，並尋找適合的教學方法。像是他在課程結束後將內容應用到自己的教學中，通過提供實例教學來培養學生的興趣、鼓勵學生積極參與討論，以促進學生的學習。同時，陳奕廷還利用各種互動網站和工具，如kahoot，來提高課堂的活躍度，並激發學生的學習興趣。他也提到通過評估學生的學習程度，教師才發現自己的教學方法並不總是能夠讓所有學生理解。這促使他們意識到設計初學者課程和入門課程的重要性，並開始思考如何更好地向學生傳授知識。

曾意儒的分享為教師提供了許多寶貴的教學啟示，強調了不斷學習和改進的重要性，以提高教學水平和學生的學習效果，同時將教學視為一項挑戰和機會，試圖找出問題並解決問題的重要性。陳奕廷在會議上也分享了他的心得，他認為教授們在教學中常常面臨挑戰，尤其是專業知識的傳授和與學生的互動。此外，陳奕廷還提到了評估學生學習程度的重要性。他主動與學生交流，了解他們的學習進度和需求，並根據反饋信息調整教學方法和內容，以確保學生的學習效果。他們勇於面對教學的挑戰和機遇，並分享了自己在教學實踐中的心得和方法，這對於提升教師的教學水平和學生的學習效果都具有重要意義。本院期許有更多的教職人員參與此培訓，共同為陽明交大的學習環境努力，從不停止進步。

Exploring the Way of Teaching:
Teaching Insights from Yi-Ju Tseng and Yi-Ting Chen

Since 2018, National Yang Ming Chiao Tung University has partnered with Advance HE from the United Kingdom to establish the Center of Higher Education Accreditation for Teaching (HEAT). This center is dedicated to offering teachers a globally recognized platform to enhance their teaching skills and adhere to professional standards. It seeks to elevate the professional teaching capabilities and skills in higher education to meet the standards outlined in the UK Professional Standards Framework (UKPSF). Furthermore, it assists teachers in applying for or obtaining international recognition through the Higher Education Academy (HEA) Fellowship. Up to now, the College of Computer Science has seen 10 faculty receive international recognition from Advance HE, comprising 1 Senior Fellowship, 8 Fellowships, and 1 Associate Fellowship.

We have invited Associate Professor Yi-Ju Tseng and Assistant Professor Yi-Ting Chen from the College of Computer Science to share their perspectives on the insights and benefits that the CLTHE (Certificate in Learning and Teaching in Higher Education) program offers to higher education faculty. Additionally, they will discuss how they integrate the course content into their teaching after certification.

Professor Tseng emphasized that the structure of CLTHE courses is intensive, requiring participants to allocate sufficient time for attendance. The course covers relevant information about CLTHE, as well as fostering teaching expertise. In the classroom, participants view teaching as an ongoing research endeavor, where they assess and enhance their instructional approaches. Their goal is to pose inquiries, identify issues, and effectively resolve them. Additionally, the program provides an environment for faculty members from various institutions to exchange teaching experiences and offer mutual feedback, promoting an understanding of diverse teaching methodologies across different colleges and stimulating the exchange of teaching insights.

During the sharing session, Professor Chen discussed the imbalance between teaching and research within the higher education faculty. He acknowledged the expertise of most faculty members in their respective fields but emphasized the distinction between teaching and research as separate professional realms. He pointed out that many professors may lack the necessary teaching skills, highlighting the importance of engaging in the CLTHE program. He encouraged faculty members interested in such training to reflect on their educational objectives and seek appropriate teaching methodologies. As an example, he incorporated concepts from the CLTHE courses into his teaching approach, using practical examples to stimulate student interest, encourage active discussions, and facilitate learning. Additionally, Professor Chen utilized various interactive platforms like Kahoot to enhance classroom participation and ignite student enthusiasm for learning. He also emphasized the significance of evaluating student learning outcomes, noting that such assessments often reveal gaps in teaching effectiveness. This recognition led teachers to acknowledge the necessity of designing beginner and introductory courses and to consider strategies for more effectively imparting knowledge to students.

Professor Tseng's presentation provided faculty members with valuable insights, emphasizing the importance of continuous learning and improvement to enhance teaching quality and student outcomes. She viewed teaching as both a challenge and an opportunity, highlighting the need to identify and solve problems. Similarly, Professor Chen shared his experiences, focusing on the challenges faculty members often face in conveying professional knowledge and interacting with students. He stressed the importance of assessing students' learning progress, actively engaging with students to understand their needs, and adapting his teaching methods and content based on their feedback to ensure effective learning. The commitment of both Professors Tseng and Chen to addressing teaching challenges and sharing their experiences and methods is vital for improving teaching quality and student outcomes. Our college hopes that more faculty members will participate in this program, working together to enhance the learning environment at National Yang Ming Chiao Tung University and continuously striving for progress.

邱維辰教授榮獲中研院年輕學者研究成果獎

文／林珮雯

中央研究院為鼓勵國內年輕學者深入學術研究，追求重要貢獻，「年輕學者研究成果獎」聚焦得獎人研究成果之影響力與創新程度，激發年輕研究人員更加深入思考，從事創新性與具有影響力的研究工作。

邱維辰教授研究含蓋電腦視覺、影像處理、機器學習領域。邱教授專注利用非監督或無監督式學習來增進模型在不同任務或領域的泛化能力，特別是在電腦視覺應用上。他的研究涵蓋了提升跨領域的適應性（例如從虛擬 環境轉移知識到現實環境的語意切割任務）、提升跨任務的泛用性（例如跨 越深度估測和光流估測兩種不同的視覺感測任務）、和針對跨任務演算法 （如元學習）之深入分析和進一步提升成效。

邱維辰教授先後也獲得其他重要獎項肯定，包括 2022 年榮獲傑出人才發展基金會年輕學者創新獎與中華民國資訊學會李國鼎青年研究獎的肯定。他是本院具研究潛力之新世代年輕學者，目前也以合聘研究員身分加入工研院機械所，協助開發自駕車的視覺感測與辨識模組，以更直接的形式貢獻所 長於臺灣產業的技術發展。邱教授也表示很榮幸獲得這個重大獎項的肯定，並且能以其母語於頒獎典禮發表得獎感言更為開心，以下是邱維教授的得獎感言：

真的很歡喜能夠獲得中央研究院年輕學者研究成果獎對我研究成果的肯定，但是這些成果不是我一個人有辦法做到的，而是許多學生共同打拼努力、許多單位不吝提供研究資源、很多國內外學術界或是工業界的好朋友作伙合作討論、更加還有很多研究界的先輩對我的照顧及牽成才有辦法達成的，當然還有最重要的，是我的家庭對我無條件的支持與包容，才有今日的我。

在人工智慧和深度學習發展非常快速的現代，我希望自己能夠成為國外內學界及工業界的橋樑，作伙團結出力為著台灣這塊土地繼續打拼貢獻。

Professor Wei-Chen Chiu was awarded the Academia Sinica Early-Career Investigator Research Achievement Award

To encourage young scholars in Taiwan to delve into in-depth academic research and make significant contributions, Academia Sinica instituted the 'Academia Sinica Early-Career Investigator Research Achievement Award.' This award strongly emphasizes assessing the impact and innovation of recipients' research outcomes, aiming to inspire young researchers toward more profound and influential endeavors.

Professor Wei-Chen Chiu conducts research in computer vision, image processing, and machine learning. His specific emphasis lies in using unsupervised learning to amplify the generalization capabilities of models across various tasks or domains, with a particular focus on applications in computer vision. His research involves enhancing adaptability across different domains (for instance, the semantic segmentation tasks of transferring knowledge from a virtual environment to a real environment), elevating versatility across various visual sensing tasks (such as depth estimation and optical flow estimation), and conducting comprehensive analyses to enhance further the effectiveness of cross-task algorithms, such as meta-learning.

Professor Chiu has earned acclaim through various prestigious awards, including the 2022 Young Scholars Innovation Award by the Foundation for the Advancement of Outstanding Scholarship and the KT Li Young Researcher Award conferred by the Institute of Information & Computing Machinery. He demonstrates substantial research potential as a forward-looking young scholar within our college. Simultaneously, he holds a joint appointment as a research fellow at the Mechanical and Systems Research Laboratories of ITRI (Industrial Technology Research Institute), contributing directly to the technological advancement of Taiwan's industry by playing a vital role in the development of visual sensing and recognition modules for autonomous vehicles.

Professor Chiu expressed great honor upon receiving this significant award, and he is particularly pleased to deliver the acceptance speech in his native language at the award ceremony. Here is Professor Chiu's acceptance statement:

"I am truly delighted to receive the Academia Sinica Early-Career Investigator Research Achievement Award, which acknowledges my research contributions. It's important to note that these accomplishments were not attained in isolation; they are the product of collaborative endeavors. This involves dedicated students, various organizations providing research resources, and numerous friends from academic and industrial circles (both domestic and international) engaging in collaborative discussions. Additionally, the indispensable care and guidance of many senior researchers in my field have been instrumental. Most importantly, my family's unwavering support and understanding have played an essential role in my current achievements.

In the swiftly evolving landscape of artificial intelligence and deep learning, I aspire to serve as a liaison between the academic and industrial sectors, domestically and internationally. My goal is to unite these sectors, fostering collaboration to contribute collectively to the ongoing progress of our homeland, Taiwan."

是日未來：跨域實作成果展 — 帶領學生成為未來的構築者

文／鍾乙君

今年一月十一日盛大舉辦的「是日未來：跨域實作成果展」，由國立陽明交通大學教學發展中心所舉辦，同時加入資訊學院的師資與學生群展現了跨學科創新專案的豐碩成果。這些專案覆蓋了從機器人學到虛擬實境、物聯網、數位製造，乃至生醫與健康科學的廣泛領域。展覽主題「是日未來」突出了當代學術研究的深邃與廣闊，並揭示了學生與教授如何通過跨領域協作，開拓科技與生活融合的新視野。展區被劃分為「智慧生活」、「未來肉身」及「明日視界」，每一部分均展示了科技如何提升生活質量並揭示了未來科技的發展潛力。

資訊學院的教授們在這一跨領域教學中扮演了核心角色，他們不僅分享了專業知識，還引導學生進行實踐，將理論與創新融合。黃世強教授指導的 3D 遊戲程式課程，要求學生在學期末完成一個結合理論與實踐的專案，學生需在 3D 遊戲引擎核心上添加自己的程式模組。黃世強教授重視實踐操作，課程透過經典遊戲如貪食蛇、皮卡丘打排球、俄羅斯方塊進行教學，學生首先須完成程式碼，然後將其上傳至 Arty 版，並通過 VGA 線將成品結果顯示在屏幕上，讓學生掌握硬體描述語言的應用，並全面理解整個流程。

詹力韋教授的互動設計與虛擬實境課程，涉及創建互動系統的流程和技能，尤其是虛擬現實應用。學生們組成團隊，共同創造創新的互動裝置。詹力韋教授指導的 Let's Break the Wastage 團隊的作品，將垃圾分類變成一個有趣的遊戲，並以餵食小動物的方式作為亮點。垃圾被轉化為可愛的動物形象，正確的垃圾分類變成了對這些小生命的關愛。只有正確分類，這些小動物才能得到充足的食物，否則它們將面臨饑餓的危險。這種互動體驗不僅喚起了環保意識，也讓使用者感受到資源回收的重要性，共同為一個更環保的未來而努力。

而近年來應用越來越廣泛的無人機應用與熱門話題元宇宙，也引起學生的強烈興趣。本院陳冠文教授開課傳授無人機自動飛航與電腦視覺概論，專注於無人機的自動飛航技術和電腦視覺技術，學生們通過實作深入學習這些技術。莊榮宏教授的 XR 跨域專題與元宇宙專題，則探討了元宇宙相關技術，並要求學生以小組形式開發專案，強調虛擬世界中的人際互動，思考未來人類的社交關係。

在技術學習方面，范倫達教授的數位電路實驗課程，為學生提供了數位電路基礎和設計問題解決能力。學生們

學習布爾代數、時序邏輯、FPGA 設計等，並通過實際操作將理論知識應用到實際工程中。林政寬教授的物聯網裝置與平台課程，則引領學生深入探索物聯網的無限可能。學生們學習 ESP32 的基本功能，包括 Wi-Fi 和藍牙技術，以理解物聯網設備的無線通信，並透過實際操作設計和實現堅固的物聯網應用。課程強調實踐操作，尤其是在傳感器技術上。學生接觸各類數字和模擬傳感器，學習它們如何從環境中收集數據，通過實踐，學生在學習中掌握傳感器的應用，以及它們在日常生活和工業應用中的重要性。

這些課程和專題展示了陽明交大在跨領域實作教學上的深厚實力，並為學生提供了一個全面的學習平台。這次的成果展是對學生學習成果的一次集中展示，也是對未來科技發展的一次展望。透過這些創新的教學方法和實踐，陽明交大資訊學院的師生們不僅展示了他們的才華和創造力，也為未來的科技創新奠定了堅實的基礎。這次成果展不僅是對過去努力的回顧，更是對未來無限可能的期待。「是日未來：跨域實作成果展」不只是一次學術與創新的盛會，也是一個對未來的推測與想像。

"Future Today: Cross-Domain Practical Achievement Exhibition" –Guiding Students towards Becoming Architects of the Future

The 'Future Today: Cross-Domain Practical Achievement Exhibition,' which took place on January 11th of this year, was a significant event hosted by the Center for Teaching and Learning Development at National Yang Ming Chiao Tung University. It featured an impressive collaboration between faculty and students from the College of Computer Science, showcasing a diverse array of interdisciplinary innovation projects. These projects spanned several fields, including robotics, VR/AR, the Internet of Things, digital manufacturing, and biomedical and health sciences. The exhibition, themed 'Future Today,' accentuated the depth and breadth of contemporary academic research, demonstrating how students and professors are expanding their horizons through cross-disciplinary practical courses into the integration of technology and life. The exhibition space was thoughtfully organized into three main sections: 'Smart Living,' 'Future Embodiment,' and 'Tomorrow's Vision.' Each section offered a glimpse into how technology is enhancing our daily lives and provided a sneak peek into the bright future of technological advancements.

Professors at the Computer Science College play a crucial role in delivering cross-disciplinary practical courses. They not only share their knowledge but also mentor students through hands-on projects that integrate theoretical insights with innovative practices. In Professor Sai-Keung Wong's 3D game programming course, students are required to complete a project by the end of the semester that synthesizes theoretical concepts with practical application. They are tasked with integrating their unique program modules into the core of a 3D game engine, highlighting Professor Wong's strong advocacy for practical applications. The curriculum cleverly utilizes classic games like Nibbler, Pikachu Volleyball, and Tetris as instructional tools. Students begin by coding these games and then upload them to the Arty board to showcase their projects on a screen using a VGA cable. This teaching strategy not only enables students to understand the application of hardware description languages but also offers them a holistic view of the project lifecycle.

In Professor Liwei Chan's course on interactive design and virtual reality, students delve into the methodologies and skills essential for crafting interactive systems, with a particular emphasis on virtual reality. Collaborating in teams, they are tasked with creating innovative interactive devices. Guided by Professor Chan, the "Let's Break the Wastage" team has taken an imaginative leap by turning waste sorting into an engaging gaming experience. This project re-envisions waste materials as adorable animal characters and makes proper waste sorting an act of kindness towards these virtual creatures. The game is designed so that the animals can receive ample nutrition only when waste is sorted correctly; failure to do so means the animals face the threat of hunger. This inventive project does more than entertain; it raises awareness about environmental protection and the significance of resource recycling, encouraging collective efforts toward a sustainable future.

Recently, the widespread use of drones and the advent of the metaverse have sparked interest among students. At our college, Professor Kuan-Wen Chen offers courses on unmanned aerial vehicle (UAV) automatic flight control and foundational aspects of computer vision, focusing specifically on the technologies behind UAV autonomous flight and computer vision. Students immerse themselves in these topics through hands-on projects. Meanwhile, Professor Jung-Hong Chuang offers cross-disciplinary practical courses on Extended Reality (XR) and the metaverse to explore related technologies. These courses encourage students to work in teams on projects that highlight the nuances of interpersonal interaction in virtual worlds, thereby fostering deeper rumination about the paradigm shift of human social relationships in the future.

In the field of technical education, Professor Lan-Da Van's course on digital circuit experiments significantly enhances students' comprehension of digital circuits and bolsters their problem-solving skills. This course covers a broad range of topics, including Boolean algebra, sequential logic, and FPGA design, enabling students to seamlessly apply theoretical concepts to practical engineering applications. Concurrently, Professor Cheng-Kuan Lin's course on IoT (Internet of Things) devices and platforms explores the infinite possibilities of the Internet of Things. It focuses on the essential workings of the ESP32, incorporating Wi-Fi and Bluetooth technologies, thus providing a comprehensive understanding of the communication protocols pivotal to IoT devices. Through hands-on projects, students gain invaluable experience in IoT application development, with a special focus on sensor technology, while exploring various digital and analog sensors and understanding how these devices collect environmental data. The practical emphasis of this course not only equips students with the skills to implement sensors in their projects but also highlights the crucial role sensors play in our daily lives and the broader industrial landscape.

The courses and projects at NYCU illustrate the university's expertise in cross-disciplinary practical education, creating a dynamic and comprehensive learning platform for students. This exhibition not only showcases the remarkable achievements of the students but also offers a window into the future possibilities of technological innovation. Through innovative teaching approaches, the faculty and students of the College of Computer Science at NYCU demonstrate their skills and creativity, establishing a solid foundation for future technological advancements. This exhibition serves as a retrospective of past achievements while simultaneously setting the stage for anticipation of limitless future opportunities. "Future Today: Cross-Domain Practical Achievement Exhibition" represents both an academic and innovative celebration and a platform for forward-thinking and envisioning what's next in the realm of technology.

資工系學會精彩活動回顧

文／戚維凌 資工系學會會長

陽明交大資工系學會是由資工系大二及大三的學生自願所組成的學生自治性組織，主要是做為學生與系上溝通的橋樑、舉辦各種活動維繫系上同學的感情、維護考古題系統與高中生專區網站等等，旨在盡所能服務系上同學，接下來將介紹這一年下來所舉辦的活動回顧：

迎新活動

迎新茶會

在大一新生放榜之後，系學會舉辦了跨越全台的北中南區迎新茶會，幫助剛剛入學的還懵懵懂懂的新生們快速建立對系上的認知、回答眾多學生們常見的一些疑問，使其更快熟悉並融入大學生活。

選課大會

剛入學的新生一定對大學課程有很多很多疑惑，在開始選課前幫助同學快速了解學分、選課規則、限制、建議及學長姊心得分享，也會實際操作選課系統讓大家熟悉如何正確選課。

直屬相見歡

為了幫助新生更快融入學校生活，系學會依照學號安排一位大二的學生做為新生的直屬學長姊，希望可以透過這個活動讓新生與學長姐建立聯繫、排憂解難。

系內抓馬盃

抓馬 (Drama) 盃，即戲劇表演比賽，透過各班自行籌組規劃一場完整的戲劇表演，是進入大學後第一個可以凝聚班級同學向心力的大型活動。不只讓多才多藝的新生盡情展現自我，也為之後「校際抓馬盃」新生戲劇比賽表演暖暖身，今年更是為資工系拿下全校第一的佳績。

邊學邊玩

企業參訪

每學期都會尋找資訊相關知名企業洽談合作，並安排企業實地參訪，近年有參訪過 LINE、緯創軟體、趨勢科技、Dcard、羅技電子等等國內外知名企業。讓同學了解業界與公司的環境，充分地思考未來職涯發展。

工作坊

系學會不定期舉辦專業職能工作坊，會邀請各領域的專家來現場教學，除了讓同學不止能學習到學校課程以外的專業技術也有非資訊相關的議題或技能，培養更多元的興趣與能力。

跨校區交流

資工護理相見歡

今年首次舉辦與陽明校區護理學系的交流活動，讓資工與護理系大一的同學互相認識、聯絡感情，在課業上也能共同進步。

護理資工球賽

兩系同學初步認識之後，為了能定期聯繫感情，因此希望能藉由體育競賽活動做更進一步的交流。

特色活動

耶誕周

舉辦一系列有耶誕節氣氛的愉快小活動，包含交換禮物、掛聖誕襪、許願牆、耶誕舞會等等，讓同學在沉重的課業壓力下有一點點的放鬆。

送舊烤肉

在臨近畢業的時節舉辦送舊烤肉，祝福學長姊的同時也增進學長姐與弟妹之間的感情。

冬至火鍋大會

在新竹寒風颯颯的冬至時分，邀請各年級的同學一同來圍爐吃火鍋維繫感情，溫暖了胃也溫暖了心窩。

The Year in Review: Wonderful Activities by the CS Student Association

The CS Student Association at Yang Ming Chiao Tung University is a self-governing organization made up of second and third-year students who are majoring in computer science. The main goal of the association is to act as a channel of communication between students and the department, as well as to organize various activities that help maintain strong relationships among students. Additionally, the association is responsible for maintaining systems such as the past entrance exam question bank and the high school student zone website, with the ultimate aim of serving the CS students to the best of their ability. In the following section, we will provide a review of the activities that were held over the past year.

• Freshman Orientation

Freshmen Welcome Tea Party

Following the announcement of first-year freshmen, the CS student association organized welcome tea parties for incoming freshmen in the north, central, and south regions of Taiwan. The parties aimed to assist newly enrolled students in promptly acquainting themselves with the department, addressing common student inquiries, and expediting their integration into university life.

Course Fair

New students often face uncertainties when it comes to choosing their courses. To help them get started, it's important to provide them with clear information about concepts such as credits, course registration rules, and any limitations. Additionally, it's valuable to offer guidance and advice from senior peers who have previously navigated the same process. Hands-on instruction on how to use the course registration system will also help students become proficient at making informed choices.

Bigs & Littles CS Mentoring

To help freshmen adjust to school life, the CS student association pairs each freshman with a sophomore student based on their student ID. The sophomore acts as a Big Brother/Sister and provides guidance and support as needed. The goal is for freshmen to establish connections with their senior counterparts and to feel supported through this initiative.

CS Drama Cup

The Drama Cup is a competition that focuses on theatrical performances. It allows each class to independently organize and create a full-fledged theatrical presentation. As the first university event, it promotes class unity and camaraderie. It's not just a platform to showcase the talents of freshmen, but also serves as a warm-up to the NYCU Drama Cup, a freshman drama competition. This year, the students of the Computer Science Department stood out and secured the top position in the university-wide standings.

• Learn While Playing

Company Visit

Every semester, the CS student association actively seeks out partnerships with well-established companies in the field of information technology and arranges visits to their premises. In recent years, we have had the opportunity to visit several renowned companies, both locally and internationally, including LINE, Wistron ITS, Trend Micro, Dcard, and Logitech. These experiences allow students to gain valuable insights into the industry's dynamics and corporate cultures, helping them reflect deeply on their future career paths.

Workshop

The CS student association organizes workshops regularly aimed at improving professional skills. During these workshops, experts from various fields provide practical guidance to students. This initiative enables students to acquire professional competencies that extend beyond the established curriculum, as well as non-technical skills or topics, thereby promoting a wider range of interests and capabilities.

• Inter-campus exchange

CS students and Nursing students come together happily

This year, the CS student association organized its first exchange event with the Nursing Department at the Yangming Campus. This facilitated mutual acquaintance, networking, and collaborative academic advancement among first-year students in both departments.

Sports Competition: Nursing vs. Computer Science

After introducing the students from both departments, the CS student association plans to maintain regular interaction using sports competitions as a means of enhancing communication.

Activities Highlights

The CS student association organized a series of festive events during Christmas week to celebrate the holiday season. The events included gift exchange, stocking decorating, a wishing wall, a Christmas party, and more. We hope to give students a break from their academic responsibilities and allow them to relax and enjoy some holiday cheer.

Farewell BBQ Party

As graduation season approached, the CS student association hosted a Farewell BBQ Party to bid farewell to the seniors and strengthen the bonds between the seniors and juniors.

Winter Solstice Hot Pot Feast

On the cold winter solstice in Hsinchu, the CS student association invited students of different grades to come together for a hot pot, fostering camaraderie and warmth.

本院與 LiveABC 合作 強化學生國際溝通力

文稿整理／白文怡

在今天全球化的世界中，英語能力對於學術和職業成功日益重要，精通英語已成為關鍵目標。本院向來強調學生專業英語能力培養，目前本院英文授課比例已達 37.11%，除了高比例英語授課外，本院亦重視提升學生日常生活溝通及跨國文化交流的雙語能力。今年度起，本院與 LiveABC 合作，提供學生 EGP (English for General Purpose) 線上課程，引進多元的外籍講師，強化本學生國際溝通力。以下邀請幾位參與學生分享心得：

廖信詠 (網際網路與行動服務實驗室)

我認為這門課程對英文會話很有幫助，每堂課都會定一個主題與老師討論，在一問一答的過程中讓我更適應用英文對話，過程中也能察覺自己還有什麼不足的地方需要加強，老師也相當友善與健談，課程整體氛圍輕鬆愉快，有如平常在聊天的情況下培養英文會話能力，一系列課程課後能明顯感受到自己的英文會話更加自然與流暢，也對未來要加強的部分有更清晰的認知，期待之後能有更多相關課程幫助學生培養英文會話能力，也推薦給想增強英文會話能力的同學們。

何秉育 (無線網際網路實驗室)

這次的 EGP 線上課程對於提升我們的英語能力起到了相當大的幫助。透過這幾次的線上課程，讓我們學會許多單字，並更加熟練英文表達技巧。課堂中與老師都是使用英文進行交流，即便有不清楚或是不了解的地方都是使用英文問答，讓我們身處於英文的教學環境當中。課程中，老師以積極正面的態度引導學習，並適時的給予我們鼓勵，讓我們學習的比較沒有壓力、更加自信的表達自己，不論是流暢度、精確性，還是文法方面都有明顯的進步。

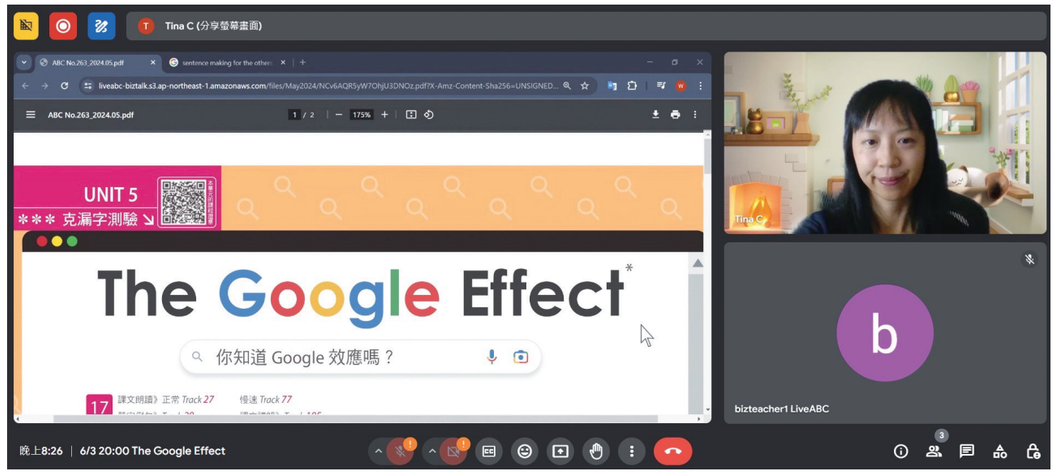
黃君瑋 (網路科學與圖學習實驗室)

這個課程對我來說幫助很大的部分就有機會多開口說英文，而且可以觀察到外籍老師是 " 如何說英文 "。 每次課程中都會有一些 vocabulary 的部分必須要用英語解釋意思，我常常想很久還是不知道怎麼講，輪到老師解釋的時候卻發現他使用的那些字詞其實我也是知道的，然而我卻沒有辦法順暢的使用簡單的單字表達一些意思，在來回的觀察學習以及數次上課之後，我的表達能力也明顯有所改善，主要是覺得自己更敢開口練習口說了。原本生活中英文口說的機會本來就趨近於 0，再加上一直覺得自己口說很菜就更不敢講，然而真的經過這樣的練習之後，雖然還是講得七零八落，但是卻也讓我意識到，其實只要能想辦法表達，對方都還是聽得懂你的意思的，因此也慢慢地更敢開口表達意見。總體來說我覺得很有用，謝謝雙語小組舉辦這樣的課程。

楊淳皓 (網際網路與行動服務實驗室)

Melanie 老師講解的非常好，也會帶領同學輪流發言，在發言過程中可以練習英文對話，老師也會適時給予的指正。五週的課程中，每周都安排許多生活化的主題，可以增進英文生活對話的能力，對於未來有需要英文報告、甚至出國，相信都會有很大的幫助。整體來說，在這幾堂課中和老師的相處非常融洽，唯一小缺憾就是只有五週五次上課。希望未來有以學期為單位的課程，若要收費也可以接受，相信學校應該能談到比我們個人更優惠的價格，學生自己有付出一些學費，相信上課會更認真，可以過濾出真正有心的學生，才不會有太多偏差的提問和對答。另外希望未來人數限制為 3-4 人，讓每個同學有更多時間可以發言！

CCS has Partnered with LiveABC to Foster Students' Global Communication Skills



English proficiency is becoming increasingly vital for achieving academic and professional success in our globalized world. At our college, we have always placed a strong emphasis on developing our students' professional English skills. Presently, the percentage of English Medium Instruction (EMI) courses in our college has reached 37.11%. In addition to a high percentage of EMI courses, we prioritize enhancing our students' bilingual abilities for daily communication and cross-cultural exchange. Starting this academic year, we have teamed up with LiveABC to provide online EGP (English for General Purpose) courses, which will introduce a diverse range of foreign instructors to prepare our students for international communication. Here are some testimonials from students.

Peter Liao (IMS Lab)

This course significantly benefits my English speaking skills. Each session revolves around a specific topic, and engaging in discussions with the instructor boosts my confidence in English conversation. Throughout the learning process, I can pinpoint areas for improvement. The instructor's friendly and approachable demeanor also makes communication easy. The course atmosphere is relaxed and enjoyable, which helps develop English speaking skills through casual conversations. After completing the course, I've noticed that my English conversation has become more natural and fluent. It has also provided me with a more precise awareness of areas I need to strengthen in the future. I highly recommend this course to students looking to improve their English speaking skills and look forward to more related courses in the future.

Benson Ho (Wireless Internet Laboratory)

The EGP online course has significantly improved our English language skills. Throughout these virtual sessions, we have gained an abundance of vocabulary and developed our ability to express ourselves in English. In the classroom, we communicate with the instructor in English. Even if there are unclear or unfamiliar areas, we use English for questions and answers, fully immersing ourselves in an English learning environment. The instructor maintains a positive approach in guiding our learning journey, offering timely encouragement and allowing us to express ourselves with less pressure, resulting in increased confidence. There is a noticeable improvement in both the fluency and accuracy of the language, as well as the correctness of grammar.

Sor Huang (Network Science and Graph Learning)

This course has been incredibly beneficial, as it has provided ample opportunities for me to engage in English conversation. Additionally, it has offered insights into how foreign instructors express their thoughts and ideas in English. During each class, there are segments where vocabulary must be explained in English, and I often struggle to express the meaning. However, when it was the instructor's turn to elaborate, I realized that I knew the words, but I couldn't convey the meaning using simple language. Through active participation and observation across multiple classes, I have noticed a significant improvement in my ability to express my thoughts. I now feel more self-assured in honing my speaking skills. Initially, I had little chance to speak English daily, and coupled with the perception of needing more proficiency in spoken English, I hesitated to communicate. However, after numerous practices, although my speech is still scattered, I have realized that others can understand me as long as I find a way to express myself. Consequently, I have become more confident in expressing my opinions. I found the course helpful and appreciate the CCS bilingual work team for organizing such a program.

Tony Yang (IMS Lab)

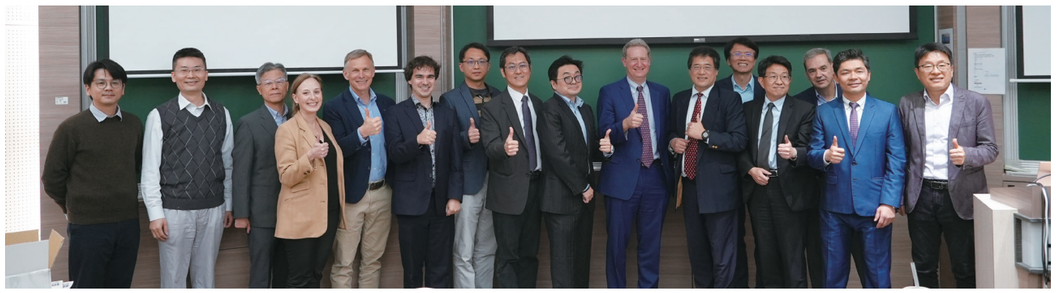
Melanie is an excellent teacher who not only explains concepts effectively but also encourages students to participate in group discussions. During these discussions, we get to practice English dialogue and receive timely corrections from the instructor. This five-week course covers practical topics that significantly enhance our ability to speak in English fluently in daily life, offering great benefits for future endeavors such as presentations and traveling abroad. The interaction with the instructor in these classes is exceptional, but the only minor limitation is that the course comprises only five classes over five weeks. I hope that the college will offer courses structured on a semester basis in the future, even if they require fees. The college could negotiate a rate more favorable than individuals could obtain independently. When students contribute to their tuition fees, they approach classes with extraordinary dedication, filtering out less committed ones and minimizing irrelevant questions and responses. Additionally, we hope to see future class sizes capped at 3-4 people, allowing each student more time to speak.

耶魯大學代表團訪問陽明交通大學資訊學院 期待共同建立研究合作機會與夥伴關係

文／杜懿洵

美國名校耶魯大學於今年三月份派出多位代表來台進行一系列的參訪，除了前往台積電與聯發科拜會與觀摩之外，也在 3 月 15 日蒞臨陽明交通大學。此次參訪除了由本院陳志成院長親自接待美國耶魯大學代表團之外，也有數位陽明交通大學學生一起加入交流，另外，也邀請到在耶魯大學做訪問研究員的前立法委員許毓仁先生一起參與。許毓仁先生專注在半導體 / 科技、地緣政治與法律之間關係的研究，也為這場交流提供了不同的視野與討論角度。

雖然代表團訪問的時間不長，但對於現下最熱門的人工智慧、資料科學等議題仍舊進行了深度且具有洞察力的討論，收穫非常豐富，而代表團對於台灣在晶片與 AI 的研發實力也非常佩服。趁著交流期間，陽明交通大學也與耶魯大學一同探索未來研究的合作機會與建立夥伴關係，請大家持續關注後續動態，並期許一起與優秀的國際人才追求知識和創新卓越！



Yale Delegation Visits the College of Computer Science, NYCU Exploring Research Avenues and Future Collaboration

In March 2024, Yale University organized a delegation trip to Taiwan. During the trip, the delegation engaged with leaders from prominent Taiwanese tech firms such as Taiwan Semiconductor Manufacturing Company (TSMC) and MediaTek. On March 15th, the delegation also visited National Yang Ming Chiao Tung University. Dr. Jyh-Cheng Chen, the Dean of the College of Computer Science, warmly welcomed the visiting delegation. Discussions at NYCU involved active participation from several of its students. Notably, Jason Hsu, a former legislator and currently a visiting researcher at Yale, was also present. Hsu's research focuses on the complex relationship between semiconductors/technology, geopolitics, and law, providing diverse perspectives and enriching the exchange of ideas.

During their short visit, the delegation engaged in in-depth discussions on trending topics such as artificial intelligence and data science, leading to numerous valuable insights. The delegation also expressed great admiration for Taiwan's prowess in semiconductors and AI. Throughout the discussions, National Yang Ming Chiao Tung University and Yale University discussed potential opportunities for future collaboration and partnerships. Please stay tuned for further updates as we work together to pursue knowledge and innovation excellence with exceptional international talents!

國際會議讓學生放眼全球

文稿整理／鍾乙君

2023 年，本院學生們參加了機器人學習大會、AAAI 人工智能研討會、國際計算機視覺大會以及 IROS 等頂尖國際會議，進入一個充滿創新和知識交流的世界。這些會議提供了學術研究的平台，讓學生們能夠與來自世界各地的專家和同行互動，分享他們的研究成果並探討未來的發展方向。這些活動不僅是知識的源泉，也是啟發青年學者的機會，讓他們在科學和技術的領域中不斷成長和進步。以下邀請幾位參與國際頂尖會議的同學分享心得：

發表論文： SCONE: A Food Scooping Robot Learning Framework with Active Perception

作者：Yen-Ling Tai, Yu Chien Chiu, Yu-Wei Chao, Yi-Ting Chen

指導教授： 陳奕廷老師

國際會議名稱： Conference on Robot Learning 2023 (CoRL 2023)

該會議重要性：機器人學習大會 (CoRL) 是一個年度國際型研討會，專注於機器人與機器學習的交集，旨在發展這兩個領域之間創新的技術。此研討會被譽為機器人與機器學習領域的重要頂級研討會，並得到來自全球頂尖公司的贊助，截至今年為止已經收錄了多篇跨領域的研究論文，展現了機器人在導航、自動駕駛、飛行與操作等場域的能力以及未來發展的潛力，是對於人類科技的發展相當具有影響力的會議。

戴嫵玲同學心得分享：這是我第一次以第一作者的身分參加實體研討會，主要參與了海報展出，與來自世界各地的學者們分享研究內容，在與指導教授和實驗室成員的合作下，我們成功地克服了準備海報和口頭報告所需的種種挑戰。這次經歷不僅豐富了我的學術知識，也加強了我在團隊合作和溝通方面的能力。非常感謝陳奕廷教授的指導，以及學校、教育部與國科會支持學生發表論文以及參與會議，收穫良多。

發表論文：PPO-Clip Attains Global Optimality: Towards Deeper Understandings of Clipping

作者：Nai-Chieh Huang, Ping-Chun Hsieh, Kuo-Hao Ho, I-Chen Wu

指導教授：謝秉均老師

國際會議名稱：Association for the Advancement of Artificial Intelligence, (AAAI 2024)

該會議重要性： AAAI 為頂級人工智慧會議，收錄各種人工智慧的最新研究。AAAI 2024 一共審核了 9862 篇人工智慧相關研究，其中 2342 篇被接受，接受率為 23.75%。

黃迺絜同學心得分享：非常感謝謝秉均教授的細心指導，我們對於強化學習中常見且實驗表現優異的演算法 PPO-Clip 進行了嚴格的理論分析。我們以不同的角度檢視 PPO-Clip 的目標函數並且成為第一篇對 PPO-Clip 在神經網路的參數化下有理論收斂分析的研究。我們運用了 entropic mirror descent 演算法去分離策略優化以及策略逼近的誤差，使我們能夠從理論的角度去控制以及分析演算法的收斂性，並證明了 PPO-Clip 會收斂到全域最佳的策略。很榮幸本研究能夠被 AAAI 接受，也很幸運能夠在 AAAI 聽到國外著名教授的演講，以及認識許多國內國外其他學校厲害的教授以及學生們，這一趟旅程使我受益良多！

發表論文：Learning Continuous Exposure Value Representations for Single-Image HDR Reconstruction

作者： Su-Kai Chen, Hung-Lin Yen, Yu-Lun Liu, Min-Hung Chen, Hou-Ning Hu, Wen-Hsiao Peng, Yen-Yu Lin

指導教授：林彥宇老師

國際會議名稱：International Conference on Computer Vision (ICCV)

該會議重要性：ICCV（國際計算機視覺大會）是計算機視覺領域中最具影響力和重要性的會議之一。該會議定期舉辦，聚集了來自世界各地的頂尖學者、研究人員和工程師，共同探討計算機視覺領域的最新研究成果、技術突破和應用創新。且 ICCV 2023 的 paper 接受率為 26.15%。

陳思愷同學心得分享：真的很開心也很榮幸自己有這個機會在學生時期挑戰國際會議的投稿，特別感謝我的指導教授 林彥宇教授，也相當感謝教授為我們找得優秀學長以及工程師所提供的指導。投稿的過程所學習到的經驗相當難得，首先是作研究所應具備的能力以及態度，教授以及學長們在每次會議中都會與我們分享在研究上應該注意的面向以及能夠改善的方向，認真參與每一次的會議都能夠從中學習到很多。撰寫 Paper 以及後續與 reviewer 的 rebuttal 流程，則是能夠徹底檢視自己對於研究主題的掌控是否足夠透徹，以及對於研究內容的思考、執行是否有疏失。很慶幸自己當初能夠加入彥宇教授的實驗室並且與一群優秀的學者一同進行高效率的研究鑽研，這是我在進入交大以前完全沒有想過會經歷的體驗。未來若還有機會，還是會持續挑戰投稿國際期刊，對於自身的提升和專業知識的累積都相當有幫助！

發表論文：Improving Robustness for Joint Optimization of Camera Poses and Decomposed Low-Rank Tensorial Radiance Fields

作者：Bo-Yu Cheng, Wei-Chen Chiu, Yu-Lun Liu

指導教授：邱維辰老師、 劉育綸老師

國際會議名稱： Conference on Artificial Intelligence (AAAI 2024)

該會議重要性：AAAI 人工智能研討會 (AAAI) 是每年舉辦的全球頂尖人工智能學術研討會之一。根據 Google Scholar 的頂級人工智能出版物 H5 指數排名，它位列第四，僅次於 ICLR、NeurIPS 和 ICML。AAAI 2024 入選率為 23.75% (2342/9862)。

鄭伯俞同學心得分享： 感謝邱維辰與劉育綸兩位教授的指導和帶領，我感到很幸運，能在碩班期間初略體驗了電腦視覺領域的研究流程，從主題定位的發想，反覆實作驗證，再到整合並呈現結果，接著參與投稿的審查與答辯，以及最後的論文發布與宣傳。回想起來我有遭遇不少挫折，尤其在實驗過程中，不乏緊迫感與無力感，不斷的嘗試與修正下，很慶幸最終能產生出具體的成果。我想這段經歷除了學術上的精進，也讓我的意志力與執行力有所成長。

發表論文：MENTOR: Multilingual tExt detectioN TOward leaRning by analogy

作者：Hsin-Ju Lin, Tsu-Chun Chung, Ching-Chun Hsiao, Pin-Yu Chen, Wei-Chen Chiu, and Ching-Chun Huang

指導教授：黃敬群老師、邱維辰老師

國際會議名稱：IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2023

該會議重要性：IROS 是智能機器人和系統領域的頂級國際會議之一，旨在探討智能機器人和智能機器技術領域的科技前沿，強調未來方向以及最新的方法、設計和成果。今年 IROS 的主題為「下一代機器人技術」。本年度共有 2760 篇論文提交。

林欣儒同學心得分享：雖然成為碩士生並不強求必須投稿論文，但我仍然非常感激兩位老師在這段旅程中給予的指導和鼓勵。每當我感到迷惘時，他們總是安慰我不必過於擔心。在他們的支持下，我不僅有幸將我的論文投稿至 IROS，並且被接受，還有機會親自前往美國參加會議。這次的會議經歷讓我深刻體會到，來自世界各地的優秀學者和研究人員都在為自己的研究付出努力。透過與來自不同國家的參與者交流，我對未來的規劃有了更多的啟發和思考。因此我也想鼓勵學弟妹，如果有機會，也應該嘗試投稿並參加這些國際會議。這不僅是一次學術交流的機會，更是一次寶貴的經歷。

International Conferences Offer Students a Global Perspective

In 2023, students from our college participated in several leading international conferences, including the Conference on Robot Learning 2023 (CoRL 2023), the Association for the Advancement of Artificial Intelligence (AAAI 2024), the International Conference on Computer Vision (ICCV), and the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2023. These conferences provided valuable opportunities for students to engage in scholarly inquiry, interact with global experts, share their research findings, and explore future avenues in their fields. In addition to serving as sources of knowledge, these conferences also served as platforms for igniting the passions of young scholars and fostering their continuous growth and advancement in the fields of science and technology. We invite several students who took part in these prestigious international conferences to share their experiences with us.

Title: SCONE: A Food Scooping Robot Learning Framework with Active Perception

Authors: Yen-Ling Tai, Yu Chien Chiu, Yu-Wei Chao, Yi-Ting Chen

Advisor: Dr. Yi-Ting Chen

International Conference: Conference on Robot Learning 2023 (CoRL 2023)

The Significance of the conference: The Conference on Robot Learning (CoRL 2023) is an annual global gathering focusing on the intersection of robotics and machine learning. The goal of the conference is to drive progress in both fields. It is widely recognized as a premier event in the fields of robotics and machine learning and receives sponsorship from major multinational corporations. The conference has accumulated numerous interdisciplinary research papers demonstrating the capabilities of robots in areas such as navigation, autonomous driving, flight, and manipulation, highlighting their future potential. CoRL is one of the most influential robotics conferences in the development of technology.

The experience of Yen-Ling Tai: It was my first time as the primary author at a physical conference. My responsibilities included presenting posters and exchanging research insights with scholars from around the world. Working with my advisor and fellow lab members, we effectively addressed the various challenges associated with preparing posters and delivering oral presentations. This experience not only expanded my academic knowledge but also improved my skills in collaboration and communication. I would like to express my gratitude to the university, the Ministry of Education, and the National Science and Technology Council for supporting students in presenting papers and participating in conferences, which has been very rewarding for me.

Title: PPO-Clip Attains Global Optimality: Towards Deeper Understandings of Clipping

Authors: Nai-Chieh Huang, Ping-Chun Hsieh, Kuo-Hao Ho, I-Chen Wu

Advisor: Dr. Ping-Chun Hsieh, Dr. I-Chen Wu

International Conference: Association for the Advancement of Artificial Intelligence, (AAAI 2024)

The Significance of the conference: AAAI conference stands as a premier event in the field of artificial intelligence, showcasing a plethora of cutting-edge research in the domain. In AAAI 2024, there were 12,100 submissions received, with 9,862 undergoing rigorous review. Following a meticulous review process, 2,342 papers were deemed worthy of acceptance, resulting in an overall acceptance rate of 23.75%.

The experience of Nai-Chieh Huang: I am very grateful to Professor Ping-Chun Hsieh and Professor I-Chen Wu for his meticulous guidance. We conducted a rigorous theoretical analysis of the PPO-Clip algorithm, which is widely used and demonstrates exceptional performance in reinforcement learning experiments. We explored the objective function of PPO-Clip from multiple angles and presented the first theoretical convergence analysis of PPO-Clip under neural network parameterization. By applying the entropic mirror descent algorithm, we were able to separate policy optimization from approximation errors, allowing us to theoretically control and analyze the algorithm's convergence. We demonstrated that PPO-Clip converges to the globally optimal policy. It was an honor for our research to be accepted by AAAI, and I was fortunate to attend the conference, listen to lectures by renowned international scholars, and meet many exceptional scholars and students from various institutions worldwide. This journey has been immensely rewarding for me!

Title: Learning Continuous Exposure Value Representations for Single-Image HDR Reconstruction

Authors: Su-Kai Chen, Hung-Lin Yen, Yu-Lun Liu, Min-Hung Chen, Hou-Ning Hu, Wen-Hsiao Peng, Yen-Yu Lin

Advisor: **Dr. Yen-Yu Lin**

International Conference: **International Conference on Computer Vision (ICCV)**

The Significance of the conference: The International Conference on Computer Vision (ICCV) is one of the most influential and important conferences in the field of computer vision. Held biennially, it brings together leading scholars, researchers, and engineers from around the world to discuss the latest research findings, technological advancements, and innovative applications in computer vision. For ICCV 2023, the paper acceptance rate is 26.15%.

The experience of Su-Kai Chen: I am extremely happy and honored to have had the opportunity to challenge myself with submissions to international conferences during my time as a student. I am especially grateful to my advisor, Professor Yen-Yu Lin, and to the outstanding seniors and engineers he found to provide us with guidance. The experience I gained from the submission process has been invaluable. It taught me the essential skills and mindset needed for research. In every meeting, Professor Lin and the seniors would share with us the areas to pay attention to in our research, as well as the directions for improvement in our studies. Actively participating in each meeting allowed me to learn a great deal. Writing the paper and going through the rebuttal process with reviewers enabled me to thoroughly assess my understanding of the research topic and evaluate whether there were any oversights in my thinking and execution. I feel very fortunate to have joined Professor Lin's lab and to have conducted efficient research with a group of outstanding scholars, which was an experience I never imagined before entering NYCU. If given the chance in the future, I will continue to challenge myself with submissions to international journals, as it is immensely beneficial for my personal growth and the accumulation of professional knowledge.

Title: Improving Robustness for Joint Optimization of Camera Poses and Decomposed Low-Rank Tensorial Radiance Fields

Authors: **Bo-Yu Cheng, Wei-Chen Chiu, Yu-Lun Liu**

Advisors: **Dr. Wei-Chen Chiu, Dr. Yu-Lun Liu**

International Conference: **Conference on Artificial Intelligence (AAAI 2024)**

The Significance of the conference: The AAAI Conference on Artificial Intelligence (AAAI) is one of the leading international academic conferences in artificial intelligence held annually. It ranks 4th in terms of H5 Index in Google Scholar's list of top AI publications, after ICLR, NeurIPS, and ICML. The acceptance rate of AAAI 2024 is 23.75% (2342/9862).

The experience of Bo-Yu Cheng: I am grateful to Professors Wei-Chen Chiu and Yu-Lun Liu for their guidance and leadership. I feel very fortunate that during my master's program, I was able to experience the research process in the field of computer vision, from brainstorming topic ideas to iterative implementation and verification, and then to integration and presentation of results. I also participated in paper submission reviews and defenses, and finally, the publication and promotion of the paper. Looking back, I encountered many setbacks, especially during the method implementation and verification phase, where I often felt a sense of urgency and helplessness. Through continuous attempts and revisions, I was fortunate to ultimately produce concrete results. I believe that this experience has not only advanced my academic knowledge but also strengthened my willpower and execution abilities.

Title: MENTOR: Multilingual tExt detectioN TOward leaRning by analogy

Authors: **Hsin-Ju Lin, Tsu-Chun Chung, Ching-Chun Hsiao, Pin-Yu Chen, Wei-Chen Chiu, and Ching-Chun Huang**

Advisors: **Dr. Ching-Chun Huang, Dr. Wei-Chen Chiu**

International Conference: IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2023

The Significance of the conference: IROS is one of the top international conferences in the field of intelligent robots and systems, aiming to explore the cutting edge of technology in the field of intelligent robots and smart machines, emphasizing future directions as well as the latest methods, designs, and outcomes. This year's IROS theme is "Next Generation Robotics." A total of 2760 papers were submitted this year.

The experience of Hsin-Ju Lin: Although being a master's student does not necessarily require submitting papers, I am still deeply grateful for the guidance and encouragement provided by my two professors throughout this journey. Whenever I felt lost, they always reassured me that there was no need to worry too much. With their support, I was not only fortunate enough to have my paper accepted by IROS, but I also had the opportunity to attend the conference in the United States in person. This experience profoundly made me realize that outstanding scholars and researchers from all over the world are diligently working on their research. By interacting with participants from different countries, I gained more inspiration and reflection on my future plans. Therefore, I would like to encourage everyone to try submitting their work and attending these international conferences if they have the opportunity. It is not only an opportunity for academic exchange but also a valuable experience.

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.

吳毅成副院長致贈王豐堅老師 (左)感謝狀

一、人事動態

◇ 自 112 年 12 月起，蔡孟勳教授擔任本校資訊技術服務中心副主任。113 年 2 月起，詹力韋教授擔任國際處國際合作組組長。

◇ 本院資訊工程學系王豐堅教授於 113 年 2 月退休，感謝老師對軟體工程的教學與研究貢獻良多，希望老師能常回系上傳承經驗。

二、國際交流

◇ 美國超微 (Supermicro) 技術部高級副總裁 (Senior Vice President of Technology)Tau Leng 博士於 2023 年 10 月 25 日至本院演講，講題為：「Building AI/ML Infrastructures - Challenges, Opportunities, and Emerging Trends」。

◇ 德國亥姆霍茲資訊安全中心 (CISPA Helmholtz Center for Information Security) Mario Fritz 教授於 2023 年 11 月 2 日至本校演講，講題為：「Trustworthy AI and A Cybersecurity Perspective on Large Language Models」。

◇ 日本連續創業家 Sachio Semmoto 博士於 2023 年 11 月 22 日至本系演講，講題為：「The way of life as a serial entrepreneur」。

◇ 中國香港城市大學 (City University of Hong Kong) 方玉光教授於 2023 年 12 月 13 日至本系演講，講題為：「Leverage Vehicles to Build a Multi-dimensional Resource Network for Smart Cities」。

◇ 美國喬治亞理工學院 (Georgia Institute of Technology) 李彥輯博士於 2023 年 12 月 13 日至本系演講，講題為：「生成式 AI 在智慧型手機上的應用大未來」。

◇ 新加坡科技設計大學 (Singapore University of Technology and Design)Tony Q.S. Quek 博士於 2023年12月14日至本院演講，講題為：「The Role of Federated Learning in a Wireless World of Foundation Models」。

◇ 美國印第安那大學 (Indiana University)David J. Crandall 教授於 2023 年 12 月 19 日至本院演講，講題為：「Egocentric Computer Vision, for Fun and for Science」。

◇ 美國德州大學奧斯汀分校 (The University of Texas at Austin)Chen Yu 教授於 2023 年 12 月 19 日至本院演講，講題為：「Learning in Humans and Machines: Two Sides of the Same Coin or Not」。

◇ 美國威斯康辛大學麥迪遜分校 (University of Wisconsin Madison)Parmesh Ramanathan 教授於 2023 年 12 月 20 日至本院演講，講題為：「Privacy-Aware Computing on Public Cloud Systems」。

◇ 2024 年 2 月 27 日美國馬里蘭大學訪問團拜訪本校，洽談未來 AI 研究趨勢以及產業發展之合作可能性。

◇ 2024 年 3 月 15 日耶魯大學訪問團蒞臨本校，進行學術交流。

三 . 教師榮譽

◇ 劉育綸教授榮獲 2024 Google Research Scholar Award!

◇ 陳健教授榮獲 112 年度資訊工程學門優良計畫執行成果獎！

◇ 嚴力行教授榮獲 112 年度資訊工程學門優良計畫執行成果獎！

◇ 邱維辰教授榮獲中央研究院 2023 年「年輕學者研究成果獎」！

◇ 李奇育教授 、張永儒教授榮獲第一屆資訊年輕學者卓越貢獻獎！

四、學生榮譽

◇ 袁賢銘教授指導蔡佩芬、廖家鴻同學榮獲 2024 EDITOR'S CHOICE ARTICLES!

◇ 袁賢銘教授指導高振群同學參與AI CUP 2023【圍棋棋力模仿與棋風辨識競賽】獲得競賽優等！

◇ 吳毅成教授指導蔡昀叡同學參與AI CUP 2023【圍棋棋力模仿與棋風辨識競賽】獲得競賽佳作！

◇ 吳毅成教授指導桂浤同學榮獲 2023 年中華民國資訊學會博士論文佳作獎！

◇ 嚴力行教授指導王靖瑄同學榮獲 2023 年中華民國資訊學會碩士論文佳作獎！

◇ 蕭旭峰教授指導 Rashid Ali 同學榮獲 IEEE VCIP 2023 Best Paper Award!

◇ 陳健、陳志成、易志偉教授指導陳冠文、何配瑜、顏嘉俊、周承淵、黃子潔、李昕穎同學榮獲 2023 年 5G 創新應用大賽校園組季軍！

◇ 李奇育教授指導許仁杰、潘成泰、羅之謙、林峻賢同學榮獲 2023 年 5G 創新應用大賽校園組最佳技術獎！

◇ 嚴力行教授指導王靖瑄同學榮獲 2023 年台灣作業研究學會碩博士論文競賽碩士組優勝！

◇ 桂浤、郭家瑋、王廣達同學榮獲中華民國人工智慧學會 112 年度碩博士論文獎！

◇ 黃俊穎教授指導林祐聖、林宇翔、尤理衡同學參與 2023 年行政院國家資通安全會報跨國攻防演練表現優異，榮獲第一名佳績！

◇ 李奇育教授指導李茵淇、陳任呈、余梓萁、戴翊安同學榮獲 2023 年通訊大賽聯網未來挑戰賽「評審團特別獎」！

◇ 彭文孝教授指導陳璽存同學榮獲 2023 第十六屆崇越論文大賞特優論文獎！

◇ 黃俊穎教授指導林宇翔、尤理衡同學榮獲第四十七屆國際技能競賽青年組網路安全職類正取國手資格！

◇ 彭文志教授、王威堯同學榮獲教育部體育署 112 年度運動科學研究發展甲等獎勵

◇ 黃俊龍教授指導徐煜倫、蔡育呈、劉力勳、王偉誠同學榮獲 TON 開發者系列工作坊 Demo Day 季軍！

1. Personnel Changes

· Dr. Meng-Hsun Tsai has been appointed as the Deputy Director of the Information Technology Service Center, NYCU, effective December 1st, 2023. Dr. Liwei Chan has been appointed as the Head of the Division of International Collaboration, the Office of International Affairs, NYCU, effective February 1st, 2024.

· Dr. Feng-Jian Wang, Professor of the Department of Computer Science, retired on February 1st, 2024. Thank you for your valuable contributions to software engineering teaching and research. We look forward to Professor Wang's frequent visits to share experiences with us.

2. International Collaboration

· Dr. Tau Leng, Senior Vice President of Technology at Supermicro, USA, gave a lecture at our college on October 25, 2023. The topic of the lecture was “Building AI/ML Infrastructures - Challenges, Opportunities, and Emerging Trends.”

· Professor Mario Fritz from CISPA Helmholtz Center for Information Security, Germany, gave a lecture at NYCU on November 2, 2023. The topic of the lecture was “Trustworthy AI and A Cybersecurity Perspective on Large Language Models.”

· Serial Entrepreneur Dr. Sachio Semmoto gave a lecture at our department on November 22, 2023. The topic of the lecture was “The way of life as a serial entrepreneur.”

· Professor Yuguang Fang from the City University of Hong Kong, China, gave a lecture at our department on December 13, 2023. The topic of the lecture was “Leverage Vehicles to Build a Multi-dimensional Resource Network for Smart Cities.”

· Dr. Yen-Chi Lee from Georgia Institute of Technology, USA, gave a lecture at our department on December 13, 2023. The topic of the lecture was “the future of Generative AI applications in smartphones.”

· Dr. Tony Q.S. Quek from Singapore University of Technology and Design gave a lecture at our college on December 14, 2023. The topic of the lecture was “The Role of Federated Learning in a Wireless World of Foundation Models.”

· Professor David J. Crandall from Indiana University, USA, gave a lecture at our college on December 19, 2023. The topic of the lecture was “Egocentric Computer Vision, for Fun and for Science.”

· Professor Chen Yu from the University of Texas at Austin, USA, gave a lecture at our college on December 19, 2023. The topic of the lecture was “Learning in Humans and Machines: Two Sides of the Same Coin or Not.”

· Professor Parmesh Ramanathan from the University of Wisconsin Madison, USA, gave a lecture at our college on December 20, 2023. The topic of the lecture was “Privacy-Aware Computing on Public Cloud Systems.”

· On February 27, 2024, a delegation from the University of Maryland, USA, visited NYCU to discuss potential cooperation in future research directions for AI and industrial development.

· On March 15, 2024, a delegation from Yale University visited NYCU for academic exchange.

3. Faculty Honors

· Professor Yu-Lun Liu won the 2024 Google Research Scholar Award.

· Professor Chien Chen has been awarded the 2023 Excellent Project Execution Achievement Award by the Computer Science & Information Engineering Program, Department of Engineering and Technologies, NSTC, Taiwan.

· Professor Li-Hsing Yen has been awarded the 2023 Excellent Project Execution Achievement Award by the Computer Science & Information Engineering Program, Department of Engineering and Technologies, NSTC, Taiwan.

· Professor Wei-Chen Chiu was honored with the 2023 Academia Sinica Early-Career Investigator Research Achievement Award.

· Professors Chi-Yu Li and Yung-Ju Chang were awarded the 1st Outstanding Contribution Award for Young Scholar in NYCU Computer Science.

4. Students Honors

· Pei-Fen Tsai and Chia-Hung Liao, advised by Professor Shyan-Ming Yuan, have received the 2024 Editors' Choice Awards

· Chen-Chun Kao, advised by Professor Shyan-Ming Yuan, participated in the "Go Chess Skill Imitation and Chess Style Recognition Competition" and won the Excellence Award!

· Yun-Jui Tsai, advised by Professor I-Chen Wu, participated in the "Go Chess Skill Imitation and Chess Style Recognition Competition" and won the Honorable Mention Award!

- Hung Guei, advised by Professor I-Chen Wu, has won the 2023 IICM Ph.D. Dissertation Award.
- Jing-Xuan Wang, advised by Professor Li-Hsing Yen, has won the 2023 IICM Master Thesis Award.
- Rashid Ali, advised by Professor Hsu-Feng Hsiao, has won the IEEE VCIP 2023 Best Paper Award.
- Guan-Wen Chen, Pei-Yu Ho, Chia-Chun Yen, Cheng-Yuan Chou, Tzu-Chieh Huang, and Hsin-Ying Lee, advised by Professors Chien Chen, Jyh-Cheng Chen, and Chih-Wei Yi, secured the third place in the 2023 Chunghwa Telecom 5G Innovation Application Contest, Campus Category.
- Ren Chieh Hsu, Tan Tai Phan, Zhi Qian Luo, and Chun-Hsien Lin, advised by Professor Chi-Yu Li, have won the Best Technical Award in the 2023 Chunghwa Telecom 5G Innovation Application Contest, Campus Category.
- Jing-Xuan Wang, advised by Professor Li-Hsing Yen, has won first place in the master's category in the 2023 ORSTW Thesis Competition.
- Hung Guei, Chia-Wei Kuo, and Kuang-Da Wang, have won the 2023 TAAI Paper Award.
- Yu-Sheng Lin, Yu-Hsiang Lin, and Jasper Yu, advised by Professor Chun-Ying Huang, have won first place in the Cyber Offensive and Defensive Exercise (CODE 2019) by the Department of Cyber Security of the Executive Yuan.
- Yin-Chi Li, Ren Cheng Chen, Zi Qi Yu, and Yi-An Tai, advised by Professor Chi-Yu Li, have won the Special Jury Award for 2023 Mobileheroes - Connectivity Innovation Challenge.
- Si-Cun Chen, advised by Professor Wen-Hsiao Peng, has won the Excellent Master Thesis Award from the Sixteen TSC Thesis Award.
- Yu-Hsiang Lin and Jasper Yu, advised by Professor Chun-Ying Huang, have secured positions to represent Taiwan in the Youth Category for Network Security at the 47th WorldSkills Competition.
- Professor Wen-Chih Peng and Wei-Yao Wang won the first-place trophy in the 2023 Sports Science Research and Development competition organized by the Sports Administration, Ministry of Education.
- Yu-Lun Hsu, Yu-Cheng Tsai, Li-Xun Liu, and Wei-Cheng Wang, advised by Professor Jiun-Long Huang, secured third place at the Ton Demo Day organized by TON Blockchain Hacker House.

院長的一封信

親愛的朋友：

本院結合陽明交通大學最完整的優秀師資，為全國最具規模與研究能量之資訊科系，致力於培育具前瞻視野的資訊產業人才。為朝永續經營前進，本院歡迎校友、家長與企業捐款贊助，也期盼關心本系、資訊教育的各界友人能夠響應，有您的齊力參與，是本院邁向卓越的關鍵力。期許未來有更多捐款做為學院向上提升的動力。敬祝大家平安健康，萬事如意。

國立陽明交通大學 資訊學院院長

陳志成 敬上

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 青年講座教授獎勵金

資通訊產業是台灣高科技產業的主軸之一，人才是帶動產業升級創新的重要動力，電機資訊等熱門領域，在延攬人才的薪資缺乏競爭力，再加上目前台灣有三分之一的大學專任教師陸續退休，大批教授退休有斷層的隱憂。為爭取好的青年教授回台，本院啟動青年講座教授獎勵計畫，捐款贊助新進年輕教授加薪，鼓勵優秀人才回台，同時也留住好的教授。

募款計畫 興建資訊二館

近年陸續成立多個研究所及院級研究中心，新的教室、研究室及實驗空間需求孔急，工程三館興建已逾37年，館舍老舊，空間已不敷使用。在學校經費補助相當有限，無法改善現有教學環境的困境下，特別需要系友們慷慨解囊，募款籌措興建資訊二館經費，以提供師生更好的研究與學習環境。

捐款帳號

- 戶名：國立陽明交通大學
- 匯款銀行：玉山商業銀行新竹分行(代號 "808")
- 帳號：9550-016-0500-551

指定用途

- 資心專案／出國交換獎學金 Q540068
- 資工系學務發展：青年講座教授獎勵金 Q520015
- 資工系學務發展：興建資訊二館 Q540178

信用卡線上捐款

資心(Q540068)

學務(Q540178)

捐款芳名錄

捐贈日期	捐贈人	捐款計畫	捐贈
113/06/12	控工系 58 級謝世堅	Q540178 資工系學務發展	美金 35,000 元
113/05/13	控工系 58 級謝世堅	Q540178 資工系學務發展	美金 65,000 元
113/03/20	黃鈺惠	Q540178 資工系學務發展	新台幣 400 元
113/03/12	李偉光	Q540068 資心專案暨海外實習生 / 交換生募款計畫	新台幣 5,000 元
113/02/23	黃鈺惠	Q540178 資工系學務發展	新台幣 400 元
113/02/20	資工 86 級校友	Q540178 資工系學務發展	新台幣 1,000,000 元
113/01/19	黃鈺惠	Q540178 資工系學務發展	新台幣 400 元

捐款意願書

西元　　年　　月　　日

捐款人資料	姓名/機構名		服務單位/職稱	
			身分證字號/統一編號	（提供身分證字號可簡化捐款者綜所稅申報作業）
	電話(O)：＿＿＿＿＿＿電話(H)：＿＿＿＿＿＿行動電話：＿＿＿＿＿＿ E-mail：＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿			
	通訊地址			
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