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陽明交大資訊人

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開拓嶄新趨勢和未來

台灣在資訊領域的技術蓬勃發展、人才濟濟，其中本校資訊學院扮演了舉足輕重的角色，在本院師生、畢業校友共同努力和支持下，無論在學術界、產業界都有卓越亮眼的表現。在 2021 年 2 月正式完成國立陽明交通大學合校後，此舉創下台灣高等教育的里程碑，再次感謝為資訊學院付出的全體師生、行政團隊同仁和畢業校友。合校是新的起點，讓我們以嶄新的校名及優良的傳統繼續攜手延續產學並茂的榮景。

面對合校新格局，在行政組織上，本院於 8 月 1 日在陽明校區正式成立「資訊學院跨校區合作推動辦公室」，肩負鏈結交大校區與陽明校區資訊與醫療兩大領域之重任，在學術研究、教學及服務等方面建立共同合作環境與平台。本期收錄教師研究成果，本校趙禧綠教授及伍紹勳教授的研究團隊，開發創新的全功能無線心臟智能照護物聯網，已榮獲多項大獎肯定，堪為智慧醫療創新最佳典範。

除了資訊專業培育外，本院一向重視國際化推展，師生在英語教學及國際學術活動的參與和成果，皆收錄在本期活動報導中。最令人振奮的是本院今年度更獲選為教育部雙語計畫重點培育學院，未來將挹注更多資源於提升國際影響力，成為本校國際化標竿學院。

傑出系友活動亦是本期另一報導重點。今年系友回娘家以「連結 ・ 凝聚 ・ 一個都不能少」為主題，邀請在各方傑出系友重回母系與資工系資訊中心（簡稱系計中）齊聚一堂，並給予在校學子學涯、職涯各方面的經驗授受。同日並舉辦傑出校友頒授典禮，也恭喜彥陽科技董事長吳銘雄學長與智易科技執行副總盧豐裕學長榮獲本校傑出校友，他們在產業界努力耕耘，都是後輩最佳學習表率。

大學取之於社會，用之於社會，面對技術突破、產業轉型等前景未知的挑戰，本人期許本院作為全國規模最大、學術能量最為充沛之資訊學院，能於關鍵時機扮演領頭之角色，帶領國內產學界開拓嶄新趨勢和未來。

資訊學院院長

陳志成

2021.11.15

Create New Trends and the Future

Taiwan makes noteworthy progress in information technology and cultivates a large number of talents, in which the College of Computer Science (CCS) at NYCU plays a major role because we have outstanding performance in both academia and industry with joint effort and support among faculty, students, and alumni. The February 2021 official merger that formed National Yang Ming Chiao Tung University (NYCU) set a milestone in our higher education in Taiwan. Once again, I would like to express my gratefulness to all faculty, students, administrative staff members, and alumni for your contribution. This merger is the starting point of a new journey. Let us continue to work together to ensure the continued prosperity of industry and academia with a brand-new name and excellent tradition.

Regarding the new perspective of the merger, our college, in terms of administrative organization, formally established the "CCS Promotional Office for Cross-Campus Collaboration" at Yang Ming campus on August 1st. “The CCS Promotional Office for Cross-Campus Collaboration” carries the great responsibility to link information technology development at Chiao Tung campus and medical research at Yang Ming campus. The primary task is to create a collaborative atmosphere and build up a collaboration platform for the best practices on academic research, teaching and services. This issue of the CCS magazine will introduce the work of Professor Hsi-Lu Chao and Professor Sau-Hsuan Wu. Professor Hsi-Lu Chao from the Department of Computer Science and Professor Sau-Hsuan Wu from the Department of Electrical and Computer Engineering formed a research team, Vipasyana, to develop an all full-functional wireless ECG for healthcare AIoT to provide user-friendly, convenient and comprehensive heart and vascular care services. Winning several awards, the research team brought out an innovation paradigm of diversified industry-academia research in Taiwan.

In addition to the dedication of computer science education, our college has always attached great importance to the promotion of internationalization. The participation and achievements of faculty and students for both teaching in English and international academic activities are reported in this issue. It is a great encouragement that our college has been selected as one of the key colleges of MOE’s Program on Bilingual Education for Students in College. We will further devote more resources to increase international influence in the future to become a beacon international college at NYCU.

Another topic of this issue is outstanding alumni activities. We set "Connection, Cohesion, and Not one less" as the reunion theme of this year to invite outstanding alumni to come home to the Department of Computer Science and CS Computer Center, and share their post-graduation experiences with students. The alumni also attended the Alumni Awards Ceremony on the same day. Congratulations to two outstanding NYCU alumni, Ming-Hsiung Wu, Chairman and CEO of Promaster Technology Corp., and Mike Lu, Executive Vice President of Arcadyan Technology Corporation. They have been working hard in the industry and would be the best role models for younger generations.

The university upholds the motto of “taking from the society and giving back to the society”. Facing challenges of unknown prospects such as technological breakthroughs and industrial transformation, I expect that our college, as the largest college of computer science with abundant research capacity in Taiwan, can play a pioneering role at a critical moment to lead industries and academic research community to create new trends and the future.

Dean of the College of Computer Science

2021.11.15

觀心自在：全功能無線心臟智能照護物聯網

文／林珮雯

由本校資工系趙禧綠教授及電機系教授伍紹勳教授組成「觀心自在」研究團隊，開發創新的全功能無線心臟智能照護物聯網，以提供友善、便利、全方位心臟照護服務。研究團隊不僅囊括 2018 年經濟部智慧聯網創新應用競賽總冠軍，還榮獲第十七屆經濟部國家產業創新獎，為臺灣產學研多元創新典範。

一百歲的心電圖儀還缺什麼？研究團隊改良傳統的心電圖儀器設備太笨重、昂貴及不方便移動使用等缺點，讓病患貼上三個有如 OK 繃的貼片，運用 3 導程差動電壓結合 AI 演算法可產生如醫療等級 12 導程的心電訊號，以利心臟即時監測，具技術優勢。為申請美國 FDA 認證，我們進一步使用傳統 V1~V6 的導程貼位，兩兩相減，取得三個差動導程訊號合成 12 導程的心電訊號 (如圖一系統架構圖所示)。

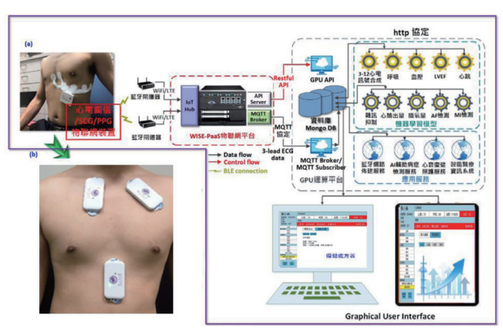
著眼於臨床上困境，心電圖監測多樣但缺少有效率的整合服務。研究團隊致力於以資通訊科技、人工智慧與創意服務模式，來逐步克服目前心臟病診斷與照護上常遇到的「症狀確認不易」、「長時完整觀測難」、「即時診斷難」、「危險預警難」，與「全時照護難」等技術、人力、與價格瓶頸。

全功能無線心臟智能照護物聯網，包含心房顫動、心肌梗塞、心臟衰竭嚴重程度等人工智慧病症檢測、心臟衰竭復健、心臟動力學參數估計、生理訊號即時監測、藍牙定位、姿態分析、深度學習模型自動更新、智能醫療資訊系統。「觀心自在」最大特色是基於開源醫療資訊系統做進一步功能開發，對每一位監控的病患，提供客製化預警 / 警示設定服務。進一步地，將病患臨床心電圖檢查結果饋入機器學習病症檢測網路模型，提供即時與非即時機器學習病症檢測服務。

觀心自在的技術與服務漸趨成熟，心電圖訊號與心房顫震檢測正確率並已達到 95%，而人工智慧心肌梗塞與心臟衰竭嚴重程度檢測雖然目前判斷準確度約 80%，但與各醫院仍持續進行人體實驗，未來更多臨床收案資料，必定能提高人工智慧檢測精準度。

觀心自在系統是結合產學研能量，研究團隊與國內多家廠商合作，包括工業電腦龍頭廠研華等 8 家協力產研機構。至於在實驗場域部分，則與台大醫院、台北榮總、台中榮總、成大醫院、新光醫院等合作。從醫院，醫生及病人的實際需求及意見回饋中，不斷修改產品及服務。

發展心臟智能照護物聯網，透過微型監測穿戴裝置可應用於心臟診斷、復健照護、急診救護及遠距醫療用途，具市場潛力。目前臨床部分已申請上市前審查，遠距照護部分亦有商品雛型，朝商業化方向發展。



Vipasyana: A Full–Functional Wireless ECG for Healthcare AIoT System

Professor Hsi-Lu Chao from the Department of Computer Science and Professor Sau-Hsuan Wu from the Department of Electrical and Computer Engineering formed a research team, “Vipasyana”, to develop a full-functional wireless ECG for healthcare AIoT system to provide user-friendly, convenient and comprehensive heart and vascular care services. The research team won not only first place in the 2018 Smart Networking Innovation Application Competition of the Ministry of Economic Affairs, but also the 17th National Industry Innovation Award of the Ministry of Economic Affairs, which brought out an innovation paradigm of diversified industry-academia research in Taiwan.

How could you improve a 100-year-old electrocardiograph? The traditional electrocardiograph is too bulky, too expensive, and inconvenient to carry, so the research team proposed a portable method: three band-aid-like patches are attached to a patient to proceed real-time 12-lead ECG digital signals by consuming 3-lead differential voltage with AI algorithm.

The massive variety and lack of integration services in ECG monitoring systems are the clinical difficulties for a long time. Using information and communication technology, artificial intelligence and innovative service models, the research team overcome step by step challenges of heart diagnosis and care in clinical scenarios, such as technology, manpower, and price bottlenecks, which comprise "the difficulty of confirming symptoms", "the difficulty of Long-term clinical observation", "the difficulty of real-time diagnosis", “the difficulty of warning signs of diseases”, and “the difficulty of full-time care”.

The full-functional wireless ECG for healthcare AIoT system is composed of heart failure rehabilitation system, cardiac dynamic parameter estimation, real-time physiological signal monitoring, Bluetooth positioning, posture analysis, automatic update of deep learning models, and intelligent medical information system. The most significant characteristic of “Vipasyana” is that it extends system functions based on an open-source healthcare information system. The enhanced system provides personalized and customized early warning/warning setting and feeds the patient-specific ECG result into a disease detection model trained by machine learning technology to provide real-time and non-real-time disease detection services.

As the technology and services of “Vipasyana” is getting mature, the accuracy of ECG signal and atrial fibrillation detection has reached 95%. Although the accuracy of the diagnosis of myocardial infarction and heart failure powered by artificial intelligence is currently about 80%, the team confidently expects to improve the system accuracy by more feedback in clinical practice in the future.

The system of "Vipasyana" is an achievement of industry and academia collaboration. The research team cooperates with many domestic manufacturers, including eight industry-research institutions such as Advantech, the leading industrial computer manufacturer. Regarding the experimental field, the team collaborates with National Taiwan University Hospital, Taipei Veterans General Hospital, Taichung Veterans General Hospital National Cheng Kung University Hospital, and Shin Kong Wu Ho-Su Memorial Hospital. They will continuously enhance products and services according to the actual needs and feedback of hospitals, doctors and patients.

Through wearable devices, the full-functional wireless ECG for healthcare AIoT system can be applied to cardiac diagnosis, rehabilitation care, emergency care, and telemedicine market; hence it is expected to witness future growth. At present, the system has been applied for the review of a premarket approval with clinical trials. In addition, a commercial prototype of the remote monitoring system has been implemented and a business plan is put on track.

魏群樹老師：學習、奉獻與創造

文／林珮雯

魏群樹教授於 2009 年及 2011 年完成交大電機資訊學士與電控碩士學位，並於 2017 年取得美國加州大學聖地牙哥分校 (UCSD) 生物工程博士學位。為貢獻所學，2019 年魏教授回到母校交大教育所任教，2010 年加入資工系服務。魏群樹教授主要研究方向包括認知工程、計算神經科學、腦機介面、機器學習和生醫資料分析。他擁有深厚的資訊背景，並具生物、教育等跨領域思維，恰好正代表陽明交通合校精神，生醫與資訊領域之結合最佳實踐者。

「小時候就覺得科學家很酷，我寫志願都填科學家。」他笑著說。魏老師帶著科學家夢想進入交大就讀，他選擇進入五年制學碩士制度，升大四暑假時立即找好實驗室，開始研讀論文。魏群樹老師回憶道，當時實驗室的教授和學長姐非常願意帶領新進成員，很快地他就有論文產出，甚至有出席研討會機會。大家做著相同領域的研究，互相討論切磋，這一切讓他初嚐了研究的樂趣，魏群樹教授決定繼續攻讀博士，未來要在學術圈裡工作。

出國深造乃是萌芽自大學時代當交換學生的經驗。魏群樹教授是交大電資學士班畢業，學士班是最早國內以出國交換為特色的科系，提供至國外一流大學進行一學期或一學年之交換學生研讀。2008 年，他至美國伊利諾大學香檳分校作交換學生，短短一個學期開拓不少眼界，也奠定未來出國留學國外發展的想法。魏群樹教授碩士畢業後，延續碩士研究方向生醫訊號分析，他赴美攻讀加州大學聖地牙哥分校生物工程博士，當時研修滿多生物課，對未來從事跨領域研究助益良多。

魏群樹教授跨足電資、生醫領域，完全展現目前最熱門跨域人才的定義。他表示，「跨領域是一項重要的能力，不同背景的人看待事情的角度會有所不同，所以多接觸不同領域，會比別人更快瞭解狀況，套用不同領域的想法與做法也會產生新的火花。」他也進一步闡釋，其實領域是人為去區分的，實際上研究本身單純就是科學問題。他笑著說，面對跨域首要之務就是把心中的隔閡打掉，回歸到原先內容本質，累積多元經驗及不同看待事情的觀點。

談到教育理念，魏群樹教授把自己定位在「幫助引導學生自主學習的人」。因為現在網路資源豐富，很多開放課程俯拾皆是。課程重點不是在聽講，老師角色在讓學生有互動，引導他們學習，最終目的是讓學生對課程產生興趣，未來可以繼續學習。

魏群樹教授坦言，自己不喜歡去管學生，但會要求學生們認真看待實驗室每件事物。他會盡量去了解每位學生的不同，有些學生適合給他進度壓力，有些學生則需要給他足夠時間。魏老師指出，因材施教讓學生們自主去發展，因此滿期待學生們自主發展出他想像不到的樣子。

「學習、奉獻與創造」魏群樹教授一直奉為人生座右銘，這句話是出於生物醫學與工程領域研究巨擘錢煦院士，近期甫於美國加州大學聖地牙哥分校榮退。魏群樹教授特別崇敬這位師長，所以銘記著他勉勵後進，人生的樂趣在學習；人生的收穫在奉獻；人生的意義在創造。持續學習、奉獻社會、創造未來也是他分享給學生們的處世準則。

Dr. Chun-Chu Wei: Life is Learning, Devoting and Creating

Dr. Chun-Shu Wei earned his bachelor's degree in Electrical Engineering and Computer Science and master's degree in Electrical and Control Engineering at National Yang Ming Chiao Tung University (NYCU). In 2017, he completed a doctoral degree in Bioengineering at the University of California San Diego. Dr. Wei returned to teach at the Institute of Education at NYCU in 2019 to dedicate to his alma mater. By 2020, he joined the Department of Computer Science at NYCU. His research area includes Cognitive Engineering, Computational Neuroscience, Brain-Computer Interface, Machine Learning, and Biomedical Data Analysis.

Dr. Wei has a solid foundation in Computer Science, and also he was well-trained in the areas of biology and education. This diverse background made him a practitioner to be able to critically engage in cross-disciplinary thinking. Also, he can represent the spirit of the merger of Yang Ming (NYMU) and Chiao Tung Universities (NCTU). The former focuses on the field of medicine and biotechnology, the latter is well-known for its development in Electrical Engineering, Computer Science, and Applied Chemistry.

"I wanted to become a scientist when I was little because it sounded really cool.", smiled Dr. Wei. With this dream, he chose the Five-Year Bachelor to Master degree program at National Chiao Tung University. As a hard-working student, Dr. Wei joined a laboratory to start his research at an early stage in his junior year during summer vacation. Within only five years, he completed both his bachelor's and master's degrees. Dr. Wei reflected on his school time, saying that his professor and lab members were very supportive to new members by providing a variety of opportunities. With their help, he finished writing the thesis very soon and even got the chance to attend conference meetings to meet different researchers in his field. He was very keen on discussing and investigating issues with these research enthusiasts. Thus, Dr. Wei decided to further pursue a doctoral degree in order to work in academia in the future. Also, Dr. Chun-Shu Wei's program during that time was well-known as a very special degree by providing exchange opportunities for students to visit top leading universities abroad for one semester or full semester year. In 2008, he had the chance to be an exchange student at the University of Illinois Urbana-Champaign for one short semester. Within a short time, it broadened his horizons completely. This experience urged him to study abroad for his Ph.D. degree. After completing his master's degree, he decided to extend his profession in Biomedical Data Analysis at the University of California San Diego, America. By taking many biology-related courses, he established the foundation to become a cross-disciplinary researcher.

Dr. Chun-Shu Wei is known for his cross-domain talents in Computer Science, Bioengineering, and education. Nowadays, many students are also trying to develop cross-disciplinary abilities. About this issue, he thinks the concept of different domains is defined and differentiated by people. Dr. Wei further explained that the core value of research is only science. To become a cross-domain researcher, it is important to only consider the core of the question and remove all gaps from different domains. He believes students should try to accumulate as many experiences as possible with different perspectives to cultivate their cross-disciplinary abilities.

Speaking of his teaching philosophy, Dr. Wei considers his role is to guide students to become autonomous learners because nowadays there are many free internet resources, such as Open Courses for students to learn on their own. From his perspective, a professor has to provide interaction opportunities for students and guide them to be interested in learning about the course. He expects students to be inspired by professors and continue to learn more after taking courses. Dr. Wei confessed that he does not like to mind students' businesses all the time. However, he would strongly demand students from his laboratory to take everything seriously. He tries to understand the personality traits of each student. Some students are capable of dealing with stress, but others need more space on their own. He thinks it is important to help students to develop and learn based on their characteristics. It's his goal to guide students to achieve their dreams that they never imagined before.

"Learning, devoting, and creating" was spoken by Dr. Shu Chien, a professor who is respectfully admired in the field of Biomedical Engineering and recently just retired from the University of California San Diego. In addition to that, this quote has always been Dr. Wei's motto. Dr. Wei's teaching philosophy was also profoundly influenced by this high-profile figure. Dr. Wei often encourages students to keep learning, devoting themselves to society, and creating new pathways in the future. After all, learning is fun, and devoting is also a way to have a rewarding life.

歡慶交大日 雙傑聚首受表揚

文／翁健棋

本校於 4 月 10 日舉辦交大日開幕式暨傑出校友頒授典禮，不單引入 360 度環景技術帶領校友們巡遊校園，結合當代潮流、技術和本校特色的虛擬偶像「妮酷」亦現身於活動之中，透過行動裝置即可與其互動，為這場盛會增添科技化和現代感，吸引千餘名校友攜眷返校參加。

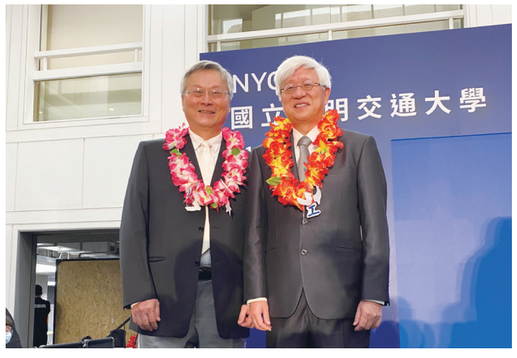
本次共選出七位傑出校友，表彰其於各專業領域的終身成就，其中彥陽科技股份有限公司董事長兼執行長吳銘雄先生、智易科技執行副總盧豐裕先生兩位同時具備本院資工系傑出系友身分，如今再次獲此肯定更使本院與有榮焉。吳銘雄董事長不單捐助電工系和資工系清寒學生獎學金，同時擔任實務導師與同學分享人生經驗；盧豐裕執行副總以其專業知識與經營實務，帶領學界和業界開創新的市場領域，兩人回饋母校皆不遺餘力，加上來自陽明校區的五名傑出校友，七位校友跨足不同領域，在世界各地發光發熱，與本校校歌中「為世界之光」歌詞相互呼應。

吳銘雄董事長於發表感言時提到自身的經歷，出身農村的吳董事長笑稱自己「在山野田地裡玩耍」仍有機會考上交大，應該將功勞歸功於父母親給予的優良基因，此番自謙之詞不禁讓在場眾人會心一笑。不過話鋒一轉，吳董事長自宏觀的角度從國家社會層面切入，分析自己作為第一屆九年國民義務教育的學生，在體系的幫助下能毋須煩惱經濟壓力，在「可負擔」的教育環境完成國高中學業；後來在父母的用心栽培和自己的不懈努力下成功考上交大。

將視野格局聚焦，吳銘雄董事長提及自己的家人們，從父母、妻子到子女，父母供其衣食無缺和良好的成長環境；妻子將其身體和家庭照料的無微不至，使其能全心全意投入事業，達到自我實現而無後顧之憂；子女奮發向上，自主學習，對未來有自己的目標和規劃，無須其勞力費心。從「國」的栽培到「家」的支持，搭配於交大求學時打下的學識、技術厚實基礎，吳銘雄董事長在 Intel、宏基和 AMD 等公司一展長才，譜下豐富且輝煌的職業生涯，今日返校受獎，為的便是將飲水思源的精神加以傳承，同時透過經驗分享給予眾學子勉勵。

同為本次傑出校友受獎人的盧豐裕執行副總談到「第二外語」的重要性，以培養國際觀為基礎，除了紙筆測驗、文件收發應用到的讀寫技能外，如何訓練自我「聽」和「說」的溝通能力更為重要。盧副總提及自己於澳洲、美國等地就職的經驗，或許身處異鄉，面對不同文化的風俗民情對於自我來說是極大的挑戰，然而若能調適好身心狀態，勇於面對挑戰，不論結果成功與否，最重要的是過程中經驗的獲取，這些寶貴經驗將成為未來成長和突破自我最為關鍵的要素。同時盧副總也分享了於職場打滾時「EQ（情緒商數）培養」極為關鍵，甚至勝過 IQ（智能商數），高情商的人獲得的就職和升遷機會遠高於易受情緒所控制者。

以和為貴，勇於挑戰，搭配正向思考的組合連技，盧豐裕副總真可謂「一本行走的職場聖經」，以傑出校友的身分傳授職場密技的同時，再次感謝交大對其之栽培。或許正如本校校長林奇宏所說：「陽明交大是一間承載了交通大學及陽明大學的歷史的年輕學校，培育無數對社會有貢獻的校友，陽明交大行政團隊會持續開創嶄新的未來。」以前輩為榜樣，為世界之光為目標，新舊學子將攜手探索各領域，推動學術和技術的發展。



Two Outstanding Alumni Honored at NYCU Anniversary

NYCU held an Anniversary Ceremony and an Outstanding Alumni Awards Ceremony on April 10th, 2021. Not only did the presentation of 360-degree Panoramas technology offer alumni a virtual campus tour, but our VTuber "Nicoo" , which combines modern trends, technology, and the characteristics of NYCU, also made an appearance at the event and everyone could interact with the virtual milieu by mobile devices. NYCU hosted a feast of technology and modernity and attracted more than a thousand alumni and their families back to campus to participate in the event.

National Yang Ming Chiao Tung University named seven honorees as outstanding alumni of the year for their lifelong professional achievements in various fields. Being outstanding alumni of the department of computer science, Ming-Hsiung Wu, Chairman and CEO of Promaster Technology Corp., and Mike Lu, Executive Vice President of Arcadyan Technology Corporation, both once again received the recognition by NYCU, which makes the College of Computer Science very proud. In addition to donating to the underprivileged students' scholarships of the Department of Electrical Engineering and the Department of Computer Science, Chairman Wu served as a mentor to share practical life experience with students. Furthermore, based on his professional knowledge and business practices, Executive Vice President Lu led collaboration between academia and industry and expanded business into new markets. Both of them spared no effort in giving back to their alma mater. Together with other five NYCU outstanding alumni, these seven alumni distinguished themselves in different fields all over the world, echoing the lyrics of school anthem "For the Light of the World".

Chairman Wu, who grew up in the countryside, smilingly said in his sharing that although he was “playing games in the wild fields and mountains”, he still got admitted to the National Chiao Tung University. He credited that to the excellent genes inherited from his parents. Such comment brought a knowing smile to everyone. However, he immediately switched the subject to a macro perspective of national and social level to analyze that as a student of the first nine-year compulsory education, he was able to finish middle school and high school without the concern of economic pressure in an "affordable" education environment with the help of the system. Later, he was successfully accepted to National Chiao Tung University due to the cultivation of his parents and his unremitting perseverance.

Chairman Wu mentioned his family members, including parents, wife, and children. His parents raised him with adequate food, clothing, and a good growth environment. His wife took good care of him and the whole family in every possible way to allay his worries, so he could devote himself to his career and achieve self-realization. In addition, his children were not only self-motivated and hardworking, but also planned ahead for the future, so he needed no efforts in his children's growth and development. With the cultivation from "nation", the support from "family", and a solid foundation of knowledge and technology trained at NYCU, Chairman Wu brought his ability to the companies, such as Intel, Acer and AMD, and hence enjoyed a rich and brilliant career. He came back to campus to receive the award and encourage students through experience sharing so as to carry forward the spirit of never forgetting the original intention.

Executive Vice President Lu, the recipient of the outstanding alumni award, talked about the importance of "a second foreign language". With the global perspectives as the basis, people needed to pay more attention on mastering the communication skills, including listening and speaking, in addition to the skills of reading and writing tested in exams or practiced in office work. Speaking of his experience working in Australia and the United States, etc., Vice President Lu said, living abroad and facing the conflict of local traditions and customs was a tough challenge. However, he adjusted his physical and mental state to face obstacles in daily life. Whatever the result might be, the most precious thing was the experience accumulated in the process. These valuable experiences would be the most critical elements for personal growth and breakthrough in the future. Meanwhile, Vice President Lu also shared that "EQ (Emotional Quotient) training” was vital in the workplace, which was even more important than IQ (Intelligent Quotient). People with high EQ were much more likely to win successful careers and get a promotion than those who were incapable of emotion control.

Possessing the composite skill set of taking harmony as most precious, facing challenges with bravery, and keeping positive thinking, Vice President Lu is indeed well known as “The Walking Workplace Bible”. While sharing workplace tips, Lu, as an outstanding alumnus, once again thanked National Chiao Tung University for providing invaluable support. At the end, our President Chi-Hung Lin emphasized, "National Yang Ming Chiao Tung University is a young school carrying plenty of heritage of National Chiao Tung University and National Yang Ming University. It has nurtured countless students into great alumni who have significantly contributed to society. The new administration team has committed to create a bright future." Taking alumni as role models and aiming for the light of the world, freshmen and current students would explore various fields as well as promote academic and technological development together.

「一個都不能少」—資工系友回娘家

文／翁健棋

資工系今年選出 11 位傑出系友，分別是蕭清志學長（計控 64）、李錫堅學長（計科 65）、楊維邦學長（計工所 68）、張瑞川學長（計工 68）、曾憲雄學長（計工 68）、朱俊湧學長（計工 69）、陳士元學長（計工 73）、吳坤榮學長（資工所 73）、楊朝棟學長（資科所 81）、洪毓祥學長（資工 79）、蘇家永學長（資工 93）。秉持著「連結 ・ 凝聚 ・ 一個都不能少」的精神，校慶活動有幸邀請到傑出系友，返校與在學學子進行求學與職場之歷程和經驗分享，並出席傑出系友受獎典禮。從在校師生到榮譽系友，眾人共襄盛舉，使得這場「老中青」三代同堂的團聚盛宴更添承先啟後、精神傳承之重要性。

於分享過程中，計工所 68 級的楊維邦學長謙虛地將傑出系友的榮譽歸功於本校與系上完善的教學研究環境，在一流的研究設備、實驗室、工作同僚與學生等條件因子綜合加成起來，方有實踐研究成果、奉獻畢生所學之機會。從國際化的前瞻思維，到軟硬體設備甚至人才管理的層面，系所所培養的學生不單局限於理工專長，引用同為計工所 68 級的曾憲雄學長所說：「不只是在學業上，在各方面交大資工都孕育了一個典範，怎麼樣用負責任的態度，怎麼樣地務實，我們有別於其他學校，解決真正的問題。」曾學長也同時舉了 Vax780 的操作經驗、全國第一個光纖網路架設等例子，再次肯定資工系所傳承的務實態度，以及創新求變，無畏困難的挑戰精神，皆是傑出系友們一致認同，有幸能於學涯中取得的「大祕寶」。

談到求學過程中的實務和實作經驗，儘管系友們戲稱本校又名「交作業大學」，許多課程師長指派作業皆不手軟，然而眾人仍對於實作中所得之收穫給予極高的肯定。曾服務於太空中心的資科所 81 級楊朝棟學長以過來人的角度分享，繳交作業的同時，能在無形中讓自己從理論到方法，從實務的實作再到系統建置，為未來執業打下良好的基礎，使自己擁有足夠能力勝任工作內容和挑戰。資工所 73 級的吳坤榮學長亦對此表示贊同，運用實務中所學，將專業知識運用於智慧交通、警政安防等領域，以自動化，自動辨識，自動通關等方式取代港口車輛進出的人工檢查繁複流程，協助提升通關效率。此一貢獻亦使吳坤榮學長獲得交通部模範公務人員、中國工程師學會傑出工程師等殊榮，實為名副其實之傑出系友。

計工 73 級的陳士元學長在分享感言時，回憶起在學階段曾加入棒球隊，每天過著讀書、打程式和訓練球技的「極限時間管理」生活，儘管如此，他仍將這項挑戰視為成長和充實自我的養分。「時間管理的技能對工作上幫助很大，尤其整個資工系的訓練，我想邏輯理性思維對我的幫助更是無庸置疑的。」陳士元學長此番中肯的發言讓與會眾人頻頻點頭。資工 79 級的洪毓祥學長則認為，「執行力」便是求學過程中所習得和訓練到最為關鍵的技能，搭配系上所提供充沛的資源和學長姐廣闊的人脈，自己方有機會於業界創新創業、一展抱負。

於活動過程中，系學會和彭文志主任也和傑出系友們分享系所現況，包括以連結系友為目的所架設的交大資工粉絲團與交大資工系友平台（NCAP），以及用於保存珍貴電腦文物與改造工程三館的「交大資工 5040 計畫」之籌備進度。舞台上下，系友們與師生交互輝映，笑談間所蘊含的不單是對於一眾明日之星的期許，更是對於整個系所未來如何繼續擁抱創新、走在學術和技術尖端的展望。身為陽明交大資工一份子的眾人，將秉持著「連結 ・ 凝聚 ・ 一個都不能少」的精神，攜手迎向前方未知的挑戰。

"Not one less"– Computer Science Alumni Reunion

The department of Computer Science named eight honorees as Outstanding Alumni of the Year. The awardees are listed below: Chih-Ching Hsiao (CC ‘64), Hsi-Jian Lee (CS ‘65), Wei-Bang Yang (CE ‘68), Ruei-Chuan Chang (CE ‘68), and Shian-Shyong Tseng (CE ‘68), Dennis Chu (CE ‘69), Shih-Yuan Chen (CE ‘73), Kun-Rong Wu (CE ‘73), Chao-Tung Yang (CS ‘81), Yu-Xiang Hong (CE ‘79), and Joe Su (CE ‘93). Adhering to the spirit of “Connection, Cohesion, and Not one less”, the anniversary was an opportunity to invite outstanding alumni back to campus to share their post-graduation experiences with students, and attend the Alumni Awards Ceremony. The reunion feast that students at school, faculty, and the honorary alumni celebrated together indicated the close bonding amid "Old, middle, and young" three generations, which is of more importance for inheriting the past and ushering the future as well as carrying on the spiritual heritage.

During the discussion, Wei-Bang Yang (CE ‘68), humbly owed the honor of outstanding alumni to the perfect teaching and research environment at school. With excellent research equipment, laboratories, colleagues, and students, you can effectively engage in research and have opportunities to make achievements by applying what you have learned in life. The expertise of students cultivated by the department of Computer Science comprises not only the skill set of engineering but also global forward-thinking, facility administration, including software and hardware, and even talent management. Shian-Shyong Tseng (CE ‘68) said, “In all aspects, in addition to academics, the department of Computer Science at NYCU set up a paradigm: acting in a responsible and pragmatic manner, we solve real-world problems, which makes us different from other schools." He once again took the operating experience of Vax780 and the first fiber optic network setup as examples to affirm the pragmatic attitude and the fearless spirit of innovation towards challenge both inherited from the Department of Computer Science. The outstanding alumni unanimously agreed how fortunate they are to get such “Great Secret Treasure'' at school.

Speaking of hands-on experience and practical training at school, alumni gave positive recognition for the benefits of practical training. The faculty assigned heavy homework even though alumni joke about NYCU as "Homework University". Chao-Tung Yang (CS ‘81), who once served in the Space Center, shared experiences from personal point of view: while preparing homework, we could build up a solid foundation for the career, from theory to application as well as from practical implementation to system architecture, so that we would be capable of performing our jobs and overcoming challenges. Moreover, Kun-Rong Wu (CE ‘73), also agreed with Yang’s comment. Applying what he has learned in practice, Wu utilized his professional knowledge to the fields of smart transportation and police surveillance. Wu replaced manual processes conducted on ports with automatic processes, such as entry/exit logs and verification, to improve the process efficiency. In recognition of his contribution, Wu was awarded the Good Model Civil Servant by the Ministry of Transportation and Communications and an outstanding engineer award by the Chinese Institute of Engineers. He truly lived up to an outstanding alumnus.

While sharing his testimony, Shih-Yuan Chen (CE ‘73) has recalled the time in the school baseball team, when he lived a life of "extreme time-management" to strike the balance among studying, programming, and baseball training daily. Nevertheless, he treated this challenge as nourishment for personal growth and enrichment. "Good time management skills are beneficial at work, not to mention the training, such as logical and rational thinking, from the department of Computer Science, which definitely has a positive effect on me." The audience nodded his pertinent opinion. Meanwhile, Yu-Xiang Hong (CE ‘79) recognized that "execution" is the most critical capability we have learned and been trained through the school of hard knocks. The abundant resources provided by the department and the extensive alumni network empowered him to pursue the business model innovation and propel the business forward.

During the feast, Chairman Wen-Chih Peng and CS Union shared the current activities of the department with outstanding alumni, including the NYCU CS fans group and CS Alumni Platform (NCAP) which was intended for alumni connection, as well as the progress of the preparatory work "NYCU CS Project 5040" for the preservation of precious computer cultural relics in the renovated Engineering Bldg 3. When alumni, either upstage or downstage, enjoyed interacting with faculty and students, what they bore in mind was not only the expectation for a bunch of stars of tomorrow, but also the future prospect of the department for continuous innovation and leading-edge progress, both in academic and technology. As members of the department of Computer Science at NYCU, we will uphold the spirit of “Connection, Cohesion, and Not one less” to overcome the unknown challenges ahead together.

系計中系友回娘家 人才輩出聚一堂

文／翁健棋

資工系資訊中心（又稱系計中，早期系友稱計中）自設立以來，便扮演著管理資訊學院的網路架構、各研究室伺服器等重要事項之控管中樞，同時提供系上教職員生各式硬體資源，滿足授課與學習需求。本院資訊工程系整合設立迄今之所以能持續為我國資訊科技研發之先驅，與中心的設立，完善的設備配置和傑出系友的經驗和精神傳承息息相關。在系計中主任曾建超教授、系友現任職中華電信研究院研究員王則涵和眾同仁用心籌備下，來自各領域的系友於今年 4 月 10 日交大日「回娘家」齊聚一堂，參與這場經驗分享和綜合討論的盛會，由第一代蔡文能教授、張瑞川教授引領，穿越數十載，連結彼此的學經歷，並對資訊中心未來做出展望和期許。

與會的黃世昆教授談到，求學時電腦設備和網路資源極其珍稀，只有到當時的系計中才有機會使用資源。同為系友的現臺灣師範大學圖書館館長柯皓仁亦提及，當時在系計中所管理的超級電腦效能約等同現在的 PC，儘管擁有最先進的設備，國內外期刊瀏覽系統在當時受限於網路頻寬仍無法順利運行，對比現今十分方便的跨國期刊資料庫，僅需輸入關鍵字詞便可精確得到欲尋之結果，結合硬體設備操作和經驗記憶認知，便可明確感受到科技進步之迅捷好比一匹良駒，一日千里。

計算機系統管理 (Computer System Administration) 和計算機網路管理 (Computer Network Administration) 等課程的實務性，以及將學習經歷作為養分成長的重要性亦是眾人所肯定的。論於系計中所得之收穫，任職華苓科技的楊基載副總談到：「在計中學到的系統工程，是軟體服務從 A 到 A+ 一個很重要的按鍵，有時候帶工程師，程式寫的很好卻不會動，因為系統連接不好，所以我還是很支持系上在這部分的堅持，這樣我們收到的人才就不是只會寫程式，會讓我們的系統從 A 到 A+。」在完善的設備提供和扎實的學習地圖引導下，系友們「計中出品，便是精品。」的人才品質保證使本院深以此為榮。

在後續短講討論中，艾智能科技的陳柏愷執行長透過自身經歷點出系上與自身之交集，從安穩畢業就職到返校繼續進修，緊接著憑實力參賽獲獎到喜獲金主投資卻於經營上遭遇瓶頸，峰迴路轉至創建 YouTube 頻道，提供知識管道供未來國家的棟樑們吸取經驗養分。人生的旅途需要探索的勇氣，好比初次嘗試組裝電腦的挑戰精神，沒有人知道結果為何，秉持之信念卻能於過程了然於胸，呼應陳執行長所說：「把我在科技和商業上的知識轉換成一般人可以理解的，這就是我現在在做的事情。這件事我做了之後我很高興，也是人生中最滿意的階段。」

從成為系計中「常駐居民」留連忘返不回宿舍，到邂逅如同少林掃地僧般，深居藏經閣（裝配各式資訊設備的系計中）卻擁有變幻莫測技術，如神一般的學長等趣事，不難發現系計中著實為眾系友學涯中共同的回憶。在交大日當天系計中系友「回娘家」一聚，儘管脫離教學體系的彼此已各奔東西，不過可以深切肯定的是，不論是於職場發光發熱，於杏壇盡心耕耘，抑或於人生這條長路追求自我實現的系友們，皆是取之於社會，回饋於社會，學以致用的最佳楷模。

Alumni Reunion–NYCU CSCC

The Computer Center (CSCC) has played an essential role for administering the network architecture and laboratory servers as well as providing hardware resources to satisfy the needs of faculty and students at the college of Computer Science since the center was founded. The reason that the Department of Computer Science at our college has so far been regarded as the pioneer of computer technology research and development in Taiwan is closely related to the establishment of the center, the abundant facilities and the outstanding alumni experience and cultural heritage. With the sedulous preparation of Professor Chien-Chao Tsen g, the director of CSCC, Tse-Han Wang, the researcher of the Chunghwa Telecom Research Institute, and colleagues in CSCC, alumni from the different fields gathered together to participate in the feast on April 10, 2021. The fabulous experience sharing and comprehensive discussion spanning decades, led by Professor Wen-Nung Tsai and Professor Ruei-Chuan Chang, wove each other's academic experiences so as to express the expectations for the future and prospects of the Computer Center.

Professor Shih-Kun Huang said in the meeting that computers and network resources were extremely scarce when he was at school. The only opportunity for students to use the resources was offered by Computer Center. Hao-Ren Ke, an alumnus and the director of NTNU Library, also mentioned that the performance of a supercomputer in the computer center at that time is close to a personal computer nowadays. Even though there were the most advanced facilities, journals and e-books system did not work well due to the limited network bandwidth. On the contrary, with modern international journal database, plentiful information is just fingertips away from the students. Integrating hardware equipment operation and memory cognition, the rapid progress of the technology is like a horse moving so fast that it is practically flying.

The practicality of courses such as Computer System Administration and Computer Network Administration, as well as the importance of taking learning experience as a nutrient for growth are also affirmed by everyone. Regarding knowledge and skills gained from the computer center, Ji-Tzay Yang, the vice president of Flowring Technology Corp., said, "The system engineering I have learned in the computer center is a very important button enabling software services from A to A+. In other words, a program with great algorithms does not mean an effective process because the interface with the system may not be connected well. I fully endorse the persistence of the practical courses in the department of Computer Science, so that the engineers we hired not only write programs but also level up our system from A to A+." Cultivated with sufficient equipment and the guidance of solid learning maps, the alumni of the Computer Center stand out from the crowd, which makes the College of Computer Science very proud.

In the following session, Po-Kai Chen, CEO of I-intelligence Technology Corp, pointed out the intersection between the department and himself through personal experience. He returned to school after working for years and then entered a competition. His award helped him win a business grant, but the business bottleneck hammered him. Later he refocused his business to YouTube channel and built up the knowledge pipeline to impart experience to future leaders in the country. To embark on the journey of life requires bravery. It is as if we build a PC for the first time and no one knows exactly what the result would be, but the belief in our mind will be getting clearer during the process, echoing Chen's words: "What I am doing now is transforming profound technology and business knowledge into the statements that ordinary people can understand. I do enjoy what I have done, and it is also the most satisfying moment in my life."

From being a "resident" in the computer center, lingering and forgetting to return to the dormitory, to encountering a senior who is like a god possessing unpredictable technology as if a sweeping monk of the Shaolin Temple, living in the Scripture Pavilion (the computer center with various equipment), it is not difficult to realize that the computer center is the collective memories in academic life for all alumni. On the reunion day of the National Yang Ming Chiao Tung University, the alumni of the computer center gathered together. Although they have separated from each other after graduation, we can confirm that our alumni are pursuing self-realization on their lifelong road and applying what they have learned whether in business or academic to become the best role models for taking from society, giving back to society.

汽車發明伊始 智慧化腳步未停歇

文／林一平 講座教授

林一平手繪之 William Rae Young, Jr.。

當一個設備由電力驅動，或能產生電力，資通訊技術就有機會與之緊密結合，產生創意及智慧。汽車就是很好的例子。傳統汽車引擎的動力能轉換成電能，因此與資通訊技術的結合相當自然。而世界潮流往電動車方向發展，對於發展汽車的智慧化更有推波助瀾的效果。

汽車剛發明時，人們對於汽車能提供的諸多附帶功能就有不少想像，並加以實踐。例如讓駕駛者能隨意打電話的智慧型駕駛科技早在 1940 年代就被提出。將電話和汽車結合是貝爾實驗室 (Bell Labs) 的構想，於 1946 年在密蘇里的聖路易市完成建置，提供汽車電話服務。主要的發明者包括 Douglas H. Ring 和 William Rae Young, Jr.。

行車安全的一個重要議題是：開車是否能使用行動電話講話或送簡訊。美國大部分的州政府只准駕駛者使用免持手機 (Hands-free)，禁止手持手機 (Handheld)。汽車免持手機設備取代了手機的揚聲器和麥克風功能，必須處理標準手機的相同擴音問題，主要的聲學問題是回聲消除和雜訊抑制。已開發取消電話中的回聲的許多方法，良莠淆雜。

開車時，從免持手機設備撥打電話的人會在呼叫中引入大量噪音。這種情況很複雜，因為軟體不僅必須消除他周圍的噪音，而且必須清晰而大聲地將他的聲音傳送給與他有聯繫的人。最好的軟體解決方案將回聲消除和降噪合併為一種技術，大大增加其靈活性。

交通警察只要看到駕駛者使用手持手機，可直接開罰單。我就曾經被拍照開車拿手機，罰了一大筆錢，著實肉痛。(編按：違規行為，請勿效仿！) 美國大部分的州政府更規定新手開車 (Novice Drivers) 或校車司機乘載學生時不准使用任何手持或非手持的手機。美國對新手開車有特別規範，因為研究顯示，新手開車時若同時講電話，比較不能注意前方路況，並會有蛇行跡象。

行車時伴隨而來的安全問題，導致更進一步的科技研發。而結合資通訊的智慧型汽車也在 1950 年代前就有人構思。一直到近代，智慧型汽車一直不斷的改進，尤其在無線及資通訊技術加持下，現在已有自動停車以及自動導航的技術。甚至駕駛只要一指按下停車鈕，車子就自動倒車入庫。這是否會影響到駕駛執照的考試方式？

我相信新科技的汽車將會改變人們開車行為，也會改變駕駛的規則。當然了，在汽車資通訊中最重要的應用是行車安全，相關的技術包括防撞雷達等等。然而乘車安全仍需靠搭車者的自我保護，例如 2012 年起台灣規定後座乘客也要繫安全帶。目前市面販賣的車種已有全自動的安全帶，但多屬於兩點式安全帶，與我們平時正常使用的三點式安全帶相比，在安全性上大打折扣。

Intellectual Footsteps Have Never Stopped Since the Invention of Automobile

A device which generates or consumes electricity may integrate closely with information communication technology to boost creativity and intellectual ability. Vehicles would be good examples for such integration. Unlike gasoline-powered vehicles, electric vehicles that are powered by electrical energy would naturally utilize a lot of information communication technology. Furthermore, shifting to electric cars has already become a worldwide trend, which may have a great impact on the advance of intelligent vehicles.

When the automobile was first invented, many whimsical ideas bloomed, and experiments regarding the ancillary functions of cars abounded. For example, the idea of smart driving technology that integrated telephones in automobiles was proposed in the 1940s. The technology initially envisioned by Bell Labs was invented by Douglas H. Ring and William Rae Young in 1946, who installed phones inside the car and tried a pilot scheme to provide in-car telephone services in St. Louis, Missouri.

An important safe driving issue: should making phone calls or sending messages while driving be allowed? Most states in the United States ban drivers from handling cellphones behind the wheel, unless the cellphones are hands-free. To substitute for the speaker and microphone of cell phones, hands-free driving devices also need to deal with the same sound amplification issues as regular cell phones do. The major acoustical issues are noise suppression and echo cancellation. Different techniques of echo cancellation specific to telephony have been developed, but these mechanisms are neither consistently effective nor efficient.

Making a call from a hands-free device while driving would introduce a lot of background noise. The situation is complicated because the device software not only eliminates the background noise, but also amplifies the caller's voice clearly. The best solution is to integrate echo cancellation and noise reduction into one algorithm to make them work together seamlessly.

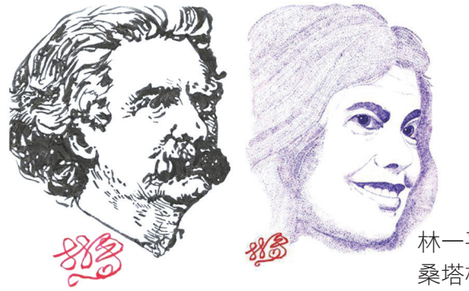
The police can pull you over and ticket you for texting or using your cell phone. I was spotted using my cell phone while behind the wheel and slapped with a hefty fine, which really hurt. (Editor's note: please do not imitate this violation of rules and regulations.) Most states in the United States prohibit novice drivers and on-duty school bus drivers from the use of cellphones at all. Many state driver licensing laws have specific provisions for novice drivers. A study shows that novice drivers talking on cell phones while driving are more likely to not pay full attention to the road and engage in careless lane weaving.

The safety requirements for driving have led to further technological development. Smart vehicles with integrated information and communications services were conceived of in the 1950s. Up to the present moment, smart vehicles have been continuously evolving as new technology became available. Wireless technology and information communication technology have been applied to automatic parking systems and automatic navigation systems. Drivers only need to press a button, and the system can enable the car to roll automatically into a garage. One may wonder if driving tests would be changed with such technologies introduced?

I believe that cars with new technologies will transform driving behavior and then change driving regulations. Of course, driving safety is still the most important application in vehicular communication systems, which includes technologies such as collision avoidance radars and more. However, passenger safety relies on the full awareness of the rider. For example, a revision of Taiwan traffic laws in 2012 requires passengers to wear a seatbelt in the rear seat of a vehicle. Nowadays, automatic seatbelts for vehicles are available on the market, but most of them are two-point seatbelts. Compared with the three-point seatbelt as a standard feature, the security of two-point seatbelts is greatly reduced.

語音 AI 仿真的關鍵：停頓

文／林一平 講座教授



林一平手繪之馬克吐溫 (左) 與桑塔格 (右)。林一平提供。

最近開始流行基於語音的多媒體物聯網 (IoMT)，被大量用於語音到文本的翻譯和語音控制應用。對於此類應用，核心技術是自然語言處理。我的研究團隊發展一套語音談話的 IoT 應用開發平台，稱為 VoiceTalk，詳細闡述了基於語音的 IoMT 開發問題。我們提出了一種新的自然語言處理機制，進行自動語音辨識，藉此發展了不少有趣的互動應用。

利用語音來進行電器控制較為簡單，例如燈光控制，或冷氣控制，只要轉譯為指令即可。其商業化的產品也都極為成熟，例如 Google、亞馬遜 (Amazon) 及小米都有語音控制的產品。

而本文翻譯 (voice to text transcription) 這項科技的發展，其難度則遠高於語音控制，若無人文素養的加持，終將流於膚淺。個人淺見，最難之處之一，在於處理語句之間的停頓 (pause)。寫文章時，句子內部主語與謂語之間如需停頓、分開的地方，就用像一隻小蝌蚪的逗號來標明。因此在進行語音辨識，轉化為文字時，聲音的停頓處，就被翻譯成逗號。然而如何找出「停頓」轉化為逗號，頗有學問。

「停頓」的運用之妙，存乎一心。厲害的作家及演說家，都各自有妙招，呈現他們不同的體會。馬克吐溫 (Mark Twain) 這麼說：「正確的用詞可能很有效果，但沒有一個用詞如同在正確的時刻暫停那樣有效。」蘇珊．桑塔格 (Susan Sontag) 則承認：「無可避免的，沉默仍然是對話中的一種語言形式和元素。」尤其，沉默也是一種回答，可微妙的代表不同意義，例如默認。

談說中在何時停頓，意思可能完全不同。換言之，在一串文字中放逗號於不同位置，意思會有很大差距。二次世界大戰時的汪精衛政權，有一位女作家名叫蘇青。蘇青的成名作，僅僅將逗點移動一個位置。《禮記．禮運》寫著：「飲食男女，人之大欲存焉。」這位女作家將之改寫為「飲食男，女人之大欲存焉。」當時民風保守。她的創作大膽前衛，自我物化，一夕成名。遇到這種語帶雙關的讀法，停頓的判讀變得很重要，否則轉譯成文字時，差之毫釐，失之千里，就貽笑大方了。

詩人朗誦時，我們的 VoiceTalk 若進入「詞」的模式，會將朗誦的詩下標點成為一闋詞。例如千家詩中的七絕詩《清明即景》:「清明時節雨紛紛，路上行人欲斷魂。借問酒家何處有，牧童遙指杏花村。」經過人工智慧，將標點符號挪移一番，就變成一闋詞:「清明時節雨，紛紛路上行人；欲斷魂！借問酒家何處？有牧童遙指杏花村。」我們正在思索如何利用 VoiceTalk 改變莎士比亞作品中的「停頓」，將莎翁的雙關語化為「三」關語。

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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 >。

The Key to Voice AI Simulation: Pause

The emergence of Voice-Activated multimedia Internet of Things (IoMT) has been used extensively in voice to text transcription and voice control application. Natural language processing is the core technology for such applications. My research team has developed a voice over IoT platform, VoiceTalk, and elaborated on the developmental issues on the IoMT. Furthermore, we have proposed an innovative natural language processing mechanism for automatic speech recognition. Many interesting interactive applications were developed with this mechanism.

It is quite straightforward to use voice control on electrical appliances, such as lights or air conditioners, as long as the voice commands are translated into instructions. This has been widely developed into commercial products; for instance, leading vendors such as Google, Amazon and Xiaomi have launched their voice-enabled products.

The technological advancement of voice to text transcription is much more difficult than simple voice control. Without a deep understanding of the humanities and literacy, any attempts at advancement would merely be superficial and cosmetic. In my opinion, dealing with pauses between sentences is one of the most difficult jobs. When writing an essay, we may place a comma, a little tadpole-like critter, in a pause or separation between the subject and the predicate in the sentence. Therefore, when using speech recognition to convert speech into text, the pause of the sound is translated into a comma. How to gracefully detect "pause" and turn it into a comma is quite subtle.

Ingenuity in using “pause” arises from practical intelligence. Most influential speakers and writers have tactics to illustrate their understanding. Mark Twain put it this way, "The right word may be effective, but no word was ever as effective as a pause with right timing." Susan Sontag wrote that "silence remains, inescapably, a form of speech." In particular, silence subtly forms answers with different meanings, such as acquiescence.

Different timing of pauses in speech may deliver different messages. In other words, misuse of commas can cause confusion or even misunderstanding of the information. Su Qing was a female writer during the Wang Jingwei regime in World War II. Her most acclaimed work was merely moving a comma one Chinese character further in a sentence from the Book of Rites (Liyun). The Book of Rites (Liyun) states “the things which men greatly desire are comprehended in meat and drink and sexual pleasure.” And Su Qing rewrote the sentence as "the things which women greatly desire are comprehended in meat and drink and sexual pleasure with men.” Social mores were conservative at the time. Therefore, her radical creativity in pursuit of self-objectification attracted people’s attention so that she became an overnight sensation. While confronting such ambiguities in speech communication, it can’t be overemphasized to interpret pauses carefully. Otherwise, a tiny lapse can lead to a huge mistake and much embarrassment.

Our VoiceTalk software has a “ci” mode, in which a poet reciting their work can have their poem converted into iambic verse. For example, the well-known Chinese poem “Tomb Sweeping Day” in the Thousand Poems, is translated thus: "Tomb Sweeping Day sees drizzles running and flying, and hearts lost in gloom, mourners on paths crying. ‘Any tavern near and far?’ I ask a boy, who points to Almond Bloom Village beyond eyeing." After the process of artificial intelligence, the punctuation marks are relocated to turn the poem into an iambic verse, "It rains on Tomb Sweeping Day, Travelers along the road; Looking gloomy and miserable! I ask ‘any tavern near and far?’ A boy points to Almond Bloom Vill beyond eyeing." Currently, we are thinking about how to use VoiceTalk to alter the placement of "pauses" in Shakespeare's works to add an additional layer of nuance to the double-meaning of Shakespearean puns.

Dr. Jason Yi-Bing Lin

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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.

梁家愷博士演講
Mobile Computational Photography at Google

文／劉柏聲 多媒體工程研究所碩士生、洪翊筑 資訊科學與工程研究所碩士生

梁家愷博士在 Google Android Camera Algorithm Team 擔任 Principal Software Engineer 及 Director。主要的研究項目為在智慧手機上的相機應用，有鑑於手機有限的記憶體及運算處理能力，針對任何演算法及軟硬體交互功能皆需要在資源與效能之間取捨，相較於傳統相機的能力可能可以差到 40 倍，但手機同時也受益於強大的處理器及方便的使用、編輯及分享等功能。這次的演講主題是關於在 google pixel 4 中對相片進行後續處理的運算難題，內容分為三個不同主題，分別是 Distortion-Free Graphie, Super Resolution Zoom 和 Fused Video Stabilization。

第一個主題中提到在過去的手機照片中，位於邊緣的人物會因為與鏡頭角度過大，不同的投影方式產生不同的拉伸變形。這部分能透過首先將照片中的主角物體篩選出來，並透過網格優化，產生整張圖的變形曲線，再對應回影像中。產生的結果會導致人臉附近的線彎曲，再對彎曲的線做額外的處理，得出一張優化後的照片。

第二個主題是利用手持拍照所產生的些微移動產生一張高解析度的影像。舉 4×4 的影像為例，有三張對同樣的位置拍的照片，彼此間有些微的移動，將這些經過位移的影像對齊，並經過不同影像之間訊息的交換融合，有些影像包含一些清晰部分，就能幫助剩下影像在同位置產生高解析度影像。

第三個主題是改進影片的穩定度，在電影場景中，人物移動時相機也會需要跟著移動，而在片場中，會需要大型機械手臂跟許多專業人士的輔助，以呈現影片的穩定度。在手機攝影中，也希望能達到這種穩定性，利用動作估計來達成連續動作的順暢度，利用模糊估計及動作解析來使畫面平滑化，並更正畫面擷取的位置，對歪斜的畫面也擷取相同方向的歪斜方框作為影像最後的結果以得到抵銷手震及過度晃動的效果。

以上這些主題都伴隨著實際應用上的一些問題，像是手機硬體與軟體的結合，需要開發出適合目前系統在效能與花費資源間平衡的最佳方式，特別是在現今使用者對自己手機拍出來的照片或影片都用高標準來要求 (4k@60fps)。以及針對不同的使用者產生不同的回饋，並利用可控制的變數來讓使用者自由的調整想要的照片感覺。縱使目前手機的相機功能在經過這幾年的發展已經日趨成熟，未來還是有很多值得探討與改善的議題，在圖片品質上，若有一張在低光源環境下的照片，如何將圖片細節與雜訊完美的分辨出來，抑或是在不同場景下如何決定最適合的色調，又或者移動中的物體與手持移動的區分…等。而在應用程式層面則是希望能設計出一套能適用在任何地區任何環境任何使用者都能使用具備通用性的軟體，並能在有限的計算資源下決定最佳的策略。將解決這些議題的技術轉化成實際的產品於手機中，讓手機相機在未來能夠擁有更多實用的功能，勝制能夠取代攝影機的地位。

在經過今天演講的內容之後，對於世界上最頂尖軟體公司之一的 Google 在影像處理及電腦視覺領域的發展有更深入的了解，當我們還在試圖利用各種方法提升我們研究的準確度時，Google 身為一家公司，更在意演算法是否能完整的複製到各種環境當中，尤其是需要考量手機硬體與大型機器的運算能力之間的差距，並研究如何生產出 user-friendly 的產品，讓使用者能在不改變原本使用習慣，甚至是讓人在使用中毫無察覺之下，盡可能的提高相片或影片的品質，也希望能達到功能即時反應避免等待時間過長的使用不方便。另一方面，梁博士也跟我們分享申請 Google 需要具備的能力以及如何對症下藥去準備，有鑑於 Google 對每位員工的期待是希望每個人都能具備獨當一面解決問題的能力，在面試的準備上，除了要應徵職位所需的專業知識外，軟體工程師所需的程式能力以及資料結構是基本外，電腦視覺工程師也必須對除了自己專業領域之外的電腦視覺任務有一定的認識，畢竟在 Google 工作是工程師取向，也就是相較於主管指派工作，Google 更希望是由工程師自發性的對工作內容產生興趣並在這基礎上不斷精進自己，不斷累積研發能量。很感謝有這次的機會能與美國 Google 內的資深工程師有這樣的交流互動，學習到業界將學術成果在實際產品上應用的經驗以及許多無法從課本或網路上得知的秘辛。

The Speech of Dr. Chia–Kai Liang
Mobile Computational Photography at Google

Dr. Chia-Kai Liang is a director/principal software engineer leading the Android Camera Algorithm Team at Google, focusing on mobile computational photography. Since mobile phones are limited in computing power and memory, any algorithm design or hardware-software interaction function has to take into consideration a tradeoff between system resources and performance. Although the capabilities of mobile phones may be 40 times less than traditional cameras, mobile phones would benefit from powerful processors and easy-to-use editing and sharing functions. Dr. Liang's talk covered the computational photography problems of subsequent photo processing in Google pixel 4. Three topics were highlighted in this talk: Distortion-Free Graphic, Super Resolution Zoom, and Fused Video Stabilization.

The first topic mentioned that subjects near the edge of phone photos, in the past, were stretched outward to cause different degrees of distortion due to the properties of the wide-angle lens. The solution was to detect the salient objects in the photo, generate deformation curves of the whole image by the grid optimization, and calculate the corresponding bended lines around the face. We then conduct additional processes based on these lines to get an optimized image.

The second topic was that a very slight movement of a hand-held camera is advantageously utilized to produce a high-resolution image. Take the example of some 4x4 images. Three photos are taken in the exact same place with slight movement between each other. By aligning these shifted images and merging information between them, the combination of multiple overlapping low-resolution images can produce a high-resolution image.

The final topic of this talk is bringing video stabilization to all those shaky-hand videos. Tracking shots normally move the camera side to side following the movement of characters through a scene. In the studio, the stability of the filming would rely on the cooperation of a large robotic arm and many technicians. Likewise, mobile photography would bring stabilization to shaky videos. It comprises several techniques, such as motion estimation to achieve the fluency of continuous motion, fuzzy estimation and motion analysis to smooth the images and correct the position of the captured frame, and the compensation frames for the skewed images, in order to offset hand-shaking effect and excessive shaking effect. However, the implementation of the solutions to the above topics on mobile phones still encounters some challenges, such as the high integration between hardware components and software modules. We have to develop an effective way to strike a balance between overall efficiency and resource utilization for specific mobile systems, especially while users are more demanding about capturing high-quality images and videos (4k@60fps) nowadays. To provide adaptive user experience for different users, the mobile phone system lets users adjust parameters to produce the image with the desired size and quality. Even though the functions of camera phones have become more mature in recent years, many unsolved issues of phone cameras would be worth exploring and improving. For example, how to reserve the details of an image while removing the random noise from the image taken in low light conditions, and how to suggest the best hue in different scenes, as well as distinguish the differences between a moving object and a hand-held movement, etc. At the application level, we hope to design a software suitable for all users with the effective usage of limited computing resources according to universal design principles. The solution to these issues would be implemented as applications running on mobile phones so that the mobile phone camera would become powerful enough to replace the standard camera in the future.

After today's speech, we have a deeper understanding of the development in image processing and computer vision in Google, one of the top software companies in the world. While we consider using different methods to improve the accuracy of our research, Google, from a real product perspective, is more concerned about the feasibility of algorithms that can be applied to different platforms, especially facing the performance gap between mobile hardware and high-performance computers. In the meantime, the design team spends a lot of effort on user-friendly products so that users can get much higher video or picture quality when they have no need to change their usage habits, or even when the functions are running behind the scenes. Furthermore, users can also receive real-time responses to avoid the inconvenience of long-waiting. Beside technical discussion, Dr. Liang shared with us the ability needed for technical jobs at Google and the tips for the preparation of the application. Since Google expects employees to solve problems independently, an applicant must equip not only with the professional knowledge for the position, such as programming skills and data structure, but also common sense regarding computer vision beyond his expertise, while preparing for the interview. After all, Google is famous for its free and self-motivation atmosphere. Compared to fulfilling the duties assigned by supervisors, Google engineers are encouraged to proactively seek interest in the daily jobs and continuously improve themselves to level up their technical skills. We are very grateful to have such a great opportunity to interact with a senior engineer in Google from the United States in person to gain industrial experience in commercializing academic research findings as well as the firsthand engineering tricks that cannot be learned from textbooks or the Internet.

黃正能教授演講
When 5G Meets with Big IoT Data for 3D World

文／陳平揚 資訊科學與工程研究所博士生

黃正能教授，於 1981 和 1983 年在台灣大學取得電子工程學士與碩士學位，並於 1988 年在University of Southern California取得博士學位。在 1989 年在華盛頓大學任職，研究的領域為多媒體訊號處理、多媒體網路、影像處理、電腦視覺及圖形識別，已在國際期刊、國際會議論文集、書籍和書籍章節發表超過 300 篇研究論文。

黃正能教授於 4 月 7 日應邀蒞臨資訊學院演講，講題為：When 5G Meets with Big IoT Data for 3D World，本次演講探討未來高頻寬 5G 為物聯網以及深度學習舉凡物件偵測、物件追蹤、3D 模型重建的影響與改變，旁及一些有趣的研究方向，並討論相關的理論基礎及研究成果。

隨著現今各地大量攝影機普及，深度學習乃至人工智慧的蓬勃發展，以及 5G 核心網路、邊緣嵌入式系統的部署，使得未來講求即時 (Real-Time) 的物聯網世界越發可行，從學術研究發表漸漸走向可落地的商業化技術，其中，3D 物理世界中的動態環境探索得以了解不同位置相機的人、車、物件資訊，這些訊息可被用於各種智慧城市應用，例如安全監控、智慧交通、商業統計收集與社區健康監測等。在本次演講中，黃教授首先展示一個自動化的人車追蹤系統，並能自動校準在 3D 空間中。黃教授也利用近來最強大的深度學習作為輔助，讓這些偵測車輛的位置和速度以及人們的姿勢都可以基於 GPS 坐標進行描述，這樣一來，多個攝像機的追蹤物體就可以在 3D 真實世界空間中有效地集成和重建，適用於更多智慧城市和智慧交通應用。

這次講座黃教授分享了許多關於他的研究領域與成果表現，無論是人物追蹤定位、車子追蹤定位、移動攝影機的物體追蹤與人體姿勢估測，在各項比賽中皆名列前茅，並於 3D MOT Challenges 2015 得到第一名、AI City Challenges 2018 的 Track1:Speed Estimation&Track3:Re-Identification 拿下第一名，其研究方法的穩定性，奠定了未來 5G 世界穩固的物聯網、車聯網基石，其中教授更分享許多在真實世界當中，有別於學術研究，會遇到的問題，譬如當演算法受到天氣或光線影響時，適時地轉換成硬體協助軟體，方能使得整體錯誤率降低，另外，要建構一項如此大的系統，除了軟硬體整合外，教授也指出演算法之間的整合也是研究者可以鑽研的一項題目，目前的相關技術，如物件偵測、追蹤、切割、深度估算，皆未有一端到端的解法，非常可惜。

The Speech of Dr. Jenq–Neng Hwang
When 5G Meets with Big IoT Data for 3D World

Professor Jenq-Neng Hwang received the BS and MS degrees, both in electrical engineering, from National Taiwan University in 1981 and 1983 separately. He then received his Ph.D. degree from the University of Southern California. In 1989, Dr. Hwang joined the Department of Electrical and Computer Engineering of the University of Washington in Seattle. His research areas are multimedia signal processing, multimedia networking, image processing, computer vision, and graphic recognition. He has published more than 300 research papers in international journals, international conference proceedings, books, and book chapters.

Professor Hwang was invited by the School of Computer Science, National Yang Ming Chiao Tung University to deliver a speech: “When 5G Meets with Big IoT Data for 3D World,” on April 7th, 2021. In the speech, He talked about not only the Impact of future 5G on the Internet of Things and deep learning, such as object detection, object tracking, and 3D model reconstruction, but also some interesting research directions as well as the related theoretical foundations and the corresponding research results.

Due to the large installation base of network cameras, the boom of deep learning and even artificial intelligence, as well as the deployment of 5G networks and edge embedded systems, the real-time Internet of Things world is becoming more feasible in the future so that academic research has been propelled into mainstream technologies for business. The exploration of the dynamic environment in the 3D physical world can grasp the information of humans, cars, and objects from cameras in various locations. The collected information can be applied in different smart city applications, such as security surveillance, intelligent transportation, commercial statistics collection, and community health monitoring, etc. Professor Hwang first demonstrated an automatic (human and vehicle) tracking system which can be automatically calibrated in 3D space. With the aid of deep learning, one of the most successful techniques recently, the position and speed of detected vehicles and the postures of humans can be illustrated on GPS coordinates. In this way, objects tracking by multiple cameras can be fused and reconstructed effectively in a 3D virtual world, which can be applied to more smart cities and intelligent transportation applications.

Professor Hwang shared his research findings and achievements in his research areas. His team focuses on people tracking and positioning, vehicle tracking and positioning, object tracking by mobile cameras, and human pose estimation, has won several awards in various competitions, such as a winner of 3D MOT Challenges 2015, as well as a winner of Track 1: Speed Estimation and Track3: Re-Identification at AI City Challenge 2018. His robust research methodology has laid a solid foundation of Internet of Things and Internet of Vehicles in the future 5G world. In addition to academic research, Professor Hwang mentioned many real-life scenarios. For example, when the system is affected by weak/strong lighting or bad weather, the algorithm would adapt system configurations in a timely manner to reduce the overall error rate. Furthermore, integration of software and hardware is no doubt a best practice to build such a system; however, Professor Hwang pointed out that the integration of algorithms would be another topic worth pursuing. It is a pity that the latest technology in this area, such as object detection, tracking, segmentation, and depth estimation, does not have an end-to-end solution.

推動跨校區合作平台
陽明交大成立『資訊學院跨校區合作推動辦公室』

文／秘書處公共關係組

國立陽明交通大學資訊學院 8 月 1 日於陽明校區正式成立『資訊學院跨校區合作推動辦公室』，負責推動資訊學院與陽明校區各醫學領域相關院、系、所、研究中心，以及各教學醫院跨領域之合作。

陽明交大林奇宏校長表示，利用先進資訊技術應用在醫療服務上已是國際重要趨勢，而未來智慧醫療產業也需要借助更多的數位科技導入，才能大幅提升醫療及人的生活品質。『資訊學院跨校區合作推動辦公室』肩負起鏈結交大校區與陽明校區原有的資訊與醫療兩大領領域之重責大任。首要任務為建立共同工作的合作環境與平台，以落實在學術研究、教學及服務三方面。

『資訊學院跨校區合作推動辦公室』主任、資訊學院施仁忠副院長表示，在橋接資訊與醫學相關領域合作的任務之下，目前具體的推動項目包含「建立學術研究合作管道」、「推動教師合作研究計畫」、「規劃跨域學程與師資」、「共同指導學生專題、碩、博士論文」、「共同發表學術論文」、「加強資訊學院與本校各教學醫院之合作」、「協助提昇社區醫療服務的智慧化」六大項目。現階段已規劃了資工系與醫學系的雙聯學程，未來也將與護理學院共同推動雙聯學程。

在「推動教師合作研究計畫」下，已有資工系曾新穆教授跟醫務管理研究所推動運用人工智慧進行病患發生疾病的預警與照護之研究；資工系荊宇泰、蕭子健、胡毓志教授跟台北榮總高齡醫學中心，也應用 VR 及光電測量技術評量高齡長者認知、肌力等參數；資工系施仁忠教授跟台北榮總乳房醫學中心則運用 VR 技術進行病患術前預估及術後評量等研究，陸續展開了跨領域的研究。

『資訊學院跨校區合作推動辦公室』的揭牌儀式，於 9/6(一) 上午 10:00 於線上舉辦，期盼藉由跨校區合作推動辦公室的成立，創造更多充份合作機會，發揮一加一大於二的綜效。

CCS Establishes the Promotional Office for Cross-Campus Collaboration

The College of Computer Science (CCS) of National Yang Ming Chiao Tung University establishes “CCS Promotional Office for Cross-Campus Collaboration” at Yang Ming campus on August 1, 2021. The office is in charge of the cross-field collaboration of the college of Computer Science with related colleges, departments, institutes, and research centers in medical fields at Yang Ming Campus, as well as teaching hospitals.

According to President Chi-Hong Lin, applying advanced information technology in medical services has become a major international trend; moreover, by adopting more digital technology, the smart medical industry in the future can greatly improve the quality of medical care and the quality of life. “The CCS Promotional Office for Cross-Campus Collaboration” carries the great responsibility of linking the original computer science and medical fields at Chiao Tung University campus and Yang Ming campus. The primary task is to create a collaborative atmosphere and build up a collaboration platform for the best practices on academic research, teaching and services.

Zen-Chung Shih, director of “CCS Promotional Office for Cross-Campus Collaboration” and associate dean of the College of Computer Science, said that with collaborations between computer science and medical fields, the current promotion projects, comprising six major tasks, include "establish collaboration channels in academic research", "promote joint research projects for faculty", "design cross-disciplinary programs and arrange faculty resources", "co-direct a project, a thesis or a dissertation", "co-authorship of journal articles", "strengthen the cooperation between the College of Computer Science and teaching hospitals at NYCU", and "assist to improve the smart medical services in community”. Currently, the dual degree program between the Department of Computer Science and the Department of Medicine has been developed. The similar program with the School of Nursing will also be developed in the near future.

In the task of "promote joint research projects for faculty", cross-field research has been successively carried out. Professor Vincent S. Tseng of the CS department has spearheaded the initiative to bring artificial intelligence into the research of early warning and care of patient deterioration with the Institute of Hospital and Health Care Administration. Professor Yu-Tai Ching, Professor Tzu-Chien Hsiao, and Professor Yuh-Jyh Hu of the CS Department use VR and photoelectric measurement technology to evaluate an older person's cognition and muscle strength with Taipei Veterans General Hospital Center for Geriatrics and Gerontology; in addition, Professor Zen-Chung Shih of the CS Department also applies VR technology to perform preoperative assessment and postoperative evaluation with Comprehensive Breast Health Center at Taipei Veterans General Hospital.

The inauguration ceremony of the “CCS Promotional Office for Cross-Campus Collaboration” was held online at 10:00 am on 9/6 (Mon.). We hope that the establishment of this office will facilitate cross-campus collaborations, through which the synergy between campuses can exert a substantial impact.

二進位博物館電腦文物展 見證資訊科技發展軌跡

文／翁健棋

近代科技日新月異，眾多劃時代的發明伴隨高速發展的學識和技術誕生於世，造福人類社會的同時，滿足各式日常生活所需。談起資訊科技發展史，電腦這項發明和其後續發展，皆在其中扮演著舉足輕重的開創地位。今年五月十三日至六月十三日這段期間，本學院協同新竹市文化局共同策劃「二進位博物館電腦文物展」於新竹市青少年館展出，從體積龐大的迪吉多電腦，到全國第一台大學聯考用讀卡機，帶領觀展者藉由歷代電腦文物的引領，遨遊於資訊科技發展之歷史迴廊。

綜觀我國科技發展史，新竹地區之所以會成為高科技產業重鎮，可將時光追溯至日本殖民政府於新竹州設立天然瓦斯研究所、海軍第六燃料廠，該設施所留下的廠房設備、技術人才後續由中油公司接收，併入經濟部聯合工業研究所。本校亦於 1958 年，在旅美校友大力支持下，於博愛校區成立第一間電子研究所，並於後續引入 IBM 650 磁鼓數據處理機，培育第一代電腦科學人才。緊接著伴隨工研院、新竹科學園區成立，新竹因學術研究與產業交織有了「台灣矽谷」的美稱，這些科技人才也成為帶動台灣產業結構轉型的重要關鍵。

曾任中華電信基金會執行長，同時為本校資訊工程學系校友的林三元先生在採訪中提到，當時政府需大量處理資料，需要適當的機器進行訓練，除了 IBM 外亦可選擇 Control Data Cyber（CDC）之大型主機用以處理如財稅等常規商業訊息。儘管這些「古董」運算速度不及現在手機的萬分之一，但以當代的觀點出發，將人腦之責委以電腦已是跨時代的認知衝擊，是件「很了不起」的事。此外，同為本校資工系校友的前數位通國際總經理吳國棟先生也談到，當時航空、陸地和海上的交通的即時管控、模擬運算、電腦輔助設計與製造和工程設計皆屬 PDP11 大型電腦主機承攬範疇，可見電腦科技應用範圍之廣，觸及各大領域。電腦設備被引入交通大學校園的同時，內部所含的工程軟體更進一步造福師生，使學術和技術的提升進入另一個層次。

工研院總營運長余孝先先生，以資工系校友的角度出發，提及四十幾年前冷氣尚未普及，體積大到可以放超過一間教室的迪吉多電腦 DEC10 卻可以享受此一福利，學生只能汗流浹背與酷暑搏鬥的趣事。儘管後來迪吉多電腦地位逐漸被其他工程電腦取代，但仍無法動搖其開創先鋒之地位。當時因電腦效能成本要價不斐，須設立分時系統供多人共用電腦；同時程式碼須打在卡片上，因其更改次數有所限制，在編寫、修改程式碼要格外嚴謹。隨著發展時間線向後推移，在我國相關產業界、學術界的努力和協助下，電腦生產、使用成本降低，使用習慣已全然轉變，個人電腦的出現亦顛覆過往對於電腦體積極大的刻板印象，在提升便利性和效能的同時，開創全新的市場和發展藍圖。

時至今日，伴隨智慧型手機的出現，網際網路住民量急速成長已為必然之趨勢，電腦功能定位隨其有所異動。本院彭文志副院長於訪談中提到對電腦文物保存的重要性，正所謂鑑往知來，透過適當地保存並回顧其發展歷史，相信對於追尋未來資訊科技之發展方向定能有所助益。如同鴻梅文創志業陳添順董事長於受訪時所述，身處現代回首望去，或許會覺得當代的硬體設備、應用方法很原始，但若非眾前輩花費心力、貢獻所學，一步一腳印踏實地演進和累積，資訊科技發展著實難以一次到位。

「組裝第一台電腦的挑戰精神需被傳承並保存。」以宏觀的視角鳥瞰資訊科技發展史，站在巨人的肩膀上的莘莘學子將身攜想像力和創造力，以其為主幹，嶄露並延伸那繁茂的新芽。

The Binary Museum of Antique Computer Exhibition Displays the Development of Science and Technology Development

Due to the rapid technological changes, many products across generations have been invented along with advancing knowledge and technology to bring convenience to daily life. There is no doubt that the invention and development of computers play a significant role in the history of science technology. The Binary Museum of Antique Computer Exhibition organized by the Department of Computer Science at National Yang Ming Chiao Tung University (NYCU) and the Hsinchu Cultural Affairs Bureau was held from the 13th of May to the 13th of June, 2021 at the Youth Center of Cultural Affairs Bureau.

The reason why Hsinchu became the center of industrial and computer technology development was because of its unique history. During the Japanese colonial period, the Natural Gas Research Center and Former Imperial Japanese Navy Sixth Fuel were established in Hsinchu. Later on, the equipment and staff were taken over by CPC Cooperation, Taiwan under the Union Industrial Research Institute. National Yang Ming Chiao Tung University (NYCU), located in Hsinchu established the first Institute of Electronics in 1958 with the support of alumni from overseas. It introduced IBM 650 Magnetic Drum Data-Processing Machine to cultivate the first generation of digital computer professionals. After graduation, these well-trained technological professionals usually worked for Industrial Technology Research Institute or companies in Hsinchu Science Park which were just starting to develop. It was also very crucial for the industrial structural transformation in Taiwan. Hsinchu soon had the new nickname, the Taiwan version of Silicon Valley.

NYCU alumni also shared their stories when they were at school. San-Yuan Lin, who was the former executive director of Chunghwa Telecom Foundation, mentioned that during that time our government needed machines to process a great amount of data. Other than IBM machines, Control Data Cyber (CDC) was also very capable of handling business data such as finance and tax documents, and it was very amazing to witness computers operating human duties. Kuo-Tung Wu, the previous general manager of eASPNet Taiwan Inc. also said that the PDP-11 computer was used to manage various transportation systems such as real-time control, analog computation, computer-aided designing and manufacturing, and engineering design. While professors and students were getting familiar with using a variety of computer equipment, their academic knowledge and technology skills were also elevated by the engineering software within those machines. Shiaw-Shian Yu, Chief Operating Officer of Industrial Technology Research Institute, added on the fun fact that the size of DEC-10 took up the space for nearly a classroom. It also needed to be stored in a room with air-conditioning turned on while most of the other students did not have the privilege to stay in the air-conditioned classroom. There were also some other strict rules when using DEC-10 because it was very expensive. For example, a time-sharing system needed to be built to provide availability for multi-users. Also coding needed to be typed on cards, so there was a limit for revising codes. Therefore, people were cautious when writing and editing codes. DEC-10 was the classic initial product of that time although it eventually got replaced by other machines.

Light-weighted personal computers appeared on the market with the development from industries and academia, and it changed the way people use the computer while the production of IBM dropped eventually over time. Until recently, smartphones were gaining popularity among netizens and thus might also change the market trend of personal computers. During the interview, Wen-Chih Peng, Associate Dean of the Computer Science Department mentioned that it is important to learn from the past, so preserving these antique computers is necessary. Also learning about its history will be beneficial for anyone who would like to further pursue a career in computer science and technology. As the president of Grand View Culture and Art Foundation Tien-Shun Chen said, although these machines may look outdated, it is worthwhile to look back at the history because people could realize things take time to learn and develop over time.

The quote, “the spirit of assembling the first computer in history should be preserved and carried on,” should be kept in students’ minds. They are encouraged to view things from a broader view and stand on the giant’s shoulder to have imagination and creation on the learning journey.

吳毅成教授榮獲科技部傑出研究獎

文／林珮雯

科技部為獎勵研究成果傑出之科學技術人才，長期從事學術或產學研究，提升台灣學術、產學研究水準，增強國家科技實力，特別設立「傑出研究獎」。本院吳毅成教授榮獲科技部 109 年度傑出研究獎。

吳毅成教授專研電腦對局應用與深度強化式學習相關應用，獲許多突破性研究成果。研發圍棋程式 CGI (CGI Go Intelligence) ，是第一個能下讓子棋的深度強化式學習 (DRL) 電腦圍棋程式，並提出新的 AlphaZero 方法，以此大幅改良 CGI 程式並提高勝率。該程式在 2017 年八月世界智能圍棋公開賽中，獲得預賽全勝冠軍、決賽亞軍，其中曾擊敗騰訊公司的絕藝、DeepZenGo，也是第一個學界程式在正式的人機賽中，打敗職業九段棋士。此外，吳教授團隊同時提出新的棋力調整方法，為全球第一個能提供超過三十多種不同圍棋棋力的系統，可在對弈過程中動態偵測棋士的棋力，研究團隊各項成果已用於培訓國家級職業高段棋士。

吳毅成教授是台灣在 AI 領域最具指標性的學者之一。他聚焦 AI 如何從虛擬環境走入真實世界的應用，這樣的結果不僅開啟學界對 DRL 技術的研究熱潮，同時也預告未來 AI 將更有機會應用於多方領域，走向產業化發展，其研究成果對台灣產業及社會有莫大貢獻，以下是吳毅成教授傑出研究獎得獎感言：

吳毅成教授：我很幸運有一個很好的研究團隊

感謝科技部的肯定，很榮幸獲得科技部「傑出研究獎」！有機會獲得此獎，應該是我很幸運地有一個很好的研究團隊，這個獎也是對我們團隊的肯定。首先要感謝科技部的支持，尤其是早期人工智慧專案計畫的關鍵協助，以及後續普適人工智慧中心給予持續的支持，以及國網的計算資源配合。也感謝陽明交大資訊學院一直以來提供很好的研究環境，諸多長官、同仁、先進於研究路途上一直給予的鼓勵與支持。這使得我們有機會與國際前沿的研究單位如 Facebook，挑戰許多高難度研究議題。我也要感謝棋界如海峰棋院 (林文伯董事長)、紅面棋王周俊勳等的支持與合作，除了捐款給我們團隊做研究，也配合我們的研究，甚至啟發我們許多新研究議題，如自動棋力調整技術。

Professor I-Chen Wu was awarded the Outstanding Research Award of the Ministry of Science and Technology

The “Outstanding Research Award”, instituted by the Ministry of Science and Technology (MOST), honors scientific and technological talents having outstanding research performance, thereby encouraging them to devote themselves to academic and industry-academic research to improve the quality of Taiwan’s research in the international community, and ultimately boost the country’s technological capacity. Dr. I-Chen Wu, professor of the College of Computer Science, received the 2020 Outstanding Research Award from the Ministry of Science and Technology.

Professor I-Chen Wu, specializing in applications of computer games and deep reinforcement learning, has achieved breakthrough results in his research. CGI (CGI Go Intelligence) is the first deep reinforcement learning (DRL) computer Go program that can play handicap-Go. Professor Wu proposed a revised AlphaZero algorithm to substantially improve CGI so that the win rate increases. In August 2017, CGI Go program won the second place in "CITIC Securities Cup", the first World AI Go Open. In this competition, CGI swept the first day of the preliminary round, and defeated FineArt, developed by Tencent Inc., and DeepZenGo from Japan. In the meantime, CGI is the first Go program developed at academic institutes to beat a 9 dan human professional in formal competitions. Moreover, Professor Wu’s team proposed a new approach to strength adjustment for the Go program. This strength adjustment system is the first program in the world that offers more than 30 different levels, and supports the dynamic detection of players’ strengths. It has been adopted to train Go professionals, e.g., the national team, to promote the national Go team skill.

Professor I-Chen Wu is one of the most prominent scholars in artificial intelligence in Taiwan. He focused on the AI technologies applied to computer games and extended to the real world. His findings not only ignited a boom in the research toward DRL in academia, but also foresaw that AI would have greater impact on diverse areas and move toward Industrial development. His research has made great contributions to industry and society in Taiwan. The acceptance speech by Professor Wu is as follows:

Professor I-Chen Wu: I feel very lucky to be a part of such a great team!

I am extremely grateful to the Ministry of Science and Technology for acknowledging my hard work this year. It is truly an honor to receive the outstanding research award of MOST. The biggest honor goes to my team. It would never be possible for me to win this award without their help and dedication. Firstly, I would like to show my sincere appreciation to the Ministry of Science and Technology for its support, especially to the early artificial intelligence project, the follow-up support of PAIR Labs, and the computing resources of Taiwan Computing Cloud. My special gratitude goes to the School of Computer Science of National Yang Ming Chiao Tung University for providing such a great research environment. I am truly thankful to officials and colleagues for the constant encouragement and advice on my research. These supports gave us the opportunity to solve challenging topics with international cutting-edge research institutions, such as Facebook. Finally, I would like to thank the Go Association such as Haifong Go (Chairman Bough Lin) and Chun-Hsun Chou for their support and cooperation. With their sponsorship and engagement in our research team, we are even inspired for new research topics, such as automatic strength adjustment technology.

打造雙語環境，資工專屬英語課程豐富精采

文稿整理／劉美君

為了提升本院學生的英語能力，晉升為國際人才，資訊學院開設了專屬於資工學生的英語課程，旨在輔助本院碩、博班生增進一般聽力與口說英語能力及學術閱讀及寫作英語能力，學生可依據學習需求彈性選擇課程。本學期共有七種課程讓同學們參與：英語溝通與表達、學術英文發表課程、英文寫作邏輯與概念、論文篇章邏輯與概念、進階英文寫作、學術文獻閱讀技巧與英文文法邏輯解析。課程豐富，訓練紮實，以下是學生參與課程的心得：

參與課程：英文寫作邏輯與概念
學　　生：莊仁輝教授實驗室 黃粵丞

很意外的，這門寫作課讓我學到了比預期多好多的知識；Willy 老師的上課非常的紮實與有趣，常常會在課程一開頭來點輕鬆的給大家看有趣的節目片段，好笑又可以讓我們了解到外國人的文化，更重要的是帶出英文與中文不管是在邏輯上還是在用法上都有很大的不同；像是中文就會很多語助詞，英文就簡單扼要，讓我們從生活化的例子，學到英文的精隨。這堂課架構不僅讓我在最近新寫 paper 的手感上，順利了不少，更讓人有感的是在閱讀 paper 上增快不少速度。後面兩周由於疫情的關係，Willy 老師在課程上更加用心與扎實 (常常晚下課)，但這兩周我居然更加認真、心無旁騖的在認真聽課 (可能是上實體課要寫東西，寫完我在滑手機)，實在是迫不及待之後的英文寫作進階課程，能讓我的英文 writing 能力提升新的一個檔次，最後再次感謝資訊學院能讓我們上這個扎實又有用的課程，謝謝 Willy 老師與 Selina 老師的協助與用心。

參與課程：英文寫作邏輯與概念
學　　生：王協源教授實驗室 謝獻爵

上課內容主要包含英文寫作邏輯養成、論文寫作的架構與句子段落的連貫。

Willy 老師透過舉例讓學生清楚了解該如何用英語人士的角度寫作，並且會閱讀學生的指導教授的論文加以分析。英文論文寫作常見結構與語句流暢度，最後期末報告再讓同學分析文本。這六週的課程收穫滿滿，非常推薦給其他同學上英語圓桌推出的一系列口說與論文寫作的課程。

參與課程：論文篇章邏輯與概念
學　　生：邱維辰教授實驗室 郭毓梁

修習了兩學期 Willy 老師的寫作課程，對於論文寫作上有很大的幫助，其中覺得 Willy 老師最用心也對我們最有效的教學方式，是他都會直接拿我們領域內文章來當作範本，以結構式的方式詳細分析論文的段落分配，這種基於架構的階層式論文分析幫助我們更能設計自己的論文，貼近學生們的論文主題也使我們能快速吸收教導的知識，是一堂對於寫作論文非常有幫助的課程。

參與課程：論文篇章邏輯與概念
學　　生：邱維辰教授實驗室 李育瑄

Willy 老師上課很用心也很有趣，在這堂課學到了很多學術寫作的架構、句法以及用字，老師會搭配相關領域的論文讓我們比較，學習各篇論文好的部分也會指出可以改進的地方。除了課程內容扎實，老師也會設計一些互動加深上課的內容， 大家都學習得很開心！很推薦其他同學來上這堂課，會是充實又開心的時光！

參與課程：英語溝通能力與表達
學　　生：孫春在教授實驗室 魏君豪

英文是這個國際化的時代非常重要的工具與技能，我個人共參加了兩個學期的英語圓桌口說課程，每週上課前老師會先告知下週要上課的主題及相關的影片連結，影片內容基本上都非常詼諧有趣，看起來毫無負擔，之後就會以該主題做口說討論。上課的氛圍非常輕鬆又有活力，強烈推薦大家結伴一起來報名，別讓這麼好的資源白白浪費了！

參與課程：英語溝通能力與表達
學　　生：邱維辰教授實驗室 李峻毅

英語圓桌是個很歡樂的課程，我參加的英語圓桌主題是口語課程，一學期有六次上課和一次的活動。老師是一個外國女生，年紀跟我們相仿所以話題相近，非常好相處。在每次上課前都會發講義以及給我們一部短片的連結，而且每次上課的主題都是由我們自主票選。這學期由於疫情的關係，老師提議我們活動為在線上玩英語版的狼人殺，完全不會有正式上課的那種嚴肅感，非常推薦大家一起來快樂且輕鬆的學英語哦！

參與課程：學術英文發表課程
學　　生：張永儒教授實驗室 鐘智吉

這次在「學術英文發表」課程，Selina 老師在課堂上給我們大量情境練習對話，練習上課內容。我覺得最實用的章節，是在敍述資料和圖表時可以使用的句型和單字整理。在需要時可以參考使用，也能讓自己更清楚地呈現數據、相關趨勢以及意義。不論是開發或是研究，有好的英文能力都可以更完整、清楚地表達自己的想法，可以更順暢地與人合作和交流。

參與課程：學術英文發表課程
學　　生：張永儒教授實驗室 林芳宇

Selina 老師的上課內容大約分成三個部分，第一是發音練習。第二是一般口說的時候會用到的，如何讓語句念起來更自然順暢。第三是報 paper 時會用到的公式句型，比方如何報告圖表。老師在講義上提供公式句型，有些時候也會帶我們做實際演練。我覺得聽老師講解這些句型，會比較了解英語報告者的鋪陳邏輯，大概了解邏輯之後，再選出講義裡面自己比較可能會用的句子記起來就好。為什麼發展英文能力對 CS(相關領域) 的學生很重要，因為我自己是一個不太會報 paper 的人，有時候自己以為講得很清楚，但其實台下的大家沒有聽懂。所以在課堂中學到了英文報告時可以用的公式，確保這些邏輯是國外聽眾可能比較容易理解的，這一點讓我比較安心。

參與課程：英文文法邏輯解析
學　　生：曾建超教授實驗室 金則禹

在這次英文圓桌的文法課程中 Selina 老師我們深入淺出的講解了一些常用的句型和規範。像是單複數的冠詞部分是我印象最深刻的，第一次瞭解到不同的冠詞會表達出作者和讀者對單詞含義的不同認知，也瞭解到了英文寫作的特點是開門見山的表達中心思想。對於　什　資工系學生需要發展英文，因　大部分先進的技術相關的文獻一般都由英文撰寫，所以需要有比較好的英文　讀能力，然后則會有寫作英文論文或者進行英語報告的需求。我會非常推薦同學來圓桌學習，並且可以根據目前自己感興趣的區塊選擇對應的課程，我覺得這是資工系給學生提供的一項十分實用的資源。

CS English Enhancement Courses to Cultivate Students' English Abilities

To increase Computer Science students' competitiveness for the future global market, the Department of Computer Science of National Yang Ming Chiao Tung University (NYCU) offers English enhancement courses to improve local students' general English and academic English abilities. Students can select the courses according to their learning needs for English. Seven types of courses were provided during the semester, including English Communication and Delivery, English Presentation for Academic Purposes, The Introduction to English Writing and English Logic 1, The Introduction to English Writing and English Logic 2, The Introduction to English Grammar Logic, and Academic Reading Course for Graduate Beginners. The following are students' reflections after joining these courses.

Course Title: The Introduction to English Writing and English Logic 1
Name: Eden Huang (Intelligent System Lab)

Surprisingly, I learned so much more than I expected from Willy's writing course. The course laid a solid foundation for the principles in English writing, and it was very interesting to learn those concepts. The course instructor would show us some hilarious clips related to language at the beginning of class. In this way, we learned some cultural differences from English-speaking countries. Most importantly, we realized that the logic and usage of English are much different from Chinese. For example, there are a lot of filler words in Chinese, but native English speakers tend to use simpler and more direct ways to express the language. After taking this course, I can write my academic papers more fluently. Furthermore, I also increased my reading speed when reading academic papers. Due to the Covid-19 pandemic, the course switched to online learning mode during the final two weeks. Not only did the course instructor put more effort into the course, and I was also more concentrated during the classes. All in all, I cannot wait to participate in the next writing course, The Introduction to English Writing and English Logic 2, to continue practicing my writing skills. I would like to thank the College of Computer Science for providing the English enhancement courses for us. Finally, I would like to show my appreciation to the course instructor, Willy, and course supervisor, Selina.

Course Title: The Introduction to English Writing and English Logic 1
Name: Jason Hsieh (Network and System Laboratory)

This writing course consists of three parts, including logic in English, sentence structure in thesis writing, and coherence between sentences. The course instructor guided students to learn writing in an English style through analyzing the structure and coherence from examples chosen from our professor's academic papers. In the final session of the course, we did a presentation on analyzing Computer Science academic papers. Overall, I learned a lot during these 6 weeks. I recommend the English enhancement program, including speaking courses and writing courses to everyone.

Course Title: The Introduction to English Writing and English Logic 2
Name: Hank Kuo (Enriched Vision Applications Lab)

After taking two writing courses with Willy, I learned a lot about thesis writing. I think these courses are beneficial to me because Computer Science academic papers were used as the class materials. During the classes, the structures and paragraphs of the academic paper were explained and analyzed in detail by the course instructor. In this way, it helped us to plan out our thesis. The topics discussed during the courses were relevant to our research field, which also was the main factor to motivate our learning. Overall, this is an informative course for Computer Science students to develop the necessary skills for thesis writing.

Course Title: The Introduction to English Writing and English Logic 2
Name: Allen Tsai (Enriched Vision Applications Lab)

I learned a lot from Willy's writing course. The structure of the class was very organized and easy to follow. During the class, different chapters in the thesis were discussed and explained by the course instructor with actual examples extracted from the Computer Science academic papers. Also, many interesting class activities took place during these 6 weeks to help us learn better. Personally, I do not like English that much. However, I was able to learn this way with less pressure in this course. I would like to show my appreciation for Willy's guidance and instruction. Thus, I recommend every student from the Department of Computer Science to take this writing course.

Course Title: The Introduction to English Writing and English Logic 2
Name: Eva Lee (Enriched Vision Applications Lab)

I learned so much and had fun from Willy's course. During the course, many sessions were covered about writing, including academic writing structure, grammar, and vocabulary. The materials used in the classroom were academic papers in the Computer Science field. Both good parts and weak parts of the articles were discussed during the class. The content of the course was really helpful for computer science graduate students at the stage of writing thesis and academic papers. Besides, I also had fun during the classes. The course instructor would conduct some interesting interactive activities to enhance our learning. Therefore, I would recommend Computer Science students to join this awesome course.

Course: English Communication and Delivery
Student: Ethan Wei (Learning Science and Technology Lab)

English ability is an important tool in the modern world. I participated in the English Communication and Delivery course for two semesters. Interesting videos and topics were assigned by the course instructor one week before class, and were used as class materials to practice English speaking. The atmosphere in the class was relaxing and energetic. I would recommend everyone to come to join this course with your lab members.

Course Title: English Communication and Delivery
Student: Patrick Lee (Enriched Vision Applications Lab)

The course, English Communication and Delivery, provided a joyful environment to learn English. Our course instructor was an American graduate student, who was easy-going and friendly to all students. She held 6 classes and one extracurricular activity for us last semester. Before every class, she would send handouts and links to us and we could choose the topics we were interested to discuss later on in class. Due to the Covid-19 pandemic, we had to switch to remote learning for the course. Our instructor guided us to play a board game, the English version of One Night Ultimate Werewolf on google meet. It helped us to learn English in an English immersion environment without too much pressure. I would recommend to everyone who wants to practice speaking English at our department to join this course.

Course Title: English Presentation for Academic Purposes
Student: Dennis Chung (Mobile and Ubiquitous Interaction Lab)

During this course, English Presentation for Academic Purposes, we did many practices to build the essential skills required for presentation. What I found the most useful part was learning how to present research data and tables from chapter 3. We also learned how to use the vocabulary and formulaic expressions applied in different scenarios in the presentation. After attending the course, I was able to present my research paper more clearly. In the future, we need good English skills to be able to communicate with others and present ourselves when developing products in the market or research.

Course Title: English Presentation for Academic Purposes
Student: Emily Lin (Mobile and Ubiquitous Interaction Lab)

There are usually three parts in the course. The first part is pronunciation practice, the second part is the practice for necessary speaking skills, such as stress and chucks. The third part is learning formulaic expressions used in conference presentations. There are example sentences provided in the handout weekly. Usually, the course instructor would explain these sentences first, then guided us to do the practice. In this way, we were able to follow the logic of these sentences. After that, we could pick useful sentences when we need to present our papers.

In my opinion, it is important to develop English skills as a student who studies in a Computer Science-related major. Before I joined this course, I was not that confident with my presentation skill because I was not sure if I could make it clear for my audience to understand my speech. After joining this course, I feel more assured if I can apply standardized formulaic examples in my presentation.

Course Title: The Introduction to English Grammar Logic
Student: Ze-Yu Jin (Wireless Internet Laboratory)

I learned many useful sentence structures and rules about grammar from this course. In English logic, things are simpler and more direct compared to Chinese, but how we select these rules to use is worthwhile to learn because the way to use grammar differently would convey different meanings to your target listeners or readers. For example, ways of using plural and singular forms with articles in different contexts will determine different meanings. As a Computer Science graduate student, it is important to sharpen your English skills, because most academic papers and technical reports are written in English. Also, there is a need to write English in a thesis and present it in English as a graduate student. Therefore, I strongly recommend Computer Science students to join this course, which is a very useful resource to us.

參與國際頂尖會議與世界接軌

文稿整理／林珮雯

近年來資訊領域學術發表重心逐漸移到頂尖國際會議論文，本院師生在人機互動、電腦視覺及人工智慧等領域的頂尖會議論文發表展現良好成效。本院透過鼓勵研究生參與國際頂尖會議等學術活動，以開拓國際視野，為未來創造更多機會。以下為邀請幾位參與其中同學分享心得：

發表論文：“I Got Some Free Time”：Investigating Task-execution and Task-effort Metrics in Mobile Crowdsourcing Tasks

作者：Chia-En Chiang, Yu-Chun Chen, Fang-Yu Lin, Felicia Feng, Hao-An Wu, Hao-Ping Lee, Chang-Hsuan Yang, Yung-Ju Chang

指導教授：張永儒老師

國際會議名稱：ACM CHI Conference on Human Factors in Computing Systems 2021

該會議重要性：ACM CHI 是人機交互動領域中最負盛名的會議，囊括許多跨領域的研究，其中主要包含設計、心理、人因、社會學、資訊與傳播等領域。

蔣佳恩同學心得分享：

我們實驗室研究訓練紮實，張永儒老師希望我們每個人都有自己的 Project，從選訂題目、實驗設計、執行及結果分析，最後到寫論文，整個走一遍讓我學習到很多，也學會承擔壓力及負責任，不因為遇到挫折放棄，這對我之後在申請到 UC Berkeley 有很大的幫助。我對 HCI 領域還滿有興趣，線上國際會議是很多不同的 session，有報告發表、問答等互動，在 CHI 發表是難得經驗。

發表論文：An Unsupervised Video Game Playstyle Metric via State Discretization

作者：Chiu-Chou Lin, Wei-Chen Chiu, I-Chen Wu

指導教授：吳毅成老師 邱維辰老師

國際會議名稱：The Conference on Uncertainty in Artificial Intelligence (UAI 2021)

該會議重要性：UAI 是關於人工智慧中不確定性之知識表達、學習與推理解釋領域之頂級國際會議。此會議自 1985 開辦，屬於人工智慧領域中深具歷史且重要的國際會議。本年度共有 777 篇完整投稿，205 篇被接受，接受率約為 26%。

林九州同學心得分享：

這是我第一篇成功投稿到 A 級國際會議的論文，也是第二次投稿 UAI 會議，這兩次的審查人員都提供了專業且具體的意見，我個人認為非常適合想研究人工智慧議題的研究者投稿。此次線上會議使用了 Underline.io 這個平台，所有投稿的口說影片都可隨時瀏覽，並可透過網頁平台進行互動，另有一個小鎮互動網頁系統，所有參與者可透過此小鎮進行直接的語音與視訊交流。但因系統方便，同一時間人較少，社交互動仍不如實體會議。

發表論文：Bridging the Visual Gap: Wide-Range Image Blending

作者：Chia-Ni Lu, Ya-Chu Chang, Wei-Chen Chiu

指導教授：邱維辰老師

國際會議名稱：IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2021

該會議重要性：CVPR 為電腦視覺領域中最頂尖的會議。今年一共約有 5900 篇有效投稿，其中有 1660 篇被接受，接受率為 27% 左右。近年來深度學習與人工智慧越來越熱門，而電腦視覺也被認為是該領域中很重要的發展方向。因此 CVPR 也被公認為是 AI 領域中的頂尖會議之一。

呂佳倪同學心得分享：

CVPR 是電腦視覺領域中最頂尖的會議，所以當初得知投稿的論文被接受真的非常開心，但由於疫情的關係，很遺憾的今年依舊是以線上會議的方式舉行，無法實際到美國與其他學者面對面交流。我的報告時段是台灣的晚上十一點到半夜一點半，一開始就有蠻多人進來我的聊天室問問題的，大部分都是針對研究方法的疑問，雖然很緊張但幸好都有順利的解決各國學者的疑惑。到了後半場來的人就比較少，而且比較多是針對研究概念的討論或是提供不同的想法，也有覺得我們的研究很有趣，專程來表達對我們論文的欣賞的人，讓我很驚喜也覺得很榮幸。這次 CVPR 是一次非常愉快的交流經驗，我得到了很多寶貴的建議，也對自己和研究更有信心，並學到如何更清楚地闡述研究概念與想法。

發表論文：Collaborative Learning of Multiple-Discontinuous-Image Saliency Prediction for Drone Exploration

作者：Ting-Tsan Chu, Po-Heng Chen, Pin-Jie Huang and Kuan-Wen Chen

指導教授：陳冠文老師

國際會議名稱：IEEE International Conference on Robotics and Automation (ICRA2020)

該會議重要性：ICRA 為機器人領域中最重要的會議之一，在 google scholar 的排名也長年盤踞榜單第一名，歷史悠久並且影響力強大。

黃品傑同學心得分享：

第一次投稿就可以順利錄取 ICRA 讓我非常開心，以前知道這是個機器人領域的頂級期刊，沒想到有一天可以收錄自己的研究內容。本篇論文將顯著性預測應用在無人機探勘上，以往的顯著性偵測都只應用在單張影像或是一段影片上，但對於無人機自動探勘而言，四周的資訊都需要被考慮，所以我們將顯著性預測應用在多張不連續影像上，同時也是第一篇這類型的研究，我們認為這是一個新穎並且非常值得研究的領域，並且建了一個新的 dataset，以利後續能有更多相關研究。

Attending International Conferences Connecting Students to the World

Over the past few years, publishing academic papers in computer science is more centered around top international conferences. The students and faculty of the College of Computer Science have received significant recognition by presenting their research accomplishments at top international conferences in human-computer interaction, computer vision, and artificial intelligence. Our college encourages graduate students to participate in academic activities such as top international conferences in order to broaden their global vision and further create more opportunities in the future. Some students share their experiences of attending the international conferences as follows:

Title of Article: "I Got Some Free Time": Investigating Task-execution and Task-effort Metrics in Mobile Crowdsourcing Tasks

Author: Chia-En Chiang, Yu-Chun Chen, Fang-Yu Lin, Felicia Feng, Hao-An Wu, Hao-Ping Lee, Chang-Hsuan Yang, Yung-Ju Chang

Advisor: Dr. Yung-Ju Chang

International Conference: ACM CHI Conference on Human Factors in Computing Systems 2021

The Significance of the conference: The 2021 ACM CHI Virtual Conference on Human Factors in Computing Systems is the premier international conference on Human-Computer Interaction, which is a multidisciplinary field of study, including design, psychology, human factors, sociology, computer science and communication fields, etc.

The experience of Chia-En Chiang:

Our lab has established a solid research and training program. Professor Yung-Ju Chang expects that everyone in the lab has their own project. Starting from choosing a topic, designing an experiment procedure, conducting the execution and result analysis, and finally compiling a paper, I have learned a lot and taken the responsibility from the process, so I would not give up when facing difficulties and challenges. Meanwhile, this experience is a great help for my admission to UC Berkeley. I am very interested in the HCI field. Online international conferences comprise a lot of different sessions, such as presentations and Q&A, etc. It is a memorable experience to present at the CHI Virtual Conference.

Title of Article: An Unsupervised Video Game Playstyle Metric via State Discretization

Author: Chiu-Chou Lin, Wei-Chen Chiu, I-Chen Wu

Advisor: Dr. I-Chen Wu, Dr. Wei-Chen Chiu

International Conference: The Conference on Uncertainty in Artificial Intelligence (UAI 2021)

The Significance of the conference:

The Conference on Uncertainty in Artificial Intelligence (UAI) is one of the premier international conferences on research related to learning and reasoning in the presence of uncertainty. The conference has been held every year since 1985. This year, 777 papers were reviewed and approximately 205 papers were accepted, with an overall acceptance rate of 26%.

The experience of Chiu-Chou Lin:

This is not only my first paper that got accepted at a top international conference but also the second paper I have submitted for the UAI conference. The reviewers' comments on both papers provided professional and specific opinions, which, I personally think, benefits greatly to researchers in artificial intelligence. UAI 2021 uses a conference platform (underline.io) this time so every illustration film of paper can be viewed anytime during the opening period and readers can interact one another over a web platform. In addition, participants can utilize a gather.town system to communicate with each other directly by streaming services. However, due to the time difference, less people get online at the same time. Therefore, it is still much easier to build social relations in a face-to-face conference than in a virtual conference.

Title of Article: Bridging the Visual Gap: Wide-Range Image Blending

Author: Chia-Ni Lu, Ya-Chu Chang, Wei-Chen Chiu

Advisor: Dr. Wei-Chen Chiu

International Conference: IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2021

The Significance of the conference:

CVPR is one of the top international conferences on computer vision. In this year's CVPR conference, 5,900 papers were reviewed, and 1,660 papers were accepted, with an acceptance rate of 27%. In recent years, deep learning and artificial intelligence have become more and more popular. Computer vision is also considered to be one of a very important developmental direction in the field. Therefore, CVPR is well recognized as one of the top conferences in the AI field.

The experience of Chia-Ni Lu:

CVPR is the top international conference on computer vision, so I was so excited when I was informed that my paper was accepted. However, due to the COVID-19 pandemic, I felt sorry that CVPR 2021 was still held online and the opportunity to the United States to communicate with other scholars was missed. My presentation was between 11:00pm to 1:30am (local time). When the session started, a lot of people flooded into my chat room and raised questions, most of which were related to research methods. At first, I was very nervous, but fortunately I was able to explain details to scholars from various countries so that everything went well. In the second half of session, Fewer people came in. Some of them chatted about my research concepts and the others proposed different ideas. Furthermore, it was not only a surprise but also an honor to me that some people particularly jumped in to express appreciation for our presentation because they thought our research was really inspiring. In summary, it was a very pleasant experience to attend CVPR 2021. In addition to the precious suggestions I have received, I felt more confident about my research and have learned how to present my ideas and research well.

Title of Article: Collaborative Learning of Multiple-Discontinuous-Image Saliency Prediction for Drone Exploration

Author: Ting-Tsan Chu, Po-Heng Chen, Pin-Jie Huang and Kuan-Wen Chen

Advisor: Dr. Kuan-Wen Chen

International Conference: IEEE International Conference on Robotics and Automation (ICRA 2020)

The Significance of the conference:

ICRA is one of the largest robotics meetings in the world. With a long history and great impact, ICRA is the flagship conference of the IEEE Robotics & Automation Society in Google scholar.

The experience of Pin-Jie Huang:

I was very happy when I was informed that my very first paper was accepted at ICRA 2020. I knew that ICRA is a top international journal on robotics research, but I never expected to present my research at ICRA. My research applied a saliency prediction method to drone exploration. In the past, saliency detection methods were applied to a single image or a video. However, regarding automated drone exploration, all the surroundings should be taken into consideration. Therefore, we applied a saliency prediction method to multiple discontinuous images, which was the first trial to take this approach on drone exploration over the world. We strongly believe that it is a novel and research-worthy topic, and we have built a new dataset to facilitate the follow-up studies.

資工系 110 年度「大專學生研究計畫」創意無限

文／翁健棋

我國科技部為鼓勵公私立大專院校學生執行研究計畫，使其儘早接受研究訓練，體驗研究活動、學習研究方法，進而加強實驗、實作之能力，特別設立「大專學生研究計畫補助」期望能吸引學生搭配指導教授之專長輔助，研究具自發性構想之嘗試性題目，以達提早培育並儲備基礎科學、應用科學、人文社會科學各領域之優秀研究人才之目的。本校本年度共核定 95 件大專學生研究計畫提案，其中資工系獲核 11 件名列前茅，本院院生通過審核之研究計畫構想不乏各類與科技發展、軟硬體應用，跨領域相結合等多元且創新之主題。

由張永儒教授指導的林詠涵同學，以研究主題「研究手機通知自動和手動管理對於使用者的差異」通過審核，以獨到的觀察點出手機的通知系統是人們意識到資訊的主要方式，選擇自優化使用者在手機通知管理上的體驗切入，透過開發具有自動管理模式、手動管理模式和兩者結合模式的通知系統，來幫助使用者管理通知，並探討手機通知自動和手動管理對於使用者之差異。同為張永儒教授指導的郭庭均同學則選定「探討如何利用預約形式之承諾提升群眾外包任務執行率」作為研究主題，透過群眾外包逐漸成為平台擴展資料集的流行方法、使用者多以智慧型手機協助相關任務等觀察發現，同時根據「承諾與一致性」理論為基礎提出假設，設計一款可以讓使用者提前預約未來任務的 Android App，研究者將以尋找提升任務執行率的方法為目標展開研究計畫。

另一方面，已廣泛應用於自動停車、輔助駕駛、車道偏移的物件偵測技術旨在找出影像中所有感興趣物體的類別與位置，由林彥宇教授所指導的黃偉傑同學便選擇以此作為研究核心。由於物件偵測廣泛的下游應用十分仰賴預訓練在大型資料集上的物件偵測模型，當它們被部署於現實場景時，經常會面臨準確度大幅下降的問題，其中的原因是訓練資料（源域）與現實場景（目標域）的影像特徵有所不同所導致。以「利用 Transformer 的領域自適應物件偵測」為主題，研究者試圖改善現有方法的效能與執行時間，期待能解決此項研究問題。而同為林彥宇教授所指導的吳季嘉同學則以「三維點雲的弱監督式語意分割」作為研究主題，探討如何透過弱監督式學習的方式，對只有部份被標註的訓練資料進行學習，來減輕標註訓練資料需要大量時間的問題，並且在訓練資料不完整的情況下，訓練出和使用完整訓練資料表現相差不大的模型。

由林靖茹教授指導的陳昱丞同學於「利用 RDMA 提升軟體定義網路路由查詢效率」研究計畫中，提及交換機上的路由表因記憶體空間有限，需要向遠端控制器詢問路由規則，造成延遲之問題。研究者提出一個路由規則安裝機制，將大流量資料的路由資訊盡可能存放在交換機記憶體中，而小流量資料路由資訊則留在遠端控制台。希望能大幅降低交換機與遠端控制器的溝通次數，增進網路效能與路由資訊即時性，同時也能作為一種新型且高效的網路遙測手段。

各研究計畫繳交研究成果報告經審查後，獲評為成績優良且有創意者，科技部將再頒發「大專生研究創作獎」給研究者，每人可獲獎金及獎狀，並頒授獎牌予指導教授。期盼眾院生之研究成果能從數千件計畫中脫穎而出，實踐所學造福社會的同時，再次為校、為院爭光！

Endless Creativity – Department of Computer Science Won 2021 “MOST Research Grant for University Students”

In order to cultivate talented researchers in basic science, applied science, the humanities, and the social sciences, the Ministry of Science and Technology (MOST) has established “MOST Research Grant for University Students” to encourage students at public and private institutions of higher education can begin—as early as possible—to carry out research projects, learn research methodology, and strengthen their abilities in conducting experiments and solving practical problems, so that students can work with their advisors on a topic that the student has come up with on his/her own, and that he/she has a strong interest in. A total of 95 NYCU students research project proposals were approved this year. The Department of Computer Science gains 11 students research project grants, which is the highest number at NYCU. The approved research proposals seek diverse and innovative concepts, including science and technology development, software and hardware applications, and cross-field integration.

Yong-Han Lin, advised by Professor Yung-Ju Chang, received the grant for the research proposal "Study on the Difference between Automated and Manual Management of Mobile App Notifications for Users". Lin, with unique perspectives, pointed out that the mobile app notification system will be the main way people recognize and interact with their apps. By starting from optimizing user experience for mobile notification services, Lin developed a notification system with multiple management modes, such as automatic, manual, or hybrid mode, to help users manage notifications, so as to explore the different impact to users between automated and manual management of mobile app notifications.

The research topic of Ting-Chun Kuo, also advised by Professor Yung-Ju Chang, is "How to Leverage the Commitment of Job Agreement to Improve the Execution Rate of Crowdsourcing Tasks". With the observation that crowdsourcing becomes a popular method to expand dataset and most tasks are completed on smartphones, as well as the theory of "commitment and consistency", Kuo first designed an Android app that allows users to book future tasks in advance. Then he will conduct research looking for a way to increase effectiveness at task execution.

In addition, the main goal of object detection technology widely used in automatic parking, assisted driving, and lane-deviation is to identify and locate one or multiple salient targets in images. Wei-Jie Huang, advised by Professor Yen-Yu Lin, chose it as his research core. The extensive applications adopting object detection rely heavily on the object detection models pre-trained on large data sets. When these applications are deployed in real-world scenarios, it is not rare that users encounter the problem of significant accuracy drop. These kinds of problems usually come from the difference of the image characteristics between the training data and the application scenario. Setting the research topic of "Domain Self-Adaptive Object Detection Using Transformer", Huang tried to improve the performance and execution time of existing methods so as to solve the research problem.

JiJia Wu, also advised by Professor Yen-Yu Lin, chose " Weakly-Supervised Semantic Segmentation of 3D Point Cloud" as his research topic to explore how to use weakly supervised learning methods to train a model with partially annotated data so as to reduce the amount of time needed for labeling training data. In the meantime, the derived model can perform nearly on a par with the model trained with a complete training data.

In the research project "Using RDMA to Improve Routing Query Efficiency in Software Defined Networks", Yu-Cheng Chen, advised by Professor Kate Ching-Ju Lin, mentioned that due to the limited local memory space for the routing table, the switch may need to inquire a remote controller for additional routing rules, which causes performance drops. Chen proposed a dispatch mechanism for routing rules to store large-flow routing information on switch memory as much as possible, while the small-flow routing information is kept in the remote control panel. In addition, he expected to maximally reduce the communications between the switch and remote controller to improve network performance via real-time routing information, and play as an efficient network telemetry method.

MOST will review the submitted research-achievement reports and present the University Student Research Award to projects graded especially outstanding and creative. Award recipients will receive prize money and a certificate celebrating their achievement. In addition, advisors of award recipients will receive a medal commemorating their achievement. We sincerely hope that the research results of our students will stand out from thousands of projects. Not only will the young talented students contribute themselves to benefit society, but they will also win glory once again for the school and the college!

國際黑客松高手雲集
院生團隊展創意奪冠

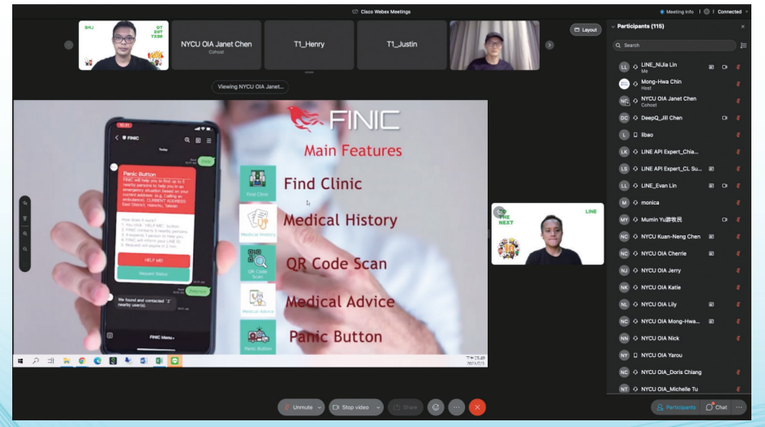
文／翁健棋

本校於近日初次舉辦融合國內與國際學生，活動過程全英文的國際黑客松創意競賽，吸引海地、印尼、印度、越南、聖露西亞、泰國、巴基斯坦、烏克蘭、俄羅斯、南韓、大陸、香港等地的選手，以及來自陽明交大、台大、清大、台科大、師大、政大、中央等校的學生報名參加。在參賽者超過百人的激烈競爭下，本院電機資訊國際學位學程、資訊工程學系以及中央大學企管所的顏狩耑（Albert Budi Christian）、安費布（Muhammad Febrian Ardiansyah）、沈迪恩（Steven Jonathan）、潘建琿（Felix Liawi）、怡拉尼（Irfandi Djailani）五人組成的 Finic 團隊，以一款健康照護服務成品拿下首獎，除獲冠軍殊榮外，未來還有機會前往 LINE 公司實習並具備優先聘用權。

此次國際黑克松創意競賽與 LINE 及 DeepQ 兩企業共同協辦，目標希望能將學生的創意與企業接軌，創造價值的同時造福社會。同時，本活動亦獲得台達電、美光、以及交大思源基金會熱情贊助，其中思源基金會特別設立「思源基金會創意特別獎」3 名，提供獎金獎勵前三名以外大膽創新的參賽隊伍，以呼應校友們勇敢創新創業的特質。本次競賽內容亦與社會趨勢和科技做結合，希望參賽者透過 LINE 所提供的聊天機器人 Chatbot，結合 Open Data 在數位轉型、健康醫療等主題上進行創意發想。儘管受到疫情影響，活動只能以線上形式進行，然而眾參賽者的創意和熱忱仍不減，人人皆絞盡腦汁，各展所長，希望能在時限內完成作品，完整地將創意構想具體呈現予評審並獲得肯定。

歷經長達四十小時的競賽馬拉松，本院院生所屬的 Finic 團隊以一款類似疾管家的 LINE 健康照護服務脫穎而出，獲得評審青睞榮獲冠軍。團隊所設計的這款服務功能包括：鄰近醫院搜尋、就醫紀錄追蹤、QR Code 掃描、線上醫療諮詢、以及 Panic Button 緊急按鈕。其中 Panic Button 更與手機定位做結合，能夠快速搜尋鄰近的 LINE 使用者提供即時求援，有效克服撥打 119 報案電話時因語言不通，錯失黃金救援時間之困境，真可謂「台灣最美的風景是人」一句之最佳實踐。此項服務不單簡化了繁雜的健康照護程序，一條龍式的整合搭配「以人為本」的設計理念更凸顯科技始終來自於人性，人機互動密不可分的關係。最終評審給予 Finic 團隊的評語為：「清楚的定義情境跟故事並整合許多 APIs、System design 也在短時間內清楚呈現出來。」以紮實的技術為基礎，搭配能彰顯台灣民眾熱心助人特質別出心裁的功能規劃，正是 Finic 團隊能勇奪第一名的關鍵。

根據協辦單位 DeepQ 使用經驗經理陳韻如所述，能解決人類真正問題的設計需自探索使用者需求出發，此次競賽以分享工作坊的方式帶領學生們從實際用戶個案找尋問題、發想解決方案，過程中學生們展現的小組團隊合作、快速組織與提出解決方案等能力皆著實令人驚嘆。LINE 台灣研發工程團隊亦表示，能透過產學合作的過程與學生交流互動，進行創意發想激盪，藉此找到優秀的工作夥伴，可謂一舉數得。為期數日的國際黑客松創意競賽不僅落實產學合作之目標，更提供學界與業界橋接之管道，引領學子進入職場的同時，再次打破學校單為知識殿堂之框架。也再次恭喜於本次競賽榮獲佳績的 Finic 團隊！



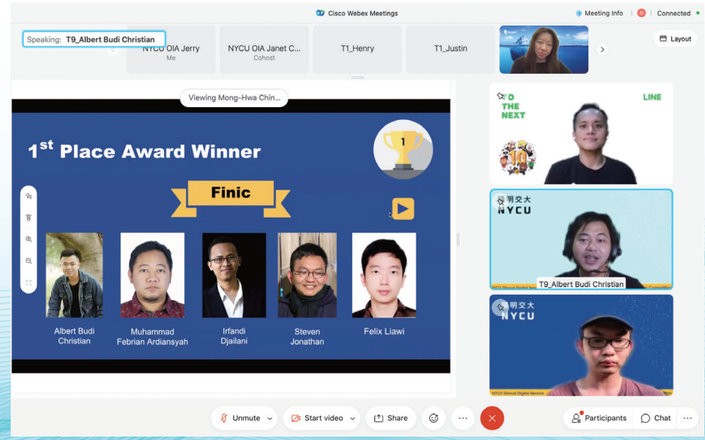
CS Team Won First Prize from International Hackathon

National Yang Ming Chiao Tung University (NYCU) held the international Hackathon for the first time recently for domestic and international students. Students from around the world including Haiti, Indonesia, India, and other countries and different schools such as National Yang Ming Chiao Tung University, National Taiwan University, and National Tsing Hua University signed up and participated in the contest. A team called “Finic”, consisting of 5 members including Albert Budi Christian, Muhammad Febrian Ardiansyah, Steven Jonathan, Felix Liawi, and Irfandi Djailani from the Electrical Engineering and Computer Science, the Department of Computer Science, and the Department of Business Administration at National Yang Ming Chiao Tung University and National Central University won first prize from this fierce contest with a health care service project.

The international Hackathon, held by LINE and DeepQ Technology Corporations, aimed to brainstorm students’ innovative ideas with business industries to create value for society. The event was also sponsored by Delta Electronics, Inc., Micron Technology, and Spring Foundation of NCTU. Among the sponsors, Spring Foundation of NCTU particularly established a special award for innovation for the top 3 winning teams to encourage students’ creativity abilities for business start-ups. To meet the needs for the social development trends with technology, contesters were encouraged to use Line chatbot and Open Data to conduct projects in areas of Digital Transformation and Health-Care Systems. Although the event switched to online due to the Covid-19 pandemic, everyone still took this contest seriously by trying to complete the projects on time with their best efforts to win judges’ hearts.

After the long 40 hours, Finic won the contest with a health care service project, which was similar to the mobile application of Taiwan Centers for Disease Control. The service includes a hospital finder, medical record, QR code scan, online healthcare consultation services, and Panic Button for emergency service. Especially, the function of Panic Button can be used with cell phone position tracking systems to search for help among LINE users. It can solve the problem if patients cannot speak on the phone when dialing 119 during the golden hour in an emergency. This helpful and thoughtful service also corresponds to the quote, “the most beautiful scenery in Taiwan is people. There are many advantages of using this service. First, it simplifies and shortens the procedure of health services. Second, it has a one-way service that is convenient for everyone. Finally, it is based on the needs of local citizens, which echoes the famous slogan “technology is derived from humanity.” The comment team Finic received from the judges was “they were able to define the contexts and stories clearly. Also, APIS and System Design were presented in detail within the time limit in their project.” Overall, Finic aimed to provide helpful service to people, with their solid foundation and skills, it was the key to win first prize.

Yun-Ju Chun, the UX manager of DeepQ Corporation said the products on the market are usually based on users’ needs to solve the problems. During this contest, she offered a workshop to guide students to find questions and come up with solutions through different real cases. She was very impressed with students’ performances such as collaborating to come up with great ideas in a short time. Furthermore, the research and development team of LINE Corporation indicated that it was great to be able to work together with those students in the contest. By exchanging innovative ideas together, they thought it was also a fantastic way to find future work partners. Overall, International Hackathon provided an opportunity for Industry-Academy Cooperation. While introducing industries to students, it also provided students with actual skills outside of class. Well done and congratulations to Finic!



資工系學會活動大集合

文／郭光祥 資工系學會前會長

交大資工系學會是大二、大三組成的學生自治性團體，主要負責舉辦各種活動凝聚系上同學感情、擔任系上與學生之間的溝通橋樑、維護考古題系統等等服務系上同學，以下為我們近一年辦理的活動集錦：

選課大會

新生入學肯定對課程、學分有滿滿的疑問，我們整理好學分、課程等規則分享給新生，也實際操作選課系統讓大家快速熟悉如何選課，也推薦各種選修、必修、通識課給新生作為選擇。

直屬相見歡

每個新生都會依照學號安排一位大二的直屬，透過這個關係讓新生更融入大學生活，任何問題也能快速解惑，這個活動把直屬們聚在一起凝聚感情。

系內抓馬盃

抓馬盃就是戲劇比賽，透過各班自行籌組一齣搞笑的戲劇來進行競爭，這個活動非常有效提升與凝聚各個班級的感情，也能讓多才多藝的新生展現自我，盡情的表現自己的演技。另外，系上也有參加校際活動「抓馬盃新生戲劇比賽」獲得全校第三名的佳績。

企業參訪

每學期都會找 IT 相關的企業洽談合作，並安排企業實地參訪，今年參訪微軟、緯創軟體、趨勢科技、Decard 這四間國內外知名企業。讓同學了解業界與公司的環境，透過與企業交流的過程中深入了解產業界對人才的需求與要求，讓同學更充分地思考未來職涯發展方向及早儲備相關技能。

競賽周活動

我們策畫了一系列大學生很有興趣的主題活動，包括麻將、乙醇小畫家、英雄聯盟線上賽等。讓同學在課業壓力之外，也能透過休閒娛樂活動凝聚感情和競爭同樂。

工作坊

這次系學會首次和系上合作舉辦工作坊活動，我們選定攝影、調酒知識與入門、投資入門等議題，邀請知名講師舉辦工作坊，讓同學更多管道培養多元興趣與能力。

Events at CS Student Association

The Student Association of the Computer Science Department is a voluntary group. Joined by 2nd and 3rd year students from our department, we aimed to build up connections among CS students by holding activities and providing a variety of services. The following are the events and activities that took place during this year.

Course Selection Help Station

In the course selection help station, we shared information about selecting courses and calculating course credits to freshman students because it can be confusing to newcomers at the beginning. We also demonstrated the school's online course system to help new students to be more familiar with the school system. In addition, information about compulsory courses, elective courses, and general education courses at our department were also introduced and shared at the help station.

Meeting up with "Student Family Group"

In this event, we held a gathering for CS student family groups. According to the tradition in our department, every freshman student is usually assigned to a student family group with a 2nd year student. The purpose is to help new students to be familiarized with the campus environment quickly and to be looked after under 2nd year students' guidance. All of them had a great gathering at this event.

Drama Competition

Drama competition was an interesting activity which every class from the CS department competed with each other through acting out a comedy drama. It was a great activity for new students to get to know each other quickly. Also, many talented new students were able to perform in front of audience. With the wonderful experience, these students went on to compete in an interscholastic drama competition and won the third prize.

Industry Field Trip

Our association collaborates with IT industries and arranges field trips to visit companies every semester. This year we visited companies including Software, Wistron ITS, Trend Micro Inc., and Dcard . Through these field trips, students gained more understanding about the working environment in the industry. Thus, it could also help them to plan their future career at an early stage.

Theme Competition

Theme Competition is a series of competitions with different themes, including Mahjong, Ethanol painter, and League of Legends. The purpose of this activity was to reduce students' stress and help them have a good time with classmates.

Workshop

The Student Association of Computer Science Department worked with the CS
department to hold workshops for CS students to cultivate their interests in many
different areas. In this year, we invited many well-known lecturers and held workshop
including photography, bartending, and financial investment.

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。

一、人事動態

◇ 為使本院資訊領域的研究能量與專業技術能與陽明校區在醫學相關領域的各學院充分的合作，本院於陽明校區設立「跨校區合作推動辦公室」，並由施仁忠副院長兼任辦公室主任。

二、國際交流

◇ 美國 Facebook Chia-Yang Tsai 博士於 2020 年 11 月 16 日於本院演講，講題為：「Beyond AV1 at Facebook」。

◇ 美國北卡羅來納州立大學 (North Carolina State University) Shih Chun Lin 博士於 2020 年 11 月 29 日於本院演講，講題為：「Machine Learning in 6G Wireless Networks」。

◇ 美國聖地牙哥加利福尼亞大學 (University of California, San Diego) 鍾子平教授於 2020 年 12 月 4 日於本院演講，講題為：「Machine Learning for Electrophysiological Data Analysis」。

◇ 美國南佛羅里達大學 (University of South Florida) Kwang-Cheng Chen 教授於 2020 年 12 月 18 日於本院演講，講題為：「Wireless Multi-Robot Systems in Smart Factories」。

◇ 加拿大蒙特利爾大學 (University of Montreal) Chin-Wei Huang 先生於 2020 年 12 月 28 日於本系演講，講題為：「Flows and Friends: A Unifying Perspective of Likelihood-Based Generative Models」。

◇ 美國北卡羅來納大學夏洛特分校 (University of North Carolina at Charlotte) Babu 教授於 2021 年 1 月 8 日與本系學術交流 VR, Health, Aging Workshop。

◇ 美國 Quantstamp Inc Martinet Lee 資深工程師於 2021 年 3 月 24 日於本系演講，講題為：「Securing the Blockchain Space and the Decentralized Finance」。

◇ 美國華盛頓大學 (University of Washingto) 黃正能教授於 2021 年 4 月 7 日於本系演講，講題為：「When 5G Meets with Big IoT Data for 3D World」。

◇ 美國 IBM Thomas J. Watson 研究中心 Pin-Yu Chen 博士於 2021 年 6 月 1 日於本院演講，講題為：「Adversarial Robustness of Deep Learning Models」。

◇ 美國紐約州立大學 (University at Albany) 張明清教授於 2021 年 6 月 2 日於本院演講，講題為：「AI Video Analytic Research in the SUNY Albany CVML Lab」。

◇ 美國伊利諾大學芝加哥分校 (University of Illinois Chicago) Philip S. Yu 教授於 2021 年 7 月 23 日於本校演講，講題為：「Broad Learning: A New Perspective on Mining Big Data」。

◇ 韓國首爾大學 (Seoul National University) Seungwon Hwang 教授於 2021 年 7 月 23 日於本校演講，講題為：「Language Model for NLP: Opportunities and Limitations」。

三 . 教師榮譽

◇ 陳志成教授榮獲 110 年度中國工程師學會傑出工程教授獎！

◇ 吳毅成教授榮獲 109 年度科技部傑出研究獎！

◇ 王協源教授、林彥宇教授榮獲第十九屆有庠科技論文獎！

◇ 陳冠文教授榮獲 109 學年度傑出教學獎。

◇ 張永儒教授、黃俊穎教授榮獲 109 學年度優良教學獎。

◇ 游逸平教授、蔡文錦教授榮獲 109 學年度院傑出教學獎。

◇ 施仁忠教授、莊仁輝教授、曾文貴教授、謝續平教授、王昱舜教授、黃敬群教授榮獲教育部 110 年資深優良教師。

◇ 易志偉教授、彭文志教授、曾煜棋教授、洪瑞鴻教授、吳毅成教授、李奇育教授、吳凱強教授團隊榮獲科技部未來科技獎！

◇ 范倫達教授參與國際高教培訓課程與認證，榮獲英國 Advance HE Fellowship!

四、學生榮譽

◇ 林文杰教授、王浩全教授指導唐千琳同學榮獲 The Web Conference 2021 (WWW'21) 最佳學生論文獎！

◇ 陳永昇教授、謝君偉教授指導陳平揚同學榮獲 ITAOI 2021 最佳論文獎！

◇ 陳永昇教授、謝君偉教授指導陳平揚同學榮獲 NCWIA 2021 最佳論文獎！

◇ 黃世強教授指導蔡承恩同學榮獲科技部 109 年度大專學生研究計畫研究創作獎。

◇ 張立平教授指導郭競友同學榮獲科技部 109 年度大專學生研究計畫研究創作獎。

◇ 顏狩耑、安費布、沈迪恩、潘建琿等同學榮獲本校國際黑客松創意競賽冠軍。

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.

1. Personnel Changes

· To effectively leverage the technology expertise and research momentum of the college of Computer Science to build up strong collaboration with the colleges in medical-related fields at Yang Ming Campus, the College of Computer Science has established a "Promotional Office for Cross-campus Collaboration" at Yang Ming campus, and appointed Associate Dean Zen-Chung Shih of the College of Computer Science as its new director.

2. International Collaboration

· Dr. Chia-Yang Tsai of Facebook delivered a speech, titled "Beyond AV1 at Facebook'', for the College of Computer Science at NYCU on Nov. 26, 2020.

· Dr. Shih-Chun Lin (North Carolina State University) delivered a speech, titled "Machine Learning in 6G Wireless Network", for the College of Computer Science at NYCU on Nov. 29, 2020.

· Dr. Tzyy-Ping Jung (UCSD) delivered a speech, titled "Machine Learning for Electrophysiological Data Analysis", for the College of Computer Science at NYCU on Dec. 4, 2020.

· Dr. Kwang-Cheng Chen (University of South Florida) delivered a speech, titled "Wireless Multi-Robot Systems in Smart Factories", for the College of Computer Science at NYCU on Dec. 8, 2020.

· Mr. Chin-Wei Huang (University of Montreal) delivered a speech, titled "Flows and Friends: A Unifying Perspective of Likelihood-Based Generative Models", for the College of Computer Science at NYCU on Dec. 28, 2020.

· Professor Babu (University of North Carolina at Charlotte) joined the VR, Health, Aging Workshop of the College of Computer Science at NYCU on Jan. 8, 2021.

· Mr. Martinet Lee, a senior engineer at Quantstamp Inc, delivered a speech, titled "Securing the Blockchain Space and the Decentralized Finance", for the College of Computer Science at NYCU on March 24, 2021.

· Professor Jenq-Neng Hwang, University of Washington, delivered a speech, titled "When 5G Meets with Big IoT Data for 3D World", for the College of Computer Science at NYCU on April 7, 2021.

· Dr. Pin-Yu Chen, IBM Thomas J. Watson Research Center, delivered a speech, titled " Adversarial Robustness of Deep Learning Models", for the College of Computer Science at NYCU on June 1, 2021.

· Professor Ming-Ching Chang, University at Albany, delivered a speech, titled "AI Video Analytic Research in the SUNY Albany CVML Lab", for the College of Computer Science at NYCU on June 2, 2021.

· Professor Philip S.Yu, University of Illinois Chicago, delivered a speech, titled "Broad Learning: A New Perspective on Mining Big Data", for the College of Computer Science at NYCU on July 23, 2021.

· Professor Seungwon Hwang, Seoul National University, delivered a speech, titled " Language Model for NLP: Opportunities and Limitations", for the College of Computer Science at NYCU on July 23, 2021.

3. Faculty Honors

· Professor Jyh-Cheng Chen was awarded the outstanding Engineering faculty award of the Institute of the Chinese Institute of Engineering, 2021.

· Professor I-Chen Wu was awarded the 2021 Outstanding Research Award of the Ministry of Science and Technology.

· Professor Shie-Yuan Wang and Professor Yen-Yu Lin won the 2021 Y. Z. Hsu Science Paper Award.

· Professor Kuan-Wen Chen was awarded the Outstanding Teaching Award of National Yang Ming Chiao Tung University, 2020.

· Professor Yung-Ju Chang and Professor Chun-Ying Huang were awarded the Excellent Teaching Award of National Yang Ming Chiao Yung University, 2020.

· Professor Yi-Ping You and Professor Wen-Jiin Tsai were awarded the Outstanding Teaching Award of College of Computer Science, NYCU, 2020.

· Professor Zen-Chung Shih, Professor Jen-Hui Chuang, Professor Wen-Guey Tzeng, Professor Shiuhpyng Shieh, Professor Yu-Shuen Wang, and Professor Ching-Chun Huang were awarded the 2021 Excellent Teacher Award by the Ministry of Education.

· The team of Professor Chih-Wei Yi, Professor Wen-Chih Peng, Professor Yu-Chee Tseng, Professor Jui-Hung Hung, Professor Professor I-Chen Wu , Professor Chi-Yu Li, and Professor Kai-Chiang Wu was awarded the Future Tech Award of the Ministry of Science and Technology.

· Professor Lan-Da Van received the Higher Education Academy (HEA) Fellow.

4. Students Honors

· Chien-Lin Tang, advised by Professor Wen-Chieh Lin and Professor Hao-Chuan Wang, was awarded the Web Conference 2021 (WWW'21) for Best Student Paper Award.

· Ping-Yang Chen, advised by Professor Yong-Sheng Chen and Professor Jun-Wei Hsieh, was awarded the ITAOI 2021 for best paper.

· Ping-Yang Chen, advised by Professor Yong-Sheng Chen and Professor Jun-Wei Hsieh, was awarded the NCWIA 2021 for best paper.

· Cheng-En Cai, advised by Professor Sai-Keung Wong, was awarded the University Student Research Award, 2020.

· Ching-Yu Kuo, advised by Professor Li-Pin Chang, was awarded the University Student Research Award, 2020.

· AlbertBudi Christian, Muhammad FebrianArdiansyah, Steven Jonathan, and Felix Liawi win the National Yang Ming Chiao Tung University International Hackathon Online Competition.

捐款意願書

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我們誠摯邀請學長姊們共襄盛舉，一同支持本院所發起的募款活動，協助培育學弟妹們為未來產業之棟樑。

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- 帶動本院學生出國交換學習風氣，把國際經驗與競爭刺激帶回交大
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