

國立陽明交通大學 資訊學院 2021.04

College of Computer Science,  
National Yang Ming Chiao Tung University

# 陽明交大資訊人

## NYCU CCS MAGAZINE

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## 目 錄

## Contents

▶ <b>院長的話 / Dean's Message</b> .....	02
提升國際影響力 Enhance International Influence	
▶ <b>產學合作 / Industry Collaboration Project</b> .....	04
醫療領域未來之星 智慧醫療 iDeepCare AI Medical's Future Star, iDeepCare	
「溫」故知新：台灣研究團隊打造 AIoT 智能溫控新時代 Gain New Insights Through Reviewing the Past: Enhance Temperature-Sensitive Manufacturing Productivity and Quality through Industrial Big Data and Artificial Intelligence	
▶ <b>教師專訪 / Interview with Faculty</b> .....	10
謝秉均老師：持續探索 找到自己喜歡又擅長的事 Dr. Ping-Chun Hsieh: Keep Exploring until You Find Your Passion	
▶ <b>資訊系友 / Alumni</b> .....	12
【系學會全新企劃 X 誰來晚餐】吳銘雄 — 驚奇有趣才是人生！ <New Project of the Student Association X Guess Who's Coming to Dinner> Mayor Wu - Make Your Life More Interesting and Exciting!	
▶ <b>科普軼聞 / Science Column</b> .....	16
量子計算的源頭 - 波爾叔叔 The Origin of Quantum Computing-Uncle Bohr	
三位女性密碼專家 Three Female Cryptanalysts	
▶ <b>活動花絮 / Activities</b> .....	20
學生用專業回饋社會 架網站關懷社會議題 CS Students Establishing Long-Term Care Websites to Give back to the Society	
資工專題競賽 創意滿點 Computer Science Project Contest: Innovation Everywhere	
2020 出國交換經驗分享會 2020 Overseas Experience Sharing Session of International Exchange Students	
學術國際化經驗分享 Sharing Academic Internationalization	
參與國際會議 鍛鍊學術英文 Attending International Conferences to Build Up Academic English Skills	
資工系首推英語學術能力課程 提升國際競爭力 CS Offered Academic English Program to Enhance Students' Global Competitiveness	
CGI Lab 團隊再創佳績！抱走 AWS DeepRacer 世界冠軍 The Team of CGI Lab Makes Another Great Achievement! Taking Home the 2020 AWS DeepRacer Championship	
CS+X 跨界合作 2020 交大物聯網科技藝術節 CS+X Cross Departmental Collaboration: 2020 NCTU IoT TechArt Festival	
▶ <b>院系消息 / News</b> .....	40
▶ <b>募款計畫 / Donation</b> .....	42

# 提升國際影響力



陽明大學與交通大學在今年 2 月 1 日正式合校。長久以來，本院為台灣培育許多優秀的科技人才，在電子資訊領域實力雄厚。隨著合校後，除了繼續深化我們在原有領域的影響力外，因為學校變得更多元寬廣，透過更多跨域合作，相信我們在電子資訊領域可以得到新的躍升。例如本期介紹曾新穆講座教授於智慧醫療領域耕耘，以人工智慧多重技術，發展出智慧性疾疾病辨識和風險預測系統。曹孝櫟教授研發 AIoT 智能溫控，將 AI 技術落地，進而帶動產業加值升級。

本院師生獲獎傑出表現亦是本期焦點。曾新穆講座教授當選 IEEE Fellow，本院已有 7 位 IEEE Fellow，十分具有國際影響力。同時本院吳毅成教授帶領學生拿下 AWS DeepRacer 全球自動駕駛賽車聯盟總決賽總冠軍和季軍，為台灣之光。

要成為有影響力的學院，我認為最重要是好好花心力培育學生，例如培養以“project based”

的主動學習，也要培養能說更會做的國際競爭力。本院師生在英語教學及各項國際學術活動參與成果，皆收錄在本期活動報導中。

本院卓越的聲譽是系友們薪火相傳積累而來，在合校後，我們仍傳承著崇實篤行的決然校風，與系友緊密連結。本期介紹彥陽科技執行長吳銘雄學長，事業有成仍時常參與母校活動提攜後進，足為學弟妹學習之楷模。

本院多年來不斷在推行國際化，致力成為具有影響力的一流學院。除了在英語教學及國際研究合作持續推展外，自本期開始，院刊採雙語形式，未來讓更多國內外朋友收到我們訊息，學院觸角更深入世界各地。

資訊學院院長

陳志威

2021.4.15

# Enhance International Influence

The newly formed National Yang Ming Chiao Tung University (NYCU) was launched on Feb. 1st, 2021. Over the past several decades, our college has cultivated many outstanding technology talents in Taiwan, thereby building up the capacity and strength in the fields of Electronics and Computer Science. With the completion of the merger, we would continue increasing our leadership and influence in the existing fields; moreover, as our university becomes more diverse and inclusive, I do believe that we can take a new leap in the fields of Electronics and Computer Science with more cross-disciplinary collaboration. For example, this issue will introduce Chair Professor Vincent S. Tseng's work in the field of smart medical care. A smart disease diagnosis and risk assessment system was developed through integrated technologies of artificial intelligence. In addition, Professor Shiao-Li Tsao developed AIoT intelligent temperature control with the implementation of artificial intelligence, thereby expanding the effect of value-added over the industry.

The outstanding performance of our faculty and students is also the spotlight of this issue. Chair Professor Vincent S. Tseng has been elected as an IEEE Fellow. With 7 IEEE Fellows in our college, we are recognized internationally. Meanwhile, the team of Professor I-Chen Wu of our college won the first-place and third-place awards in the AWS DeepRacer, Global Autonomous Racing League Finals. They are indeed the light of Taiwan.

To become an influential college, the most important job in my mind is to devotedly equip students with the ability of “project based” proactive learning, and global

competitiveness is not only communication skills but also execution. The achievements of our faculty and students' participation in academic English courses and various international academic activities are covered in this issue.

The brilliant reputation of our college is accumulated by the contributions from the graduates, passing down from generation to generation. After the merger, we still inherit the spirit of the university, work pragmatically, and closely collaborate with alumni. This issue will introduce Ming-Hsiung Wu, the chief executive of Promaster Technology Corporation, who is so successful in his career and keeps supporting his alma mater to groom the young talents. He is a role model for our students to learn from.

For many years, our college has been pursuing internationalization in order to become the top tier college with great international influence. Besides the steady promotion of academic English courses and international research collaboration, the CCS Magazine, from this issue, is presented in a bilingual format. As more foreign and domestic friends receive our information in the future, the tentacles of our college will be spread deep into the world.

Dean of the College of Computer Science

2021.4.15

# 醫療領域未來之星

文／高儷玲

## 智慧醫療 iDeepCare



本校數據科學與工程研究所曾新穆教授，帶領團隊執行科技部的「iDeepCare」計畫，藉由醫療影像、生理訊號、病歷醫囑等多面向資料進行探勘分析及機器學習建模，針對慢性病、癌症、突發性疾病等重要疾病，建立兼具高準確性及即時性的早期健康風險偵測與警示系統。而此計畫不僅成功獲選為「科技部 2018 未來科技突破獎」，更在發表於醫學消化內科全球排名第一的期刊 Gastroenterology (Impact Factor: 19.233) 後，榮獲美國路透社專欄越洋採訪，備受肯定。

「iDeepCare」計畫的目標是結合深度機器學習和巨量資料分析技術研發智慧型深層健康照護系統，與國內醫療機構和專家合作，收集各種生醫原始資料建立模型，能實際應用於精準醫療、預防保健、個人化醫療、風險預測等，例如：與三總合作用大腸內視鏡影像建立開發大腸息肉 AI 辨識模型，可輔助醫師辨別息肉的良惡質性，準確率可以達到 96%，判讀速度可達 0.5 秒以下的即時性；另外和北榮合作心律不整預警系統，則能預測高風險猝死的布魯蓋達氏症候群心電圖表現，一般內科訓練醫師判斷準確率只有 47.5%，透過 AI 機器卻可達 75%。

談及本次計劃與多家醫療機構合作，曾新穆

教授表示，過去在軟硬體環境尚未成熟時，相關發展受限於運算速度、模型建立等問題，而如今隨著人工智慧相關技術日益進步，漸漸開始與一些國際知名的研發機構合作，並運用數據科學協助改善經營管理及提升創新應用，才有今日與多家醫療院合作的緣分。

面對外界質疑台灣相對於美國、中國等大國運算資源較不足，要如何在人工智慧領域中競爭，曾新穆教授則說：「我們能靠演算法的設計及領域知識的結合取勝，像是智慧醫療領域，台灣的醫療人才非常強，結合夠深的領域知識，搭配良好設計的演算法，我們比起其他大國也不會遜色。」

過去不少醫療診斷因為誤診或未能及早發現，不僅造成病情更為嚴重，也增加醫療資源的消耗。而 iDeepCare 系統及相關技術可整合開發為智慧醫療領域所需要的智慧型診斷輔助系統，在醫療照護端可降低誤診率及提高診斷效率。在產業應用性上，在病人端可及早發現疾病及早治療並降低醫療耗費；在資訊服務產業則可擴展開發為各種醫療分析系統，與現有的 HIS 醫院資訊系統、PACS 影像系統、CIS 臨床資訊系統等相結合及加值，並可拓展至全球之智慧醫療產業。

# AI Medical's Future Star, iDeepCare

The Ministry of Science and Technology research project "iDeepCare" led by Dr. Vincent S. Tseng, the Professor of the Institute of Data Science and Engineering of National Yang Ming Chiao Tung University, aims to develop an Intelligent Deep-level Healthcare system and mechanisms based on artificial intelligence (AI) technologies through clinical physiology, medical imaging, and medical advice literature to increase the accuracy and efficiency of biomedical data analysis, such as in chronic diseases, cancer, and suddenly critical illness. The iDeepCare project was awarded with FutureTech Breakthrough Award by Ministry of Science and Technology in 2018. Furthermore, part of this work was published in Gastroenterology (Impact Factor: 19.233), the top journal in the field of gastrointestinal diseases. Dr. Tseng was later interviewed by Reuters too because of his significant achievements on this work.

Working with domestic medical care institutions and experts, the objective of iDeepCare is to combine Machine Learning and Big Data Analytics to develop a smart healthcare system. By constructing models based on big data of biomedicine, it can be applied in the field of precision medicine, healthcare prediction, personalized medicine, and disease early detection. The smart healthcare system with high accuracy of early detection for health risks is expected to result in significant contributions in the field of precision medicine. Take Dr. Tseng's project as an example, the application of AI in colorectal polyp detection established together with Tri-Service General Hospital can help doctors identify the histological type of polyps with 96% accuracy within less than 0.5 seconds. Another collaboration project his team worked together with Taipei Veterans General Hospital has developed an arrhythmia warning system. It can predict a high-risk cardiovascular disease called Brugada syndrome (BrS) with an accuracy rate of

75% through AI machines, whereas only 47.5% of an accuracy rate is estimated by licensed physicians because of the complexity. Dr. Tseng said that this project would have been limited in the past because the relevant technology was underdeveloped, and it would encounter difficulties such as computation speed and model construction. Now with the advance of AI, he and his team have started collaborating with world-renowned research institutions using data science methods to enhance management and innovations of the fields in biomedicine. That brought them the opportunities to work with many medical institutions later on.

Considering that Taiwan's computational resources are limited compared to other countries like America and China, many people have questioned our potential in the AI market. In response to that concern, Dr. Tseng held a positive view of the future. He said, "Algorithm design and domain knowledge play vital roles in Taiwan's AI future development. For instance, we have distinguished human resources in the medical field so that we can combine knowledge in medicine with well-designed algorithms to outperform in the market". In the past, patients might have been misdiagnosed from time to time. It could cause more serious conditions and more unnecessary resources are consumed in medical care. iDeepCare and the underlying technologies can lower misdiagnosis rates and enhance higher accuracy and efficiency of biomedical data analysis. This smart system can be applied in many aspects in the medical field. For example, patients are likely to be diagnosed earlier and spend less medical treatment fees. Furthermore, medical analysis systems in information services can be combined with Hospital Information System (HIS), Picture Archiving and Communication System (PACS), and Clinical Information System (CIS) to expand AI in medical development globally.

# 「溫」故知新：

## 台灣研究團隊打造 AIoT 智能溫控新時代

文／科技部提供

近年來數位科技領域之蓬勃發展，先進國家均投入大量資源開發各種數位科技前瞻關鍵技術，配合行政院科技會報辦公室「數位國家·創新經濟發展方案」(DIGI+) 方案，科技部推動大數據、人工智慧、物聯網等關鍵技術開發，促使學術界團隊與產業界共同研究合作，協助企業開發數位相關系統或產品，落實產業之需求，以提升國內技術競爭力。

工業製造流程中經常出現高精度之溫控生產步驟，而溫度敏感性生產牽涉參數間複雜的互動，因此常仰賴老師傅的經驗，透過頻繁量測與停機校正來確保生產品質。在科技部「數位經濟技術創新研發與應用」專案計畫的支持下，國立陽明交通大學資訊工程學系團隊研發「工業物聯網溫控生產預測技術」，透過物聯網 (IoT) 蒐集工業大數據 (Big Data)，並成功運用人工智慧 (AI)

技術建立溫控生產之即時品質監控與預測系統，不但大幅縮減煩瑣的人工測溫與校正流程，還能“溫”故知新，根據過往的製造經驗，預測從未生產過產品的製程參數，協助工廠快速進入新產品量產階段。本計畫開發之工具與流程已在百條產線落地，實證研發成果帶來溫控生產品質與效率的顯著提升。

溫控生產主要的挑戰在於生產品質和生產標的物承受的溫度和時間有關。而製造過程中，我們僅能控制生產設備的加溫曲線，這與生產標的物實際接受到的常有不同。無法精準掌握即時環境、設備，甚至於生產標的物的變動，便造成了生產品質的下降。雖然透過頻繁和定期的量測和調校，或由經驗豐富的工程師持續觀察與修正，可以確保生產品質，但無形中也增加了設備與人力的負擔。更重要的是，大量新產品的推出帶給

製造端很大的困擾，新產品的導入需透過嘗試錯誤 (trial and error) 才能讓生產穩定，而製程參數設計與優化往往耗費相當多的時間、人力與物力。為此陽明交大資工研發團隊投入溫控生產研究多年，透過安裝少量但關鍵的物聯網感測裝置，捕捉溫控生產環境與過程之動態特性，累積工業生產大數據，並運用人工智慧技術建立溫控生產之即時生產品質監控與預測系統，除了免除人工測溫與校正流程，精準掌握每一個產品的生產品質外，還能根據過往的製造經驗，預測從未生產過產品的製程參數，快速進入新產品量產階段。

研發團隊以印刷電路板 (Printed Circuit Board Assembly, PCBA) 生產為例，說明本研發成果帶來產能和品質突破性的提升。近來年電子產品面對嚴苛的生產要求，無論是少量多樣造成換線 / 調機頻繁，品質規格隨著產品特性如車規、醫規逐年提高，產品大小如穿戴式、主機等差異巨大，這些特性讓生產難度提高，製程配方設計困難。其中關鍵步驟『表面黏著技術 (Surface Mount Technology, SMT)』被廣泛應用於印刷電路板的生產中，簡單來說，SMT 製程便是將電子零件黏著在塗滿錫膏的印刷電路板上，透過回流爐 (Reflow Oven) 高溫加熱進行回流焊接 (Reflow Soldering)，將電子零件緊緊固定在板卡上。而回流爐的溫度控制是最為關鍵的項目，過高的溫度可能導致電子零件的損壞，而不適當的溫度或加熱速度則可能造成焊接缺陷。為了確保產品的良率，SMT 工程師需要為每種產品個別設計專屬的製程參數，並在回流爐產線上反覆測試，佔用許多寶貴時間。

為了協助產業界升級電子產品製程，將「工業物聯網溫控生產預測技術」應用於 SMT 產線，主要技術亮點在於下列三項。

### 人工智慧溫度預測模型達到 100% 的生產履歷追蹤

研發的溫控生產預測技術在回流爐加裝溫度感測器，結合熱力學模型與機器學習模型，以人

工智慧建立個別印刷電路板之溫度預測模型，即時精準推論每一片板卡的生產溫度曲線。有別於傳統需要在每次生產前花費時間測溫，並只能紀錄單一產品的溫度曲線，本系統透過即時感測，便可自動化達到 100% 的生產履歷追蹤。

### 工業製程大數據分析協助新產品快速導入

過去對於全新板卡產品的生產，需要透過反覆的試生產和調整，導入時間與花費都相當可觀，本溫控生產預測系統累積足夠多生產與製程參數資訊後，可以進一步透過機器學習分析印刷電路板設計、回焊爐製程與實際產品溫度變化的關係，推薦新產品的製程參數，協助工廠收斂製程參數，將新產品導入快速推進到量產階段。

### 與產業密切合作將技術落地

透過與研華科技的密切合作，一開始便深入工廠了解產線運作流程，取得第一手資料進行分析。研發團隊選定實際用於量產印刷電路板的 SMT 產線進行技術導入，在不影響到產線生產的情況下安裝感測器與部署系統，以即時的生產資料驗證技術與完善系統，排除實務上遇到的各種問題。因此，當系統的準確性與效能被驗證完成之後，便可以快速地複製到各地工廠的多條產線上，讓技術真正落地，帶來立即、顯著的效益。

陽明交大團隊與研華科技等四家廠商共同合作，透過工廠產線的實際導入，在大量場域數據的驅動下，成功建立了回流爐製程即時生產品質監控與預測系統，目前已經部署到全球各地超過 7 個工廠，100 條以上產線，總體效益已超過每年 5,000 萬。創新工業人工智慧 (Industrial AI) 應用的擴散，尚需考慮到異質設備與不同場域的物聯網和數據整合，快速 AI 模型的建立與部署，AI 模型的持續修正與維護，這些皆仰賴平台技術的加速，本計畫積極與研華科技工業雲端平台 (WISE-PaaS) 合作，將本研究成果「工業物聯網溫控生產預測技術」以 WISE-Marketplace APP 的形式上架並對外推廣，期待帶動溫控生產工藝的升級，創造更高的產業效益。



▲ 合影左起為研華科技楊瑞祥技術長、國立交通大學資訊工程學系曹孝傑教授、科技部工程司徐碩鴻司長、「數位經濟技術創新研發與應用」計畫辦公室楊得年領域召集人。

## Gain New Insights Through Reviewing the Past: Enhance Temperature–Sensitive Manufacturing Productivity and Quality through Industrial Big Data and Artificial Intelligence

High-precision temperature control process is commonly applied to industrial manufacturing. To guarantee the quality of temperature-sensitive manufacturing, it often leverages veteran engineers' experiences by frequently adjusting configuration which also implies suspending running machines. Thanks to the support of Digital Economy Project from Ministry of Science and Technology (MOST) of Taiwan, the research team at Department of Computer Science, National Yang Ming Chiao Tung University (NYCU) developed "Industrial IoT Temperature Control Mechanism for Production Prediction" to collect Industrial Big Data and establish a real-time production monitoring & prediction system based on artificial intelligence (AI). With the system, the complicated manual process of thermal profiling and calibration could be significantly reduced. Moreover, the parameters of manufacturing process for new products could be estimated based on historical manufacturing records, and therefore the process from new production introduction (NPI) to stable and mass manufacturing would be accelerated.

The challenge of high-precision temperature control production is that production quality is greatly related to the precise regulated temperature and time on target product. However, only the temperature of heating device can be well controlled. The heating temperatures are often different from what the target

products suffer. The rough temperature control of facilities and environment could result in the production degradation. To achieve stable production, veteran engineers must frequently observe the production behaviors and adjust the process parameters. It increases the load of both facilities and labors. Moreover, the mass NPI keep engineers occupied to optimize the process parameters for each new production because the procedure of NPI depends on trial and error before an available recipe obtained. To solve the issues, the research team of NYCU CS have been investing several years in temperature-sensitive production. With some critical IoT sensors, the dynamic properties of process and environment in temperature-sensitive production can be captured. Thus, the real-time production monitoring & prediction system is created based on Industrial Big Data and AI. With the system, many complicated processes of manual profiling and calibration can be omitted while the quality of each product is monitored precisely. Furthermore, the process parameters of new product, which is never manufactured, can be easily estimated based on the past manufacturing records, and the mass manufacturing stage can be quickly achieved.

Take Printed Circuit Board Assembly (PCBA) for example, the diversity of electronic product brings strict production restrictions while the quality requirements are continuously increasing. It is difficult

to design suitable recipe of manufacturing process quickly to achieve good production quality with complicated and various product properties. Surface Mount Technology (SMT) is a critical procedure for PCBA production and has been widely used. In SMT procedure, electronic components are placed on a Printed Circuit Board (PCB) that solder paste has been spread on. Then the board will pass through the reflow oven under high temperature for soldering to attach the electronic components to the board solidly, and the temperature control is the most critical point. Overheating could damage the electronic components and insufficient heating behaviors could result in solder defects. To guarantee the product quality, SMT engineers must design specific process parameters for each product and verify it on production line; therefore, the efficiency of SMT production is decreased.

In this project, "Industrial IoT Temperature Control Mechanism for Production Prediction" is applied on SMT production line to assist industry in enhancing process of electronic products, and three highlights should be pointed out.

First, Intelligent Sensing with Hybrid Models. Thermal sensors are installed in reflow oven to capture real-time temperature curves. Combing thermodynamic and machine learning models, temperature prediction model of particular PCBA could be created, and real-time temperature curves for each product would be estimated. Different from the conventional approach, where only one sample board are recorded with frequently manual profiling, the proposed system could achieve 100% production history tracking based on real-time sensing and monitoring.

Second, Industrial Big Data Analysis. Repeated production trials and adjustments are required for introducing entire new PCBA and cost considerable time and money. With the proposed system, the massive data from IoT devices and industrial process of manufacturing can be efficiently collect for further

analysis via machine learning. The PCBA designs and reflow soldering process are studied; therefore, the process parameters of new PCBA product could be easily recommended and enter to mass manufacturing stage quickly.

Third, Real Field Application Driven. In this project, the research team closely collaborates with Advantech Co., Ltd. to study real manufacturing processes in depth and obtain firsthand data. The SMT production lines for PCBA mass manufacturing are selected for applying the proposed technology. The system and the sensors are deployed without affecting the regular production, and the system is continuously enhanced and verified with real-time production data. The real issues are immediately solved in this process; therefore, the system can be quickly duplicated to all production lines while the accuracy and efficiency has been verified. It brings instant and significant benefit.

Under the collaboration with four companies in this project, the real-time reflow production monitoring & prediction system has been created successfully based on the massive field data. The system has been introduced into more than 100 production lines, 7 factories around the world, and the overall benefit could exceed NTD 50M. For spreading novel industrial AI applications, several topics should be well studied, i.e., integration of heterogeneous facilities and fields, rapid creation and deployment of AI models, continuous enhancement and maintenance of AI models. The research team aggressively collaborate with Advantech Co., Ltd. to leverage its WISE-PaaS, which is a cloud platform for accelerating industrial AI applications. The proposed "Industrial IoT Temperature Control Mechanism for Production Prediction" would go on the market as WISE-Marketplace APP for promotion. We are looking forward to promoting the upgrade of temperature-sensitive manufacturing and raising industry benefit.

## 謝秉均老師： 持續探索 找到自己喜歡又擅長的事

文／高儷玲

### 兩次轉換領域 追求內心志向

擁有德克薩斯州 A&M 大學電機博士學位的謝秉均教授，回憶求學生涯中兩次影響深遠的轉換領域經驗。碩士畢業後，謝教授到一家新創公司工作擔任類比電路設計工程師，工作期間他深刻體會到，電路設計的開發時程相當漫長，從設計到初步產出往往需要半年至一年的等待，且需要投入大量時間、確認各種 design rule 細節。在發覺自己並不適合這種研究型態後，他選擇停下腳步重新思索自己真正想做的方向，最後毅然決定轉而投入網路最佳化的領域。

第二次轉換領域，是在讀博士班的第四年，儘管當時已有一些不錯的研究成果，但他一直對於研究成果感到不踏實。「雖然我能找到最佳策略的網路演算法，但這個『最佳』總是需要建構在許多模型假設上」謝秉均教授說道。而藏在內心深處已久的問題慢慢地浮現「是否有機會在極少的模型假設下，仍然可以找到最佳策略？」同年，在因緣際會下接觸到強化學習後，回到台灣並專注於其研究。

### 從回答問題到提問 再定義問題

「我覺得專業知識的傳授是相對容易的，而真正不容易培養的是問問題和定義問題的技能。」謝秉均教授同時強調，往往研究問題的架構設定 (problem formulation) 有大概率就已經決

定研究題目的價值。因此教學上謝秉均教授喜歡採用問答的方式，不但能刺激學生主動去思考，上課也會有比較多互動不無聊，更重要的是能讓學生第一手體會和拆解經典知識材料，以及他們回答問題所獲得的成就感。這同時也能作為問題範本讓學生參考，進而漸漸熟悉如何提問和定義問題，而在作業設計上亦是如此。

### 給學生的建議：持續探索 多做加法

強化學習領域中有一個重要的觀念是「exploration-exploitation tradeoff」，簡單地說，若想在未知環境中找出最大化獎勵的策略，持續探索尚未熟悉的領域是必要的，而大學正是探索最佳的時間點，每一次修課、做專題、聽演講、參加活動都是探索潛在喜愛和擅長的領域的機會。因此謝秉均教授鼓勵同學多做加法、少做減法，會有更大機會找到自己喜歡且擅長的事。

另外，他也鼓勵學生盡量利用大學四年培養有效率的自學能力。因為未來無論是從事學術研究或投入業界職場，大部分所需的技能或觀念都不存在教科書中。學會快速找到關鍵資料、自行組織看似毫無章法的知識片段、並系統化吸收是每天工作和生活中必須的技能，這同時也是做大學專題研究或是碩士班最值得花時間掌握的能力之一。



## Dr. Ping-Chun Hsieh: Keep Exploring until You Find Your Passion



learn Reinforcement Learning and returned to Taiwan to do more relevant research.

### Answering, raising, and defining questions

“I think lecturing professional knowledge is easier compared to training students’ skills to ask and define questions, which are the crucial skills students should have when doing research”, said Dr. Hsieh. In addition, problem formulation can determine the value of research topics. In order to train students with these abilities, Dr. Ping-Chun Hsieh usually encourages students to think actively and raise questions in his class. During this interesting interaction, students can gain a sense of achievement to know the material knowledge and find the solutions to the raised questions. It also provides an example for students to be familiar with asking and defining questions in students’ projects and assignments.

### Pursuing his passion after two major profession changes

Dr. Ping-Chun Hsieh, with a Texas A & M University doctoral degree in Computer Science and Engineering reflected on his two major profession change journeys. He worked as an analog circuit design engineer in a start-up company after graduating from graduate school. During the work, he often needed to spend a lot of time checking many details of design rules that usually took him half a year to one year. After realizing this type of job was not suitable for him, he then decided to enter the field of Web Marketing Optimization after consideration. It was the first direction change in his career path.

### Advice to students: keep exploring and doing things that you are good at

Dr. Hsieh said that “exploration-exploitation trade-off” is an important aspect in Reinforcement Learning. In other words, keeping exploring unfamiliar fields is the most rewarding strategy in its environment. It is very similar to the learning journey that takes place in the university. By taking courses, doing projects, and participating in different activities, students can increase the opportunities for them to find their interests and professions. Therefore, Dr. Hsieh encourages students to do more things that they are already good at to further pursue their passion in life.

The second time when Dr. Hsieh changed his profession was during the fourth year of his doctoral program. He always felt uncertain about his research even though his research findings were often quite good. “I was able to find the best network algorithm, but it had to be built on hypothesis models”. Dr. Hsieh then continued, “I always wondered if it was possible to find the best network algorithm within the limited hypothesis models?”. In the same year, he started to

He also encourages students to develop self-learning ability, an essential skill in academic studies and industries during the four-year time in university. Dr. Hsieh thinks it is crucial to know how to search for relevant information and digest the knowledge systematically because most of the skills and concepts needed for the future are not from textbooks. Most importantly, self-learning ability is required when doing university projects and completing a master’s thesis.

## 【系學會全新企劃 X 誰來晚餐】

文／范瑀真

# 吳銘雄 — 驚奇有趣才是人生！

### 吳銘雄會長小檔案

#### ► 學歷

- 國立交通大學計算機科學系學士（67 級）
- 國立陽明交通大學 EMBA 就學中（22E）

#### ► 現職

- 彥陽科技股份有限公司董事長兼執行長
- 酪陽實業股份有限公司董事長
- 交大思源基金會監察人

#### ► 經歷

- 國立陽明交通大學傑出校友（民國 110 年）
- 宏碁電腦業務課長（民國 70 - 75 年）
- Intel 零件部業務經理（民國 75 - 77 年）
- AMD 業務經理（民國 77 - 78 年）
- 新陽電子董事長（民國 78 - 84 年）
- 交大北區校友會理事長（民國 100 - 102 年）
- 國立交通大學資工系傑出系友（民國 107 年）

109 年 11 月 12 日傍晚時分，一場世代對話的盛宴在工三館拉開帷幕。由資工系系學會主辦，《系學會全新企劃 x 誰來晚餐》邀請了計算機科學系 67 級系友學長吳銘雄回娘家，與系所師長、大學部學生餐敘。學長大方贊助當晚的美食美酒，佳餚當前賓主盡歡，老中青三代同聚一

堂，聊求學、創業，聊生活之道。

什麼？怎麼聽起來又是千篇一律的人生勝利組傳記？別急，吳銘雄可能跟你想的很不一樣。在延畢尚未流行的民國 60 年代，他因擋修淪為「延畢先驅」；事業如日中天時毅然放棄外商的高薪並自行創業，卻因過度擴張而破產，而後在兩個月內捲土重來；好飲美酒還不夠，更喝出傲人的洋酒代理副業，憑的全是一股「喜歡」的熱情。

給唸書唸得很痛苦的你、想創業的你、對未來迷茫的你。跟學長走過這數十載跌宕，總有某一瞬的念頭或智慧，能為你年輕的靈魂熨貼騷動。

### 成績吊車尾，人脈通八方的「延畢先驅」

「我是我們班最後一名，但前三名遇到戀愛問題時，都會來找我當顧問。」吳銘雄是超級業務，三句話內便抓住眾人目光，惹得全場哄堂大笑。大學期間，他發現自己和生硬的教科書緣分淺薄，再怎麼埋頭苦唸，成績單上仍看不見前方同學的車尾燈。樂天派的吳銘雄並不因此沮喪，

他知道書唸不好，自己還有更多面向的天賦值得耕耘。他體格壯碩，是個天生的運動好手，雙棲游泳隊、田徑隊之外，也常支援籃球比賽。

吳銘雄總是洋溢著熱情和活力，他的身邊不乏許多好朋友。有趣的是，其中有許多朋友，是因延畢而結識。因為微積分擋修工數、物理又沒修過，吳銘雄唸到大五才畢業。「我大五時才跟大一新生一起修物理，結果因此認識了前後七、八屆學長學弟。」如今各班都有自己的 LINE 群組，吳銘雄笑說，自己同時在好幾個群組裡面，甚至 67 級、68 級的畢業紀念冊裡，都有他的名字，其人緣之好不在話下。

台下的學生向吳銘雄請益，要如何才能廣結善緣？學長不假思索地答，「待人誠懇，你會遇到很多人來跟你一起走。」作為一個從大學時代就「不務正業」的資工人，這個信念一直支撐著他，乃至後來創業，即便曾經顛簸，也始終有貴人和朋友不離棄。

### 超級業務員創業慘賠 2000 萬，東山再起彥陽高照

從大三起吳銘雄確立方向，比起當工程師或教授，他更喜歡接觸人、在與人的互動中實現工作價值。「所以我修了很多商管的課，我想做生意。」民國 70 年，他進入宏碁電腦，做到業務課長，開啟了他的超級業務員之路。他先後在 Intel、AMD 擔任業務經理，從頭開始了解電腦設備、IC 零組件的產品、市場和通路關係。

民國 78 年吳銘雄帶著滿滿信心創辦新陽電子，初期氣勢鼎盛，讓他野心高漲，過度擴張產品線和營業據點。「我資本額 2000 萬，後來遇到被倒了 2000 多萬，財務缺口補不上，就破產了。」新陽電子於民國 84 年結束營業後，他用兩個月的時間釐清錯誤、重新擬定策略，選擇自己熟悉的 IC 零組件代理東山再起，創辦彥陽科技。

成立至今逾 25 年，彥陽科技多次獲得 Qorvo、Chrontel 年度最佳代理商，更是同行產品市佔率第一名，資本額也從創立時的 500 萬元台幣，累積到今天資本額 4 億 2 千 4 百多萬元，年營業額約 38 億元。吳銘雄很感激，在負債那段痛苦難熬的期間，有兩位朋友不斷給予精神和實

質上的幫助，讓他能夠從低谷中爬起。

### 愛喝能喝，喝出自己的美酒事業

「葡萄酒的世界是五彩繽紛的世界，就像看萬花筒，隨時都會發現美麗與驚喜。」這是酪陽實業的座右銘，也是吳銘雄的人生哲學。一如羅丹所說，世界從不缺少美，而是缺少發現美的眼睛，他好飲美酒，不甘於台灣葡萄酒價格高昂難親近，索性親自飛到加州的 Napa Valley，和酒莊老闆商洽代理。

「老闆看我也不懂酒，問說為什麼要讓我做？我告訴他，自己做了 30 年的零組件代理，一年可以做一億美金的營業額，老闆聽完都傻住了。」當然，除了數字會說話，吳銘雄還有他一貫的誠摯與熱情，把酒言歡過三巡，一樁美事便在明媚的葡萄莊園發生。

吳銘雄找來 67 級同班同學「酒博士」任俊，協助打理酪陽的業務。一幫好友將興趣和工作以美妙的比例調合，如今代理事業成熟，多款品牌在酪陽的耕耘下，在台灣賣到世界第一的銷售額；酪陽不僅賣酒，更提供品酒會所、品酒課程，也定期舉辦餐酒會，讓各路酒國英雄交杯交心。對吳銘雄而言，生命何其短暫，更應該浪費在美好的事物上。

### 出錢出力，積極回饋交大，與學弟妹分享人生經驗

活動的尾聲，學弟好奇地問學長，接下來的人生還有想「為自己」做的事嗎？吳銘雄聽了莞爾笑道，自己過了花甲，已什麼都不缺。如今身上背負的不只是「自己」，而是更大的責任：公司的員工、股東、甚至這個社會，他眼裡看到的，是企業家的責任與胸襟。

「還有 ..... 交大人特別愛校，趁著還能夠做的時候，我想努力回饋自己的母系，盡力幫助學弟妹。」吳銘雄多年捐助資工系和電工系清寒學生獎學金，並且多次在校本部和台北校區和同學分享人生經驗。這一次，他為系學會的新企劃吹響第一聲號角，和大夥共度一個愉快、饒富溫度的夜晚。期待下一場晚餐暢敘，我們和學長姐相約再見！





<New Project of the Student Association X Guess Who's Coming to Dinner>

# Mayor Wu – Make Your Life More Interesting and Exciting!

**Chief executive Mayor Wu** ←

► **Education:**

- BA Computer Science, NCTU(67)
- EMBA program, NYCU (22E)

► **Employment**

- Chief executive of Promaster Technology Corporation (now)
- President of Prowine Co. Ltd. (now)
- Supervisor of Spring Foundation of NCTU (now)

► **Experience**

- Outstanding alumni of NYCU (2021)
- Section Manager of Acer Inc. (1981-1986)
- Sales Manager of Intel Corporation (1986-1988)
- Sales Manager of Advanced Micro Devices, Inc (1988-1989)
- President of Xinyang Electronics (1989-1995)
- Chairman of BEIYOU (Alumni Association), NCTU (2011-2013)
- Outstanding alumni of Computer Science department, NCTU (2018)

What? Why does it sound like a stereotypical story of the whole package? Don't be hasty. Mayor Wu may be very different from what you think. In the 1960s, when deferred graduation was not a popular option for students, he was a "pioneer" of it because he didn't complete some prerequisite courses prior to his required courses. In addition, he gave up a high-paying job in foreign company and started his own business; however, he went bankrupt due to excessive expansion, and two months later, he made a remarkable comeback. He enjoys drinking fine wine; moreover, because of a passion of "I like it", he has built up an outstanding wine broker business.

To you, struggling in studying, hoping to start a business, or confused about the future. After decades of ups and downs, a momentary thought or wisdom from Mr. Wu may soothe your young soul.

**The last in the class, but a well-connected "pioneer of deferred graduation".**

"I was the last in our class, but the top three students always came to me as a consultant when they had problems with relationships." Mayor Wu is a super salesman. He caught everyone's attention in three sentences, causing the audience to burst into laughter. When he was in college, he discovered that textbooks don't like him. No matter how hard he studied, he still couldn't glimpse the "rear lights" of his classmates in front of him on the transcript. The optimistic Mayor Wu was not depressed. He knew that he didn't study well, but he had other gifts. He is strong and a natural athlete playing for the amphibious swimming team and

In the evening of November 12, 2020, a feast of cross-generation conversation was held in the Engineering Bldg 3. Hosted by the student association of Department of Computer Science, this event, "New project of the student association X Guess Who's Coming to Dinner", invited Mayor Wu, an alumnus of Department of Computer Science, to have a dinner with faculty and undergraduate students of the department. Mr. Wu generously sponsored the food and wine in the feast, and everyone enjoyed their meals very much. Three generations of old, middle-aged and young people gathered together to talk about studying at school, starting a business, and the way of life.



the track and field team, as well as basketball games.

Mayor Wu is always full of enthusiasm and vitality. There are always many good friends around him. Interestingly, many of them met because of deferred graduation. Because of failing calculus and physics, Mayor Wu did not graduate until his fifth year. "I took physics with the freshman in my fifth year, and as a result, I met students that were seven or eight year younger." Nowadays each class has its own LINE group. Mayor Wu smiled and said that he is in several groups. Moreover, his name is even in the graduation memory books (67 and 68). There is no doubt that he is so popular.

The students asked Mayor Wu, how to build good connections? Mr. Wu replied without hesitation: "Treat people sincerely, and a lot of people you met will come with you." Mr. Wu always keeps this belief since being a CS person who "failed to perform a job duty" in college. There are some friends that have been there through his best and worst time of his career.

**Super salesman has NT\$ 20 million in debt while running a business.**

Making a remarkable comeback, Promaster Technology Corporation is flourishing.

Since junior year, Mayor Wu has confirmed his direction. Instead of being an engineer or a professor, he prefers to contact people and fulfill work values by interacting with one another. "So I took a lot of business management courses. I want to start a business." In 1980, he worked in Acer Inc. as a head of the business section, which led the way of a super salesman. He served as sales manager in Intel and AMD successively; from the beginning, he explored the relationship between product, market and channel in computer equipment and IC components.

In 1989, Mayor Wu founded Xinyang Electronics with full confidence. In the beginning, he was so ambitious that he excessively expanded product lines and business bases. Wu said, "My capital was NT\$ 20 million. Later, I lost more than NT\$ 20 million. With the unfilled financial gap, I went bankrupt." After Xinyang Electronics ceased operations in 1995, he has spent two months clarifying the mistakes, recreating strategy, and choosing the IC components broker business that he is familiar with to establish Promaster Technology Corporation.

Since its founding 25 years ago, Promaster Technology Corporation has won the best broker of the year awards of Qorvo and Chrontel several times with the largest market share in an industry. The capital has also increased from NT\$ 5 million at the time of establishment to more than NT\$ 424 million today, with an annual sales revenue about NT\$3.8 billion. Mayor Wu is very grateful. During the tough financial times, two friends continued to provide spiritual care and substantial support so that he could come out of the valley.

**From enjoy drinking to his own wine business**

"The world of wine is a colorful world. When you look into a kaleidoscope, you see something amazing and beautiful." This is the motto of Prowine Co. Ltd. and the philosophy of life of Mayor Wu. As Rodin said, "The world is not lack of beauty, but a lack of eyes to find beauty." He enjoyed drinking wine and was unwilling to accept the expensive wines in Taiwan. Therefore, he flew to Napa Valley in California and negotiated with the owner of the winery.

"The owner found that I was unfamiliar with wine, and asked me why he should partner with me. I told him that I had been in an IC component broker business for 30 years with a turnover of 100 million US dollars a year. The owner is numb with shock after hearing what I said." Of course, besides numbers, Mayor Wu, with his usual sincerity and enthusiasm, drank and chatted merrily with the wine owner, thereby something beautiful happened in the bright vineyard.

Mayor Wu recruited "Dr. Wine", Jun Ren, his former classmate, to help take care of Prowine's business. A group of friends strikes the right balance between interests and work. Nowadays the broker business is mature. Many brands are sold in Taiwan with the world's largest sales under the hard work of Prowine. Prowine not only sells wine, but also provides wine tasting club, wine tasting courses, and regular food and wine parties, so that the wine enthusiasts from different places can meet each other. For Mayor Wu, life is short, so it should be spent on beautiful things.

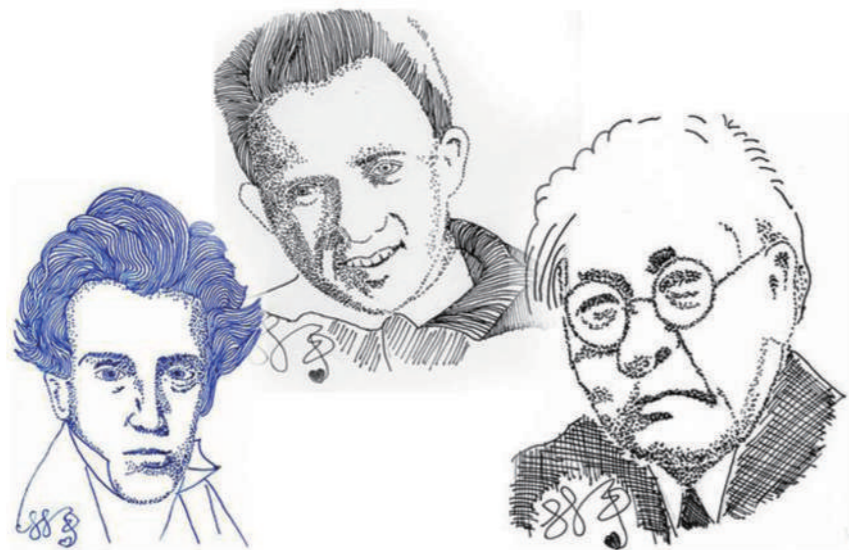
**Keep supporting for his alma mater and share life experience with young students**

At the end of the feast, students asked Mr. Wu out of curiosity, "is there anything else he would like to do "for himself" in the rest of his life?" Mayor Wu smiled and said that after he had passed his sixties, he had lack of nothing. Now he does not carry only "himself" but also a greater responsibility, such as the company's employees, the shareholders, and even the society. What he sees in his eyes is the responsibility and generosity as an entrepreneur.

"Also... the people of NCTU love the school very much. While I am still in my position, I want to try my best to give back to my alma mater and support young students." Mayor Wu has donated underprivileged students' scholarship to the department of Computer Science and the department of Electrical Engineering for many years, and shared his life experience with students several times in Guangfu Campus and in Taipei campus. This time, he is the first one to blow the horn for the new project of the student association, and spent a pleasant warm night with everyone. Looking forward to the next dinner, we will be able to gather again with our alumni.

# 量子計算的源頭 - 波爾叔叔

文 / 林一平 講座教授



林一平手繪之齊克果、海森堡、仁科芳雄。

量子計算被認為是新一代的計算技術，其理論的源頭可追溯到丹麥人波爾 (Niels Henrik David Bohr)。他被認為是 20 世紀最偉大的科學家之一，好友們都親密的叫他「尼克叔叔」。

波爾早期的思想深受 19 世紀宗教哲學家，也是存在主義哲學之父齊克果 (Soren Kierkegaard) 的影響。齊克果寫了被稱為有史以來最長，也最隱晦難懂的情書《非彼即此》(Either/Or) 給愛人奧森 (Regine Olsen)。結果奧森離他而去，和別人訂婚，而《非彼即此》則變成現代存在主義的聖經。

《非彼即此》和齊克果 1845 出版的書《生命道路的各階段》(Stages on Life's Way) 有相當的關連性。雖然波爾不盡然完全同意齊克果《非彼即此》的看法，他的確熟讀《生命道路的各階段》。這本書敘述一個事件在各個階段有不同的呈現。當我們描述光的物理行為為這個事件時，將波動性與粒子性都納入考量，或許就是「光」這事件在各個階段不同的呈現。

諸位讀者可能不知道，波爾是李國鼎的師兄，2 個人都曾經接受過拉塞福 (Ernest Rutherford) 的指導。基於拉塞福的理論基礎，波爾發展出量子理論 (Quantum Theory)，也因此於 1922 年獲頒諾貝爾獎。他的兒子 Aage Niels

Bohr 也是諾貝爾獎得主，成為物理史父子檔的一段佳話。

波爾最厲害的學生是海森堡 (Werner Heisenberg)，他是建立量子動力學 (Quantum Mechanics) 的最重要人物。1941 年波爾和海森堡討論原子彈的可能性。海森堡後來成為德國納粹原子彈計畫的主持人。日本也於 1941 年開始研製原子彈，計畫的負責人則是接受過波爾訓練的仁科芳雄。仁科芳雄後來指導了日本第一位諾貝爾物理獎得主湯川秀樹 (Hideki Yukawa)。

由於教出懂原子彈理論的德國及日本徒弟，波爾深深憂慮軸心國會發展出威力強大的武器。因此於 1943 年逃到美國後，就參與催生了曼哈頓計畫，在新墨西哥州的羅斯阿拉摩斯實驗室指導美國科學家研製原子彈。為了保密，每個在該實驗室的科學家都必須化名。波爾的化名是尼古拉斯·巴克。不過認識他的好友都叫不習慣，仍然暱稱他為「尼克叔叔」。

波爾死後葬於哥本哈根的公墓，與齊克果及安徒生 (Hans Christian Andersen) 為鄰。化學元素 Bohrium (Bh) 係因為紀念波爾而命名。波爾生前最後一篇論文《Light and Life revisited》(Licht und Leben-noch einmal) 發表於 1963 年 (他去世後一年)。顯然波爾臨死之前對生命仍充滿好奇。

# The Origin of Quantum Computing—Uncle Bohr

Quantum computing is considered to be a new generation of computing technology, and the origin of the theory could be traced back to the Danish Scientist, Niels Henrik David Bohr. Bohr is generally regarded as one of the foremost scientists of the 20th century. His friends familiarly called Bohr "Uncle Nick," a nickname referencing Bohr's wartime alias.

It is known that Bohr, in his early years, was deeply influenced by Soren Kierkegaard, a 19th century philosopher of religion and the father of existentialism. Kierkegaard wrote the longest and most obscure love letter *Either/Or* to his beloved Regine Olsen. Orson left him and got engaged to someone else, but *Either/Or* became the Bible of modern existentialism nevertheless.

*Either/Or* and *Stages on Life's Way*, published by Kierkegaard in 1845, are closely connected. Although Bohr didn't completely agree with Kierkegaard's view in *Either/Or*, he did read *Stages on Life's Way* thoroughly. This book describes how an event is presented differently in various stages. When we describe some event of the physical behavior of light and consider both wave and particle characteristics, it may be the event of "light" that may have different appearances in various stages.

You may not know that Bohr is Kwoh-ting Li's senior fellow. They both had studied under the supervision of Ernest Rutherford. Based on Rutherford's theoretical foundation, Bohr developed Quantum Theory and was awarded the Nobel Prize in 1922. His son, Aage Niels Bohr, is also a Nobel Prize winner, which is broadly eulogized in the history of physics.

The best student of Bohr is Werner Heisenberg, one of the most important pioneers of quantum mechanics. In 1941, Bohr and Heisenberg discussed the feasibility of an atomic bomb. Heisenberg later became the leader of the Nazi atomic bomb program. Japan also started to develop atomic bombs in 1941, and the leading figure in the Japanese Atomic Project was Yoshio Nishina, who had also studied physics under Bohr. Nishina later mentored Hideki Yukawa, Japan's first Nobel Prize winner in physics.

Because his German and Japanese apprentices understood the atomic bomb theory, Bohr was deeply worried about the Axis Alliance's potential to develop devastating weapons. Therefore, after escaping to the United States in 1943, he participated in the birth of the Manhattan Project and instructed American scientists to develop the atomic bomb at Los Alamos National Laboratory in New Mexico. In order to keep the project confidential from others, every scientist in the laboratory must have a pseudonym. Bohr's pseudonym is Nicholas Baker. However, the friends who knew him were not used to it and instead called him "Uncle Nick".

After Bohr died, he was buried in a cemetery in Copenhagen, next to Kierkegaard and Hans Christian Andersen. The chemical element Bohrium (Bh) was named in honor of Bohr. Bohr's last paper "Light and Life Revisited" (*Licht und Leben-noch einmal*) was published in 1963, one year after his death. Obviously, Bohr was still curious about life in his last days.

# 三位女性密碼專家

文／林一平 講座教授



林一平手繪之傅利曼(左)與拉瑪(右)。

女性在資通訊科技的貢獻，相當顯著。全世界第一位電腦程式工程師勒芙蕾絲(Ada Lovelace)是女性。二次大戰時，男性上戰場，很多運用電腦計算資料的工作由女性執行。

第一次世界大戰後美國海軍密碼沙福(Laurance Safford)創辦了海軍密碼組織。沙福在美國海軍鼓吹解碼的重要性，在海軍的月刊《Communications Bulletin》放了猜謎遊戲，找到提供最佳解答的官兵，勸他們加入他的密碼情報單位。在他的單位有一位二十世紀初期美國最偉大的女性密碼專家(Cryptanalyst)，名叫德里斯科爾(Agnes Driscoll)。她於1911年畢業於俄亥俄州立大學，先在德州的軍校教音樂，再到一家高中擔任數學老師。1918年她在海軍擔任文書上士(Yeoman)。由於學歷太好，長官就教她解密碼。1921年，赫本(Edward Hebern)發明全世界第一部密碼機(Hebern cipher machine)，宣稱以此機器加密，無人可破解。然而德里斯科爾本事高強，兩三下就將赫本加密的訊息解開。德里斯科爾被尊稱為X夫人(Madam X)或海軍解碼第一夫人(the first lady of naval cryptology)。

美國第一位女性密碼專家是傅利曼(Elizebeth Friedman)，她最大的貢獻是破解走私毒犯的密碼。由於她破解密碼，更抓到二次大戰日本隱藏在美國最重要的女間諜。但她最為人認知的貢獻是在莎士比亞的研究。她和先生(William F. Friedman)寫了一本書《The Shakespearian Ciphers Examined》，榮獲由Folger Shakespeare Library以

及 American Shakespeare Theater and Academy 頒發的獎項。

過去一直有傳說，莎士比亞的劇本實際是別人寫的。例如馬克吐溫就曾發表長達4頁的文章《莎士比亞不是我們知道的莎士比亞》，羅列了所有已知事實證明歷史書介紹的莎士比亞根本不懂戲劇。於是很多人想找出莎士比亞劇本的「真正作者」。當中的一種說法認為作者是法蘭西斯培根，並懷疑劇本中可能包含培根密碼(Bacon's cipher)。許多人曾試圖從莎士比亞的舊劇本中找出上述密碼。傅利曼夫婦證明莎士比亞劇本中沒有包含培根密碼或者其他密碼。讀者諸君如果感興趣莎士比亞劇本作者之謎，可參見卡雷爾(J. L. Carrell)的著作《莎士比亞的秘密》(The Shakespeare Secret)。

在二戰時期思考保密對軍事通訊的重要性，而發明秘密通訊的方法，則屬好萊塢女演員拉瑪(Hedy Lamarr)的故事最具傳奇性。1940年拉瑪參加宴會。在鋼琴邊閒聊之際，看到手指在琴鍵彈跳，忽然想到可以利用跳頻發展出一個秘密通訊的方法，應用於軍事通訊系統，抵擋敵人的電波干擾(Anti-jamming)並且防止竊聽。1985年高通(Qualcomm)在美國加州成立，以展頻技術(Frequency Hopping)為基礎，研發出CDMA(Code Division Multiple Access)系統，常提及拉瑪的貢獻。

**林一平**  
國立陽明交通大學資工系終身講座教授暨華邦電子講座

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

# Three Female Cryptanalysts

Women have played a vital role in the field of information technology. The world's first computer programmer, Ada Lovelace, was a woman. During World War II, women stepped into computer operation and programming work while men went off to war.

After World War I, a U.S. Navy cryptologist, Laurance Safford, established the Naval cryptologic organization. Safford advocated for the importance of Communications Intelligence in the U.S. Navy and recruited promising cryptanalysts by putting puzzles in the Navy's monthly Communications Bulletin. One of America's greatest female cryptanalyst in the early twentieth century, Agnes Driscoll, was in his unit. Driscoll received a Bachelor of Arts degree from Ohio State University in 1911. She began working as a music teacher at a military academy in Texas and later worked as a math teacher in a high school. In 1918, she served as a chief yeoman in the U.S. Navy. Because of her good academic qualifications, the chief in the unit taught her the skills of deciphering. In 1921, Edward Hebern built the world's first Hebern cipher machine and claimed that no one could crack the data that was encrypted by this machine. However, Driscoll was quite proficient and deciphered Hepburn's encrypted message in a jiffy. Driscoll was therefore known as Madam X or the first lady of naval cryptology.

The first female cryptanalyst in the United States was Elizebeth Friedman. Her greatest achievement was cracking the encryptions of smugglers. Moreover, owing to her assistance, the government caught the most important Japanese female spy in the United States during World War II. However, her most recognized contribution was her research in Shakespeare. She and her husband, William F. Friedman, wrote a book, The Shakespearian Ciphers Examined, which received awards from Folger Shakespeare Library and American Shakespeare Theater and Academy.

There is a popular conspiracy theory that someone other than William Shakespeare of Stratford-upon-Avon wrote the works attributed to him. For example, Mark Twain published a four-page article "Shakespeare is not the Shakespeare we know", which listed all known facts that the Shakespeare described in history books did not understand drama.

Therefore, many people want to find out the "real author" of Shakespeare's works. Some sources claim that the author is Francis Bacon and suspect that the scripts may contain Bacon's cipher. Many people have tried to find the ciphers from Shakespeare's scripts. The Friedmans refuted the claims that the works of Shakespeare contain hidden ciphers that disclose Bacon's or any other candidate's secret authorship. If you are interested in the mystery of Shakespeare's works, please refer to J. L. Carrell's book, The Shakespeare Secret.

The key aspect of communications is the ability to transmit messages within the military and between allies in utter secrecy and security during World War II; however, the most legendary story regarding inventing secret communication system was of Hollywood actress Hedy Lamarr. In 1944, Lamarr attended a banquet. While chatting by the piano, she noticed the fingers bouncing on the keys. She suddenly thought that frequency hopping could be applied to a secret communication system used in military communication systems for anti-jamming and eavesdropping prevention. Qualcomm, established in California in 1985, developed a CDMA (Code Division Multiple Access) system based on frequency hopping, so Lamarr's contributions have been retroactively recognized.

**Dr. Jason Yi-Bing Lin**

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

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

# 學生用專業回饋社會 架網站關懷社會議題

文／林珮雯

台灣正面臨少子化及高齡化的嚴峻問題，本校資工系學生運用專業回應高齡及安寧療護議題。本校服務學習中心、資工系與台大新竹醫院、社團法人中華民國誠馨照顧協會合作，共同開發相關衛教資訊網，透過分析使用者需求、規劃網站內容，為台灣長期照護與安寧療護等社會議題多盡一份心力、關懷。

根據國發會推估，2025年台灣就會進入超高齡社會，2034年全國一半以上人口都將是中高齡者。人口高齡化造成長照、居家照護、安寧療護的需求人數與日俱增，如何導入科技協助更有效運用醫療資源，已成為未來各方積極發展的重點。

本校服務學習中心許維蓉小姐指出，2016年起服務學習中心團隊與資工系林正中教授規畫服務學習課程，發揮資工系專業，協助台大新竹醫院架設網站，推廣安寧療護資訊。2019年在校友牽線下，與社團法人中華民國誠馨照顧協會合作，服務學習課程新增長照組，並由資工系人機介面專家張永儒教授帶領課程，深入分析使用

者需求，架設推廣長照網站。

資工系修課學生張嘉誠指出，動手設計長照衛教資訊網前，會先了解服務所蘊含的精神，因此在課程中不只學到如何架設網站，更藉由醫護及長照從業人員的分享，認識失智症照護的各個面向，讓他感到這是非常有意義的事。

學生游承翰也分享，當初以為服務內容是到長照機構陪伴長輩，但後來才知道是幫忙建置網站增加曝光度，使大眾更關注長照議題。他認為長照已是全世界不可忽視的議題，能多一份關心就是多一份助力。學生林鴻廷也補充，藉由課程，他更加了解長照 2.0 推行狀況，以後如果身邊的人有需要，就能提供協助。

長期照護與安寧療護絕不是中、老年人才需要面對的問題，年輕人越早認識相關議題，越能及早準備，學校與醫療、長照機構合作即是學子們絕佳的學習場域。藉由這項服務本校師生走出校園，深化大學與社會的連結，未來將繼續帶領學生運用專業知能服務社會。



## CS Students Establishing Long-Term Care Websites to Give back to the Society

Due to the issues of low birth rate and aging society in Taiwan, students of the Department of Computer Science (CS) at National Yang Ming University make efforts by applying knowledge into actual practices. To contribute to long-term care and hospice care, they worked together with the university's Service-Learning Center, Hsin-Chu Branch of National Taiwan University Hospital, and Cheng Shin Adult Daycare Center to develop a health education information network by analyzing user needs and planning content for the website. According to National Development Council, Taiwan is estimated to become a super-aged society by 2025, and half of the population will be middle-aged adults by 2034. There is an urgent need for recruiting employees in long-term care, home care, and hospice care. Therefore, how will technology be incorporated effectively in medical resources has become critical in nation's healthcare development.

Wei-Jung Hsu from the Service-Learning Center recalled that their team started working with Dr. Cheng-Chung Lin of the CS department to set up a website for Hsin-Chu Branch of National Taiwan University Hospital to promote hospice care education. Starting from 2019, introduced by an alumni of the CS department, students started collaborating with Cheng Shin Adult Daycare Center. Additionally, the long-term care group has officially added to the options in the service learning course. Throughout the course, Dr. Yung-Ju Chang, a professor expertized in Human-Computer Interaction of the CS department also

guided students to analyze user needs and set up a website to promote long-term care education.

Overall students gave positive feedback to this collaboration project course. Chia-Cheng Chang, indicated that he found it very meaningful to learn not only the knowledge to design websites but also to learn the meaning of servicing and the fundamental concepts about taking care of dementia patients. Cheng-Han Yu, after participating in the course said that the issue of long-term care should be well-considered and not be neglected by the public. In the beginning he thought it was about accompanying elders, but soon he realized it was about establishing a website to raise the public's awareness about long-term care issues. Hung-Ting Lin, another student who also joined the course mentioned that he was able to gain more understanding about the current situation of Long-Term Care Plan 2.0 in Taiwan. In the future, he will be able to provide more information to others if necessary.

Overall, the issues of long-term care and hospice care should be fully understood across different generations, from young to old. It is better to start preparing at an earlier stage, hence students can learn by doing some collaboration projects with healthcare and long-term care institutions. Stepping out the campus to connect and serve in the society, professors and students of the CS department devoted their knowledge into practices in real life.



# 資工專題競賽 創意滿點

文稿整理／王艾妮

資訊工程學系一年一度的專題競賽在大學部同學踴躍參與下已圓滿落幕！專題競賽一直以來都是同學們展現專題課程研究成果、發揮創意、互相交流的活動，也強化了資工系同學們的凝聚力，同學們一起互相討論及參與都帶來無比的成就感。在授課老師林盈達教授及各專題指導老師的鼓勵下，本次競賽共 10 組報名參賽，感謝各位同學踴躍參與，讓專題競賽變得更豐富有趣。

本次初賽於 109 年 11 月 25 日於工三館大廳舉行，初賽隊伍共 10 組，共 6 組進入決賽。決賽於 12 月 23 日舉行，經過同學精彩的報告和展示後，最後產生特優 1 組（獎金每組 15,000 元）、優等 2 組（獎金每組 10,000 元）、佳作 3 組（獎金每組 5,000 元）。以下是各組得獎作品介紹：

## 特優：在 P4 交換機上支援 Per-flow Fair

### Queueing

學生：孫呈佑、蕭宇辰

指導教授：王協源

當 TCP 與 UDP 在競爭有限頻寬而發生封包遺失時，TCP flows 會因為壅塞控制機制將自己的傳送速率降低，而 UDP flows 則是會以相同傳送速率不斷擠壓 TCP flows。最糟的情況是當 UDP flows 的傳送速率超過整個通道頻寬時，TCP flows 會因為不斷遺失封包而將自己的傳送速率降低到幾乎為零的速率，使得 TCP flows 的使用者所分配到的可用頻寬相較 UDP flows 非常不公平。我們利用 P4 交換機設計並實作一個系統保障所有 flows 皆能公平使用頻寬。

## 優等：CAMPUS- 校園群眾外包系統

學生：郭庭均、李東穎、林彥淳、邱筠絮

指導教授：張永儒

有感於學生這個族群大部分的時間都生活在校園，然而卻經常因為無法得知校園特定地點的即時狀況，因而造成生活上的不便。此外校園中對於無障礙/友善設施或是空間需求的使用者，在取得校園中相關資訊時也都有許多困難，且相關資訊可能無法獲得即時性的更新。為了讓生活在校園中的人們可以得知特定地點的資訊，我們設計了 Web-Based 的校園即時回饋平台，透過群眾外包 (Crowdsourcing) 機制，校園內的每個人都可以在 CAMPUS 地圖上標註值得被分享的資訊，每位使用者是資訊需求方，同時也都是資訊提供方。透過協作的方式，來達到校園地點資訊



的即時與統一性，以及地點呈現的直觀性。

## 優等：分散式網路服務架構

學生：簡志璋

指導教授：吳育松

NoXerve 是一個分散式網路服務架構，目標是提供標準化且適當抽象化的功能，讓開發者可以免去許多底層機制例如連線的煩惱，充分利用分散式的優點（例如可以 scale up 計算能力、儲存空間等）輕鬆的開發服務與應用程式。並且可以結合為服務的概念，各服務可以各自維護、開發、部屬。

## 佳作：應用類神經網路於角色運動控制

學生：蔡承恩、陳俊惟

指導教授：黃世強

電腦動畫無論是在遊戲動畫又或是電影產業都相當的盛行。我們參考相關的論文中，發現一篇論文，作者是利用類神經網路的計算與技術，除了讓玩家操控角色產生動作外，也同時處理角色腳步不會穿過凹凸不平的地面。而我們的專題，則是將作者所開發的技術，加入多個角色，模擬彼此間相互互動的情景。

## 佳作：使用 SAT 演算法完成 PCB 非曼哈頓同步步逃離繞線之研究

學生：郭家佑

指導教授：李毅郎

傳統 PCB 的逃離繞線與區域繞線是分開設計，然而同時考量才能有最佳化品質。此專題首度利用同時演算法，在執行逃離繞線時也考量到區域繞線的品質，從而達到比商業軟體與先前學術研究成果都還要優良的繞線品質。內容為 45 度逃離繞線 MAX-SAT 的 clause 設計，以 concurrent 的方式完成合法的 non-Manhattan PCB 逃離繞線。

## 佳作：物聯網結合物理實驗模擬教學

學生：張皓鈞、謝昕辰

指導教授：林一平、鄭昌杰

使用物聯網平台 IoTtalk 將手機陀螺儀與網頁上的物理模擬實驗結合，打造出適合中學生的互動式物理實驗模擬教材。

最後，十分感謝授課教師邱維辰教授與所有評審委員（本系吳凱強教授、魏群樹教授）的協助，讓本次專題競賽圓滿落幕。



# Computer Science Project Contest: Innovation Everywhere

The annual Project Contest, held by the department of Computer Science, has ended successfully with many active undergraduate participants. The Project Contest is designed for undergraduate students to present their research results in Project Courses, make innovation, and collaborate with each other. It helped enhance group cohesion among students in the Department of Computer Science, and made students feel accomplished while collaborating with each other. Encouraged by the lecturer, Dr. Ying-Dar Lin, and the instructors of different topics, 10 groups entered this contest. Thank you all for your participation to make the contest more fun and engaging.

The preliminary competition was held on November 25, 2020, in the hall of Engineering Bldg 3. Ten teams competed for six qualified quotas of the final this year. The final was held on December 23, 2020. After judges reviewed great presentations and demonstrations by students, one group was awarded to Special Excellence (a scholarship of NT\$ 15,000 per group), two groups were awarded to Excellence (a scholarship of NT\$ 10,000 per group), and three groups were awarded to Excellent Work (a scholarship of NT\$ 5,000 per group). The works of each winning group are briefed as follows:

## Special Excellence: Supporting Per-flow Fair Queueing on P4 Switches

Students: Chen-Yo Sun, Yu-Chen Hsiao

Instructor: Shie-Yuan Wang

Providing per-flow scheduling in switches can isolate the traffic of flows that compete for the bandwidth of a bottleneck link. Since UDP does not use congestion control, a UDP flow can consume all the bandwidth of a bottleneck link without considering its fair share on the link. If per-flow scheduling can be used in switches, a UDP flow whose sending rate exceeds its fair share can be enforced to use only its fair share. Thus, it will not severely harm the achieved throughput of a TCP flow, which employs congestion control and will throttle its sending rate to use the bandwidth left by UDP flows. Although per-flow scheduling has important benefits, due to the high implementation costs with providing per-flow queues in switches, this capability is rarely provided in commodity switches on the market. In this paper, we design, implement, and evaluate our scheme in P4 programmable hardware switches. Our scheme provides near per-flow scheduling in switches without per-flow queues. Experimental results show that our scheme nearly achieves what per-flow scheduling can provide when scheduling the packets of competing UDP and TCP flows.

## Excellence: Crowd-Assisted Map Pervasive University Service

Students: Ting-Chun Ku, Dong-Ying Li, Yen-Chun Lin, Yun-Chien Chiu

Instructor: Yung-Ju Chang

Students live on campus most of their time, but often feel inconvenience in their daily life because of being unable to know the real-time situation of a specific location on the campus. In addition, people who have access to barrier-free/friendly facilities or space requirements on campus also have many difficulties in obtaining relevant information that may not be updated in real-time. In order to allow people on campus to get information about a specific location, we designed a Web-Based

real-time feedback platform called CAMPUS. Through the crowdsourcing mechanism, everyone on the CAMPUS platform can mark the information that is worthy of being shared on the map, each user is not only an information requester but also an information provider. Through collaboration, the real-time and uniformity of campus information and the intuitiveness of location presentation are able to be achieved.

## Excellence: Distributed Network Service Architecture

Student: Chih-Wei Chien

Instructor: Yu-Sung Wu

NoXerve is a distributed network service architecture. The goal is to provide standardized and properly abstracted functions, so that developers can avoid many obstacles such as connection troubles, and make full use of the advantages of distribution (e.g. scale up computing power, Storage space, etc.) to develop services and applications easily. And can be combined into the concept of micro-service, each service can be maintained, developed, and deployed separately.

## Excellent Work: USING NEURAL NETWORK FOR CHARACTER MOTION CONTROL

Students: Chien-En Cai, Chen Jun Wei

Instructor: Sai-Keung Wong

Computer animation is very popular in both the game and film industries. We found a paper in which the author used neural network-like computing and technology to allow the player to manipulate the character's movements while at the same time handling the character's footsteps without crossing uneven ground. In our project, the technique developed by the author is used to simulate interactions between multiple characters.

## Excellent Work: Concurrent non-Manhattan PCB routing using SAT

Student: Chia-Yu, Kuo

Instructor: Yih-Lang Li

Conventional PCB escape routing and area routing are designed separately. However, the concurrent ways can optimize the quality. In the project, the concurrent algorithm is used to improve the quality of the area routing while the escape routing be executed. Also, it achieves better routing quality than commercial software and previous academic research results. The project is about design of 45-degree escape routing with MAX-SAT, completing the legal non-Manhattan PCB escape routing concurrently.

## Excellent Work: Interactive physical simulation with IoT technology

Students: Hao-Chun Chang, Hsin-Chen Hsieh

Instructor: Yi-Bing Lin, Chang-Chieh Cheng

Using IoT technology combines smartphone's gyroscope and physics simulation animation on websites. And design an Interactive physics teaching material for high school students.

Finally, I would like to thank Professor Wei-Chen Chiu and all judges, Professor Kai-Chiang Wu and Professor Chun-Shu Wei of the department of Computer Science, for their assistance for making this contest a success.

# 2020 出國交換經驗分享會

文稿整理／高儷玲



2020 年因新冠肺炎影響，國際交流活動受影響，本院邀請兩位出國交換的學生分享經驗，分別到美國伊利諾大學香檳分校及德國曼海姆大學。儘管和以往相比體驗到的時間較短，但兩位學生仍從中得到許多寶貴經驗，以下擷取自同學的分享：

## 洪立宇 同學

交換學校：德國曼海姆大學

過去在高中已經有過到德國交換的經驗，很開心藉由這次交換舊地重遊，並幸運地找到以前的朋友，也順利在當地結交新朋友。因為曼海姆大學是以商管為主，所以這次我做了一個跨出舒適圈的決定，選擇曼海姆大學的資財系，對我而言也是蠻特別的一個突破，因為對於許多資訊學院的學生而言，在交大通常都上偏理工的課程，而透過交換上到一些財經相關的課程，像是 Fintech (金融科技) 和 blockchain (區塊鏈) 的應用。

交換期間我修了 Data Mining, Data Security & Privacy, German B2, German History。德國和台灣上課的有些不同，例如基本上每一堂課不管是程式還是非程式的課程都有練習課，而且練習課是大家都必須參與，因此在練習上獲得很多幫助。考試的方式是期末考整本書的範圍，沒有期中考，因此時間安排和讀書進度必須事先規劃好。而報告大多是期末報告，採小組合作的方式，通常一組可能會超過五六個人，算是比較大型的合作，我認為在這些方面都與台灣的上課模式不同。

德國在 3 月多就因為疫情封鎖學校，但是學校的應對措施並沒有像台灣做的那麼完善，直到 4 月底才正式規定在室內和公共區域要帶口罩。疫情爆發後基本上都是透過線上修課、繳交作業，也因為比較少到學校去上課，感受最深的是生活步調變得非常緩慢，卻也因此有多餘的時間思考自己未來的方向。

最後我想分享自己交換的心得，我認為除了修課、旅遊，最重要的是體驗當地文化，非常鼓勵大家可以多出去看看，多走走，而且一定要願意打開自己的心，放開自己去接受、去改變、去聆聽別或瞭解自己。

## 吳浩安 同學

交換學校：伊利諾大學 - 香檳分校

因為受到疫情影響，這次交換只有短短兩個月的時間，因此主要著重在我所體驗到的文化差異上，分別是有兩個印象深刻的故事。有天和同學在等公車時，看見一位坐輪椅的女生要從道路到人行道，但因為道路和人行道有落差，她無法單靠自己的力量上去，剛好當時我們在一旁等公車，然後她做了一個我從來沒有在台灣會預期別人會對我做的事情，只見她對我們伸出一隻手，然後問我們能不能幫忙拉他一把。

在尋求幫助的當下，她是非常有自信的表示她需要幫忙。這件事讓我學習到，我們不必把自己的地位放得很低，或是擺出自己很可憐這樣子去求別人幫忙，而是要能夠很有自信的詢問。因為給予他人幫助是一種能力，不僅是受到幫助的人，幫助別人也能從中獲得快樂。而我認為這種正向回饋的關係能在社會裡不斷傳遞會是一個蠻不錯的狀態。

第二個故事，是有次獨自去逛社團博覽會，因為不習慣一個人行動，所以有點不自在，剛好遇到熱情的同學想跟我介紹，當下我就把台灣人那種不太好意思又有些尷尬的態度擺出來，回答：「Maybe not？」對方聽了反而很意外的告訴我：「It's ok to say no」他意識到我不太好意思拒絕，也告訴我直接拒絕也沒關係。這次的經驗讓我感覺對方很尊重我的選擇，而他們的友善是單方面的，不強迫人也不會因為被拒絕而態度變差。

在當時不管跟任何人講話，都能感受到他人談吐的自信，相較之下就顯得自己在这方面有很大的不足。大多數人也都很友善，不求回報方面付出，對於每個人都給予很大的尊重及空間。去學校的健康中心做檢查就能察覺，每項檢查前，需要你捲起袖子打針或是脫掉上衣照 X 光的時，醫護人員都會很清楚用口語徵詢你的同意，才會繼續下一步的檢查。總結這次的交換，雖然只有兩個月的時間，仍讓我看到許多文化差異，並從中發掘許多自己的不足及當地文化值得學習之處。

# 2020 Overseas Experience Sharing Session of International Exchange Students

Due in large part to the impact of the COVID-19 pandemic in 2020, international exchange activities have been affected. Our college invited two exchange students to share their experiences, at the University of Illinois at Urbana-Champaign in the United States and at the University of Mannheim in Germany, respectively. Although the current exchange program is shorter than the program in the past, both students still gain a lot of valuable experience. The following information was extracted from their sharing,

## Student: Li-Yu Hong

Exchange: University of Mannheim in Germany

I had studied as an exchange student in Germany when I was in high school. It was great to revisit the places by the exchange program and luckily contact my old friends successfully as well as make new friends there. Because the University of Mannheim focused on business management, I decided to step outside my comfort zone. Choosing the Department of Finance of the University of Mannheim was also a very special breakthrough in my life. In general, many computer science students at Chiao Tung University usually take science and engineering courses; however, while on exchange, I took some finance courses, such as Fintech (financial technology) and blockchain applications.

I took Data Mining, Data Security & Privacy, German B2, German History during exchange. There are some differences between Germany and Taiwan in a way of conducting classes. For example, almost every class, no matter which is a coding course or a non-coding course, has a practice session in which everyone must participate, and I gain a lot from it. The examination would cover material from the entire course at the end of the semester. Because there was no mid-term exam, students must plan ahead for the reading schedule and conduct the time management effectively. In addition, many reports are final reports, which would be team collaboration. Usually, a group would comprise more than five or six members, and this kind of cooperation would relatively be regarded as a large-scale cooperation. I think these aspects are different from the way of conducting classes in Taiwan. Germany's schools closed down in March as details of the coronavirus pandemic emerged; however, the school's actions responding to COVID-19 were not as complete as those in Taiwan. It was not officially required to wear a mask indoors and in public areas until the end of April. After the outbreak of the pandemic, students took courses and handed in homework online. Because I seldom went to school, I felt the slow pace of life and spent more time thinking about my future direction.

Finally, I want to share my exchange experience. In addition to study and travel, I think that the most important thing is to experience the local culture. I

strongly encourage everyone to go abroad to explore the world, visit different places, as well as be willing to open your mind to absorb, change, listen to others, or understand yourself.

## Student: Hao-An Wu

Exchange: University of Illinois at Urbana-Champaign

Due to the impact of the COVID-19 pandemic, this exchange was only two months long, so the main focus here would be the cultural differences I have experienced. There were two memorable moments. First, one day when I was waiting for the bus with my classmates, I saw a girl in a wheelchair who was going up a curb. However, because of the gap between the road and the curb, she could not steer her wheelchair up on her own. When she saw we were waiting for the bus on the curb, she did something that I had never expected others to ask for me in Taiwan. She waved at us and asked if we could help her.

In the meantime, she seemed very confident to express that she needed help. This experience taught me that we don't need to look down on ourselves, or make ourselves miserable when we ask for someone's help. On the contrary, we shall be able to ask for help with confidence. Moreover, helping others has a dual benefit. Not only does it provide support to needy people, it makes the helper feel better too. I think it would form a good self-amplifying cycle that this positive feedback would be pursued continuously in society.

Second, one day I went to the Clubs Fair alone. I felt a little uneasy because I was not used to going out alone. Meanwhile, I met a passionate classmate who wanted to share something with me. I then behaved as Taiwanese would do while feeling embarrassed, and replied, "Maybe not?" To my surprise, he said: "It's ok to say No." He realized that I was too embarrassed to refuse, and told me that it was okay to refuse directly. This experience made me feel that he respects my decision very much. In addition, they don't force people to change and they won't have negative attitudes towards people because of rejection.

At that time, no matter whom I talked, I could feel their confidence. In comparison, I showed much less self-confidence. Most people were very friendly and helped others without expecting in return. They treated others with respect and kept the space they needed. You can feel the same way when you go to the health center of the university for a physical examination. Once you needed to roll up your sleeves for shots or take off your shirt for an X-ray, the medical staff clearly asked for an oral consent before moving forward. In summary, although staying in the USA only for such short two months, I was able to sense cultural differences, from which I realized my own imperfections and the merits worthy to learn.

# 學術國際化經驗分享

文稿整理 / 高儷玲

本院很榮幸邀請到林盈達教授分享其個人對學術國際化的經驗及看法，而由於篇幅所限，以下內文只擷取講座部分內容：

## 學術國際化的必要性

傳統與在地化的學術傳播方式，無法在知識經濟的時代下永保國家的競爭力，唯有透過學術的產業化、國際化與全球化，才能有效保持個人或國家創新能力與競爭力。

## 人才具備特質

現今高等教育邁向全球化的發展，使各國學者必須和世界各地的人才競爭與合作。因此林教授提出學術國際化的人才應具備的特質，分別為國際視野、國際態度、國際競爭力、國際活動能力以及適應力。

**國際視野：**具備各國相關知識，能換位思考，以協助國際溝通、協調與合作，並能思考問題與肯定自我價值。

**國際態度：**能體認文化差異，並能公平競爭、友愛合作與自尊自愛、自信自強的正確態度。

**國際競爭力：**擁有語文能力與領域專業知識，能順應國際發展趨勢與領域專業需求，表達與發揮專業能力，擁有被國際領域認可的實力與說服力。

**國際活動能力：**要有好奇心，熱愛體驗各種不同的生活與參加各種不同競賽或活動，並清楚掌握可運用資源與建立良好人脈，以協助達成個人目標。

**適應力：**要跟不同文化、背景的人快速交流，必須要有很強的整合、溝通、談判與適應社會環境變化的能力，在不斷學習和培養良好的人際關係中得到提升。

## 學者國際化三大願景：研究、服務、教學

### 一、「研究」具國際競爭力

#### (一) 研究題材：夠新夠大夠重要

研究成果的影響力大小在選定題目時就決定泰半，往往「新題目舊方法」比「舊題目新方法」更有影響力，除非新方法得到另一個數量級的改進。大部分的研究生對題目好壞較沒感覺，所以有賴指導教授的建議或討論，也要避免加了很多流行關鍵字 (buzzwords) 造成題目變小，或做與他人差距不大的研究。最好能在聽 keynote 時觸發新的想法，或在會議與人腦力激盪，當然也可以在地毯式的調查甚至撰寫 survey 論文後往較未被妥善解決的問題邁進。最後一種方式，先實作再從研究過程中尋找「真實問題」，而不論哪一種

來源，都可以一次思考一個藍圖 (roadmap) 並耕耘數年。

#### (二) 合作對象：向上向下向左右

合作的好處除了資源的整合共享，更能因為互相鞭策、激盪與檢視讓速度與品質更好，而透過會議交流或學術服務工作認識接近領域的人，就可以安排日後參加會議時順道去演講訪問，例如：申請 IEEE Distinguished Lecturer 進行海外演講行程，演講的深入討論就能觸發共同有興趣的主題。對於合作模式，牽涉到雙方的 profile 高低，切記不要「假合作或半合作真掛名」，長期就會累積不少合作愉快有效率的夥伴關係。

#### (三) 研究發表：最佳化質量與影響力

台灣過於重視 A 級期刊，導致學者花許多時間產出一篇論文到 A 級期刊的水準，但花太少時間在思考有影響力的題目，因此無法提升其價值。

根據統計，研究調查 (Survey) 論文的平均被引用數是研究論文的三倍，但台灣很少做研究調查論文，原因是不知道可以這樣做及英文撰寫不夠快，而這對學生其實是個很好的訓練，林教授也提醒研究調查的數量也要適量。最後，創造影響力不是只侷限在論文，專利、標準、新創等「產業影響力」也應得到認可，但仍是要看被市場接受與否、新創營運績效等影響力指標。

## 二、「服務」具國際能見度

### (一) 期刊編輯：細水長流的審稿

若在某一期刊已發表多篇論文，且整體研究績效 (如被引用數) 與該期刊影響係數匹配，就可以在年底向主編 (Editor-in-Chief) 自我推薦擔任編輯 (Associate Editor)。在擔任編輯多年後，也可競選主編，通常是由學會主管或出版商籌組遴選委員會，經討論後選出。擔任編輯等職務是專業的學術服務，必須講究管理的效率、品質與倫理，應「慎用而非濫用」能決定論文生殺大權的權力，不能容許造假、拉幫結派、要求作者引用自己論文等行為。也要熟悉與善用線上審查系統，每週 1-3 次總時數 2-4 小時，有效率專業的挑選審查者、提醒審查者控制時程、閱讀審查意見、做出有鑑別力的審查建議或決定。

#### (二) 會議議程委員：短期大量的審稿

與期刊編輯類似的概念，如果已多年在一個會議發表論文，便能找議程主席 (Program Chair) 自我推薦擔任議程委員 (Program Committee Member)。而議程委員需在 1-2 個月處理大量投稿的審查。議程主席需熟悉 EDAS 等審稿系統的批次作業方式，才能在短時間內分配數百篇投稿

論文給議程委員，並於最後根據審查結果批次決定錄取名單。

#### (三) 競選獎項與職位：由小而大

期刊 (含雜誌) 與會議是一個學會 (Society) 的主要發表平台，為了動態強化學會的會議、期刊、標準參與、獎項頒發等運作，學會再透過許多不同領域的技術委員會 (Technical Committee, TC)，分別就其技術主題支持各會議與期刊的運作。

學會的重大決策須提報到理事會 (Board of Governors, BoG) 表決通過。所有職位與獎項的競選都有其資格標準，在競選或自薦前應先評估自身研究績效、服務經驗等是否與「現任或前任」相當，才能提高成功機率。

## 三、「教學」具國際化及全球化

### (一) 教學英語化：本地生 > 外籍生

英語教學的目的是「引進外籍生來刺激教授與本地生國際化」，然而目前各大學的外籍生

與英語授課比率分別停滯在 10% 與 30% 左右，仍有三分之二的教授與本地生未實際進入英語授課，這只是國際化待突破的「初始門檻」，在不同國籍外籍生的實驗室裡習慣以英語長時間討論，也是培養師生更國際化的「進階門檻」。

### (二) 教學國際化：出國與跨國

上述有提及，透過演講安排最容易建立合作夥伴關係，主動或被動安排一年 5-10 場演講至 2-4 個出國行程中，不是難達到的事情。訪問研究時也能安排正式授課，或是在 Coursera 等線上授課平台開課，可惜教育部與各校未能與 Coursera 談成授權，目前這種模式在並不普遍。

### (三) 教材全球化：出版教科書

從用嘴教一班到用書教全世界，透過國際出版社出一本教科書就可以全球化。儘管出書的準備工程龐大，但可以從自備全新投影片教材開始，累積兩到三年後，再將其轉換寫成書的章節，待審查通過就可以簽約，接著照進度繳各章，然後再經過審查後的修改，最後校稿至定稿。

學術國際化之願景、目標與方法 林盈達 8-2020

願景	目標	方法
研究具國際影響力	研究題材：夠新夠大夠重要 - 如何挑選具影響力的研究題目？	主題演講 (keynote)：看見趨勢 交流討論：腦力激盪 研究調查：地毯式空間清查 系統實作：自己找真實問題 四個避免：看論文追隨題目、讓學生自己決定、挑太細的題目、跟別人區別不大
	合作對象：向上向下向左右 - 如何尋找、建立、多元化與管理夥伴關係？	尋找與建立夥伴關係：會議社交、服務共事、演講安排 管理夥伴關係：上下左右、誰出題目與學生、互訪或遠距 多元化夥伴關係：1-2、2-1、2-2、1-1-2 的 32 種組合
	研究發表：最佳化質量與影響力 - 以何種投稿策略最佳化研究發表的質量與影響力？	會議 vs. 期刊：兼顧或偏重 A 級 vs. 被引用數：傳統標準或國際標準 論文製程前段與後段：影響力 vs. 品質 調查論文 (survey)：被引用數的放大 專利、標準與新創：產業影響力的追求
服務具國際能見度	期刊編輯：細水長流的審稿 - 如何成為國際期刊之編輯、特刊客座編輯與主編？	期刊編輯：從經常作者的期刊開始 特刊客座編輯：提計畫書在投入的子領域找同好與追隨者 主編：從學術傑出到管理編輯委員會與審稿流程 名聲來自品質與正直：慎用而非濫用權力 善用線上審稿系統：每週 1-3 次數小時
	會議議程委員：短期大量的審稿 - 如何成為會議議程委員、議程主席、大會主席與指導委員？	議程委員會：從經常作者的會議開始 議程主席與大會主席：透過技術委員會、指導委員會或理事會 指導委員會：會議的內圈影響者 審稿品質與速度：帶學生一個月審十篇 短期大量：熟悉線上批次作業
	競選獎項與職位：由小而大 - 如何競選各種行政職位與獎項？	職位與獎項獲得：理解評比標準 技術委員會：連接會議、特刊、標準與獎項 理事會：學會的決策委員會
教學具國際化與全球化	教學英語化：本地生 > 外籍生 - 為了外籍生才英語教學？	本地生國際化：師生共同成長 吸引外籍生：擴充研究能量
	教學國際化：出國與跨國 - 如何教到國外去？	國外演講：尋找合作可能 國外授課：結合訪問研究 線上開課：打破國界的全球化
	教材全球化：出版教科書 - 從用嘴教一班到用書教全世界？	自編教材投影片：出書的預備動作 國際出版商出書：從計畫書到校稿

# Sharing Academic Internationalization



Our college is honored to have Professor Ying-Dar Lin share his personal experiences and views on academic internationalization. Due to space limitations, the following notes are extracts from the lecture:

## The necessity of academic internationalization

Traditional local education and knowledge dissemination approaches cannot always maintain a country's competitiveness in the era of knowledge economy. Through academic industrialization, internationalization and globalization, we could effectively maintain the level of knowledge, improve the quality of human resources, and maintain innovation capabilities as well as economic competitiveness in our country.

## The international characteristics of talents

With the globalization of higher education, scholars from various countries must compete with talents from all over the world. At the same time, they must develop the strength and know-how adapted to local conditions so that they can co-work with people from different countries easily. Therefore, Professor Lin characterized international academic talents as international perspective, attitude, competitiveness, capability, and adaptability, as follows. Scholars need to equip themselves with these characteristics in their mentality.

**International perspective:** General knowledge about countries, better international communication with empathy, coordination and cooperation, as well as self-worth affirmation.

**International attitude:** A correct attitude, such as recognition of cultural differences, fair competition, friendly cooperation, and self-esteem, as well as self-confidence and self-improvement.

**International competitiveness:** Possess language ability and domain expertise, adapt to the current global development trends and domain professional needs, express and exert professional ability, and possess the strength and persuasive power recognized internationally.

**International capability:** Have curiosity, enjoy experiencing different kinds of life and participating in different competitions or activities, and have a clear grasp of available resources and establish good

connections to help achieve personal goals.

**Adaptability:** To communicate quickly with people from different cultures and backgrounds, you must have a strong ability to integrate, communicate, negotiate, and adapt to changes in social environment, which can be improved through continuous learning and building effective interpersonal relationships.

Three visions of scholars' internationalization: research, service, and teaching

With international mentality, the three basic scholarly jobs could have better visions, including research with international impact, service with international visibility, and teaching with global coverage.

## 1. "Research" with international impact

### 1-1. Research subject: new, big, and important enough

The impact of research results is much determined at the time you choose the topic. In general, "new topic and old approach" are often more influential than "old topic and new approach" unless the new approach improves by another order of magnitude. Having no idea regarding the quality of the topic, most graduate students rely on the advice or discussion from the adviser. In addition, do not narrow down the research topic by adding a lot of buzzwords or do research not far away from others. It's best to trigger new ideas while listening to the keynote speech, or brainstorming with people in meetings; of course, you can also move on to problems that have not been properly solved after thorough surveys or even writing survey papers. The last approach of finding a topic is to implement first and then look for "real problems" identified in the process. No matter which approach you choose, you can think of a roadmap of topics first and work on it for years.

### 1-2. Partnership: Up, Down, Left and Right

The benefits of collaboration are not only integration and sharing of resources, but also better speed and quality due to mutual encouragement, triggering, and inspection. If you get to know people close to your field through conferences or academic services, you may schedule lectures and visits to them on your future conference trips. If you apply for IEEE Distinguished Lecturer for overseas lectures, the in-

depth discussion in the lectures may trigger common interest for collaboration. Regarding the collaborative model, it depends on the profile level of both parties. In any case, don't be credited as an author if without discernible contributions. Build long-term collaborative relationships to cultivate mutually beneficial partnerships.

## 1-3. Research publication: optimizing quality and impact

In Taiwan, over-emphasis is placed on class-A journals, thereby causing scholars to spend a lot of time producing a paper meeting the standards of class-A journals, but spend too little time thinking about influential topics, which however cannot enhance the paper value much. According to statistics, the average number of citations of survey papers is three times higher than that of research papers. But Taiwanese scholars rarely do survey papers because scholars are not familiar with the approach and writing in English is a bottleneck. However, it is actually a very good training for students. Nevertheless, Professor Lin also reminded that the number of survey papers should not be excessive. Finally, developing impact should not be limited to papers, for example, "industrial impact", such as patents, standards, and startups, should also be recognized. Nevertheless, it still depends on the market's acceptance, performance, and other impact indicators.

## 2. "Service" with international visibility

### 2-1. Journal editors: a long-term stream of manuscript reviews

If multiple papers have been published in a certain journal, and your overall research performance, such as citation count, matches the impact factor of the journal, you could volunteer yourself to the Editor-in-Chief as an Associate Editor, say near the end of each year. After serving as an editor for many years, you could also campaign for Editor-in-Chief appointed by a selection committee organized by the director of the society or the publisher. Being an editor is a professional academic service. The efficiency, quality and ethics of management are very important. The privilege to determine acceptance or rejection of a paper should be "used with caution and not abused". The acts of falsification, formation of gangs, and requesting authors to cite your own works should be prohibited. In addition, you should be familiar with and make good use of the online review system, 1-3 times a week, with a total time of 2-4 hours per week, so that you can efficiently and professionally select reviewers, remind reviewers to control the schedule, read review opinions, and make editorial recommendations or decisions.

### 2-2. Program Committee Members: a short-term burst of manuscript reviews

Similar to the concept of journal editors, you could volunteer yourself to the Program Chair as a program committee member if you have published multiple papers in a conference for years. A program committee member is responsible to handle the review of a large number, e.g., 10-20, of submissions within 1-2 months. The Program Chair must be familiar with the "batch" operation mode, in EDAS or other review systems, in order to assign hundreds of submitted papers to the program committee members, and finally decide the acceptance list based on the review

results.

## 2-3. compete for awards and positions: from small to big

Journals, including magazines, and conferences are the main publication platforms of an academic society. In order to dynamically strengthen the society's operations with conferences, journals, standard participation, awards, etc., a society runs many technical committees (TC) in different areas to support the operation of conferences and journals for their technical areas. Major decisions of a society must be reported to the Board of Governors (BoG) for approval. All competitions for positions and awards have their own qualification standards. Before running for election or self-nomination, you should evaluate whether your research performance, service experience, etc. are comparable to the "current or predecessor" in order to increase the chance of success.

## 3. "Teaching" with internationalization and globalization

### 3-1. English teaching: local students > foreign students

The purpose of using English as a medium of instruction (EMI) is to "solicit foreign students so as to stimulate the internationalization of faculty and local students." However, the ratio of foreign students and the ratio of EMI courses in various universities have stagnated at about 10% and 30%, respectively. Almost two-thirds of faculty and local students are not actually participating in EMI, which is the baseline of internationalization that we should strive to break. When faculty and students are able to discuss with foreign students of different nationalities in English consistently in labs or classes, the elevated ratios will make faculty and students more internationalized.

### 3-2. Teaching internationalization: going abroad and transnational

As mentioned above, it is easy to establish a partnership through speech arrangements. It is not difficult to arrange 5-10 speeches in 2-4 overseas trips a year, either proactively or passively by invitations. Short lectures can be arranged during visits, or full courses could be offered at online teaching platforms such as Coursera. Unfortunately, the Ministry of Education and many universities have not negotiated with Coursera yet to get authorized to offer courses there. Therefore, at present, this teaching model is not common in Taiwan.

### 3-3. Globalization of teaching materials: publishing textbooks

From teaching a class with your mouth to teaching the world with textbooks, globalization can be achieved by publishing textbooks with international publishers. Although getting a manuscript ready for publishing takes much work, you can begin with preparing your own teaching slides, accumulate these slides for two or three years, and then convert them into chapters of the textbook. After passing the review on a book proposal and the first chapter, you would sign the contract, and then submit all chapters according to a schedule. After being edited and revised, you would proofread the final draft to ensure your manuscript ready for publication.



## 參與國際會議 鍛鍊學術英文

文稿整理／林珮雯



全球化浪潮下，各國對國際化的重視日益升高，其中參與國際會議即是最佳鍛鍊學術能力及國際競爭力途徑之一。近期，本院碩博士生踴躍參與頂尖國際會議論文發表，整體研究成果豐碩，陳志成教授師生團隊更獲 MobiCom 2020 SRC 的第一名。以下是我們邀請幾位參與國際會議發表同學分享心得：

**發表論文：**Reward-Biased Maximum Likelihood Estimation for Linear Stochastic Bandits

**作者：**Yu-Heng Hung, Ping-Chun Hsieh, Xi Liu, and P. R. Kumar

**指導教授：**謝秉均老師

**國際會議：**Association for the Advancement of Artificial Intelligence (AAAI)

**該會議重要性：**AAAI 是人工智慧 (AI) 領域的頂級會議之一。今年，總共 9034 篇論文投稿 AAAI，有 1692 篇論文被接受。這樣總體接受率約為 21%。為了促進 AI 研究品質以及鼓勵研究人員之間的科學交流，AAAI 用嚴謹的審核標準來篩選被接受的論文。除此之外，AAAI 也是每年人工智慧領域領域中各個研究員、企業、講者能夠彼此交流的一個重要場地。

**洪鈺恆同學心得分享：**非常感謝教授在這段時間的幫忙。尤其是在寫作上遇到困難時，教授總是不厭其煩的引導我如何更好及更準確的表達自己的想法。收到被接受的通知的那一刻，真的很高興我們的研究被大家認同。但是今年的 AAAI 因為疫情的關係所以改成線上會議，時差讓所有與會者無法同時開會討論，這使得會議現場的熱

絡程度沒有往年高。儘管如此，還是遇到了幾位對這篇論文感興趣的與會者，在得到他人的鼓勵與支持後，我對未來的研究方向有了更多的信心和想法。

**發表論文：**Using magnetic fingerprints to position cars on multi-layer roads

**作者：**Ping-Fan Ho, Chia-Chen Wang, and Jyh-Cheng Chen

**指導教授：**陳志成老師

**國際會議：**ACM International Conference on Mobile Computing and Networking (MobiCom) 2020

**該會議重要性：**MobiCom 為行動計算及無線通訊領域的頂尖會議。

**王嘉誠同學心得分享：**ACM 的會議都有一個很特別的競賽，叫做 "The ACM Student Research Competition (SRC)"。在我們的海報論文 (poster paper) 被接受之後，也獲選參加 SRC。為了能在競賽中獲勝，我夙夜匪懈的準備 paper 的報告。但一想到競爭對手都是各國頂尖的研究者，當下著實覺得希望渺茫。沒想到，我們的 paper 竟然獲得了 MobiCom 2020 SRC 的第一名！而且，是從 2005 年 MobiCom SRC 開辦以來，台灣的學校第一次獲得研究所組的前三名！能獲得這個獎，最感謝的是一路上悉心指導我，在研究上給予我很多幫忙的陳志成教授。也謝謝何平凡研究員技術建議。還有謝謝本實驗室陳禕及涂瑞衡同學的協助。拿了這個獎之後，讓我對自己的研究更有信心了！

**發表論文：**Every Pixel Matters: Center-aware Feature Alignment for Domain Adaptive Object Detector

**作者：**Cheng-Chun Hsu, Yi-Hsuan Tsai, Yen-Yu Lin, and Ming-Hsuan Yang

**指導教授：**林彥宇老師

**國際會議：**European Conference on Computer Vision (ECCV)2020

**該會議重要性：**ECCV 是兩年一次的電腦視覺研究會議，與 CVPR、ICCV 並列電腦視覺領域的三大頂級會議。ECCV 2020 的投稿數為 5025 篇，其中有 1361 篇被接收，接收率約略為 27%。

**徐晟鈞同學心得分享：**此次 ECCV 為我參加過的第二個電腦視覺 / 人工智慧相關的國際研討會議，同時也是我個人在 Domain adaptation 領域的第一個研究成果。這次有幸能參加 ECCV 會議很大程度上得仰賴老師及學長的幫忙，無論是在理論發想、實驗設計和寫作上，他們都給了我不可或缺的協助。由於疫情緣故，此次會議被改為線上會議，Poster 階段變成所有作者自己主持一個線上會議房，因此如果想聽報告或提問只需要加入對方房間即可，不用人擠人，也算是很特別的經驗。總之，參加會議室一次很好的學術交流經驗，過程中不但能與世界各地不同背景的學者交流，也能得到一些有效的回饋，對未來研究很有幫助。

**發表論文：**Learning Face Recognition Unsupervisedly by Disentanglement and Self-Augmentation

**作者：**Yi-Lun Lee, Min-Yuan Tseng, Yu-Cheng Luo, Dung-Ru Yu, and Wei-Chen Chiu

**指導教授：**邱維辰老師

**國際會議名稱：**International Conference on Robotics and Automation (ICRA) 2020

**該會議重要性：**ICRA 為機器人領域中最頂尖的會議。該會議收錄許多與機器人以及自動化相關的論文。

**李懿倫同學心得分享：**這是我第一個研究題目，很榮幸的能夠被世界頂尖會議所接受。當收到論文被接受的通知當下，內心既開心又興奮。然而，可惜的是剛好碰上疫情爆發，最後會議為了安全考量，緊急改成透過 slack 線上舉辦。雖然有些

許沮喪，但依然能夠在線上分享所做的成果。會議過程中有來自世界各地的學者討論著我的研究方法以及成果，同時也給了一些不錯的建議，從中我受益良多。除此之外，會議中也有其他優秀的研究，透過參與他們的報告使我增廣見聞，吸收不同研究領域的精華。這次參加國際會議讓我學到如何表達自己以及與國外學者互相討論交流，並也深刻的意識到語言上的不足，期望下次還有機會參加國際會議時能夠更好的透過英文來表達溝通。

**發表論文：**DEN: Disentangling and Exchanging Network for Depth Completion

**作者：**You-Feng Wu, Vu-Hoang Tran, Ting-Wei Chang, Wei-Chen Chiu, and Ching-Chun Huang

**指導教授：**邱維辰老師、黃敬群老師

**國際會議名稱：**25th International Conference on Pattern Recognition (ICPR 2020)

**該會議重要性：**ICPR 為 IAPR(International Association for Pattern Recognition) 組織下最大的研討會之一。近年來專注於提供在電腦視覺、語音、自然語言處理、人工智慧等領域一個大型的交流平台。此次為 ICPR 第 25 屆，而該研討會也已有接近 50 年的歷史。今年一共有 3250 篇投稿，並有 1411 篇被接受 (約 43.4%)，我們的論文更是榮幸能被選為其中僅佔 144 篇 (約 4.4%) 的 Oral paper 之一。

**張庭維同學分享：**因疫情的關係，這次研討會很可惜的改成線上分享，包含預先錄製介紹影片，及單天的線上的簡短介紹及 QA 環節。ICPR 很貼心的將不同主題分成多個不同時段及不同的線上會議室，讓與會者可以選擇自己有興趣的主題進行線上的交流。雖然要在很多學者前全英文解說我們的論文很讓人緊張，但是能回答他們的問題、聽取他們的建議卻也是一個無比有趣的經驗。且線上研討會也沒有想像中的嚴肅、死氣沉沉，相反的聽到很多幽默的講者，用輕鬆的方式解說他們令人驚豔的研究，是我學習的典範。參加這次會議是我一個難能可貴的經驗，接觸到很多最先進的想法的同時，也讓我學習如何更好的闡明自己的理念，讓其他人更快速的理解自己的想法。

# Attending International Conferences to Build Up Academic English Skills



Due to the coming of a new wave of globalization, a lot of positive attention has been given to internationalization in many countries. Attending international conferences is one of the best ways to polish academic English skills and strengthen global competitiveness. Recently, the graduate students of our college have actively participated in top international conferences to deliver oral or poster presentations, which boosts the overall research productivity. The team of Dr. Jyh-Cheng Chen won the first-place award in MobiCom 2020 SRC. Some of the students, attending international conferences in 2020, share their experiences as follows:

**Title of Article :** Reward-Biased Maximum Likelihood Estimation for Linear Stochastic Bandits

**Authors :** Yu-Heng Hung, Ping-Chun Hsieh, Xi Liu, and P. R. Kumar

**Advisor :** Dr. Ping-Chun Hsieh

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

**The Significance of the conference :** AAAI is one of the top conferences in artificial intelligence (AI). In this year, 9,034 papers were reviewed and approximately 1,692 papers were accepted, with an overall acceptance rate of 21%. To promote research in the field of artificial intelligence and foster scientific exchange between researchers, AAAI selected papers on artificial intelligence according to the highest reviewing standards.

**The experience of Yu-Heng Hung:** I truly appreciate Professor Hsieh's support during the sessions in the conference. Especially when I encounter difficulties in writing, Professor Hsieh always helped me present our ideas effectively and precisely. I am very delighted to know that my paper was accepted by AAAI. However, it's a pity that AAAI-21 was changed to a virtual conference due to the pandemic. It is hard to meet

at the same time for all participants owing to time deference, so the conference was less active this year. Nevertheless, after engaging with other researchers who are interested in our work, I have more confidence and ideas for future research directions.

**Title of Article :** Using magnetic fingerprints to position cars on multi-layer roads

**Authors:** Ping-Fan Ho, Chia-Cheng Wang, and Jyh-Cheng Chen

**Advisor:** Dr. Jyh-Cheng Chen

**International Conference:** ACM International Conference on Mobile Computing and Networking (MobiCom) 2020

**The Significance of the conference:** MobiCom is a top conference in mobile computing and wireless networking.

**The experience of Chia-Cheng Wang:** ACM conferences offer a special competition called "The ACM Student Research Competition (SRC)." After our poster paper was accepted, we were also selected to participate in SRC. In order to win the competition, I have been working hard to prepare for the presentation. However, I didn't exactly think of success once I saw that the competitors are all top researchers from different countries. Out of my surprise, our paper won the first-place award in MobiCom 2020 SRC! It is the first time that the students in Taiwan have received the top-three awards in the graduate category since the inauguration of MobiCom SRC in 2005. I would like to thank my advisor, Professor Jyh-Cheng Chen. He gave me lots of advice and helped me with my research. I would also like to thank Dr. Ping-Fan Ho for technical suggestions. In addition, Yi Chen and Rui-Heng Tu, I really appreciate your assistance. Because of this award, I feel very confident about my research!

**Title of Article :** Every Pixel Matters: Center-aware Feature Alignment for Domain Adaptive Object Detector

**Authors :** Cheng-Chun Hsu, Yi-Hsuan Tsai, Yen-Yu Lin, and Ming-Hsuan Yang

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

**International Conference :** European Conference on Computer Vision (ECCV)2020

**The Significance of the conference :** ECCV, one of the top conferences in computer vision, alongside CVPR and ICCV, is a biennial research conference. ECCV 2020 has an acceptance rate of 27 %, 1,361 out of 5,025 submissions.

**The experience of Cheng-Chun Hsu:** ECCV 2020 is not only the second international conference I have attended in computer vision/artificial intelligence fields, but also the first conference I have presented my research result in the field of Domain adaptation. It is the honor for me to have a chance to attend the ECCV conference. My advisor and seniors have given me all necessary assistance regarding theory development, experimental design and writing. Due to the pandemic, the conference was changed to be online. The Poster presentation was turned into a virtual conference room hosted by all presenters. In other words, if you want to hear presentations or ask questions, you may join one of the rooms without jumping into crowds as an in-person conference, which was a very special experience for me. In short, attending the conference would get amazing academic exchange experience. I have not only communicated with scholars from different backgrounds around the world, but also received some effective feedback, which might be very helpful for future research.

**Title of Article :** Learning Face Recognition Unsupervisedly by Disentanglement and Self-Augmentation

**Authors :** Yi-Lun Lee, Min-Yuan Tseng, Yu-Cheng Luo, Dung-Ru Yu, and Wei-Chen Chiu

**Advisor :** Dr. Wei-Chen Chiu

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

**The Significance of the conference :** ICRA is the top conference on Robotics and Automation. ICRA2020 received 3,512 submissions, a new record, from 64 countries and 14,665 authors. Overall, 3,446 papers were reviewed.

**The experience of Yi-Lun Lee:** It is my first research topic, and I am honored to be accepted by one of the top conferences in the world. When I received the notification that my paper was accepted, my heart was full of joy. However, it is a pity that the conference was changed to be held online via slack due to the pandemic. It was fine with me to share my

research online even though I felt a little frustrated. During the conference, scholars from all over the world discussed my research methods and results, and gave me some good suggestions. I benefited a lot from the discussion. In addition, there were some excellent researchers in the conference. Hearing their presentations has broadened my knowledge and made me realize the essence of research in different fields. By attending the international conference, I learned how to express myself and communicate with foreign scholars; in addition, I realized my English skill is insufficient. I hope I can speak in English well when I have the opportunity to attend an international conference next time.

**Title of Article :** DEN: Disentangling and Exchanging Network for Depth Completion

**Authors :** You-Feng Wu, Vu-Hoang Tran, Ting-Wei Chang, Wei-Chen Chiu, and Ching-Chun Huang

**Advisor :** Dr. Wei-Chen Chiu and Dr. Ching-Chun Huang

**International Conference :** 25th International Conference on Pattern Recognition (ICPR 2020)

**The Significance of the conference :** ICPR2020 is the flagship conference of IAPR the International Association of Pattern Recognition and the premiere conference in pattern recognition, covering computer vision, image, sound, speech, sensor patterns processing and machine intelligence. It is the 25th event of the series, so turning 50 years old since its beginning. There are 3,250 qualified submissions this year and 1,411 papers are accepted (about 43.4% acceptance rate). Our paper is honored to be chosen as one of the 144 oral papers (about 4.4%) in this conference.

**The experience of Ting-Wei Chang:** It was a pity that the conference was changed to be held online due to the pandemic, including pre-recording introduction videos, one-day online brief introductions, and QA sessions. ICPR defined the session time schedule in order to meet as much as possible the differences in the time zone of the participants. Participants may join the session they are interested in according to the schedule. Although making presentations in English before many scholars is very stressful, I still feel pleasure when I was able to answer their questions and listened to their suggestions. The online conference was not as boring and serious as I have imagined. On the contrary, many hilarious motivational speakers presented their amazing research in a casual way. The way they presented at the conference is worth learning. Attending the conference is a memorable experience to me. While I studied many of the advanced ideas, I have learned how to present my ideas well and help others understand my ideas more effectively.

# 資工系首推英語學術能力課程 提升國際競爭力

文／劉美君 資工系英語助教

## 首次推出英語學術能力課程

為了面對全球化及國際化的就業市場需求，本院致力於推動雙語國際化，在提高資工專業領域全英語授課的比例之同時，為了協助本地學生適應全英語授課的能力，在過去幾年本院也推出專屬的英語口說及聽力課程，來增進學生對一般英語能力的信心，使推動全英語授課的成效更佳。因課程對學生有幫助，系上教授們更進一步建議學生的學術英語閱讀及寫作能力也是提升國際競爭力的重要的條件。因此除了原本的英語口說課程外，本學期資工英語課程教學團隊第一次推出英語寫作邏輯課來協助學生建構撰寫論文及學術投稿的能力。

資工專屬英語課程的教學團隊由本校英語教學研究所美籍碩士生 Dejah Crystal 老師、本系英語助教劉美君老師及來自清大外文研究所認知語言組畢業的王俊凱老師組成，共十一個實驗室參與了英語溝通與表達課程（英語口說課），而另外有六個實驗室報名了學術英語寫作課程。每位老師的課程內容豐富，各具有特色。例 Dejah 老師的課程擅長用美國的文化設計有趣的課程，劉美君老師的課程喜歡帶入熱門時事議題，並且鼓勵學生用英文討論，增進學生的語言學習動機。而在本學期新增的英語寫作邏輯課程中，王俊凱老師特別使用資工系領域 paper 作為教材，深入淺出的講解複雜的學術邏輯架構。學生及教授對新課程的反應良好，認為英語能力和專業能力一樣都需要花時間好好學習，而資工英語課程教學團隊提供的課程針對不同英文需求，包含一般聽力與口說英語能力及學術寫作英語能力，都對資工學生在不同階段非常有幫助。

## 課程介紹

本計畫預計在 109-2 學期繼續開設改良後的三類型英語增能課程，學生可依據學習需求選擇課程：

### 一、英語口說能力表達課

**Level 1 基礎英語與生活英語口說課程：**增加學

生一般生活主題的英語聽力及口說練習，全英文上課，適合需要在短時間增加英語流暢度的學生。

**Level 2 學術英文發表課程：**增加學生在學術發表及會議討論時的英語能力，透過朗讀練習、發音練習、架構統整練習，訓練在正式場合發表英語的能力。適合需要在會議中用英文發表或有學術發表需求的學生，需參加過口說課程 level 1 的學生才能報名。

### 二、學術英文寫作邏輯課

**Level 1 基礎英文寫作 (1)：**英文寫作邏輯與概念。

**Level 2 基礎英文寫作 (2)：**論文篇章邏輯與概念，需要參加過寫作課 level 1 的學生才能報名。

**Level 3 進階英文寫作，**需參加過 level 1 及 level 2 的寫作課程並已著手在撰寫論文或 conference paper 學生可報名。

### 三、學術閱讀與文法課

**Level 1 學術文獻閱讀技巧：**增進閱讀句子的流暢度及增進閱讀英文文獻的技巧，適合剛進入碩班生的學生報名。

**Level 2 英文文法邏輯解析：**學習用邏輯解析英文文法，對於用英文式思考去閱讀、撰寫句子更有概念，需參與過閱讀課程 level 1 的學生可報名。

其他相關課程訊息聯繫請洽劉美君英語助教 selinaliu731@nctu.edu.tw



# CS Offered Academic English Program to Enhance Students' Global Competitiveness

To increase Computer Science students' competitiveness for the future global market, the Department of Computer Science of National Yang Ming Chiao Tung University (NYCU) aims to build a bilingual education environment by offering more medium of instruction (EMI) courses. Meanwhile, customized English courses are also provided by a teaching team in the department to enhance local students' confidence for general English in speaking and listening. By taking the courses, students can adapt to English-medium courses more successfully. With the success of the courses provided for the past few years, professors of our department further suggested that the academic reading and writing abilities should also be considered as important training for students to face global challenges in the future. Therefore, the Introduction to English Writing and English Logic course was offered the very first time this semester to help students to focus on academic English and develop their required skills for writing thesis and journal articles.

Dejah Crystal, an American master's students from the Institute of Speaking English to Other Languages of NYCU, Mei-Chun Liu, the department's English assistant, and Jyun-Kai Wang, a lecturer graduated from the master's program of the Foreign Language Department of National Tsing Hua University (NTHU) joined this teaching team. Overall, 11 labs joined English Communication and Delivery courses (speaking course) and 6 labs signed up for the Introduction for English Writing and English Logic. All of the courses were very instructive and specially customized. For example, Crystal used culture as an important element in her speaking course to arrange a lot of interesting in-class activities. Also, Liu incorporated trendy topics in her lesson contents and motivated students to discuss in English as much as possible. In Jyun-Kai Wang's English writing class, Computer Science journal articles were widely used as materials to explain the complicated concepts of organization and structures about writing. Professors and students gave positive feedback to the English program, indicating that English ability and professional knowledge are both important and require time for CS students to learn step by step. They also agreed that this program can serve different English learning needs

for Computer Science students at different stages.

## Course introduction

We aim to offer three types of adjusted English courses after collecting feedback from students. Students are able to select courses according to the needs.

### 1. Speaking and listening course

**Level 1 English Communication and Delivery:** the goal of the course is to increase students' listening and speaking fluency. It targets students who want to be familiar with a full English speaking environment in a short time.

**Level 2 English academic presentation course:** the purpose of the course is to train students' ability in presenting and discussing in conference meetings through read aloud, pronunciation, and organization practices. It is suitable for students who need to make English presentations. Students need to take the level 1 speaking course before taking this course.

### 2. Academic Writing Course

**Level 1 The Introduction to English Writing and English Logic 1.**

**Level 2 The Introduction to English Writing and English Logic 2:** the Concept and Logic of Thesis. Students need to take the level 1 writing course before joining this course.

**Level 3 Advanced English Writing:** it targets students who already took level 1 and level 2 writing courses and have already started working on thesis or conference papers.

### 3. Academic Reading & Grammar Course

**Level 1 Academic Reading Course:** students will learn to apply effective reading skills and strategies in an academic context. It is a good introductory course for first-year graduate students.

**Level 2 The Logic of English Grammar:** students will gain more comprehension about the grammar logic in readings and sentence writing using authentic examples.

Any information regarding to the CS customized English program, please contact Mei-Chun (Selina) Liu, selinaliu731@nctu.edu.tw



# CGI Lab 團隊再創佳績！ 抱走 AWS DeepRacer 世界冠軍

文／高儷玲

AWS DeepRacer 全球自動駕駛賽車聯盟總決賽於 2020 年 12 月 15 日舉行，由於受到疫情影響，本屆的所有賽事均移至線上進行虛擬賽，大會公佈最終的比賽結果，由國立交通大學電腦遊戲與智慧實驗室（CGI Lab）學生許博鈞和郭奎廷分別拿下總冠軍和季軍，繼前年朱詠嘉同學在比賽中獲得季軍後，再度成為台灣之光。

2020 AWS DeepRacer 全球自動駕駛賽車聯盟自去年三月起展開為期八個月的資格賽，儘管各地接受疫情所困，仍吸引世界眾多業界與學術界的高手參加，總計超過 1 萬人次的挑戰和篩選，最終由 112 位全球各界好手在線上進行分組淘汰賽。

AWS DeepRacer 是一個由進階機器學習技術「強化學習」（Reinforcement Learning, RL）驅動的 1/18 比例自動駕駛賽車，自 Amazon Web Services (AWS) 於 2018 年發表以來受到各界注目，並為此每年舉辦賽車比賽，參賽者須運用強化學習驅動，是 AWS 專為強化學習初學者所設計的機器，希望透過有趣和高娛樂性的方式為開發人員提供探索機器學習的機會。

藉由朱詠嘉學長過去在比賽中的經驗分享和傳承，這次 CGI Lab 做足萬全準備，從 3 月開始透過進行比賽和觀摩對手，不斷優化 RL 模型，只為獲得更好的成績。由學長黃勁博帶領高誌佑、許博鈞、郭奎廷和鄭紹雄四位學弟，爭取到冠軍賽的參賽資格，並在分組淘汰賽的第一組稱霸前四名，更是打敗去年的世界冠軍日本選手 Sola，全數晉級 32 強。

最後由許博鈞同學和郭奎廷同學出戰總決賽，值得一提的是，兩位也是晉級決賽唯二的學生代表，並在賽前便已獲得相當亮眼的成績，許博鈞同學在資格賽的線上對戰聯賽便已得過數次冠軍，而郭奎廷同學則是在去年 5 月的線上高峰會競速賽中獲得冠軍殊榮。在總決賽兩位同學與六位各國企業開發人員透過線上模擬環境模式對戰，以最短時間完成 5 圈，分別獲得 2 分 0.856 秒和 2 分 2.655 秒的好成績，成功打敗許多優秀的企業參賽者，將世界總冠軍抱回台灣，再度向世界顯示台灣的科技人才不容小覷。



## The Team of CGI Lab Makes Another Great Achievement! Taking Home the 2020 AWS DeepRacer Championship

The 2020 AWS DeepRacer League Finals was held on December 15, 2020. Due to the impact of the pandemic, all events of this year were going full virtual. AWS DeepRacer League announced 2020 Championship Cup winner Po-Chun Hsu in Taiwan and third-place winner Kuei-Ting Kuo from CGI Lab in Taiwan, who are both from Computer Games and Intelligence Lab (abbr. CGI Lab) led by Professor I-Chen Wu, College of Computer Science, National Yang-Ming Chiao-Tung University. After Yeong-Jia Roger Chu, from CGI Lab too, won the third-place award in the competition last year, our students are, once again, the light of Taiwan.

The 2020 AWS DeepRacer League has launched an eight-month qualification tournament since March last year. Despite impact of the pandemic, the tournament still attracted developers from academia and industry around the world to participate in the qualifying stage, having more than 10,000 challenges and screenings. Finally, 112 players from all over the world advanced to the knockout stage of the championship online.

AWS DeepRacer is an autonomous 1/18th scale race car designed to test RL (Reinforcement Learning) models by racing on a physical track. Since AWS DeepRacer was announced by Amazon Web Services (AWS) in 2018, it has attracted attention from all over the world and the racing competition is held every year. Participants develop a reinforcement model to control throttle and steering. The platform was designed by AWS for RL beginners to provide developers with opportunities to explore machine learning in a fun and

highly entertaining way.

Based on Yeong-Jia Roger Chu's past experience in the competition, the CGI Lab is fully prepared this time. Starting from March, through competitions and observation with opponents, the RL model has been continuously optimized in order to achieve greater results. Senior student Jin-Bo Huang, leading four younger students, Chih-Yu Kao, Po-Chun Hsu, Kuei-Ting Kuo, and Shao-Xiong Zheng, advanced to the finals and dominated the top four places in the first group of the knockout stage. He also defeated last year's world champion Sola of Japan. All advanced to Top 32.

In the end, Po-Chun Hsu and Kuei-Ting Kuo represented the CGI Lab in the finals. It is worth mentioning that both of them are also the student representatives who have advanced to the finals, and their results are very impressive. Po-Chun Hsu has won several championships in the qualifying stage. Kuei-Ting Kuo won the championship in the online summit competition in May last year. In the finals, Po-Chun Hsu and Kuei-Ting Kuo competed against six professional developers from different countries in the online simulation environment, completing 5 laps in the shortest time, 2 minutes 0.856 seconds and 2 minutes 2.655 seconds respectively. They successfully defeated many outstanding professional developers, and took the world championship cup back to Taiwan. Once again, they showed the world that Taiwan's scientific and technological talents should not be underestimated.



# CS+X 跨界合作

## 2020 交大物聯網科技藝術節

文／高麗玲

5G 將進入大眾的生活，因為 5G 的普及物聯網時代進入全新的階段，交大以物聯網為主題，舉辦「2020 交大物聯網科技藝術節」，於 2020 年 12 月 16 號到 30 號，在交大工三館及浩然圖書館外草皮展出，本次展覽的主題是對於網路的未來提出一種全新想像。以林一平教授的 IoTtalk 平台，作為此次物聯網與科技藝術實驗的接口，透過物聯網分別連結「馬達動力」、「智慧鏡裝置」、「LED 燈光裝置」，用網路傳輸動態數據、即時圖像、DMX 訊號等，呈現物聯網的多個面向。

此計畫邀請交大資工、應藝、傳播所共同合作，而交大應用藝術所所長許俊成教授表示「這是交大難能可貴的地方，通過不同系所的合作，創造出不同火花。」此外也邀請互動藝術團體「有電互動」製作 LED 動力裝置，共展出三組藝術裝置作品《手的延伸 掌的傳承》、《光柵風景 -- 飛進蒲公英裡面的鳥》、《鏡中幾何》。

本次藝術節的幕後功臣林一平教授表示，這個計劃的發想是源自校長希望布袋戲和科技做結合，「我們希望把人文藝術和互聯網科技做結合，並在校園發揚光大，也希望營造一個健康快樂的校園。」，林教授表示這是計劃最主要的目的，同時也特別感謝資訊學院提供場地。

策展人羅禾淋教授談及計劃的核心脈絡

IoTtalk，不同於過往的平台，IoTtalk 有很大的擴充性，更適合作為更新數據的推手。因不用思考運算只需輸入輸出便能處理，因此也成為科技應用或博物館展覽的一大助力。而這次舉辦的是一個示範型的展覽，雖然作品件數很少，但實驗了很多有趣的東西，例如戶外 LED 裝置。

這次傳輸使用的是 DMX512，同時也是劇場的規格，代表未來有很大的擴充性，甚至是布袋戲的手部數據，也可以透過 IoTtalk 及機械手臂重現。而這個傳輸不局限於數據，也能是多媒體如圖像，聲音、影像等。它是一種不同的互動藝術的前置，像鏡中的裝置，可以自行拼裝想要的圖案，送到裝置中心後，結合全部人的作品變成一個大型的創作，不但讓科技藝術的創作更多元，也讓民眾能一同參與創作，而這也是 IoTtalk 最有價值的地方。

「基本上藝術節有一點示範性質，藉由交大工理工背景的專長及技術，發展一些新的聯想，甚至是連接到 5G 的部分。」羅禾淋教授說道，由今年的科技藝術節做為開場白，讓大眾知道交大有大在科技藝術。同時也表示明年將會再舉辦科技藝術節，屆時希望能讓更多學生參與，邀請更多像本次合作的友電互動設計公司，甚至是和校外的藝術家、創作者互動。讓交大作為目前全臺唯一做互聯網科技藝術成為其領域先鋒，並期盼引領更多人關注並投入在科技藝術中。



# CS+X Cross Departmental Collaboration: 2020 NCTU IoT TechArt Festival



5G is becoming a noticeable and recordable fact among the general public. Because of the rapid popularization of 5G, the Internet of Things has entered a new stage. Chiao Tung University held the "2020 NCTU IoT TechArt Festival" on the Internet of Things. Taking place from December 16-30, 2020, the exhibition was located in the public space between Engineering Bldg 3 and National Yang Ming Chiao Tung University Library. Proposing a new imagination for the future of the Internet is the exhibition's main message. On top of Professor Yi-Bing Lin's IoTtalk platform as the interface between the Internet of Things and experiments in Art and Technology, "motor power", "smart mirror device", and "LED lighting device" are respectively connected through the Internet of Things. Dynamic data, real-time images, and DMX signals, etc., are simultaneously transmitted over the Internet, which presents multiple aspects of the Internet of Things.

This project was in cooperation with the Department of Computer Science, Institute of Applied Arts, and Institute of Communication Studies. Professor Chun-Cheng Hsu, the director of the Institute of Applied Arts, NCTU, said, "It is of great value for Chiao Tung University to ignite diverse sparks via team collaboration among involved departments." In addition, an interactive art group, Electricity Interaction, was invited to set up LED installations. Three sets of art installations, "Extension of the hand, Inheritance of the palm", "Optical grating Landscape-bird flying right into a dandelion", and "Geometry in the Mirror" were presented to the public.

Professor Yi-Bing Lin, the behind-the-scenes hero of this art festival, said that the idea of this project came from the President's wish to combine puppet shows with technology. "We hope to integrate humanities and art with Internet technology and glorify it on campus, while we build up a healthy and happy campus." Professor Lin said that this is the main purpose of the project. Meanwhile, he also expressed his gratitude to the College of Computer Science for providing the venue for this festival.

The Curator, Professor He-Lin Luo, talked about IoTtalk, the core of the project. Unlike the former platforms, IoTtalk possessed great scalability ensuring the best capability for updating data. Performing input and output without calculations, IoTtalk became a great help for technology applications or museum exhibitions. Although the number of art works is small, this festival, as a demonstration, has done some experiments with quite a few interesting things, such as outdoor LED installations.

The protocol used by this project is DMX512, a theater specification as well, which means that it is with great extensibility in the future. Even the gesture behavior of puppet shows can also be reproduced through IoTtalk and robotic arms. Moreover, this transmission is not only applied to data, but also to multimedia such as images, sound, and videos, etc. It is a front end of a different interactive art; for example, an installation in a mirror. You can assemble the desired patterns by yourself, send it to the installation center, and later combine all the works into a large-scale creation. It has not only diversified technology art creations, but also encouraged people to participate in joint creation, which is the most valuable part of IoTtalk.

"Basically, this art festival is sort of for demonstration purposes. With the expertise and technology of Chiao Tung University, new associations will be inspired, even connected to 5G." Professor He-Lin Luo said that the Technology Art Festival this year will serve as the opening remarks to declare to the public that Chiao Tung University is doing technology art. At the same time, he also expressed that there will be another technology art festival next year. He hopes to increase student participation, invite more Interactive Design companies, such as Electricity Interaction, and even interact with artists and creators outside the campus. He expects that Chiao Tung University, as the only university doing IoT technology art in Taiwan, will be a pioneer in this field and lead more people to pay attention and dedicate themselves to technology arts.



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

- ◇ 本院施仁忠教授於 110 年 2 月起擔任本院副院長。
- ◇ 趙禧綠老師於 110 年 3 月 1 日起擔任電機資訊學士班副主任。
- ◇ 本院資訊工程學系王國禎教授、林甫俊教授於 110 年 2 月退休。感謝二位老師對本院的付出與貢獻，春風化雨、培育棟樑，希望老師們能常回系上傳承經驗。

### 二、國際交流

- ◇ 曾煜棋教授與曾新穆教授於 109 年 12 月 3 日至 12 月 5 日辦理 2020 年人工智慧普適應用國際學術研討會 (ICPAI 2020)，本會議以人工智慧跨領域跨學門多元化的國際 AI 應用論文研討為主，並邀請美國、日本等頂尖學者分享 AI 重要成果。
- ◇ 謝續平教授、吳育松教授等幾位資訊安全領域老師於 109 年 10 月 5 日至 10 月 9 日辦理第 15 屆 ACM ASIA 電腦與通訊安全國際會議 (ACM ASIACCS 2020)，本會議為 ACM 兩大世界頂級資安會議之一，此次邀請 8 位國外講師，聚焦於資安維護以及相關領域的研究與開發，並建立跨國的互動合作，提供一個相關最新技術以及知識的平台。

### 三、教師榮譽

- ◇ 吳毅成教授榮獲中華民國資訊學會 2020 年資訊榮譽獎章！
- ◇ 邱維辰教授榮獲第六屆電機資訊年輕學者卓越貢獻獎
- ◇ 本院彭文志教授、陳永昇教授、彭文孝教授、黃敬群教授參與國際高教培訓課程與認證，獲得英國 Advance HE Fellowship 申請認證通過！
- ◇ 趙禧綠教授、伍紹勳教授研究團隊榮獲第十七屆國家新創獎 - 學研新創獎！
- ◇ 曾新穆講座教授當選 IEEE Fellow!
- ◇ 曾煜棋教授榮獲科技部 107 年度傑出特約研

### 究員

- ◇ 本校「廣達－交大聯合 AI 研究中心」榮獲「2020 WITSA Global ICT Excellence Awards - Public/Private Partnership Award」Runner Up 及「2020 全球資通訊科技應用傑出貢獻獎－傑出公眾合作服務獎」亞軍
- ◇ 彭文志教授榮獲中國電機工程學會 109 年度傑出電機工程教授獎
- ◇ 易志偉教授、彭文志教授榮獲教育部體育署 109 年度運動科學研究發展甲等獎勵！

### 四、學生榮譽

- ◇ 吳毅成教授指導許博鈞、郭奎廷同學榮獲 AWS 2020 DeepRacer 本年度世界賽冠軍與季軍！
- ◇ 本院博士生林惠婷與曾筠茜同學參與國際高教培訓課程與認證，獲得英國 Advance HE Fellowship 申請認證通過！
- ◇ 吳毅成教授指導吳迪融同學榮獲 TAAI 109 年度博士論文獎！
- ◇ 陳志成教授王嘉誠同學榮獲 ACM MobiCom 2020 Student Research Competition 第一名！
- ◇ 吳毅成教授指導吳迪融同學榮獲 TIEEE 第十屆最佳博碩士論文獎博士論文優等！
- ◇ 嚴力行教授指導陳奕佳同學榮獲 APNOMS 2020 Student Paper Award!
- ◇ 張永儒教授指導吳亭葳同學榮獲臺灣人機互動研討會 TAICHI 2020 Honorable Mention!
- ◇ 詹力韋教授、張永儒教授指導陳冠聞同學榮獲臺灣人機互動研討會 TAICHI 2020 Best Paper Award!
- ◇ 胡毓志教授指導吳家丞、楊潔生、曾敬惟、程冠連同學榮獲 2020 全國智慧製造大數據分析競賽大專與研究生組 Project A 首獎！
- ◇ 易志偉教授、彭文志教授指導黃昱銓同學、廖以諾同學、陳靜萱同學榮獲教育部體育署 109 年度運動科學研究發展甲等獎勵！

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

- Dr. Zen-Chung Shih has been named associate dean in the College of Computer Science, effective February 1st, 2021.
- Dr. Hsi-Lu Chao has been appointed as vice director of EECS Undergraduate Honors Program, NYCU, effective March 1st, 2021.
- Dr. Kuo-Chen Wang and Dr. Fuchun Joseph Lin, professors of the College of Computer Science, retired on February 1st, 2021. Thank you for your dedication and contribution to our college over the years. It would be great that both professors come back to our college and share experiences with us in the future.

### 2. International Collaboration

- The 2020 International Conference on Pervasive Artificial Intelligence (ICPAI 2020) from December 3 to December 5, 2020, hosted by Dr. Yu-Chee Tseng and Dr. Vincent S. Tseng, focused on cross-discipline and cross-domain AI applications in various fields and engaged with top scholars from the USA and Japan.
- Dr. Shihpyng Shieh, Dr. Yu-Sung Wu and other faculty in Cyber Security held the 15th ACM ASIA International Conference on Computer and Communication Security (ACM ASIACCS 2020) from October 5 to October 9, 2020. As one of the best cyber security conferences in the world, this conference invited 8 foreign lecturers and focused on information security maintenance as well as research and development in related fields in order to establish international collaboration and provide a platform with the latest technology and knowledge.

### 3. Faculty Honors

- Professor I-Chen Wu was awarded the IICM Medal of Honor of Institute of Information & Computing Machinery for 2020.
- Professor Wei-Chen Chiu was awarded the sixth EECS Outstanding Young Scholar Award.
- Professor Wen-Chih Peng, Professor Yong-Sheng Chen, Professor Wen-Hsiao Peng, and Professor Ching-Chun Huang have successfully completed Advance HE accredited courses. Professor Wen-Chih Peng received the Senior Fellow HEA; Professor Yong-Sheng Chen and Wen-Hsiao Peng received the Fellow HEA; Professor Ching-Chun Huang received the AF HEA.
- The team of Dr. Hsi-Lu Chao and Dr. Sau-Hsuan Wu

was awarded the 17th National Innovation Award in the Academic research category.

- Professor Vincent S. Tseng has been elected as a Fellow of the Institute of Electrical & Electronics Engineers (IEEE).
- Prof. Yu-Chee Tseng was awarded the Merit NSC Research Fellow Award in 2018.
- Quanta-NCTU Joint AI Research Center received the runner-up place award from the 2020 WITSA Global ICT Excellence Awards - Public/Private Partnership Award.
- Professor Wen-Chih Peng was awarded outstanding EE faculty award of Institute of the Chinese Institute of Electrical Engineering for 2020
- Professor Chih-Wei Yi and Professor Wen-Chih Peng received 2020 Sports Science Research and Development best award from Sports Administration, Ministry of Education.

### 4. Students Honors

- Bo-Chun Hsu and Kuei-Ting Kuo, advised by Dr. I-Chen Wu, were awarded the 1st place and 3rd place of 2020 Championship Cup sponsored by AWS DeepRacer League, respectively.
- Hui-Ting Lin and Yun-Chien Tseng received the Fellow HEA.
- Ti-Rong Wu, advised by Dr. I-Chen Wu, won the 2020 TAAI Ph.D. Dissertation Award.
- Chia-Cheng Wang, advised by Jyh-Cheng Chen, was awarded the first place in ACM MobiCom 2020 Student Research Competition.
- Ti-Rong Wu, advised by Dr. I-Chen Wu, was awarded the TIEEE Best Ph.D. Dissertation Award.
- Yi-Chia Chen, advised by Dr. Li-Hsing Yen, was awarded the APNOMS 2020 Student Paper Award.
- Ting-Wei Wu, advised by Dr. Yung-Ju Chang, was awarded the TAICHI 2020 Honorable Mention.
- Kuan-Wen Chen, advised by Dr. Liwei Chan and Dr. Yung-Ju Chang, was awarded the TAICHI 2020 Best Paper Award.
- Chia-Cheng Wu, Chieh-Sheng Yang, Ching-Wei Tseng and Kuan-Lian Cheng, advised by Dr. Yuh-Jyh Hu, won the first-place award of project A in 2020 IMBD - College Student Group.
- Yu-Chuan Huang, I-No Liao and Ching-Hsuan Chen, advised by Dr. Chih-Wei Yi and Dr. Wen-Chih Peng, received 2020 Sports Science Research and Development best award from Sports Administration, Ministry of Education.



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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