

是日未來：跨域實作成果展——帶領學生成為未來的構築者

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

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

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



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

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

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

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



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

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

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

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

sustainable future.

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

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

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