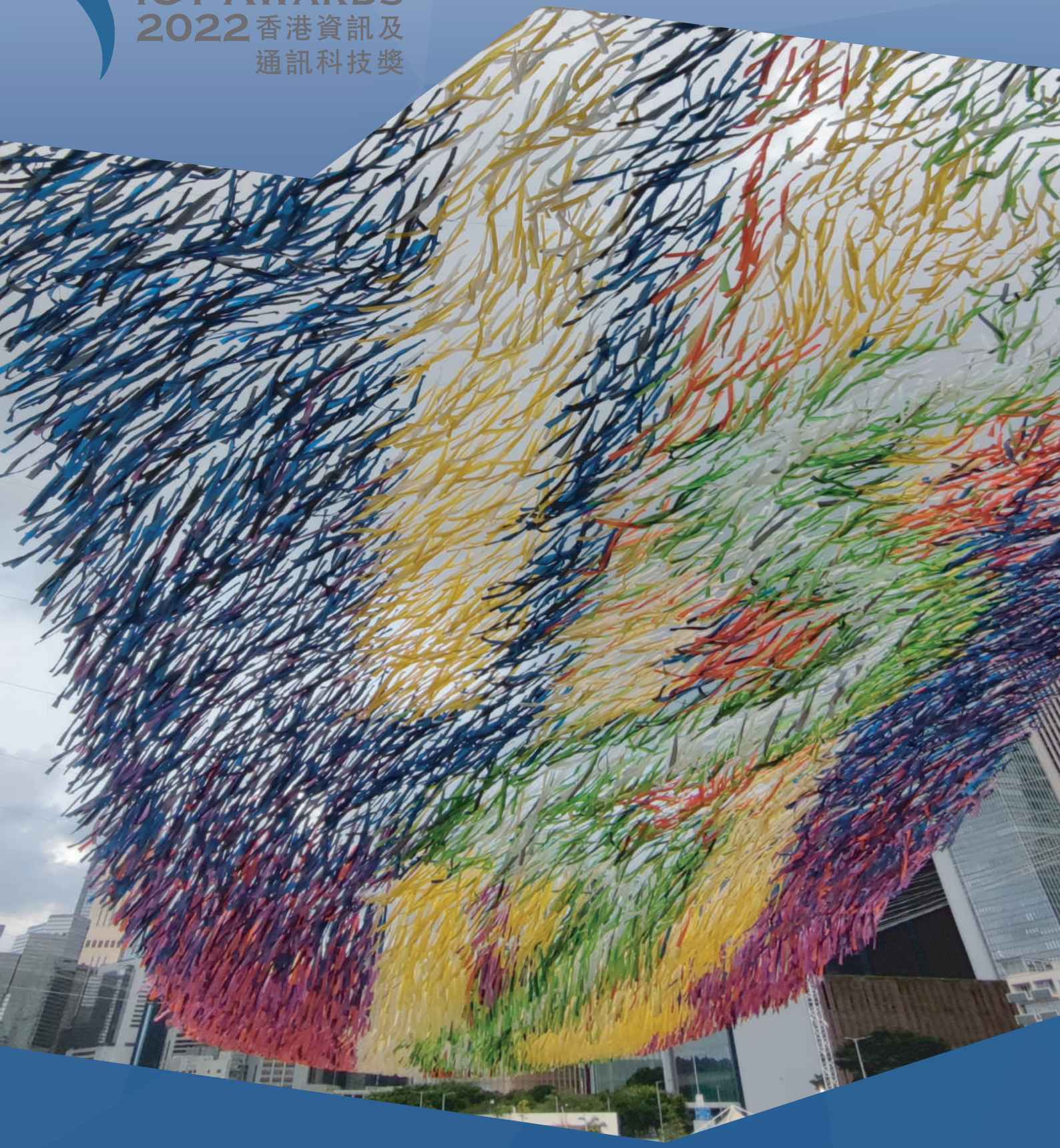
HONG KONG
ICT AWARDS
2022香港資訊及
通訊科技獎

Student Innovation Award
學生創新獎



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HKNETEA 香港新興科技教育協會 10th

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Winning Product 得獎作品	Issue Addressed 對應的議題	Issue Resolved / ICT Applications Promoted 解決的問題 / ICT應用的促進	Award 獎項	Ref Page 參考頁
基於人機互認知的機械人協作製造系統	引入工業4.0新概念，從根本上改變生產和管理系統的方式	解決定制化生產所面對的困難和機器人靈活性不足的問題，開發一套增強現實(AR)引導的人機協作製造系統，提升系統的感知、推理和認知能力。在高度精細和靈活的裝配下實現走向數字化的智能製造。	學生創新大獎 及 學生創新(大專或以上)金獎	4
Streaming Hub	促進視頻娛樂方式互動性和多樣性，提升網上直播體驗	Streaming Hub 是一個全新直播解決方案，允許在任何地方進行直播，自定義工作流程 (借助 AI 引擎，系統識別主播手勢並允許創建產品的增強現實 3D 模型，提供智能互動) 來製作高質量直播節目。	學生創新(大專或以上)銀獎	34
智識收	照顧弱勢社群，避免安全事故	透過「智識收」手機應用軟件及器材智能檢測及遙控控制開關晾衫架，讓用家更有效，更智能打理家務，解決長工時打工仔及忙碌家庭主婦洗衣乾衣的問題；讓長者晾衫工作，大大降低意外出現。	學生創新(小學)金獎	6
病毒BYE BYE！(智能消毒鞋櫃)	保護環境，減少廢物	智能消毒鞋櫃，解決疫情下消毒噴霧和紙張的消耗量大幅增加的問題。	學生創新(小學)銀獎	8
垃圾源頭分類器	保護環境，減少資源浪費	垃圾源頭分類器，解決低效率垃圾回收計劃造成資源浪費破壞環境的問題。	學生創新(小學)銅獎	10
智箱牛盾	保護環境	「智箱牛盾」智能郊區垃圾箱解決兩大問題：1. 防止牛隻到垃圾箱覓食；2. 加強收集郊區垃圾箱的頻率，避免垃圾放置在外。	學生創新(初中)銀獎	19
Be a Dance Arranger	促進藝術互動性和多樣性，提升體驗	運用藝術科技令藝術的呈現更具互動性，甚至可以讓觀眾借助科技創作出屬於自己的作品。	學生創新(初中)銅獎	21
關愛360	照顧弱勢社群，促進長者福祉	「關愛360」流動應用程式提升獨居長者的身心健康，感受到家人溫暖，肯定自我價值，重新連繫社會。	學生創新(初中)銅獎	23
樂活「腦」友：認知障礙長者混合實景復康活動應用	照顧弱勢社群，舒緩社會醫療成本	樂活「腦」友虛擬實景(VR)應用程式預防並減緩長者認知障礙症。結合1)運動治療、2)多感官環境療法 及 3)緬懷療法。不需要任何其他設備或額外的專業協助，能隨時隨地進行康復活動。	學生創新(高中)金獎	26
智護全方位	照顧弱勢社群，照顧獨居長者需要	智護全方位機械人設有監測長者體溫和室內活動情況、智能藥盒及視像聯絡功能，照顧長者多方面需要。	學生創新(高中)銀獎	28
親子馬拉松單車機	照顧弱勢社群，提高長者生活素質	「親子馬拉松單車機」運用長者親朋子孫的照片、錄音和視頻，吸引和鼓勵長者使用腳踏機改善腳部機能。物理治療師也可透過互聯網收集和分析數據給使用腳踏機長者適當建議。	學生創新(高中)銅獎	30

Student Innovation Award
學生創新獎

Background
背景

The Hong Kong ICT Awards aims at recognising and promoting outstanding information and communications technology (ICT) inventions and applications, thereby encouraging innovation and excellence among Hong Kong's ICT talent and enterprises in their constant pursuit of creative and better solutions to meet business and social needs.

The Hong Kong ICT Awards was established in 2006 with the collaborative efforts of the industry, academia and the Government. Steered by the Office of the Government Chief Information Officer, and organised by Hong Kong ICT industry associations and professional bodies, the Awards aims at building a locally espoused and internationally acclaimed brand of ICT awards.

There are eight categories under the Hong Kong ICT Awards 2022. There is one Grand Award in each category, and an "Award of the Year" is selected from the eight Grand Awards by the Grand Judging Panel.

The "Hong Kong ICT Awards: Student Innovation Award" provides a platform for local ICT talents to demonstrate their outstanding works and achievements in the ICT industry. It is an award to promote the development of the local IT and provide young people more opportunities to access and learn new technology and broaden their horizon and creativity. This can help increase the possibilities in the future development of information technology.

香港資訊及通訊科技獎旨在表揚及推廣優秀的資訊及通訊科技發明和應用，以鼓勵香港業界精英和企業不斷追求創新和卓越，謀求更佳和更具創意的方案，滿足企業的營運需要，造福社會。

通過業界、學術界和政府的共同努力，香港資訊及通訊科技獎於二零零六年成立。香港資訊及通訊科技獎由政府資訊科技總監辦公室策動，並由香港業界組織及專業團體主辦，目的是為香港建立一個廣受香港社會愛戴、並獲國際認同的資訊及通訊科技專業獎項。

2022香港資訊及通訊科技獎設有八個類別的獎項。每個類別均設有一個大獎，而最終評審委員會再從所有大獎中甄選出「全年大獎」。

香港資訊及通訊科技獎：學生創新獎為本地資訊科技人才提供一個展示他們在資訊科技行業的傑出作品和成就的平台。 該獎項旨在推動本地資訊科技的發展，為年輕人提供更多接觸和學習新技術的機會，拓寬視野和創造力。 這有助於增加信息技術未來發展的可能性。

Message from Chairman
會長獻辭

Mr. Alex Hung
Founding Chairman

洪文正 先生
創會會長

Innovation is the cornerstone of technological development. It promotes the development of society and improves our quality of life. Hong Kong is a well developed economic system dominated by service industries. Its sustainable growth must rely on the continuous advancement of ICT and innovation technologies and brought by the STEM industry. As the ICT and STEM industries become more globalized and competitive, the ability to innovate is the most critical success factor. Nowadays, it is indispensable to cultivate our outstanding next generation. Therefore, we must stimulate students' interest in ICT and strengthen their basic knowledge of ICT through extracurricular activities, thereby enhancing their interest and awareness of STEM subjects, preparing for the future integration into the fast-paced digital society and enhancing their creativity and innovative thinking.

Innovation is essential to the development of ICT. We need a sufficient number of people and organizations to actively care about and participate in it, and get in touch with various schools. In other words, the initial stage of development must include the participation of the entire community and build awareness at all levels of society.

This year, the Hong Kong Emerging Technology Education Association (HKNETEA) has been established for 10 years. The association understands what it takes to organize a community project. Since its establishment, we have been actively cultivating the next generation of ICT professionals. At the same time, our outstanding performance and effectiveness have been widely recognized by the society. Through the advocacy and implementation of iconic projects such as the Greater Bay Area STEM Excellence Award, the China Youth Science Video Festival (Hong Kong), the Hong Kong ICT Award, the World Summit Youth Award, and mYouth, not only have we established partnerships and close cooperative relationship with major educational institutions in Hong Kong and Asia-Pacific region, but also has accumulated a large number of supporters of younger generation all over the world.

HKNETEA is proud of our strengths and capabilities in promoting emerging technologies, as well as our passion for promoting students' interest and creativity in ICT innovation. Thanks to my team, board members, all sponsors, reviewers and supporting organizations!

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創新是科技發展的基石。它推動了社會的發展，提高了我們的生活質量。香港是一個以服務業為主的發達經濟體系，其可持續增長必須依賴不斷進步的信息通信創新技術和STEM行業帶來的技術。當ICT和STEM行業變得越來越全球化和具競爭性時，創新能力是最關鍵的成功因素。如今，培養我們優秀的下一代是不可或缺的。

因此，我們必須激發學生對ICT的興趣，通過課外活動加強他們的ICT基礎知識，從而提高他們對STEM學科的學習興趣和意識，為未來融入快節奏的數字化社會做好準備。增強學生的創造力和創新思維同樣重要。

創新對信息通信技術的發展至關重要，我們需要足夠數量的人和組織，積極關心和參與創新，並接觸不同學校。換句話說，發展初期必須包含全社區的參與，並在社會各個層面建立意識。

香港新興科技教育協會成立十週年，我們了解組織一個社區計劃需要什麼。自協會成立以來，我們不斷積極培養下一代ICT專業人才，同時出色的表現和成效得到了社會的廣泛認可。通過大灣區STEM卓越成就獎、全國青少年科學影像節、香港資訊及通訊科技獎、世界峰會青年獎、mYouth等標誌性項目的倡導和實施，我們不僅與香港和亞太地區的主要教育機構建立了密切的合作關係，在全球也積累了大批年輕一代的支持者。

香港新興科技教育協會為我們推動新興科技的優勢和能力，以及我們對促進學生對 ICT 創新的興趣和創造力的熱情而感到自豪。

感謝我的團隊、理事會成員、所有贊助商、評審和支持組織!

請點讚我們的Facebook專頁 https://www.facebook.com/hknetea/ 並瀏覽我們的網站www.hknetea.org

Student Innovation Award Judging Panel
學生創新獎評審委員會

HONG KONG ICT AWARDS 2022 香港資訊及通訊科技獎

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(錢玉麟教授)

Deputy Chief Judge

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(陳淑文女士)

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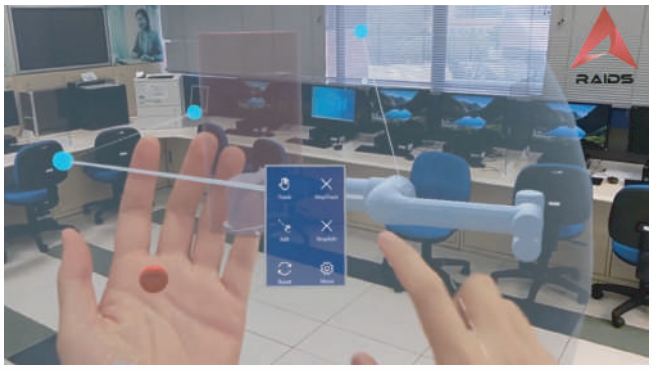
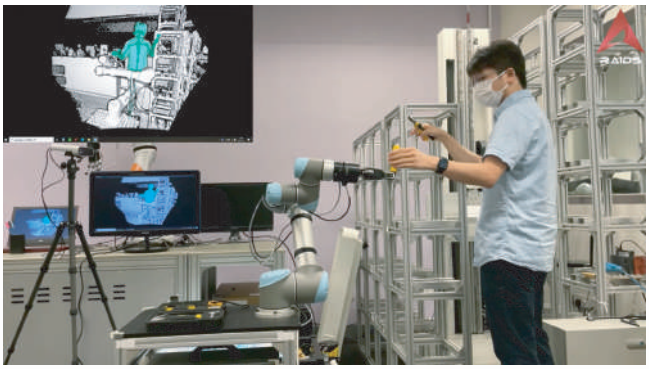
(City University of Hong Kong)
(賴偉超教授)

Mr. Leo WONG, Chief Business Development Officer
(iAsia Online Systems Limited)
(黃卓威先生)

Student Innovation Grand Award
and Student Innovation (Tertiary or above) Gold Award
學生創新大獎
及 學生創新(大專或以上)金獎

The Hong Kong Polytechnic University 香港理工大學
TSANG Chin Lok / LI Cheng Xi / KWOK Hin Chi (曾展樂 / 李成熙 / 郭軒慈)





Mutual Cognitive Human-Robot Collaborative Manufacturing System

Human-robot collaborative assembly (HRCA), as one of the major implementations in modern smart factories, allows seamless communication and cooperation between human operators and robots to fulfill various manufacturing assembly tasks in a shared workspace. Owing to its flexible automation capabilities, HRCA has been playing an ever-significant role to realize personalized production in mass efficiency, which combines the high accuracy, reliability, and repeatability of collaborative robots with the high flexibility and adaptability of humans to realize optimal productivity.

With the popularity of the collaborative manufacturing paradigm between humans and Cobots, the proportion of Cobots increased significantly in the market. Nevertheless, the corresponding associated application areas and control approaches of Cobots are immature, especially in facing individualized tasks. The trend of mass customization in existing manufacturing models has led to a lack of automated solutions for detailed product assembly, where the manual assembly is still the mainstream assembly method used by small and medium-sized enterprises (SMEs) for complex customized products. In sense, Cobots lack the ability to adapt to new tasks and require highly human labor to be reprogrammed by engineers, increasing time costs and reducing the fluency of human-robot collaboration.

基於人機互認知的機械人協作製造系統

人機協作裝配作為現代智能工廠的主要實現方式之一，允許人類操作員和協作式機器人在一個共享的工作空間內完成各種製造裝配任務。由於其靈活的自動化能力，人機協作裝配在實現大規模個性化生產方面一直發揮著重要的作用。它將協作機器人高精確度、可靠性及可重複性的特性與人類的高靈活性和適應性相互結合，以實現最佳化的生產力。

隨着這種協作製造模式的普及，協作式機器人在機械人市場上所佔的比例明顯增加。 然而，相應的應用領域和協作式機器人的控制方法仍未發展成熟，特別是在應對個性化的任務上，機器人缺乏適應新任務的能力，需要工程師對其重新進行程式設計，過程增加了時間成本及降低了雙方協作的流暢性。 在現有的製造模式中，大規模定制化生產成為了一個種新趨勢。然而，在缺乏產品細節裝配相關自動化解決方案的前提下，人工裝配仍然是中小型企業用於復雜定制化產品的主流裝配方法。

為了解決定制化生產所面對的困難和機器人靈活性不足的問題，我們提出一個基於人機互認知的機械人協作製造系統以改善雙方的協作效率。為了在高度精細和靈活的裝配情況下實現智能操

To address the problems of difficult customized production and insufficient robot flexibility in the on-demand manufacturing process, a cognitive Cobot control system is proposed to improve and smoothen the human-robot collaboration process. In order to realize intelligent operations in highly refined and flexible assembly situations, we developed a set of augmented reality (AR) guided human-robot collaborative manufacturing system for customized products. It integrates virtual and realistic task planning and dynamic guidance of visual data which enhance the intelligence of robots. It also facilitates information sharing with Augmented Reality (AR) and provides human-in-the-loop control approaches in a user-friendly manner to better fuse human operators' intelligence. AR-assisted human-robot collaborative flexible production moves towards intelligent manufacturing managed by industrial information technology, migrating algorithmic models from the field of artificial intelligence to realize the identification of customized products in complex industrial scenarios at the cost of small samples, significantly improving the efficiency of assembly in existing manufacturing models in SMEs, enhancing the ability of robots to perform multi-modal tasks, freeing people from repetitive processes, and making human-robot collaboration the optimal choice for companies in the industry.

With the deployment of the system, the perception, reasoning, and cognition capabilities of the system are enhanced including both the intelligence of industrial personnel and industrial robots to realize complex environment perception and motion path tracking, share assembly tasks between humans and Cobots based on perception information, and then adapt to fasten the personalized production progress, while interactively visualizing and dynamically communicating instructions on-demand on an AR platform, forming a new model of flexible, versatile, rapidly adaptable, highly automated and cost-effective customized product assembly.

Comments from Judging Panel
評審委員會評語

It is a high-value and forward-looking self-developed cobot project at local university, which is in alignment with the re-industrialization of Hong Kong advocated by the Hong Kong SAR government.

Although the development is in the conceptual stage, the project has a fairly complete system that can be applied to different fields and fields in Hong Kong, and is compatible with the use of different industrial hardware.

It is believed that this project has high potential to become a very successful example, realizing local R&D in Hong Kong's industrial transformation, and leading the development of Hong Kong's Industry 5.0 !

作，我們開發了一套增強現實（AR）引導的人機協作製造系統。它集成了虛擬現實的任務規劃及視覺數據的動態引導，並增強了協作式機器人的人工智慧和AR信息共享，以用戶友好的方式提供人為監督的控制方法，從而更好地融合操作員和協作式機器人的智慧。 AR輔助的人機協作柔性生產走向了數字化的智能製造，並將人工智能領域的算法模型遷移到複雜的工業場景中，實現了以小樣品為代價的定制化產品的識別，增強協作機器人執行多模式任務的能力。系統將人從重複的製造過程中解放出來，使人機協作成為行內企業的最佳選擇。

隨著系統的感知、推理和認知能力得到提升，複雜環境感知和運動路徑跟踪得以被實現，從而更好的分配人和協作式機器人之間的裝配任務，加快個性化生產的進度。

2-minute Video
2分鐘短片介紹

是一個高價值前瞻性的大學自主研發人機協同工作模式項目，符合香港特區政府倡導的香港再工業化。

雖然發展處於概念階段，但項目具備頗完整系統，可應用於現時香港不同範疇及領域，並兼容配合不同 工業硬件的使用。

相信此項目有很高潛質成為一個非常成功例子，將本地研發實現於香港工業轉型，並引領發展香港工業5.0的未來！

Student Innovation (Primary Schools) Gold Award
學生創新(小學)金獎

CCC Heep Woh Primary School 中華基督教會協和小學

HUANG Maoshen / WEN Pak Hei / HUNG Hiu Nam (黃茂燊 / 溫栢曦 / 洪曉楠)

i-Collect

Hong Kong is famous for its long working hours. Sometimes after we hang the laundry, we can’ t collect it on time. Also, the elderly with deteriorating health are prone to falls and accidents when hanging the laundry. You can also use a remote control switch according to personal needs. It’ ll be like “Everything auto! Life without obstacles! ” Users can take care of housework more effectively and intelligently with this software-iCollect. They can free up time with their families. It can also reduce the chance of accidents caused by hanging the laundry near windows.

With i-Collect Apps , we can retract the laundry and dry out clothes using the remote control on our smartphones. To enjoy the great convenience brought by i-Collect, you just have to download the app and it’ ll do the rest for you. The main functionalities of i-Collect is real-time weather conditions and to operate through light sensors and humidity sensors. For the smart features, laundry is automatically retracted when it rains. Clothes are automatically dried on sunny days. You can also remotely retract clothes as you wish.

i-Collect has light-sensitive and humidity sensors and is programmed through Micro:bit.It is easily made and installed and can be installed anywhere.

From time to time, we can see news where people fall off the building when collecting laundry. i-Collect can be the solution to this problem. Also, it can replace the poor drying racks of the Housing Department which often go rusty after a year. Furthermore, it can help the risk group — old people who are prone to falls and accidents because of cognitive and physical problems.

By intelligently retracting and drying laundry, you are not afraid of any weather. With this app of intelligently retracting and drying of clothes, the elderly single people working long hours can have a worry-free life.

It is just Simple, time-saving & safe! We can use technology to live a smarter and healthier life. Through the program, you can flexibly collect and dry laundry.It is user-friendly & meets the needs of users.

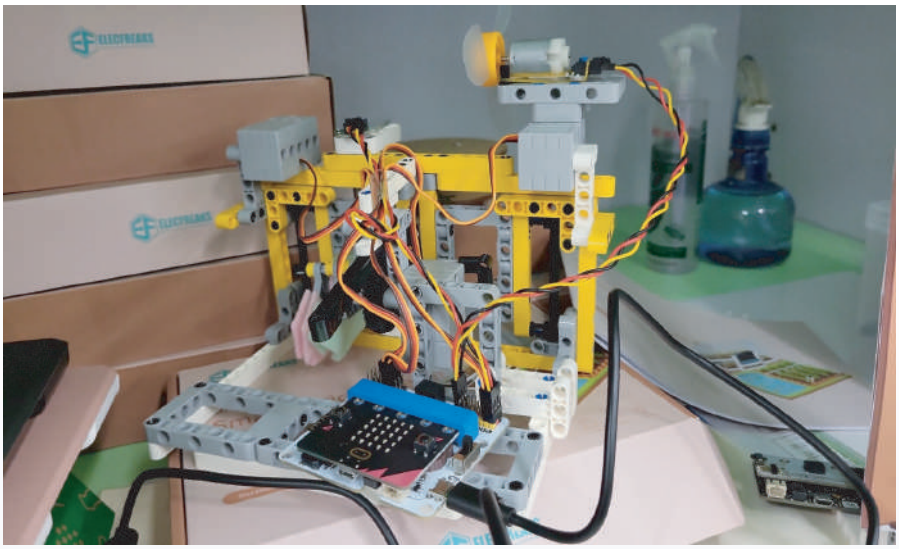
智識收

常言道：「落雨收衫」，「衰仔唔記得收衫，D衫濕晒啦，又要再洗過啦」洗衫收衫是每個家庭必做的家務之一。工時長｜港人每週工作52小時。打工仔不是人人也有能力及可購置乾衣機。往往能晾衫卻不能按時收衫；婦女日常忙於處理家務及照顧小孩；長者身體機能退化易跌倒，因收衫晾衫出意外屢見不鮮。

透過《智識「收」 》手機應用軟件，透過光敏及濕度傳感器智能開關晾衫架，還可按照個人需要，進行遙控控制開關，「識收、識開，生命無礙」。而且，透過製作《智識「收」 》手機應用軟件及器材，讓用家可更有效，更智能打理家務，騰出時間與家人相處；長者也可智能處理晾衫工作，大大降低因晾收衫跌落街的意外出現。

怎樣才能自動收晾衫？我觀察到可以利用光感器/濕度感應器來智能檢測及透過相同的光感器/濕度感應器來控制開關。而且，為了應付香港潮濕多霧的天氣，我們特以加設小風扇，吹走感應器附迎的水氣，令感測器運作更有效更準確。此外，我們更可以透過雲端，利用編程來自動啟動開關，又可以透過IoT來遠端控制。整個設計只須透過簡單的積木、Micro:bit來設計，一般普通家庭也可安裝。

2-minute Video
2分鐘短片介紹



Comments from Judging Panel
評審委員會評語

- Detailed analysis and research of design drawings.

- It is practical, and it is a good idea to be able to divide into automatic and manual collection of clean laundry.

- Recommendations：To strengthen research on practical use (e.g. for the elderly & with high humidity environment)

- 有設計圖詳細分析及研究。

-實用性強，能分為自動收衫及手動收衫是不錯的想法。

-建議可加強實際使用研究 (例如 適合老年人和高濕度環境)

Student Innovation (Primary Schools) Silver Award
學生創新(小學)銀獎

Hong Kong Baptist Convention Primary School 香港浸信會聯會小學
MA Tin Yuet / CHOY Ethan (馬天悦 / 蔡逸帆)

Virus, Goodbye! (Smart Antivirus Shoe Cabinet)

During the pandemic, many people use disinfectant spray to disinfect their worn shoes and put their shoes on disposable paper to prevent soiling the floor when they return home. The consumption of disinfectant spray and disposable paper has increased significantly.

Therefore, we have invented Smart Antivirus Shoe Cabinet. We hope that using this shoe cabinet could effectively reduce the consumption of disinfection spray and disposable paper.

Moreover, it is not only an environmentally friendly product, but also a product for fighting the virus and facilitating people's lives.

According to test results, we have rebuilt and improved the shoe cabinet. Our Smart Antivirus Shoe Cabinet Version 2.0 has been made.

Main Improvements:

1. Used VEX IQ parts to make the shoe cabinet. The structure is more stable.

2. Increased the size of the shoe cabinet. Suitable for adult shoes now.

3. Made a hole at the bottom of the shoe cabinet. Added transparent base and UV light. Modified the programme to add the function of disinfecting soles of the shoes.

Main Functions:

1. To disinfect soles of the shoes by using UV light.

2. To disinfect the interior of the shoe cabinet by using UV light.

3. To open and close the door automatically.

UV Lights Operation Logic:

	Door closed	Door open
Shoes inside	Switch on the UV light at the bottom to disinfect soles of the shoes	Switch off the UV light immediately
No shoes inside	Switch on the UV light both on the ceiling and at the bottom at the same time to disinfect the interior of the shoe cabinet	Switch off the UV light immediately

病毒BYE BYE！(智能消毒鞋櫃)

疫情下，很多人回到家都會用消毒噴霧消毒鞋子，又用紙張墊著鞋子，以防弄污地面，所以消毒噴霧和紙張的消耗量大幅增加。有見及此，我們製作了智能消毒鞋櫃，希望能有效減低消毒噴霧和紙張的消耗量，既環保，又能消滅病毒，幫忙抗疫，同時方便人們的生活。

根據測試結果，我們重新製作並不斷改良，加入新功能。現在的智能消毒鞋櫃已是2.0版本。

主要改良：

1. 改用VEX IQ零件製作鞋櫃，結構更加穩固。

2. 加大了鞋櫃尺寸，可以放入成人的鞋子。

3. 在櫃底開洞，加入透明膠片及UV燈，並修改程式，加入消毒鞋底功能。

主要功能：

1. UV燈消毒鞋底

2. UV燈消毒鞋櫃內部

3. 自動開關櫃門

UV燈運作邏輯：

	已關櫃門	已開櫃門
櫃內有鞋	櫃底開啟UV燈消毒鞋底	即時關閉所有UV燈
櫃內沒有鞋	櫃頂及櫃底同時開啟UV燈消毒鞋櫃內部	即時關閉所有UV燈

Comments from Judging Panel
評審委員會評語

- Very useful design with clear objectives
- The overall idea is easy to operate and implement
- The UA light can shine upon the sole, it would be better if it could also be cast upon the vamp
- Need to solve the problem of putting multiple pairs of shoes

- 非常有用的設計，目標明確
- 整體想法好易操作易推行
- UA 燈照射鞋底，如果也能夠照射鞋面會較好
- 需要解決多雙鞋放入的問題

2-minute Video
2分鐘短片介紹

Student Innovation (Primary Schools) Bronze Award
學生創新(小學)銅獎

King's College Old Boys' Association Primary School 英皇書院同學會小學
CHAN Kayden / LEUNG Hoi Ching (陳昊朗 / 梁海情)

AI garbage sorter

Hong Kong is highly urbanized and produces a large amount of waste everyday. Although the amount of garbage is huge, Hong Kong' s garbage collection plan is not efficient enough. A lot of garbage, which can be recycled, is sent directly to landfills. This causes waste of resources and damages the environment.

The invention is made by Micro:bit, LEGO, artificial intelligence lenses, and other sensors. The invention will also create a mobile application to facilitate users to find nearby waste source sorters and encourage citizens to use them by introducing a points system and coupons.

Operation flow:

1. The user puts the waste items into the sorter one by one.

2. The classifier uses an artificial intelligence lens to classify the items, which can be divided into “recyclable” ; and “non-recyclable” , and then subdivided into different categories.

3. The non-recyclable garbage will be removed from the machine, and the user is required to dispose of it in other garbage bins.

4. The recyclable garbage will be moved onto the sorting conveyor belt according to the analysis of the lens, and then sorted according to the subdivided types.

5. The recyclable garbage will be sent to different temporary storage areas.

垃圾源頭分類器

香港高度城市化，每天都產出驚人的垃圾量。垃圾量雖然龐大，但香港的垃圾回收計劃卻欠成熟，很多可以回收的垃圾會被直接送至堆填區，不但造成資源浪費，更會破壞環境。

發明品使用Micro:bit、LEGO、人工智能鏡頭、及其他感應器製作而成。發明品亦會創作手機應用程式，用作方便用家尋找附近的垃圾源頭分類器，並以積分、優惠券等方式鼓勵市民多分類。

運作流程：

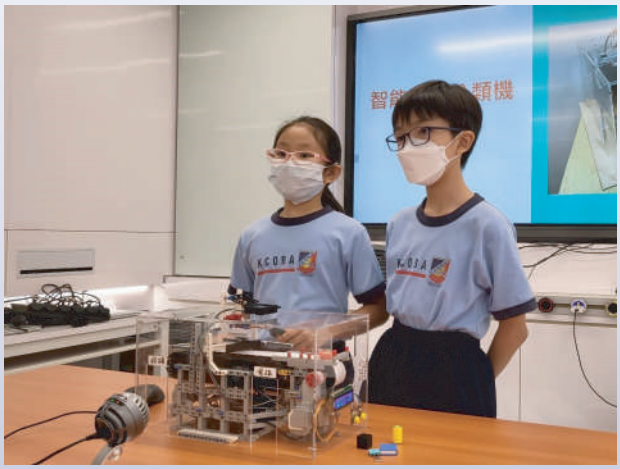
1. 用家將垃圾逐件放進分類器。

2.分類器利用人工智能鏡頭，將垃圾分類，可以先分為「可回收」及「不可回收」，再細分成不同種類。

3.不可回收的垃圾將會移出機器，要求用家自行在其他垃圾筒棄置。

4.可回收的垃圾會因應鏡頭分析，移入分類輸送帶，再按細分的種類存放。

5. 按垃圾種類送至不同暫存區地方處理。



Comments from Judging Panel
評審委員會評語

- Good Prototype, a good design for Environmental Protection

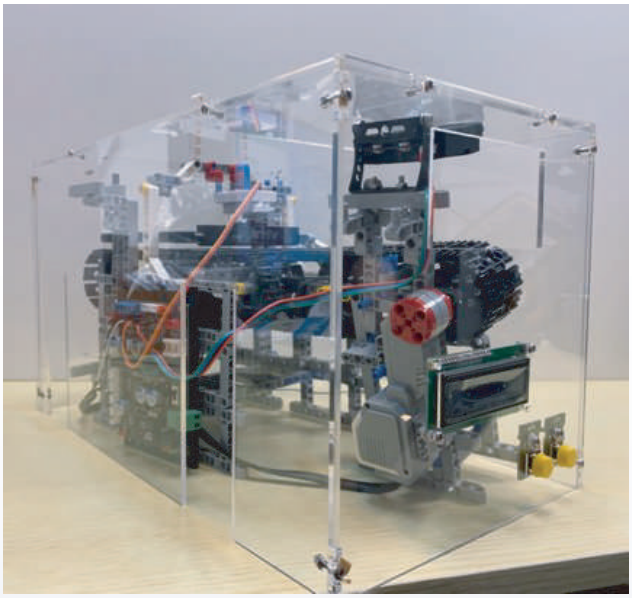
- The idea of Q r code reward system is good but need to consider well

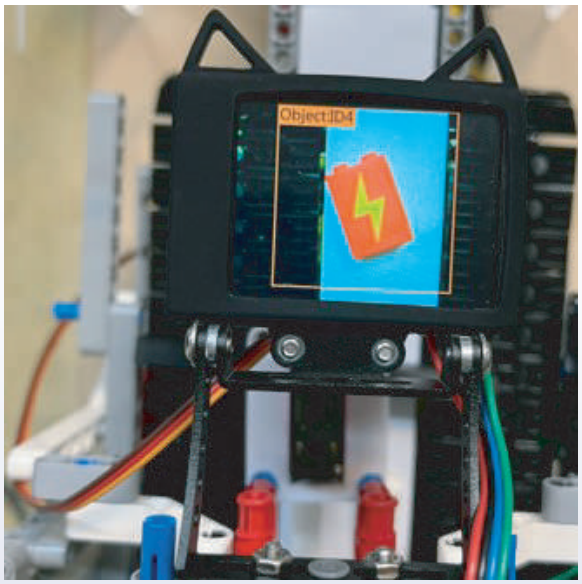
- It is recommended that different QR codes be issued each time for effective use by different users.

- 模型很好，是一個環境保護的好設計

- 二維碼獎勵系統的想法很好但需要好好考慮

- 建議每次發出不同的二維碼，以供不同用戶有效使用





2-minute Video
2分鐘短片介紹

Student Innovation (Primary Schools)
Certificate of Merit
學生創新(小學)優異證書

AD & FD OF POHL Leung Sing Tak School
博愛醫院歷屆總理聯誼會梁省德學校

NG Sum Yin / LO Wing Lam / CHUNG Pui Yuet Audrey / LUI Yuet Shuen Amber
(吳鈋妍 / 盧穎霖 / 叢培悅 / 呂玥璇)

Intelligent Recycle System

To reduce the amount of rubbish and promote the importance of recycling, we designed a product, called Intelligent Recycle System. It is a product combined with AI and IOT technology. We used app inventor 2 to develop an application to remotely control our 'intelligent recycle bins'.

Before we built up the prototype, we collected different kinds of recyclables, including used paper, cans, plastic bottles to take photos so that we could run the machine learning process. When we scanned the recyclables, our app will classify them into different categorises according to their appearances.

When the category is found, the message will be delivered to the system by means of IOT. Then the corresponding recycle bin will be opened automatically.

智能分類易

智能分類易是一個結合AI及 IOT的「智能回收箱」加上由App inventor 2所製作的APP組成。製作原因是為了舒緩香港的垃圾問題及提高市民回收廢物的意識。

早前我們把廢紙、鋁罐、膠樽相片輸入至電腦進行機器學習，當掃描物件時，手機就會透過人面辨識技術，比較數據庫，辨認回收品的外貌，找出最適當分類。

當AI能分辨回收物所屬類別，如鋁罐，訊息會透過物聯網，傳送到回收箱，合適位置的蓋子就會自動打開，方便用家將回收物放到箱內。

Student Innovation (Primary Schools) Certificate of Merit
學生創新(小學)優異證書

Buddhist Lam Bing Yim Memorial School 佛教林炳炎紀念學校

TSE Pui Ki / LIU Ying Lin Amy / DUNCAN Summer Grace (謝佩其 / 劉穎林 / 陳夏嫩)

U-traps intelligent water replenishment

In order to effectively block the invasion or spread of odors and viruses through the U-shaped water trap, keep enough water in the U-trap. We designed a "smart water replenishment system" that can automatically fill the U-trap with water.

The "Smart Water Supply System" consists of a "Water Level Sensor" and a "Water Injector" connected to the water storage device. Place the device in the U-trap, and the "water level sensor" will sense the water level in the elbow and transmit the data to the micro:bit. If the system detects that the water storage is too low, it activates the "water injector" and fills the elbow with bleach diluted 1:99 to reach a safe level. When the water storage capacity of the water storage device is too low, the light will be on and a reminder message will be sent to the user's mobile device to remind the "water storage device" to replenish the water storage. Most of the water inlet positions of the U-trap are covered by sunlight or lights. The power supply of the "smart water replenishment system" will be provided by solar energy charging and storage external mobile batteries. Try to make the power of the device self-sufficient.

防疫智能補水系統

為有效阻隔臭氣和病毒經U型隔氣彎管入侵或傳播，令彎管中保持足夠儲水。我們設計了一件可以自動為U型隔氣彎管注水的「智能補水系統」。

「智能補水系統」由「水位感應器」及連接儲水裝置的「注水器」組成。將裝置放在U型隔氣彎管內，「水位感應器」便會感測彎管內的水位高度，將數據傳輸到micro:bit。若系統偵察到儲水量過低，便啟動「注水器」，以1:99稀釋後的漂白水注入彎管以達至安全水平。而當儲水裝置的儲水量過低時，便會亮燈及有提示訊息傳送到用家手機上，提醒為「儲水裝置」補充儲水。而大部份的U型隔氣彎管進水位置均有太陽光或燈光覆蓋，「智能補水系統」的電力供應會由太陽能充儲外置行動電池提供。盡量令裝置的電力達到自給自足的效果。

Student Innovation (Primary Schools) Certificate of Merit
學生創新(小學)優異證書

Fung Kai Innovative School 鳳溪創新小學
LIU Wei / OU Jiaying / CHAN Tsz Chun / LUK Ho Yin (劉薇 / 區家穎 / 陳子俊 / 陸浩賢)

Smart doctor:Urine health detection system

Human excrement is an important standard that reflects our health. By observing our urine' s colour, it allows us to understand our body condition. That' s why we invited this Smart doctor: Urine health detection system, a machine which uses AI technology to detect the colour of our urine, so that users can check their condition of urine at home.

We divided the system into two parts: the model of our AI machine and the real-time feedback system. We used Teachable Machine to produce the AI machine model. What' s more, p5.js platform was used to create the real-time feedback system. This shows the testing result and health advice for users.

Our main goal is to let the public and students learn about the relationship between our excrement and health through this invention.

智慧醫生:尿尿健康偵測系統

人體的排洩物是反饋我們健康的重要指標！每天觀測尿液顏色能協助我們知道自己的身體狀態。我們製作了「智慧醫生尿液檢測系統」，一個利用人工智能技術檢測尿液顏色，協助用戶在家進行早期尿液健康檢驗的發明。

整個系統分為兩大部分：人工智能模型建立及實時數據反饋系統；我們利用Teachable Machine製作人工智能模型，並利用p5.js平台製作實時檢測界面，讓用戶能知道尿液檢測結果及健康建議。

我們系統透過這個發明，讓大眾及同學認識排洩物與我們健康的重要關係！

Student Innovation (Primary Schools) Certificate of Merit
學生創新(小學)優異證書

King's College Old Boys' Association Primary School 英皇書院同學會小學
LU Kai Shing Rultus / LI Yan Tung Jasmine / WONG Chun Wai (呂佳誠 / 李昕瞳 / 黃進煒)

Anti-epidemic cleaning robot

In the past few years, as the pandemic continues to plague us, many businesses and people are facing various crises, especially the catering industry. As a restaurant, they need to pay attention to hygiene to prevent the spread of the virus, and the tables always need to be well-maintained and clean, which is bound to require more manpower. Also, it is difficult to attract customers during the pandemic and this makes it difficult for the restaurant to remain in business. Therefore, we thought of using robots to help solve these problems. In addition to the most basic cleaning function of the robot, it also has a variety of additional functions, such as spraying sterilized alcohol, displaying the menu, sanitizing lamps with ultraviolet light for additional disinfection and providing masks for customers. This table cleaning robot surely can keep the restaurant clean to a higher standard. Nevertheless, it also can replace many employees. We believe it can help restaurant owners to solve many of the difficulties they are facing.

Of course, we still have a lot of improvement ideas for the cleaning robot, and we hope to have the chance to accomplish it in the future:

1. The table cleaning robot can detect when the diners leave, and it will automatically start the disinfection process after a few minutes.

2. The table cleaning robot can clean different sizes of tables and can measure the size of the table itself to adapt accordingly.

3. The table cleaning robot can clean sauces, such as tomato sauce, soy sauce, chili sauce, etc.

4. The table cleaning robot will come in a variety of sizes so that it can be used in any restaurant, large or small.

抗疫抹枱機械人

由於疫情持續困擾著我們,尤其是餐飲業面臨著多種的危機。作為一間餐廳,必須要注重衛生以防止病毒擴散，且檯面也需要時刻保持清潔，這樣勢必需要更多人手來完成。疫情下請人難，人工開銷大也造成餐廳生存的難上加難。於是我們想到了用機械人來解決這個問題。抹枱機械人除了具備最基本的抹枱功能,還增加了多種附加功能，如:噴出消毒酒精、顯示餐牌、用紫外光消毒燈額外消毒、為顧客提供口罩，可謂是「一人多用」，既可更高標準地保持餐廳清潔，亦能取代大量人手，相信可以幫助餐廳東主們解決不小的困境。

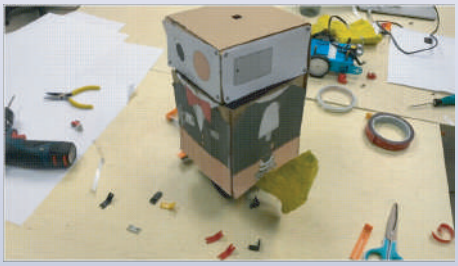
未來改善:

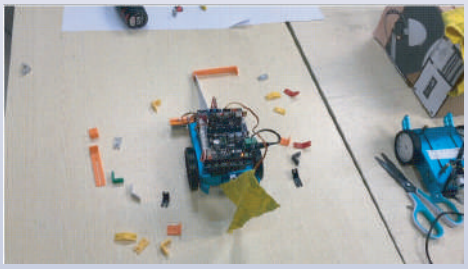
－自動檢測到客人離開,過了一段時間,便自動開始進行消毒工作;

－清潔不同大小的桌子,並可以自己量度桌子的大小;

－清潔一些醬汁,例如茄汁、豉油汁、辣椒汁等;

－盡量縮小,使其佔用較少的空間,這樣一些小的茶餐廳也可以使用。





Student Innovation (Primary Schools)
Certificate of Merit
學生創新(小學)優異證書

King's College Old Boys' Association Primary School 英皇書院同學會小學

YE Pak Yin (葉柏言)

AI moving table system

In different activity rooms and classrooms in school, it is often needed to adjust the arrangement of tables and chairs according to different activities. This requires the effort and time of the school staff.

Design of Smart Desk

The invention consists of several smart tables. Each smart table uses Micro:bit as the main drive board and four universal wheels are installed at the bottom, so that the smart table can move flexibly. The smart station also has an artificial intelligence lens, which is used to sense the April Tag on the ground, so as to facilitate the placement and array between the smart tables.

Classroom design

There is a central Micro:bit in the classroom for commanding purposes, sending and receiving messages to different smart tables. The layout of the classrooms will be divided into grid coordinates. The classrooms are subdivided into different squares. The X-axis is represented by English letters, while the Y-axis is represented by numbers. At different XY-axis intersections, there are different April tags, which can be identified by the artificial intelligence lens on the smart tables.

搬搬枱枱小系統

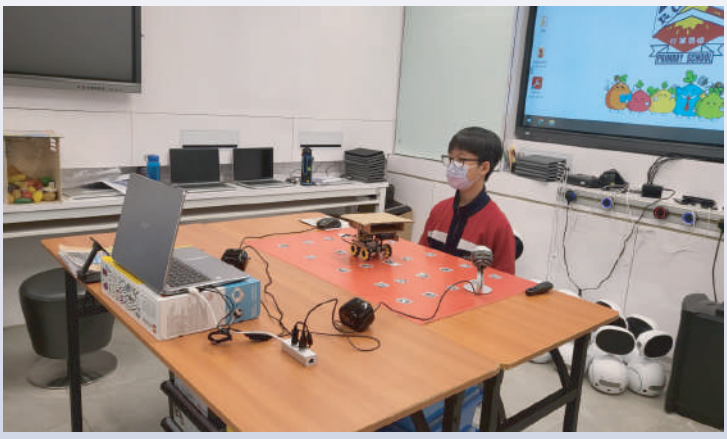
學校不同的活動室、禮堂、班房等，經常需要按照不同活動而調整桌椅的排列方法，每一次均需要花費校工們的力氣與時間去搬運，而且費時。

智能枱的設計

發明由數張或數十張的智能枱組成，每一張的智能枱均由Micro:bit作主要驅動板，而底部都會裝有四個萬向輪，令智能枱可以靈活移動。而智能枱亦設有人工智能鏡頭，用作感測地上的April Tag，以方便智能枱之間的擺位與列陣。

班房設計

班房設有一個中央Microbit作指揮用途，收發訊息予不同智能枱。班房的格局會以格網座標的形式劃分而成，如果在上方鳥瞰班房，我們可以見到班房被細分成不同的正方形，當中X軸用英文字母去顯示　，而Y軸則用數字顯示。而在不同的XY軸交叉點上，均設有不同的April　Tag，讓智能枱上的人工智能鏡頭去辨認。



Student Innovation (Primary Schools) Certificate of Merit
學生創新(小學)優異證書

Po Leung Kuk Lam Man Chan English Primary School 保良局林文燦英文小學

NG Keng Yan Kayton (吳鏡昕)

Brain Helper

"Brain Helper" is a good helper for the elderly. It is because the elderly will encounter different inconveniences in their daily lives, such as poor memory, not knowing foreign languages, getting lost and not knowing how to go back home. People who recovered from Covid-19 would also experience brain fog, leading to poor memory."Brain Helper" has functions including calling for help, daily activities and item expiration dates notification, sharing messages, and translation functions. The "call for help" function can send text messages to family members according to the GPS location of the user. Regarding the "reminder" function, it will remind different due dates, such as turning off the fire, appointments with friends, taking medicine, paying bills/renewing your ID card, watching TV/surfing the Internet etc. It also has a photo-sharing function. Its artificial intelligence features include translation, voice-recognition input and photo recognition for checking food expiration dates.

腦幫手

「腦幫手」是長者的好幫手，以處理長者日常生活中所遇到不便，例如:記性不好、不懂外語及在外面迷路不懂得回家。新冠康復者也會遇上腦霧，引致記性不好。「腦幫手」的功能包括:　求救、提示日常活動及物品到期日提示、分享功能、翻譯功能。當中求救功能，可以針對長者的GPS位置，發短訊告訴家人。至於提示功能可提示不同的到期日，如煲湯熄火、約朋友、接孫、吃藥、繳費/換證、看電視/上網、覆診它也有拍照分享功能。它的人工智能功能包括翻譯、聲控輸入及影像智能查食物到期日。

Student Innovation (Primary Schools)
Certificate of Merit
學生創新(小學)優異證書

Shanghai Alumni Primary School 滬江小學

CHUNG Pok Ho Aiden (鍾博皓)

UO Monitor

According to my observations, many patients need to use urine bags due to their physical conditions.

UO Monitor is a simple device for monitoring the volume of urine in the urine bag. It is attached to a weight-sensing monitor which is connected to a computer. The weight of the urine in the urine bag will be transmitted to the computer for recording in real time. When the weight reaches a preset level, the computer will make a sound to prompt the caregiver to clean the bag. The computer will also record the cleaning time and the amount of urine that has been discharged.

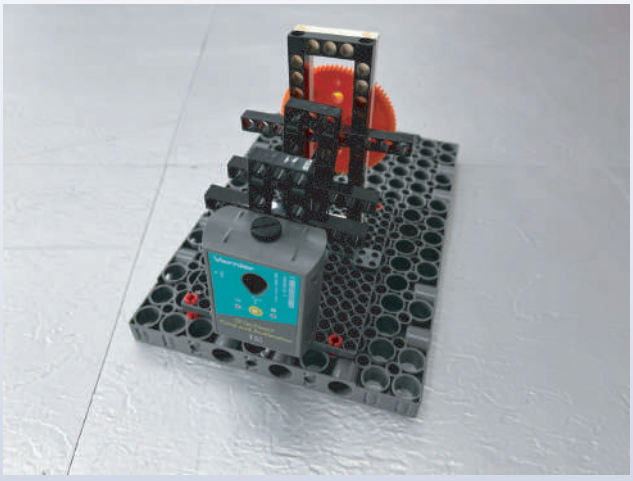
With the help of the UO monitor, caregivers do not need to keep track of the urine bags all the time. The computer can also help record the daily urine output of patients clearly which can help both caregivers and doctors to understand the physical conditions of the patients.

尿袋容量監測器

不少病人因身體的狀況變差，而需要長時間使用尿袋排尿。照顧者因而需要每天定時清理尿袋及紀錄排尿量，大大增加他們照顧病人的壓力。

尿袋容量監測器是一個簡易裝置，用來監測尿袋內尿液的容量。我們會在病人尿袋上方的掛鈎位置連接一個可感應重量的監測器。監測器會連接著電腦，實時將尿袋內尿液的重量傳輸至電腦作紀錄。當尿袋內的尿液達到某個預設的指標，電腦就會發出聲音提示照顧者清理尿袋。電腦同時會把清理時間和已排放的尿量紀錄下來。

使用尿袋監測器可減低照顧者在照顧病人時的憂慮，不用無時無刻記掛着尿袋的情況。電腦同時可以把每天的排尿量清楚紀錄，方便照顧者及醫護人員了解病人的身體狀況。



Student Innovation (Secondary (Junior) Schools) Silver Award
學生創新(初中)銀獎

Lingnan Secondary School 嶺南中學

MAK Sheung Kit / WONG Ho Ming / LAU Chit Hei / KAM Yiu Chuen
(麥常杰 / 黃浩銘 / 劉捷熙 / 甘堯銓)

AI Cow's Shield

We found that garbage bins in the suburbs were often full. This caused tourists to put their garbage next to the bins and many cows foraging in the bins and they got sick or died after eating garbage.

Therefore, we hope our design can solve the following problems:

1. Preventing cows from foraging in garbage bins.

2. Increasing the frequency of emptying suburban bins to avoid garbage being placed outside the bins.

The "AI cow' s shield" is a smart suburban garbage bin which integrates three applied technologies (AI, automation and IoT). It includes three main functions:

Prevent cows from foraging in the bins

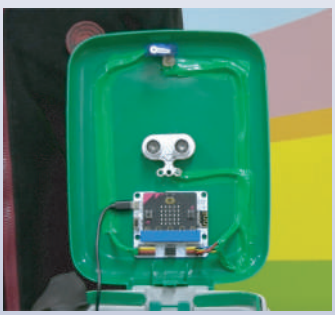
1. The artificial intelligence camera connects to the buzzer. When cows approach the bins, the buzzer emits sound which drives the animals away. Meanwhile the bins are locked to prevent them from being overturned. Thus the garbage does not fall out.

2. Notify cleaners to collect garbage

The ultrasonic sensor gives cleaners information on how full the bins are. When the bins are nearly full, notifications will be sent through IFTTT to cleaners so they will empty them soon.

3. Conduct statistics on garbage collection in each district

With use of the Internet of Things, occupancy rates of the bins are recorded. The cleaning contractor can monitor the garbage capacity in real time and formulate solutions to any problems detected.



智箱牛盾

我們發現到郊區垃圾箱經常裝滿，令到遊客將垃圾放置垃圾箱旁。加上太多郊區牛隻到垃圾箱覓食，導致牛隻食垃圾後患病甚至死亡。

因此，我們希望解決兩大問題:

1. 防止牛隻到垃圾箱覓食。

2.有效地加強收集郊區垃圾箱的頻率，避免垃圾放置在外。

而「智箱牛盾」是一款集合三大應用科技(人工智能、自動化及物聯網)的智能郊區垃圾箱。當中包括三大主要功能:

1. 防止牛隻到垃圾箱覓食

透過人工智能鏡頭偵測是否有牛隻或其他動物接近垃圾箱，並利用蜂鳴器發出聲音驅趕及用伺服馬達鎖上垃圾箱，避免動物推翻垃圾箱使垃圾掉出。

2. 自動通知清潔承辦商收集垃圾

利用內部的超聲波感應器得知垃圾箱內的垃圾容量。當偵測到垃圾箱接近滿時，便透過IFTTT通知清潔承辦商安排清潔工人前往收集。

3. 統計各區智能郊區垃圾箱的垃圾收集情況

透過物聯網技術，智箱牛盾會定時上傳垃圾箱內的垃圾容量至網上，讓清潔承辦商實時監測垃圾收集情況，並透過數據制定相應的垃圾收集策略。

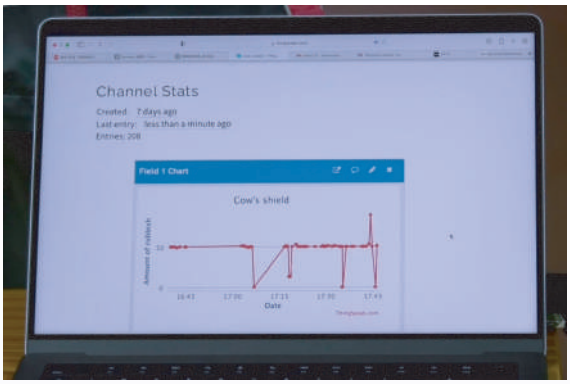
Comments from Judging Panel
評審委員會評語

- Rubbish bins for country parks - smart rubbish bins similar products in market, however its application in rural area is creative to solve one of the major problems

-Good and innovative but need to solve the Wifi connectivity and battery issues

- 郊野公園垃圾桶 - 智能垃圾桶市場上類似產品，但其在農村地區的應用是創造性的，用來解決其中一個主要問題

- 良好和創新，但需要解決無線上網連接和電池問題



2-minute Video
2分鐘短片介紹

Student Innovation (Secondary (Junior) Schools) Bronze Award
學生創新(初中)銅獎

Diocesan Girls' School 拔萃女書院

CHAN Ki Yi Charlotte / CHAN Tsz Nam Aelita / LEUNG Chung Man Jasmine / LUK Cheuk Yiu Sylvia
(陳麒伊 / 陳芷楠 / 梁頌敏 / 陸倬瑤)

Be a dance arranger

Traditionally, the presentation of arts is usually a one-way communication. But nowadays, with art technology, the presentation of art can be more interactive. We can even let the audience create their own masterpiece with the help of technology. And that’ s why we made this prototype. Our prototype consists of three major components, the music, the dance arranger program, and the visual presentation.

Everyone has their own favourite music. We don’ t want to limit the styles of music of the performance. So, we create a program to let the audience download their favourite YouTube video as the background music. After the music is downloaded, we make use of an A.I. algorithm to analyse the beats of the music so that we can send out commands to the robots and have the robots dance along to the beat of the music.

The second component of our prototype is the dance arranger program. At the moment, we have developed a simple Python program to demonstrate this idea. Ultimately, we would like to create a Scratch like for the audience to use.

Finally, the most interesting part of our prototype is the visual presentation. How about if the audience can choose a virtual background, with many special effects for the dance performance? The virtual background can be the original YouTube music or any A.I. generated content.

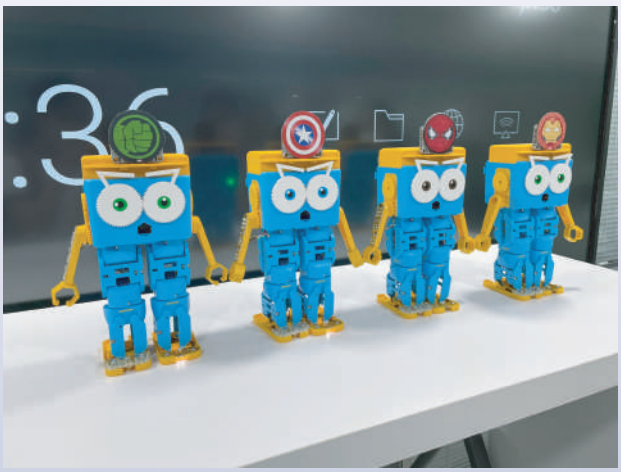
Be a dance arranger

傳統上，藝術表演者與觀眾的交流一般都是單向的。但是，運用藝術科技，我們可以令藝術的呈現更具互動性。我們甚至可以讓觀眾借助科技創作出屬於自己的作品。這就是我們製作這個作品 Be a Dance Arranger 的原因。我們這個作品包括了三個主要部分，分別是音樂、舞蹈編曲程式及視覺呈現。

每個人都有自己喜歡的音樂。我們不想限整個表演的音樂風格。因此，我們編寫了一個程式，讓觀眾下載他們最喜歡的 YouTube 視頻作為背景音樂。下載音樂後，我們使用 A.I.算法分析音樂的節拍，這樣我們就可以向機器人發送命令，讓機器人隨著音樂的節拍跳舞。

我們作品的第二個部分就是舞蹈編曲程序。目前，我們開發了一個簡單的 Python 程式來為機器人編排舞蹈。最終，我們想編寫一個 Scratch like 既程式來為機器人編排舞蹈。

最後，我們作品中最有趣的部分是視覺呈現。透過虛擬的背景和不同的特效，我們可以令的機器人的舞蹈表演更生動，虛擬背景可以是原本的 YouTube 音樂影片或任何 A.I.生成的內容。



Comments from Judging Panel
評審委員會評語

- Art-Tech, creative enough for users to choose and play, however lack originality with high reliance on other element

- Very good topic, extended reality mix with AI

- Good to apply with robotics tech.

- 藝術科技，有足夠的創意供用戶選擇和玩，但缺乏原創性，高度依賴其他元素

- 很好的話題，擴展現實與人工智能的結合

- 很適合與機器人技術一起應用

2-minute Video
2分鐘短片介紹

Student Innovation (Secondary (Junior) Schools) Bronze Award
學生創新(初中)銅獎

St. Paul's Convent School 聖保祿學校
TSUI Tsz Ka / KWOK Sum Yan (徐子家 / 郭心仁)

ACE360

ACE360 is a one touch easy mobile app developed by Android Studio with 7 functions tailor-made for seniors The key functions are “VR360 Past Present Tour” , “Life Story Journal” inspired by Life Review Theory, “Health Tracker” fitness monitoring, a two way IP camera “Virtual Guardian Cam” and 3 other online communicative tools. Aside from the elderly friendly functions which helps to reassure their self-value, enhance family communications and strengthen their connection to the society, ACE Robot also allows users to choose their colour preference and their own family photo on the robot body which reminds them of their close family and friends. Regarding app security, we use AES to encrypt all the files with texts, photos and videos so as to protect user’s digital privacy.

For “VR360 Past Present Tour”, we used a 360 video camera to shoot 18 old districts in Hong Kong and the elderly can also choose to wear a VR headset for a better experience. They can recall their precious memories while discovering new attractions. This strengthens their connections with the society and the young generations.

“Life Story Journal” provides a personalized digital platform for the elderly to record their memorable events in their life. The idea is like Reminiscence Therapy, it can reassure senior’ s self-esteem and confidence by recognizing their accomplishments.

To conclude, we hope through ACE360, we can shorten the distance between the elderly and their families, re-establish their self-identity and confidence, as well as, more easily integrate themselves into the world of technology.

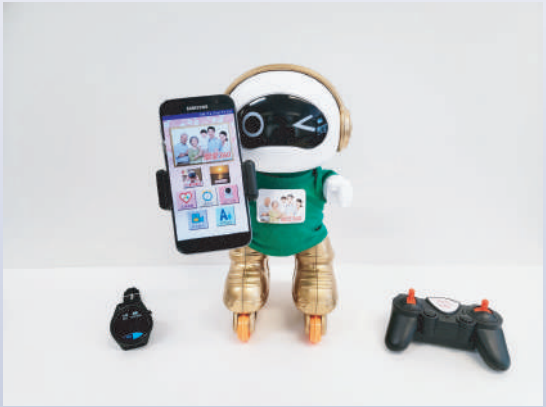
關愛360

「關愛360」具備七項涵蓋情感、回憶和聯繫的實用功能，當中包括「VR360重遊舊地」、「生命足跡」電子回憶錄、「活得健康」監測系統、「朝見晚見」視像鏡頭等。為配合長者需要，「關愛360」的介面設計簡單易用，用家更可自選顏色及家庭照片，配備「關愛寶寶」遙控機器人手機支架以增添親切感。為確保用家個人私隱，程式預設了高級加密標準(AES)，符合網路安全要求。

團隊運用360攝像機拍攝香港不同地區的景觀，長者即使未能外出，也可以安坐家中，戴上VR眼鏡看影片，回憶昔日的美好時光，還可以認識香港的新景點，加強與年輕一代的交流，聯繫社會，維繫長者的精神健康。

「生命足跡」的概念源自「長者生命故事冊 」，提供創新電子自助平台，讓長者可以親手記錄珍貴往事，為子孫留下世界上獨一無二、具個人特色的電子回憶錄。長者可在「留住這一刻」，記錄生活中的珍貴經歷。而「樂齡想當年」，可讓長者回首過去的美好時光，分類記錄昔日往事，欣賞個人成就。此外，程式設有「家人互動區」，長者可以選擇特定的主題與家人分享，有助增強長者的幸福感。

我們希望透過「關愛360」可以提升獨居長者的身心健康，感受到家人的溫暖，肯定自我價值，重新連繫社會。



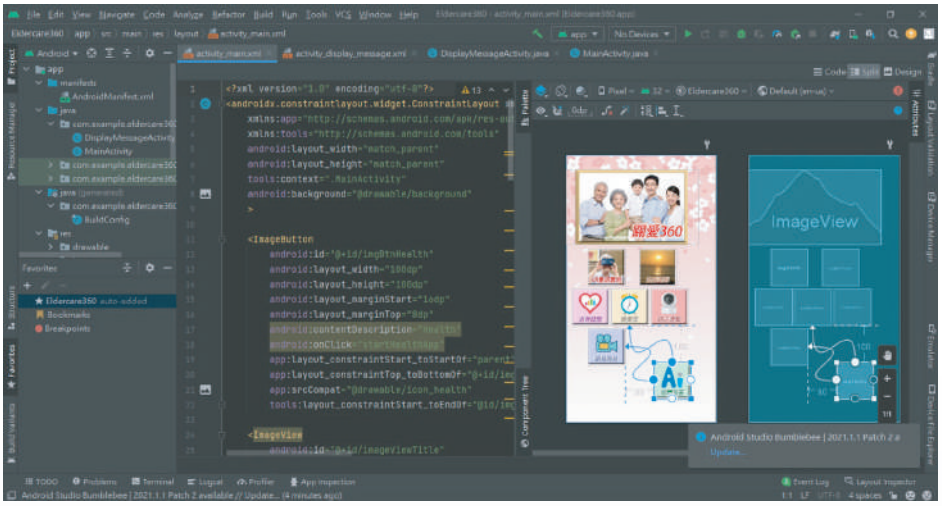
Comments from Judging Panel
評審委員會評語

- Well-designed and tailor made

- The app might be an attractive elderly care solution with mix of various app functions but lacking innovation

- 良好設計和量身定制

- 應用程序可能是一個有吸引力的老年護理解決方案，具有多種應用程序功能，但缺乏創新



2-minute Video
2分鐘短片介紹

Student Innovation (Secondary (Junior) Schools) Certificate of Merit
學生創新(初中)優異證書

Fanling Rhenish Church Secondary School 粉嶺禮賢會中學

SO Ho Chun / WONG Shun Wang Viol / XIAO Chi Fu / CHAN Chun Hin
(蘇皓晉 / 王信泓 / 蕭智富 / 陳振軒)

AI Baby Monitor

At present, infant accidents often occur in our society. The main reason is that when caregivers are busy and have no time to take care of infants, infants may touch dangerous objects or enter dangerous areas out of curiosity and result in accidents. Our designs use artificial intelligence to identify some items that are dangerous to babies. When a baby goes to some dangerous places or has the opportunity to come into contact with dangerous objects, an alarm can be issued in time to prompt adults to pay attention to the baby. Our devices are divided into four parts: anti-fall pillow, Raspberry Pi computer version, alarm and camera. We first collect images of objects that may be dangerous to babies (such as scissors, medicines, etc.), and images of features of places that we want to prevent babies from entering (such as toilets in bathrooms and stoves in kitchens) and use Teachable Machine to carry out Machine learning to classify images as hazardous and non-hazardous. Then, when the baby approaches a dangerous object, the camera attached to the anti-fall pillow transmits the image of the object to the computer for analysis, and the system compares the learned Tensorflow model with the objects on site at that time, and then infers whether the object is dangerous or not. The category, if so, will automatically activate the buzzer to sound an alarm, drawing adults' attention to the baby's situation in the house and taking action to avoid accidents.

AI嬰兒監察器

目前社會經常發生嬰兒意外，主要原因是因為照顧者有事情忙碌，無暇看顧嬰兒的時候，嬰兒因著好奇心而接觸危險物品或進入危險的區域，導致意外發生。我們的設計品利用人工智能的方法辨別一些對嬰兒構成危險的物品。可以在嬰兒去到一些危險的地方或有機會接觸危險物件時及時出警報提示大人去注意嬰兒。我們的裝置分為防跌枕、樹莓派電腦版、警報器及攝像頭四部。我們首先收集可能對嬰兒構成危險的物件(例如剪刀、藥物等)的圖像，及想防止嬰兒進入的地方的特徵圖像(如廁所裡的馬桶及廚房裡的爐頭)，利用Teachable Machine進行機器學習，歸圖像為危險及非危險。然後，當嬰兒接近危險物件時，掛在防跌枕上的攝像頭將物件圖像傳輸到電腦板作分析，系統會將已學習的Tensorflow模型與當時與現場物件進行比對，進而推測物件是否屬於危險類別，如是，會自動啟動蜂鳴器發出警報，提醒屋內的成人注意嬰兒情況並作出行動，避免意外發生。

Student Innovation (Secondary (Senior) Schools) Gold Award
學生創新(高中)金獎

German Swiss International School 德瑞國際學校
CHAN Ingrid Wai Hin / PONG Emily (陳蕙軒 / 龐瑤)

MRRAED: Mixed Reality Rehabilitation Activities for Elderly with Dementia

In Hong Kong, 1 in 10 elderly is suffering from cognitive impairment including dementia. Academic research predicts that the elderly with dementia will increase to 333,000 by 2039 among those aged 60 or above - a challenge to our society from financial and medical aspects. Early diagnosis and intervention are crucial in the prevention and treatment of dementia due to the nature of the disease.

This project aims to design a virtual reality (VR) rehabilitation activities application, called VRRAED that allows the elderly with dementia to simultaneously practice physical and cognitive skills via a user-friendly setting, immersive virtual environment, and customized content.

To maximize the effectiveness of the application, VRRAED integrates multiple approaches to dementia treatment with the capability to personalize the content in the form of text, images, video, and audio that the elderly users are familiar with.

Exercises and physiotherapy: maximizing attention, upper-extremity and lower-extremity motor activity, body balance, muscle strength, etc.

Multi-sensory environment therapy: relaxation and reduction of behavioural symptoms by stimulating the sense of sight, hearing, and touch

Reminisce therapy: featuring setting, photos, or music from a certain time of the patient’ s life as a stimulus to trigger the user's memory

The entire duration of completing the activities will be less than 5 – 10 minutes and is subject to the user's speed and comprehension of the required motions.

After putting on the VR headset, the users enter an immersive environment of Victoria Park. To trigger the user's memory, a classic song Tian Mi Mi (Sweet as Honey) will be played as the background music while the virtual instructor welcomes the user and starts the game with warmup activities. The user will follow the demonstration to catch the flying butterflies placed in four corners to ensure that the user uses all arm muscles, wrists, and fingers repetitively. The second activity requires the user to reach out to the four corners to pluck the flowers, using the arm, shoulder, and neck muscles. This activity can improve cognition, muscle movement, and concentration. Afterward, the user moves on to a more challenging activity - playing tennis. The user grabs onto the tennis racket and makes a swinging motion toward the ball to practice the coordination between the hand, eyes, and upper body.

At the last session, the user will be brought to a pavilion, where they can listen to the classic songs simply by touching the music video wall. The user can relax, enjoy the selected song, and sing along to trigger their memory.

The user will remain seated throughout the activities, making it easy for the elderly with limited mobility to complete the tasks. Apart from wearing a VR headset, the user does not need any other equipment, making it more convenient for the user to conduct the activities safely at any place and at any time.

In the future, the team aims to collaborate with tech companies and NGOs to provide VR headsets with the VRRAED app for free to the elderly with dementia in HK.

Comments from Judging Panel
評審委員會評語

- Very interesting product with good research

- It suits the needs and interests of the elderly and have potential to be more popular

- Need more scientific data to prove the results and larger test samples for function improvement

- 非常有趣的產品，有很好的研究

- 它適合老年人的需求和興趣，並有可能更受歡迎

- 需要更多的科學數據來證明結果和更大的測試樣本來進行功能改進

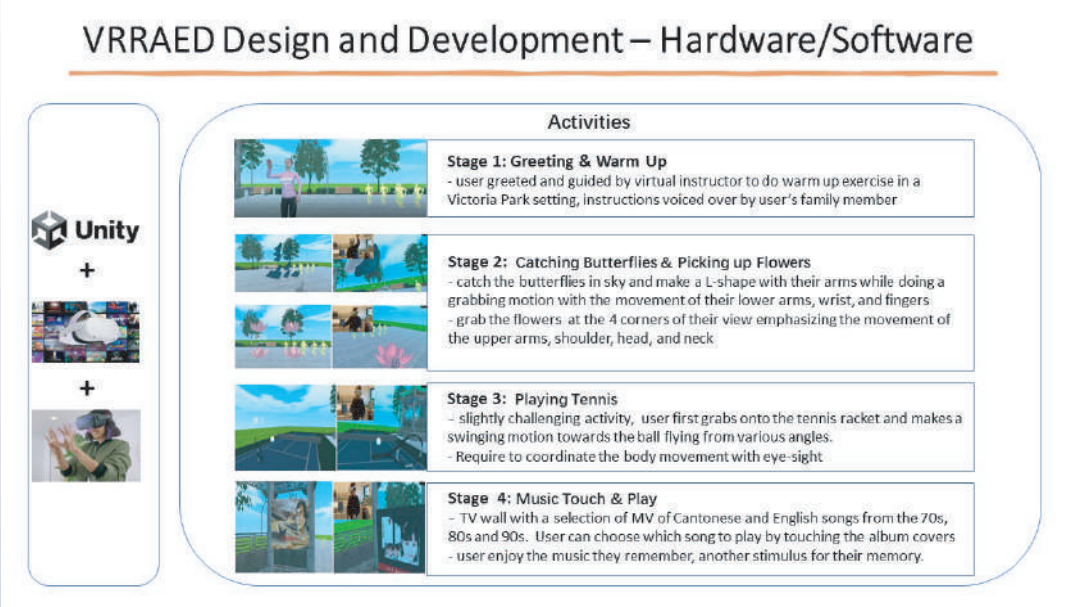
2-minute Video
2分鐘短片介紹

樂活「腦」友: 認知障礙長者混合實景復康活動應用

目前香港每10名長者就有1人患認知障礙症，研究指 2039年60歲及以上的香港人中將達33萬或11%的人患有認知障礙症, 患者長期依賴家庭及社會照護，衍生龐大社會醫療成本，因此如何預防及減緩認知障礙便成為全球關注熱點。

“樂活「腦」友”應用程式的目標使用者是患有輕度和中度認知障礙症的長者。發明項目旨在設計一個虛擬實景（VR）康復活動應用程式，讓病患長者通過使用者友好的設置、沉浸式的虛擬環境和個人化內容，同時練習身體和認知技能，隨時隨地進行客製化的復康活動，達到每日固定體能及腦力訓練，預防並減緩認知障礙症

“樂活「腦」友”的設計採取以人為本的方法，結合了1）運動治療 - 以最大限度地提高注意力、上肢運動活動、身體平衡和肌肉力量。2）多感官環境療法 - 通過刺激視覺、聽覺和觸覺來放鬆和減少行為癥狀; 以及3）緬懷療法，以觸發使用者的記憶。這是目前認知障礙非藥物治療的重點之一, 因此我們挑選維園這個長者共同回憶的場所,並加入六七十年代的懷舊老歌環節。此外，.用戶在整個活動過程中保持坐姿，方便坐輪椅或長期臥床的認知障礙者長者夠輕鬆完成任務。 除了一副VR眼鏡外，不需要任何其他設備或額外的專業協助，便能隨時隨地進行康復活動。



Student Innovation (Secondary (Senior) Schools) Silver Award
學生創新(高中)銀獎

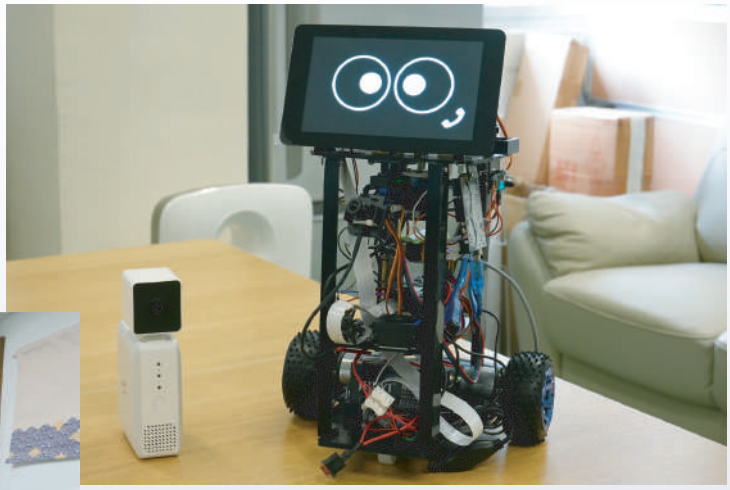
VTC Youth College (Kwai Fong) 職業訓練局青年學院 (葵芳)
KWOK Hau Ling / TANG Ngo Kiu Susanna / IU Lap / LEUNG Tsz Kin
(郭巧玲 / 鄧澈喬 / 姚立 / 梁子健)

Care in 360 Degrees

Elderly people living alone are prone to falls. In order to reduce the chances of being rescued later, we designed a robot with an AWS Deeplens camera to monitor the situation of the elderly in the house. The robot will ask if the elder needs help after a fall. In addition, there is a smart pill box and body monitoring function, and the pill box will remind the elderly to take medicine. The body monitoring function can help record the body temperature of the elderly. It is convenient for family members to monitor the physical condition of the elderly. In addition, the robot will have a screen to provide video contact with family members. We hope that this solution can comprehensively cater for the needs of the elderly.

智護全方位

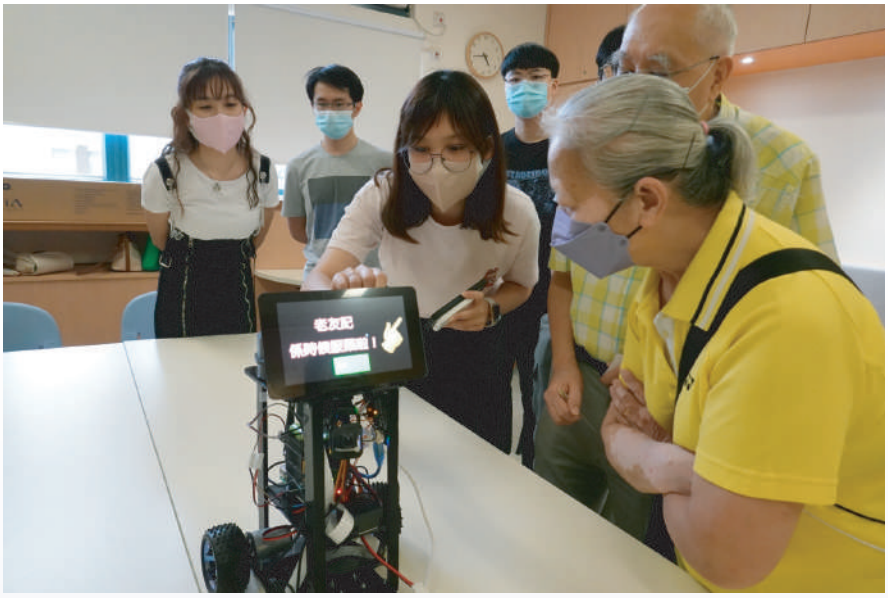
獨居長者容易跌倒，為減少之後失救的情況。我們設計了機械人配合deeplens鏡頭，監測長者在屋內的情況。在長者跌倒後詢問是否需要幫助。另外設有智能藥盒及身體監測功能，藥盒會提醒長者服藥。而身體監測功能可以幫忙紀錄長者體溫。方便家人監測長者身體狀況。另外機械人會有屏幕界提供與家人視像聯絡功能。面我們希望這個方案能全方位照顧長者需要。



Comments from Judging Panel
評審委員會評語

- Well done! Innovative design and practical
- Prototype stage
- There are still many technical limitations
- Improvements are needed in all areas of implementation

- 做得好！ 設計新穎實用
- 原型階段
- 仍然存在許多技術限制
- 需要在所有實施領域進行改進



2-minute Video
2分鐘短片介紹

Student Innovation (Secondary (Senior) Schools) Bronze Award
學生創新(高中)銅獎

Heung To Secondary School (Tseung Kwan O) 將軍澳香島中學

CHU Tsz Ying / NGAI Ho Chun / HO Kai Yui / LAU Yu Hin (朱芷瑩 / 魏浩峻 / 何啟睿 / 劉宇軒)

New Century Pedal Exerciser

Due to deterioration of leg, hospitals and nursing homes provide Pedal Exercisers for the elderly to use. However, the elderly may not take the initiative to use the Pedal Exerciser, and it is difficult for family members to understand the health of the elderly. During the epidemic, the above-mentioned places do not allow relatives and friends to visit the elderly, so the relationship between the elderly and relatives or friends may not be maintained. The elderly also cannot know the latest situation of their family members. In addition, physiotherapists cannot collect data on the use of Pedal Exercisers from the elderly may delay the elderly's treatment. Therefore we invented the " New Century Pedal Exerciser " for nursing homes or hospitals. This device uses photos, audio recordings and video clips of relatives, friends or descendants of the elderly to attract or encourage them to use the device to improve the muscle strength of their legs. Physiotherapists can also collect the frequency of the elderly using the device through the internet, and analyze the data, and then give the elderly the most appropriate advice on using the Pedal Exerciser.

For physiotherapists:

The device can collect the data of the elderly's exercise, and judge the muscle strength of elderly' s leg of the elderly based on the data

Through the data, the rehabilitation progress of the elderly can be known

The most suitable training method can be provided for the elderly to improve the muscle strength of elderly' s leg based on the data

They can know the muscle strength of elderly' s leg of the elderly at the first time

For the elderly:

He/she can improve the muscle strength of their leg effectively

He/she can do exercise more effectively through the encouragement of family members and relatives and friends

He/she can know the current situation of your family through the device, so that the elderly will feel the favor and their life will become happier

For elderly family members:

Through the unique function of the device, they can show their concern for the elderly and build up a good relationship with the elderly

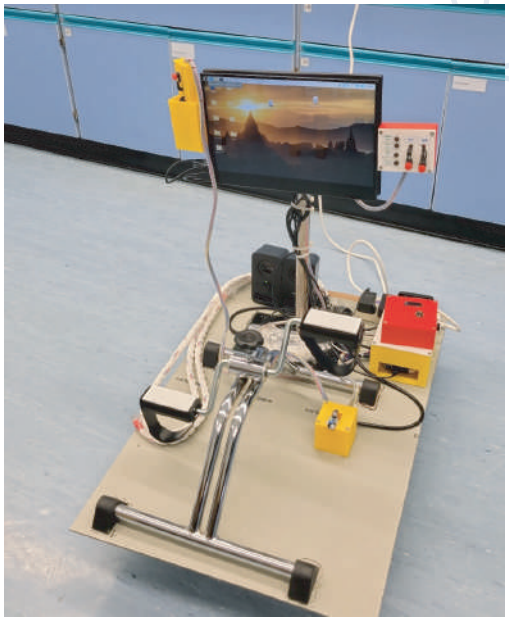
They can induce the elderly to exercise and improve the muscle strength of their leg through the voice, photos and video clips of family members

For society:

The device can arouse the society's attention to the elderly doing exercises in hospitals or nursing homes

More resources may be spent on promoting gerontechnology and encourage the elderly to use the latest technology to improve their physical condition

The device may encourage the community to develop more intelligent devices for the elderly to benefit them



親子馬拉松單車機

長者腳步機能退化，因此醫院和護老院提供腳踏機予長者使用。但長者運動量是否足夠？家人可否監察長者使用腳踏機的頻率？疫情期間上述地方不允許親朋探望長者，長者會因為未能與家人見面而未能提起精神做運動。物理治療師未能探望長者，或會延誤長者的診療，甚至未能給予長者改善腳部活動能力的建議。因此我們製作「親子馬拉松單車機」，運用長者親朋子孫的照片、錄音和視頻，吸引和鼓勵長者使用腳踏機改善腳部機能。物理治療師也可透過互聯網，得知長者使用腳踏機的頻率，並收集數據作分析和給予長者使用腳踏機的適當建議。

此產品採用Raspberry Pi 3微控制器，配合RFID讀卡器、障礙物感應器、按鈕、發光二極管、顯示屏和揚聲器等零件製作而成。產品創新之處包括：

市場上沒有類似產品，能讓長者得知親朋近況，同時在親朋鼓勵下做運動

透過產品的設計，長者在未能與親朋見面的情況下仍可感受到他們的關懷

對長者而言，產品能有效地鼓勵長者做運動，保障他們的健康；長者也可透過此產品得知家人的近況，使自己感到恩惠，生活變得更開心；家人可透過產品獨特功能拉近與長者的距離。對社會而言，產品可喚醒社會對長者做運動的關注，並讓大眾推動樂齡科技，提高長者的生活素質。

2-minute Video
2分鐘短片介紹

Comments from Judging Panel
評審委員會評語

- A comprehensive studies for the report

- Very good to have real practice

- The idea is beneficial to the elderly

- Should consider the way to attract the elderly (e.g. more options on exercise)

- It's better to involve more human touch, more creative ideas and more interactive components (e.g. direct contact with relatives)

- 是一個綜合研究的報告

- 有真正的實踐

- 想法對老年人有益

- 可以考慮吸引長者的方式 (例如更多的運動選擇)

- 最好包含更多的人情味，更多的創意和更多的互動元素 (例如與親友直接聯繫)

Student Innovation (Secondary (Senior) Schools) Certificate of Merit
學生創新(高中)優異證書

Christian and Missionary Alliance Sun Kei Secondary School
基督教宣道會宣基中學

CHAN Yik Chung / HON Ki Ching / CHAN Yu Shing / PO Hiu Tung
(陳益聰 / 韓其政 / 陳宇丞 / 布曉彤)

AI Search and Rescue on the Hill

Owing to the pandemic, people are restricted to travel overseas and therefore chose to go hiking in Hong Kong as an alternative. However, we observed an increasing trend of missing cases on the hill. In most cases, the rescue services begin after the missing person's family calls for help. In view of this, our project AI Search and Rescue acts as a preventive device designed to patrol the mountains, automatically find the unconscious and send the location to the rescue department. Throughout the process, we apply artificial intelligence to identify human joints and analyze the corresponding angles to identify the state of the hiker. We hope that our invention will reduce the fatality rate of hiking accidents.

AI山徑救援

在疫情下，防疫限制使香港人未能出外旅遊，而選擇了在香港遠足作為替代。　然而，我們觀察到遠足失踪案件有增加的趨勢。對於大部份案件，救援部門是在失踪者的家人求救後才開始採取行動的。有鑑於此，我們作品AI山徑救援為一種預防性裝置，旨在在山上巡邏，自動尋找失去知覺的人並將位置發送給救援部門。在整個過程中，我們應用人工智能辨認人的關節，並分析相應的角度，以辨認行山人士的狀態。我們希望藉着我們的發明能降低遠足意外的死亡率。

Student Innovation (Secondary (Senior) Schools) Certificate of Merit
學生創新(高中)優異證書

Lok Sin Tong Yu Kan Hing Secondary School 樂善堂余近卿中學

CHAN Kam Kwan / YU Hoi Lam (陳金群 / 余凱琳)

Unlimited DanSing

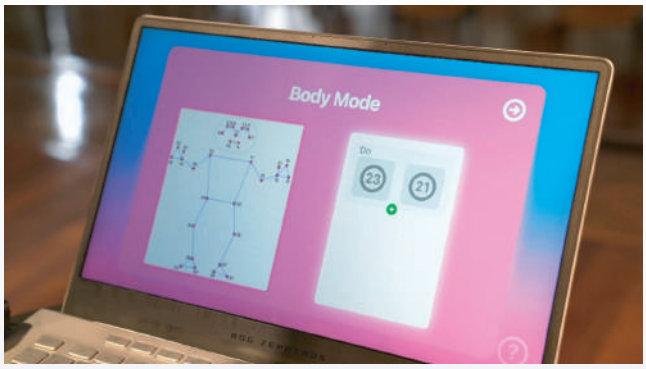
In this world, many people have a music dream. Unfortunately, not everyone can pursue his or her dream because of physical disabilities. Therefore, we want to design an accessible musical instrument for everyone to use.

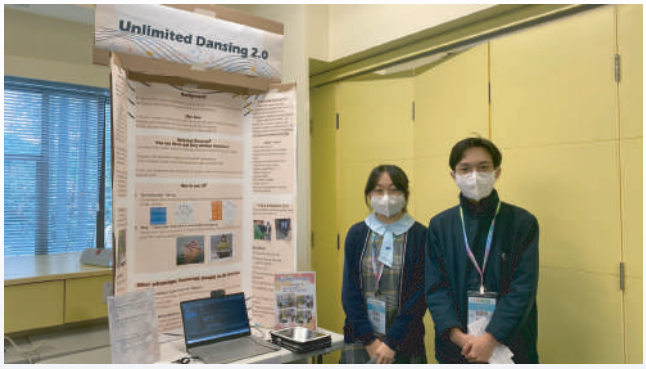
"Unlimited DanSing" is a product that makes music by sensing the movement of the user's limbs. The user can customise any movement to express the tone. With this product, anyone can turn their body into a musical instrument.

舞樂無限

世界上很多人都有一個音樂夢，奈何肢體殘疾人士因先天或後天的缺憾未能演奏傳統樂器。因此我們希望設計一款簡單、易用及低成本的電子樂器給這群熱忱音樂的人士。

「舞樂無限」是一款無障礙樂器，透過活動身體來發出不同音調。用家可以按照自身活動能力自定義任何動作去表達音調。任何人都可以透過「舞樂無限」將身體化為樂器。





Student Innovation (Tertiary or above)
Silver Award
學生創新(大專或以上)銀獎

Hong Kong Institute of Vocational Education (Sha Tin)
香港專業教育學院（沙田）
KWOK Man Ho / CHAN Man Him / LEE Tung Kin / YIP Tak Wa
郭汶灝 / 陳旻謙 / 李東鍵 / 葉德華

Streaming Hub

Live Streaming is one of the most popular forms of video entertainment. However, producing online live shows is at two extremes - a high-quality programme that requires professional equipment and lower-quality, lightweight Streaming using a single mobile phone.

Streaming Hub is a brand new solution that combines the advantages of both solutions.

The system allows users to produce high-quality live Streaming with flexible and full-featured controls. Streamers can use the scene editor to design their screen layouts or choose one of the built-in visual themes. Users can plan for the show scenes, switch screen layouts and camera angles at any time, and control their live show just like a professional video mixer. Streaming Hub runs only on tablets, allowing everyone to create high-quality Streaming anywhere, just like on a smartphone.

The system’s flexibility does not just allow the user to stream from anywhere. It offers different HUBs that would enable custom workflows. E.g.:

Gesture Control

The host no longer has to control the collaborators in front of the audience. Gesture Control Center lets you start performing with just a countdown gesture in front of the camera. Or perform other actions, such as muting the microphone by making cool gestures. It is a whole new way to control your live stream.

Augmented Reality 3D Models

Customers can display products through AR. Streamers can take photos of products from all angles, and Streaming Hub can create a 3D model with extreme detail. With AI human posture detection, streamers can display 3D models on the screen or send them to customers’ phones to enhance the level of interaction.

Intelligent interaction

Customer reviews and feedback are crucial in live-streaming e-commerce. With Streaming Hub’s AI engine, the system can understand comments in chat rooms and recommend appropriate action. This can streamline and improve customer engagement experience.

Streaming’s full-featured live-streaming app runs on a table’s powerful enough to create professional-grade live streams without bulky devices. It also fits and enhances production workflow with various hubs. It comes with an AI engine that recognizes your gestures and allows you to create 3D models of your products. Streaming Hub gives everyone a streamlined workflow to produce high-quality live shows.

Comments from Judging Panel
評審委員會評語

- A good combination of different technologies

- Streaming interface and workflow can enhance

- Very close to the real product

- Great commercial value. It is time to prepare for a go-to-market plan

- Need to define target customers and size of target market

- 不同技術的良好組合

- 流媒體界面和工作流程可以增強

- 非常接近真實產品

- 巨大的商業價值。是時候準備進入市場計劃了

- 需要定義目標客戶和目標市場規模

Streaming Hub

網上直播是其中一種最受歡迎的視頻娛樂方式，可是，直播節目正處於兩個極端 - 需要專業設備、製作豐富的高質量以及製作質量較低但輕使的手機的直播。

Streaming Hub 是一個結果兩種直播優點的全新的直播解決方案。系統允許用戶通過靈活且功能齊全的控件製作高質量的實時流媒體。直播主可以使用場景編輯器設計自己的屏幕佈局，或者只選擇一種內置視覺主題。您可以使用場景計劃您的節目，亦可隨時切換屏幕佈局和攝像機角度，就像專業視頻混音器一樣控制現場節目。Streaming Hub 只而在平板電腦上運行，讓每個人都像使用智能手機一樣可以在任何地方製作高質量的流媒體。

系統的靈活性不僅允許您在任何地方進行直播。它提供不同的 HUB，允許自定義的工作流程。例如：

手勢控制

主持人無需再控制觀眾面前的合作器。手勢控制中心讓您只需在鏡頭前做一個倒計時手勢即可開始表演。或者通過做靚音手勢來運行其他操作，例如將麥克風靜音。這是一種全新的控制直播流的方式。

增強現實 3D 模型

客戶可以通過 AR 方式展示產品。直播主可以從各個角度為產品拍照，而 Streaming Hub 可以藉此創建一個具有極致細節的 3D 模型。通過 AI 骨骼檢測，主播可以在屏幕上顯示 3D 模型，或者將其發送到客戶的手機，提升直播媒體交互的層次。

智能互動

客戶的評論和反饋在電子商務世界中至關重要。借助 Streaming Hub 的 AI 引擎，系統可以理解聊天室中的評論。並建議適當的行動。提升客戶參與體驗。

總括而言，Streaming 功能齊全的直播應用程序在平板電腦上運行；無需笨重的設備即可製作專業級的直播節目，功能強大。它還適合併通過各種集線器增強您的工作流程，借助 AI 引擎，系統可以識別您的手勢並允許您創建產品的 3D 模型，為每個人提供了一個使捷的工作流程來製作高質量直播節目。

2-minute Video
2分鐘短片介紹

Student Innovation (Tertiary or above)
Certificate of Merit
學生創新(大專或以上)優異證書

City University of Hong Kong 香港城市大學

LIU Wei / WANG Chenchen / DONG Jiajie (劉為 / 王陳陳 / 董佳傑)

Immune Factory - Cancer Immunology

With the increase in the number of cancer patients in China, the cancer testing market is expanding, and the prospect of gene therapy based on cancer genes is good. Immune Factory is compatible with all mainstream gene sequencing data. It provides doctors with accurate immunotherapy solutions based on gene data and unique protein 3D structure generation technology. The safe and reliable data management system provides users with comprehensive and accurate one-stop services and brings doctors a better diagnosis and treatment experience. Currently, the product is relatively mature in early cancer screening. It has already achieved preliminary cooperation with hospitals for clinical testing, in which the model' s accuracy rate of lung cancer diagnosis is as high as 97%, and the stomach cancer diagnosis can reach a 95% correction rate.

Immune Factory platform is an innovative, intelligent cancer immunotherapy system based on a leading AI algorithm developed by the team. Based on genetic testing, biometric analysis, artificial intelligence, and other technology empowerment, the product can provide the whole process of cancer diagnosis and treatment solutions, from cancer detection and disease diagnosis to the intelligent generation of individualized immunotherapy plans. Doctors can not only analyze and diagnose patients' genetic data more efficiently, comprehensively, and accurately through the platform, but also use the AI algorithm in the system to design personalized cancer antibody drugs and treatment plans for patients through the analysis of patients' database information, which significantly reduces the complexity and treatment cost of cancer, and set cancer drugs and treatment plans for each patient.

免疫工廠 - 癌症免疫診療官

隨著我國癌癥患者數量穩定增多，癌癥檢測市場不斷擴大，基於癌癥基因的基因診療前景良好。但是癌癥變異速度快，現有治療手段傳統，藥物繁多，較難取得成效。Immune Factory可以兼容所有主流基因測序數據，並基於基因數據和獨有的蛋白三維結構生成技術為醫生提供精準免疫診療方案，安全可靠的數據管理系統為用戶提供全面精準的一站式服務，為醫生帶來更好的診療體驗。目前，產品在癌癥早篩上相對成熟，已與醫院取得初步合作，進行臨床測試，其中團隊模型肺癌診斷準確率高達97%，胃癌診斷準確率高達95%。

Immune Factory智慧癌癥免疫診療平臺，是團隊自主研發的一套基於領先AI算法的創新性智能癌癥免疫診療系統。基於基因檢測、生信分析、人工智能等技術賦能，產品可提供從癌癥檢測、病情診斷到智能生成個體化免疫治療方案的全流程癌癥診療解決方案。醫生不僅可以通過平臺更加高效、全面、精準地對病人的基因數據進行分析和診斷，還可以通過對患者免疫組庫信息的分析，利用系統內的AI算法為患者設計個性化的癌癥免疫治療抗體藥物與治療方案，大幅降低癌癥免疫治療的復雜程度與治療成本，真正做到為每一位患者量身定製專屬的癌癥免疫治療藥物與治療方案，為患者帶來更多治愈的希望。

Student Innovation (Tertiary or above) Certificate of Merit
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City University of Hong Kong 香港城市大學

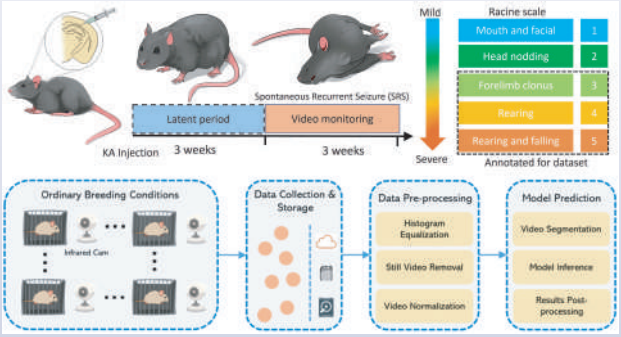
REN Junming / XIAO Zhoujian (任俊名 / 肖洲鍵)

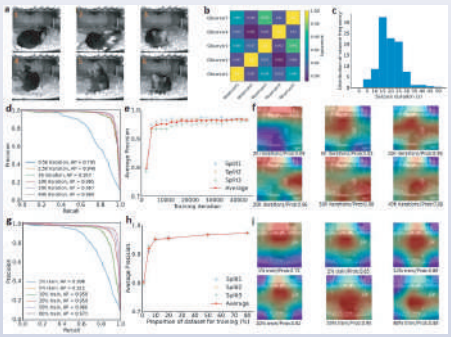
DeepSeizure:Video based Automated Epilepsy Seizure Recognition System of Animal Model for Preclinical Drug Development

Temporal Lobe Epilepsy (TLE) is the most common type of acquired epilepsy refractory to current anti-epilepsy drugs in adults. Researchers need a long-term recording and analysis of epilepsy seizures in the preclinical development of chronic anti-epileptic drugs (AEDs). Quantifying the frequency of spontaneous recurrent seizures (SRS) caused by TLE is crucial for preclinical treatment efficacy evaluation. The manual observation of epileptic seizures from videos is commonly used but highly laborious and time-consuming. Here, we proposed an automated seizure detection platform which is software based on deep learning that could efficiently recognize stage 4-5 epileptic seizures of modified Racine scale from chronic epileptic-induced models such as mice and Bama minipig. This automated seizure detection platform is based on the deep spatial-temporal network (STN) and transfers initial weights from a pre-trained large-scale human action dataset. Remarkably, this model achieved expert-level accuracy performance with a small number of epileptic clips (~150) and 120 times faster than human experts on seizure detection. Besides, with the excellent generalization of this model, it's easy to transfer to other environments, even to other species, and maintain a good performance. In summary, it could help researchers rapidly screen epileptic seizures, and record seizure time and degree, which accelerates the preclinical drug development.

基於視頻的癲癇識別系統用於臨床前藥物開發

顳葉癲癇 (TLE) 是最常見的獲得性癲癇類型，對目前的成人抗癲癇藥物無效。研究人員需要長期記錄和分析慢性抗癲癇藥物 (AED) 臨床前開發過程中的癲癇發作情況。量化由 TLE 引起的自發性複發性癲癇發作 (SRS) 的頻率對於臨床前治療效果評估至關重要。從視頻中手動觀察癲癇發作是常用的方法，但非常費力和耗時。在這裡，我們提出了一個自動癲癇發作檢測平台，該平台是基於深度學習的軟件，可以有效地從小鼠和巴馬小型豬等慢性癲癇誘發模型中識別改良拉辛量表的 4-5 期癲癇發作。該自動癲癇檢測平台基於深度時空網絡 (STN)，並從預先訓練的大規模人類行為數據集中傳輸初始權重。值得注意的是，該模型通過少量癲癇（約 150 個）實現了專家級準確度性能，並且在癲癇檢測方面比人類專家快 120 倍。此外，由於該模型具有良好的泛化性，很容易轉移到其他環境甚至其他物種，並保持良好的性能。總之，它可以幫助研究人員快速篩查癲癇發作，並記錄癲癇發作的時間和程度，從而加速臨床前藥物的開發。





Student Innovation (Tertiary or above)
Certificate of Merit
學生創新(大專或以上)優異證書

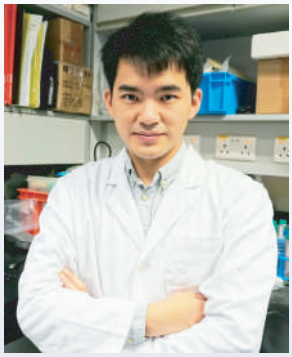
City University of Hong Kong 香港城市大學
ZHOU Chuanwen (周傳文)

ZenxTag-Smart Food Label

Smart Food Label is an ultra-low-cost, paper-based labeling tag that can respond selectively to a biogenic amine - the universal indicator of food spoilage. The core of our biogenic amine sensing technology is a unique iron-based molecular complex. The complex is an ensemble of two molecular components. It has a very deep green color. Upon contacting the vapor of biogenic amines, this molecular ensemble is designed to break up, leaving behind only the component that shows a distinctive red-orange colour. The resultant high contrast colour change is very easy to be spotted by the naked eye. Its colorimetric response is cumulative and irreversible which means the label will react to spoiled food even though it is kept chilled afterward. It does not require any power supply and can operate even at low temperatures where frozen food is stored. This biogenic amine-sensing technology is ideal for pre-packaged food products, especially meat products.

ZenxTag-智慧食品標籤

智慧食品標籤是一種超低成本的，可以選擇性地響應生物胺（食品腐敗的通用指標）的紙質標籤。我們的生物胺傳感技術的核心是一種獨特的深綠色的鐵基配合物。該配合物是兩個分子組分的集合體。在接觸生物胺氣體後，這種分子集合體會被分解為獨特橙紅的成分。該過程中的高對比度顏色變化（深綠到橙紅）很容易被肉眼識別。這種比色響應具有累積性和不可逆轉性，這意味著即使食品在腐敗之後保持冷藏，標籤也會對變質的食物做出反應。食品標籤完全無源且能夠在低溫下工作。這種生物胺傳感技術非常適合用於預包裝的肉類或魚類產品。



Student Innovation (Tertiary or above) Certificate of Merit
學生創新(大專或以上)優異證書

Hong Kong Institute of Vocational Education (Sha Tin)
香港專業教育學院（沙田）

LEE Tsz Ting / NG Kwan Ho / CHAN Yiu Keung / YEUNG Hang (李芷婷 / 吳君豪 / 陳耀強 / 楊鏗)

Drag and Play Reality Builder - A No-code AR Experience Creation Tool

STEM education has been a viral topic among Hong Kong's education sector in the past several years. It covers four aspects including science, technology, engineering and mathematics and aims to give students a whole range of experiences and skills which will be useful in their future career. To achieve these goals, teachers in school have arranged different activities for students such as research of GPS technology, chemical materials, or making some simple toys which apply the theory of physics. Apart from the traditional activity, AR will be one of the suitable solutions for STEM education in future giving its interaction with users and the creativity it can arouse. Therefore, our team proposed making easy-to-use AR authoring tools especially for STEM. And we hope to help teachers and students have a better engagement using AR technologies.

Reality Builder is a no-coding AR creation and programming environment. Users only need to create their own AR world by dragging and dropping blocks. Even if they are not familiar with programming, they can use the no-code programming environment to design their own AR scenes. Users can create interesting augmented reality games or interactive experiences by manipulating rich game and logic components. The breakthrough point of the work is that users can design AR space settings and interaction logic in the same editor at the same time, instead of switching between two editors like existing editors.

In addition, Reality Builder also provides a series of auxiliary functions. The product provides convenient three-dimensional model making tools such as: Voxel modeling, three-dimensional model scanning, room scanning, lowering the threshold of 3D content creation. Users can share their designs through the sharing hub, or even download designs from other users, thereby promoting communication between players, which will also stimulate more design ideas, and users can also export their works as a standalone iOS or Android application.

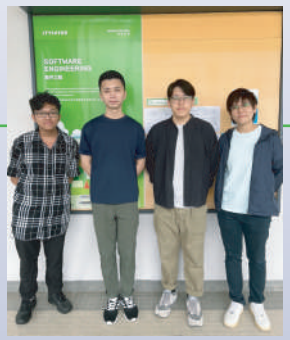
無代碼擴增實境開發工具

STEM 教學是香港教育界的熱門話題。 它涵蓋了科學、技術、工程 和數學四個方面，旨在為學生提供一系列對他們未來的職業生涯有用的經驗和技 能。 為了學生的發展，學校的老師們為學生安排了不同的活動，比如研究 GPS 技 術、化學材料，或者製作一些應用物理理論的簡單玩具。 除了傳統的活動，AR (擴增實景) 將成為未來 STEM 教育的合適解決方案之一，賦予其與用戶的互動以及 它可以激發的創造力。 AR 將是另一種具有巨大潛力的方法，因為它方便展示了各種實驗和場景。

Reality Builder 以是一個零代碼的 AR 創作編程空間，用戶只需以拖拉的方式創作自己的世界，即使不熟悉編程亦可以運用無代碼編程環境來設計自己的 AR 場景。用戶可通過操縱豐富的遊戲和邏輯組件去創建有趣擴增實境遊戲或互動體驗。作品的突破點是用家可以同時於同一個編輯器完成 AR 空間設置以及互動邏輯，而不像現有編輯器般於兩個編輯器之間切換。

此外， Reality Builder 亦提供一系列的輔助功能。產品提供便捷的立體模型製作功具如：Voxel 建模、立體掃描建模，房間掃描建模，降低創作的門檻。用戶可以通過 共享中心共享其設計，甚至可以從其他用戶下載設計，從而促進玩家之間的交流， 這也將激發更多的設計思想，用家的製作亦將作品可以匯出，利用產品的執行環境封裝成 iOS 或安卓平台為獨立的 APP 產品。

將來，希望該應用程序將成為學生體驗 AR 遊戲樂趣的工具，亦可以窺探擴增實境與元宇宙共融的可行性。同樣，通過允許用 戶掃描現實生活對像到遊戲場景中，這將大大增強遊戲的樂趣，並可以更廣泛地 使用應用程序。我們的 Drag and Play Reality Builder 將是 STEM 教育的好工具之一。



Introduction of Leading Organiser
籌辦機構簡介

Founded in 2012, Hong Kong New Emerging Technology Education Association (HKNETEA) is a non-profit making educational organization, mainly aim at promoting the development of the local Information Technology through promoting and organizing information technology related activities and competitions. We hope to provide young people more opportunities to access and learn new technology products in order to broaden their horizons and improve their creativity.

"Vision, Innovation, Knowledgeable and Commitment" is our goal of Talent Development. We provide a wide range of activities and services for young students, and give them chances of self-improvement and development, and train up the spirit of positive outlook and concern for society, to become a new generation of Hong Kong which is knowledgeable and creative.

Objectives:

-To raise the awareness and importance of the application of Creative Information Technology in education

-To provide more opportunities for Hong Kong's Teenagers to participate in the international or China region Creative Information Technology education related activities

-To provide more opportunities for the teenagers to exchange knowledge and experience with different countries

香港新興科技教育協會的主要創辦目的是透過舉辦及宣傳有關資訊科技的活動和比賽,推動本地資訊科技的發展,並提供更多機會讓青少年接觸和學習新穎的科技產品,擴闊他們的眼界,並提供空間讓他們發揮創意,從而在資訊科技發展上創造出無限的可能性及突破,為本地資訊科技發展開創更光輝的未來。本會以「視野、創新、博識、承擔」作為培育人才的目標,為青年學生提供多元化的活動及服務,藉此讓青年人有機會自我培育及發展,逐步建立積極的人生觀和關心社會人群的精神,成為具有知識、創意及植根於香港的新一代。本會倡導並創造條件讓青年學生認識、關心資訊科技發展,藉此培養青年人對社會的歸屬感和責任感,同時為老師提供各種支援教育服務,提升教師的專業質素。

本會的宗旨為:

- 提高各界對資訊科技創意應用於教育的認識及其重要性;

- 為香港的青年提供更多的機會參與國際性或大中華區的資訊科技創意教育的活動;

- 增加香港青少年到外地交流知識和經驗的機會。

Enquiry
查詢

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鳴謝

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Leading Organiser 籌辦機構

Hong Kong New Emerging Technology Education Association
香港新興科技教育協會

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- **Hong Kong Cyberport Management Company Limited** 香港數碼港管理有限公司
- **Hong Kong Science and Technology Parks Corporation** 香港科技園公司
- **Hong Kong Trade Development Council** 香港貿易發展局
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HKUST Entrepreneurship Center 香港科技大學創業中心
CHKCI
HKIE The Hong Kong Institution of Engineers 香港工程師學會
香港專業及資深行政人員協會 Hong Kong Professionals and Senior Executives Association
Cyberport 數碼港
Rotary 國際扶輪3450地區
JSIT 聯校資訊科技學會 Joint School Information Technology Association
bcs Hong Kong Section 英國電腦學會（香港分會）
Rotary Club of Peninsula East 半島東扶輪社
Hong Kong Life Sciences Society 香港生命科技青年會
葵青區家長教師會聯會
大埔區家長教師會聯會
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