



HONG KONG
ICT AWARDS
2021 香港資訊及
通訊科技獎

Student Innovation Award 學生創新獎

Photo Credit to
Mr. Alex Hung

Leading
Organiser
籌辦機構



HKNETEA
香港新興科技教育協會

Content 目錄

Background	背景	1
Message from Chairman of Organiser	籌辦機構/會長獻辭	2
Hong Kong ICT Awards 2021: Student Innovation Award Judging Panel 2021香港資訊及通訊科技獎：學生創新獎評審委員會		3
Hong Kong ICT Awards 2021: Student Innovation Grand Award and Student Innovation (Tertiary or Above) Gold Award 2021香港資訊及通訊科技獎：學生創新大獎及學生創新(大專或以上)金獎		4
The Hong Kong Polytechnic University (Jackal XU Zhenda) / The Chinese University of Hong Kong (Rex MA Chun Hung) 香港理工大學 (許真達) / 香港中文大學 (馬俊鴻)	Dr.Body-Scan 紅外三維脊柱及體態分析儀	4
Hong Kong ICT Awards 2021: Student Innovation (Tertiary or Above) Award 2021香港資訊及通訊科技獎：學生創新(大專或以上組)獎		5
Silver Award 銀獎		
City University of Hong Kong (LAM Wah Shing / NASKAR Shounak) / The Hong Kong University of Science and Technology (LAI Ho Man / LEE Ching Fei) 香港城市大學 (林華盛 / NASKAR Shounak) / 香港科技大學 (黎浩文 / 李政斐)	Smart Transfer Robot 智慧過床機器人	5
Bronze Award 銅獎		
The Hong Kong Polytechnic University (LI Ho Hin Toby / CHAN Lok Chun / YIP Hoi Ying) / The Chinese University of Hong Kong (WONG Ka Yan) 香港理工大學 (李浩軒 / 陳樂晉 / 葉鎧瑩) / 香港中文大學 (黃嘉茵)	The All-in-one AI-based Knee Osteoarthritis Management System 膝部退化性關節炎人工智能管理系統	7
Certificate of Merit 優異證書		
Hong Kong Institute of Vocational Education (Sha Tin) (MA Yujun / CHAN Yan Lung / WONG Long Kiu / TSANG Yui Chung) 香港專業教育學院(沙田) (馬玉駿 / 陳殷龍 / 黃浪翹 / 曾銳聰)	AI Presentation Training System 智能演講訓練系統	8
Hong Kong Institute of Vocational Education (Tsing Yi) (Tam Wing Chun / Fan Cheuk Pan / Yeung Wai Nam) 香港專業教育學院(青衣) (譚永駿 / 樊焯楨 / 楊煒楠)	Hong Kong Traffic Flow Monitoring and Analysis Platform 香港交通流量監控及分析平台	9
The Hong Kong Polytechnic University (CHER Chun Ho / LI Chak Yiu) 香港理工大學 (車俊豪 / 李澤耀)	VR (Virtual Reality) Vocational Training System for People with Mental Disorder 智障人士虛擬實景(VR)職業訓練系統	10

Hong Kong ICT Awards 2021: Student Innovation (Secondary (Senior) School) Award
2021香港資訊及通訊科技獎：學生創新(高中組)獎

Gold Award 金獎

Christian Alliance S W Chan Memorial College
(CHOW Wang Yui / LAU Wei Bong / CHEUNG Sau Nam /
CHEUNG Yiu Fai)
宣道會陳朱素華紀念中學
(周泓睿 / 劉韋邦 / 張首男 / 張耀暉)

EMG-Driven Virtual Environments for Stroke-Rehabilitation
中風復康輔助遊戲 11

Bronze Award 銅獎

Christian and Missionary Alliance Sun Kei Secondary School
(TSANG Sung Tak / WONG Tsz Ching / LEE Cheuk Lok /
LU Hiu Tung)
基督教宣道會宣基中學
(曾崇德 / 王梓晴 / 李卓樂 / 盧曉彤)

Marine Guard: A Monitoring System by Using AI Image Detection & Submarine to Recognize
大海撈污 12

Fung Kai No.1 Secondary School
(WONG Wai Nok Matthew / FONG Ching)
鳳溪第一中學
(黃諾 / 房正)

Welcome Home - Smart Residential AI System
AI 愛回家 13

Certificate of Merit 優異證書

ECF Saint Too Canaan College
(LEE Tsz Chun Jamie / WONG Oi Ying / YIP Tin Yee)
基督教中國佈道會聖道迦南書院
(李祉晉 / 黃藹瑩 / 葉天儀)

FlashMatch
智能配色鏡 14

Hong Kong ICT Awards 2021: Student Innovation (Secondary (Junior) School) Award
2021香港資訊及通訊科技獎：學生創新(初中組)獎

Gold Award 金獎

Ju Ching Chu Secondary School (Yuen Long)
(LAU Juliana / KWOK Cheuk Yin / CHAN Yuen Hei)
裘錦秋中學(元朗)
(劉鏗琪 / 郭卓妍 / 陳菀禧)

Caelus
人工智能運動應用程式 15

Bronze Award 銅獎

St. Paul's Convent School
(CHEUNG Si Ya Elinor / CHOW Hiu Hang Kaitlyn)
聖保祿學校
(張思雅 / 周曉珩)

Laughter Catcher
快樂鳥 16

St. Paul's Convent School
(LEE Audrey / Cherene NGAI / Annie QIN / Audrey
聖保祿學校
(李曉晴 / 魏晴 / 覃麒安 / 沈鋸嵐)

CAPS Carbon Life
SENG) 17

Certificate of Merit 優異證書

St. Paul's Convent School
(LEE Yan Lam Janice / LI Yongxuan Sophia / Samantha LAM)
聖保祿學校
(李欣霖 / 李萱 / 林心潔)

Gondola
吊船 18

Hong Kong ICT Awards 2021: Student Innovation (Primary School) Award
2021香港資訊及通訊科技獎：學生創新(小學組)獎

Gold Award 金獎

King's College Old Boys' Association Primary School
(YE Pak Yin)
英皇書院同學會小學
(葉柏言)

AI Water Machine
飲水小助手

19

Silver Award 銀獎

King's College Old Boys' Association Primary School No.2
(LAM Zit / LEUNG Cheuk Yin / YIP Ka Po Anakin)
英皇書院同學會小學第二校
(林哲 / 梁焯彥 / 葉家寶)

Smart Bin
環保Smart Bin

20

Bronze Award 銅獎

Shanghai Alumni Primary School
(CHAN SIU HANG / CHAN WAI KIU / LEE YI LONG)
滬江小學
(陳肇珩 / 陳惠喬 / 李爾朗)

Smart Trash Bin
智慧環保回收箱

21

Certificate of Merit 優異證書

C.C.C. Heep Woh Primary School
(LEE Siu Him Cedric / LAM Man Yiu / LAU Tsz Yiu)
中華基督教會協和小學
(李兆謙 / 林文耀 / 劉子曜)

Pearl of Elderly Wisdom - Inherit the wisdom
of the elders and let the wisdom of new
generation grow
《「長」智慧》 - 傳承長者的智慧，讓新生代
智慧增長

22

Diocesan Boys' School Primary Division
(LAM Kin Hei Kingsley / WU Chun Ting Justin /
Michael Robert-David Kai Fung YEH / Sean LEE)
拔萃男書院附屬小學
(林見熙 / 胡俊霆 / 葉榮丰 / 李山)

Personalize 3D face mask using mobile
phone
利用手機裝造個人化3D口罩

23

G.T. (Ellen Yeung) College
(TSE Chung Lai / SHIH Long Ho / TAM Ho Kwong / LEE Ka Kiu)
優才 (楊殷有娣)書院
(謝仲禮 / 施塋鎬 / 譚皓光 / 李家翹)

FIND MY CAR
智能汽車防盜系統

24

G.T. (Ellen Yeung) College
(WONG Chi Ping / TONG Ho Chit Torris / WONG Yu Yan /
SHIH Long Ho)
優才 (楊殷有娣)書院
(黃智平 / 湯皓捷 / 王禹人 / 施塋鎬)

Anti COVID Station
學校防疫站

25

King's College Old Boys' Association Primary School
(LEUNG Tsz Ying Sophia)
英皇書院同學會小學
(梁芷滢)

Anti-epidemic game
抗疫神戲

26

Kowloon Tong School (Primary Section)
(LEE Yin Jun / SZE-TO Chak Yu Daniel / SIU Hong Yat)
九龍塘學校(小學部)
(李彥諄 / 司徒澤雨 / 蕭康逸)

Go Green Scan
環保密密掃

27

Certificate of Merit 優異證書

<p>Kowloon Women's Welfare Club Li Ping Memorial School (CHENG Jinting / WONG Sung Yan / POON Hiu Tung Hilton) 九龍婦女福利會李炳紀念學校 (程錦婷 / 黃崇殷 / 潘曉瞳)</p>	<p>Shoe Savior - Smart Sterilized Spray 智能消毒地墊 救救鞋子吧</p>	<p>28</p>
<p>Lok Sin Tong Leung Kau Kui Primary School (Branch) (CHEN Xin Hui / YAN Cherish / DENG Po Yi) 樂善堂梁錫琚學校(分校) (陳新慧 / 甄雅雯 / 鄧寶兒)</p>	<p>Handrail Cleaning Robot 扶手清潔器</p>	<p>29</p>
<p>The ISF Academ (LEE Tsak Ming Casey) 弘立書院 (李澤茗)</p>	<p>Bus vacancy controller</p>	<p>30</p>
<p>VNSAA St. Hilary's School (POON Kai Hang / FUNG Chit Rio / CHUNG Kar Tung) 漢師德萃學校 (潘啟亨 / 馮哲 / 鍾嘉彤)</p>	<p>Umbrella Rainwater Removing Device 環保雨傘除水器</p>	<p>31</p>
<p>Introduction of Leading Organiser</p>	<p>籌辦機構簡介</p>	<p>32</p>
<p>Acknowledgement</p>	<p>鳴謝</p>	<p>33</p>

Student Innovation 學生創新獎



HONG KONG
ICT AWARDS
2021 香港資訊及
通訊科技獎

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 2021. There will be one Grand Award in each category, and an "Award of the Year" will be selected from the eight Grand Awards by the Grand Judging Panel.

The "Hong Kong ICT Awards: Student Innovation Awards" 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。

2021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，而最終評審委員會會再從八個大獎中甄選出「全年大獎」。

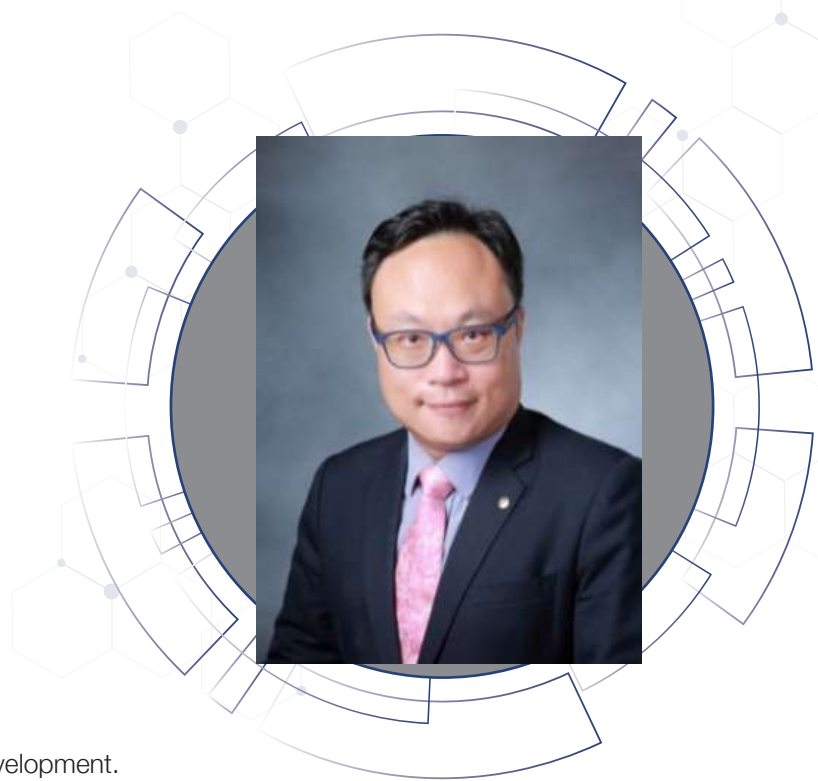
香港資訊及通訊科技獎：學生創新獎為本地資訊科技人才提供一個展示他們在資訊科技行業的傑出作品和成就的平台。該獎項旨在推動本地資訊科技的發展，為年輕人提供更多接觸和學習新技術的機會，拓寬視野和創造力。這有助於增加信息技術未來發展的可能性。

Message from Chairman 會長獻辭



Mr. Alex Hung, MH Founding Chairman

洪文正 先生
創會會長



Innovation is the cornerstone of technological development. The economic growth of Hong Kong must rely on the continuous advancement of ICT and innovation technologies and brought by the STEM industry. Nowadays, to cultivate our outstanding next generation, we must stimulate students' interest and strengthen their basic knowledge of ICT through extracurricular activities, preparing them for the future integration into the fast-paced digital society and enhancing their creativity and innovative thinking. As such, we need a sufficient number of people and organizations to actively care about and participate in ICT, and get in touch with various schools. The initial stage of development must include the participation of the entire community and build awareness at all levels of society.

This year 2021 marks the 10th anniversary of the Hong Kong Emerging Technology Education Association (HKNETEA). 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. 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!

創新是科技發展的基石。香港的經濟增長必須依賴於STEM產業帶來的ICT和創新技術的不斷進步。如今，要培養優秀的下一代，必須通過課外活動激發學生的興趣，加強他們對ICT的基礎知識，為未來融入快節奏的數字社會做好準備，增強他們的創造力和創新思維。我們需要有足夠數量的人和組織積極關心和參與信息通信技術，並與各種學校取得聯繫。發展的初始階段必須包括整個社區的參與，並在社會各個層面建立意識。

今年 2021 年是香港新興科技教育協會 (HKNETEA) 成立 10 週年。該協會了解組織社區項目需要什麼。自成立以來，我們一直積極培養下一代ICT專業人才。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等等標誌性項目的倡導和實施，我們不僅建立了合作夥伴關係 並與香港及亞太地區的主要教育機構建立了密切的合作關係，同時也積累了大量全球年輕一代的支持者。

HKNETEA 為我們在推廣新興技術方面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感到自豪。感謝我的團隊、董事會成員、所有贊助商、審稿人和支持組織

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

Chief Judge

Prof. Francis CHIN Yuk-lun, Emeritus and Honorary Professor (Department of Computer Science, The University of Hong Kong, Founder and Chief Solutions Officer, DeepTranslate Limited)
(錢玉麟教授)

Deputy Chief Judge

Ms. Paulina CHAN Shuk-man, Museum Director (Hong Kong Science Museum)
(陳淑文女士)

Prof. Emil CHAN Ka-ho, Vice Chairman (Hong Kong New Emerging Technology Education Association)
(陳家豪教授)



Members

Mr. Stanley KAM Wai-ming, Vice Chairman (The Hong Kong Association for Computer Education)
(金偉明先生)

Mr. Aaron HUI Hon-chung, Business Development Director, APAC (AgilePoint Inc.)
(許漢忠先生)

Ms. Justina HO, Chairlady (The Institution of Engineering and Technology Hong Kong)
(何臻言女士)

Mr. Eric YEUNG Chuen-sing, JP, Founder & Honorary President (Smart City Consortium)
(楊全盛先生, JP)

Mr. Terence LEUNG, Senior Manager, Esports and Youth Team (Hong Kong Cyberport Management Company Limited)
(梁德明先生)



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 (Jackal XU Zhenda) /
The Chinese University of Hong Kong (Rex MA Chun Hung)
香港理工大學(許真達) / 香港中文大學(馬俊鴻)

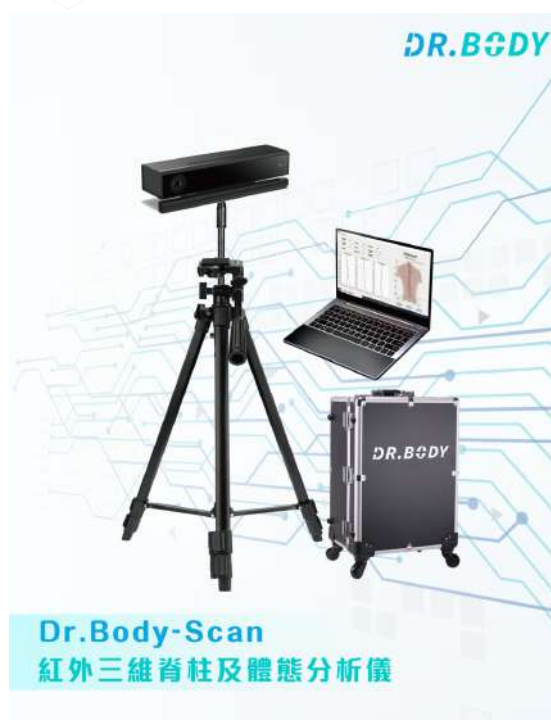
Dr.Body-Scan

Dr.Body-Scan Infrared 3D spine and posture assessment analyzer, a professional medical infrared analyzer, is tailored for 3D evaluation of scoliosis issues.

It innovates from traditional X-rays, by using infra-red imaging technology to perform 3D reconstruction and thermal imaging of the human back. Using AI, it locates the medical anatomical feature points of the human back automatically, while using the musculoskeletal model to process the 3D structures of big bones, such as backbones, for calculation, leading to a safe and reliable detection, close follow-up, long term analysis for non-surgical cases and assistance for rehabilitation projects of scoliosis and other bad postures.

The analyser can scan within 10-second effectively provides medical staff and patients with three-dimensional information of the spine, while users can check the test report real-time through the APP, enjoy personalized customization and adaptation services based on back data.

We commit to escort the healthy growth of teenagers' spines and posture.



紅外三維脊柱及體態分析儀

Dr.Body-Scan 紅外三維脊柱及體態分析儀是為脊柱異常彎曲三維評估以及體態分析量身打造的专业醫學紅外檢測設備。

Dr.Body-Scan 打破傳統X光的限制，採用成熟的紅外成像技術，對人體背部體表進行三維重建及熱成像，基於AI算法對人體背部醫學解剖特徵點自動定位以及肌骨生物力學模型推理出脊柱等大骨骼三維形態並進行自動計算測量，實現了安全可靠的脊柱側彎等不良體態篩查、密切的檢測、對非手術治療的長期隨訪評估以及協助治療方案的製定。

分析儀只需10s的掃描就能為醫護人員與患者提供脊柱的三維信息，且用戶可以在APP上隨時查閱檢測報告，根據背部數據享用個性化定制和適配服務。致力為青少年脊柱及體態健康成長護航。

Comments from Judging Panel 評審委員會評語

This project is a model of the application of technology to the United Nations' Sustainable Development Goals. It can greatly improve the use of simple, low-cost and non-radiation equipment to analyze children with scoliosis in developing countries who are lacking resources. It is really meaningful and rare.

Regardless of the market value and its positive impact on society, the project is a rare masterpiece of recent times and is in line with the role played by Hong Kong in the Greater Bay Area and the general direction that Hong Kong needs to focus on in the development of biotech.

這項目是個科技應用於聯合國的可持續發展目標的典範。它可大大提高正缺乏資源的發展中國家患有脊柱側彎問題的兒童在仍然可以醫治的階段利用簡單及較低成本及無輻射的設備進行分析，實在有意義及難得。

無論市場價值及對社會對社會的正面影響也是近來少有的佳作。正配合國家大灣區香港擔當的角色及香港發展 biotech 需要重點發展的大方向。



Student Innovation (Tertiary or Above) Silver Award

學生創新 (大專或以上) 銀獎

City University of Hong Kong (LAM Wah Shing / NASKAR Shounak) /
The Hong Kong University of Science and Technology
(LAI Ho Man / LEE Ching Fei)

- 香港城市大學 (林華盛 / NASKAR Shounak) /
香港科技大學 (黎浩文 / 李政斐)

Smart Transfer Robot

HORIZON, a smart transfer robot equipped with a fully automatic patient transfer system, is the first product available in the market aiming to solve the lifting-transferring problem in elderly caring centers, sanatoriums, and hospitals. HORIZON provides a complete solution to the elderly to let them get on and off a bed, go to the toilet and take shower by themselves to increase their self-care abilities.

HORIZON is connected to the internet to achieve precise indoor transportation from ward to the ward, ward to washroom etc. With the 5G AIoT system, online robotics Fleet management is achievable to maximize operational efficiency and improve the quality of service in the elderly care service industry in the future.

智慧過床機器人

面對日新月異的醫療挑戰及本港人口老化加速，本地醫院、護養院及安老院對人手需求不斷增加，惟醫護人員數目供不應求，導致現有架構下的人員壓力過大及影響醫療服務質素。

Horizon智能過床機械人希望透過科技協助減輕醫護人員的負擔及提升工作安全。機械人具備智能運送及過床的功能，可自動搭載病人到指定位置，醫護人員可透過變換模式，將病人從坐立轉變為躺平姿勢。機械人透過偵測與病床水平，自動調整到合適高度後，安全將病人從裝置轉移到病床上。過程只需由一位人員從旁協助及照顧病人，從而減少轉移病人過程的人手，及提升了過程的安全性。

Student Innovation (Tertiary or Above) Bronze Award

學生創新(大專或以上)銅獎

The Hong Kong Polytechnic University
(LI Ho Hin Toby / CHAN Lok Chun / YIP Hoi Ying) /
The Chinese University of Hong Kong (WONG Ka Yan)
香港理工大學(李浩軒 / 陳樂晉 / 葉鎧瑩) /
香港中文大學(黃嘉茵)

The All-in-one AI-based Knee Osteoarthritis Management System

CLAIRE develops the state-of-the-art AI-based Knee Osteoarthritis (KOA) Management System. It includes a KOA prognosis system that aids doctors in early diagnosis by utilising accessible predictors in the community. Our AI analyses additional medical images and biomarkers, just like in secondary healthcare settings, to aid personalised treatment with interdisciplinary efforts for optimal treatment outcomes.

Our mobile application can provide community patients with self-management support through the provision of health education. Furthermore, the application includes a gait video analysis to provide an economical and remote treatment evaluation inside our community. To create an integrated patient and caregiver support experience, we construct an online healthcare professional reservation platform and in-app advertisements of medical equipment.

Our project aims to enhance the interplay between primary and secondary healthcare for the betterment of public health. Meanwhile, insurance companies can leverage our AI for accurate customer risk profiling to offer improved social protection with individualised insurance plans.

膝部退化性關節炎人工智能管理 系統

膝骨關節炎(KOA)是一種普遍且無法治療的退化性關節疾病，危害香港百分之十人口的健康。

現時缺乏病人自我管理及可靠的KOA預診工具，使醫生難以針對個別病患提供合適及即時的治療，令患者錯過可扭轉疾病進程的黃金治療期。隨病情惡化，接受費用高昂的膝關節置換手術是病患的唯一選擇。

因此我們研發了KOA一站式人工智能管理系統，研發時採用了美國的數據庫，預測精準度超過八成，並已發表成學術論文。此人工智能系統以提供快速且成本低的社區篩查、及協助醫院作診斷分流和制訂個人化治療方案、增強病人自我管理能力，從而改善慢性疾病管理。



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)
(MA Yujun / CHAN Yan Lung / WONG Long Kiu / TSANG Yui Chung)
香港專業教育學院 (沙田) (馬玉駿 / 陳殷龍 / 黃浪翹 / 曾銳聰)

AI Presentation Training System

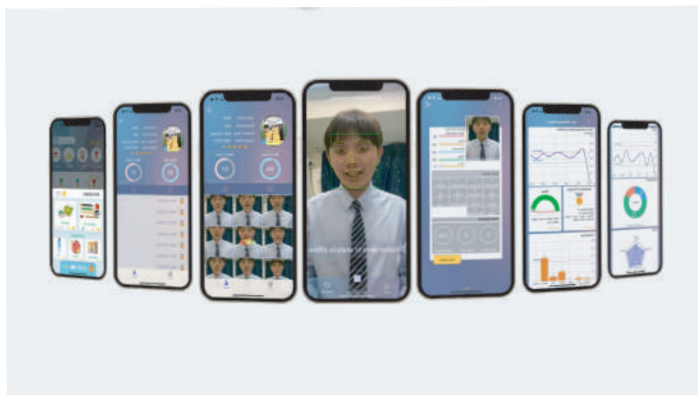
This project is a mobile application that helps analyze and improve users' presentation skills. Powered by AI technology, the app collects users' data such as speaking voice volume and pace, facial expressions, hand gestures and body movement to help them identify their areas of strengths and weaknesses in presentations.

The app can also instantly recognize speech to analyze whether users use excessive filler words, meaningless vocabulary, bad words or insulting words. In addition, the app can analyze the content of a PowerPoint presentation including in real time to give comments and feedbacks, such as whether the font size, number and use of words and number of pictures are appropriate, so as to help users prepare a good quality presentation file efficiently.

智能演講訓練系統

智能演講訓練系統是一個流動應用程式，運用人工智能技術，幫助用家分析及改善演講技巧。系統透過收集包括音量、語速、面部表情、手部及身體動作等數據，協助用家了解演講時的長短處，並提供建議從而提高用家的演講能力。

系統亦能即時識別語音，以提醒用家在演講時是否有使用空泛、負面或不當的詞語等。此外，系統能就演講簡報的內容提供即時建議，例如用字、字體大小、字數、以及圖片數量等，從而幫助用家準備一份優質的簡報。



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

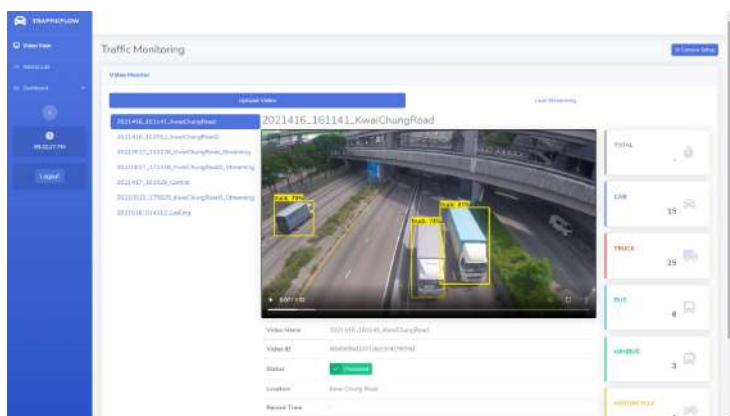
Hong Kong Institute of Vocational Education (Tsing Yi)
(TAM Wing Chun / FAN Cheuk Pan / YEUNG Wai Nam)
香港專業教育學院(青衣) (譚永駿 / 樊焯楨 / 楊焯楠)

Hong Kong Traffic Flow Monitoring and Analysis Platform

Under the Smart City Blueprint for Hong Kong 2.0, the project is a Smart Mobility initiative that is aimed to manage, analyse, and forecast traffic flow. The system includes machine learning models for real-time traffic video analysis which is developed by Convolutional Neural Network and Gated Recurrent Units approaches. The models can detect vehicles and consolidate the traffic circumstance from different video. The analysis result will store in a cloud server and the target user can collect the data through our Application Programming Interface for further analysis like Advertising, Road administration. Furthermore, the system also provides a central management platform for visualising data by the dashboard and also managing data.

香港交通流量監控及分析平台

此項目旨在設計車流量統計系統，配合香港智慧城市藍圖2.0發展，對道路交通進行統計、分析、預測以協助管理。系統透過分析影片、閉路電視等影像內容，利用機器學習技術的卷積神經網路(CNN)及門控循環神經網路(GRU)建立模型進行物件偵測，統計影像內的道路情況，並且根據結果透過雲端服務提供API用戶進行進一步分析，以提供進行廣告投放、道路管理等所需的道路使用者的資訊及道路使用狀況。另一方面系統亦提供中央管理系統(CMS)，旨在進行管理及可視化儀錶板分析影像中的數據等功能。



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

The Hong Kong Polytechnic University (CHER Chun Ho / LI Chak Yiu)
香港理工大學 (車俊豪 / 李澤耀)

VR (Virtual Reality) Vocational Training System for People with Mental Disorder

One out of every seven people in Hong Kong suffers from a mental disorder. In recent years, many colleges and institutions have used VR technology to conduct research and clinical trials to help people with mental disorders. Their research points out that VR is very effective for the rehabilitation of mental disorders and has great potential.

In view of this, we have collaborated with the Department of Rehabilitation Sciences of the Hong Kong Polytechnic University to design a VR vocational training system that helps people with mental disabilities not only train them to live independently, but also eliminates dependence on others, thereby improving the quality of life. To this end, we will focus on the system's high flexibility, high ease of use, and freedom from time, location, and security constraints. In addition to developing a VR system, we also conducted user tests, and the results are also satisfactory to me.

智障人士虛擬實景 (VR) 職業 訓練系統

香港每7個人就有1位患有精神障礙。近年有不少學院和機構都利用VR技術去研究和臨床試驗，幫助精神障礙人士，他們的研究指出VR對於精神障礙既康復非常有效而且仲有好大既潛力。

有見及此，我們跟香港理工大學康復治療科學系合作，設計出一個幫到精神障礙人士既VR職業訓練系統，不單止訓練到他們的獨立生活能力，使到他們不用再依賴他人，從而提升佢地既生活質素。為此，我們會集中考慮系統的高彈性、高易用性、不受時間、地點和安全限制。我們除了開發一個VR系統之外，亦進行了用戶測試，效果亦令我地滿意。

Student Innovation (Secondary (Senior) School) Gold Award

學生創新 (高中組) 金獎

Christian Alliance S W Chan Memorial College
(CHOW Wang Yui / LAU Wei Bong / CHEUNG Sau Nam / CHEUNG Yiu Fai)
宣道會陳朱素華紀念中學 (周泓睿 / 劉韋邦 / 張首男 / 張耀暉)

EMG-Driven Virtual Environments for Stroke-Rehabilitation

As an enhancement of the traditional rehabilitation program, our invention provides an auxiliary approach for stroke patients and their therapists to boost the recovery progress based on the current medical system. Starting from three to twelve months after having a stroke, the patients undergoing rehabilitation treatment are our target. Instructed by their therapist, our measure allows the recovery-training to take place at the patient's home.

中風復康輔助遊戲

中風復康輔助遊戲是一個復康輔助配套，為治療師及中風患者提供能配合現行制度並更完善的治療方案，以促進治療成效。使用對象為香港中風後三個月至一年的中風復康患者，配套讓患者能夠在治療師的指引下在家進行復康訓練。

Student Innovation (Secondary (Senior) School) Bronze Award

學生創新 (高中組) 銅獎

**Christian and Missionary Alliance Sun Kei Secondary School
(TSANG Sung Tak / WONG Tsz Ching / LEE Cheuk Lok / LU Hiu Tung)
基督教宣道會宣基中學 (曾崇德 / 王梓晴 / 李卓樂 / 盧曉彤)**

Marine Guard: A Monitoring System by Using AI Image Detection & Submarine to Recognize

To solve this problem, our team discussed and did some research. We concluded that to solve or at least alleviate ocean pollution, the simplest and direct method is to clear the pollutants in the ocean. Therefore, we constructed a system named Marine Guard that consists of a submarine used for locating pollutants. There is a camera on the sub for recording the environment underwater. The system also includes a 3D printed smart buoy for receiving GPS signals and signals from the remote control of the submarine through an antenna. Also the core of the system, an AI that can recognize pollutants appeared in videos.

The system works as follows, users control the submarine to record underwater and gain the video, then send the video and the GPS location from the smart buoy online for the AI to recognize the pollutant appeared. The AI will specify the location and the type of pollutant on a map. With this information, we can effectively locate the pollutants in the ocean and clean them with ease.

大海撈污

我們制作了一款名為大海撈污的系統，系統包括了一部用以定位污染物的潛水艇，潛水艇上裝載了GoPro攝影機以拍攝水底的環境，一個浮標以3D打印制作的，浮標內含有GPS裝置及接收潛水艇遙控器信號的天線，以及整個系統的關鍵，用以辨認影片中出現過污染物的的人工智能。

整個系統的運作流程如下：用家以DIY潛水艇拍攝水底，取得影片，將影片及浮標提供的GPS坐標傳送至網上由AI進行辨認並在地圖上標籤出污染物的種類及位置。有了這些資料，我們能輕鬆地定位污染物所在的位置並進行清理。

Student Innovation (Secondary (Senior) School) Bronze Award

學生創新 (高中組) 銅獎

Fung Kai No.1 Secondary School (WONG Wai Nok Matthew / FONG Ching)
鳳溪第一中學 (黃衛諾 / 房正)

Welcome Home - Smart Residential AI System

The Welcome Home used an AI face recognition system which consist OpenCv, NumPy and Time & pySerialTransfer showcased by Lego. In real situation, the building with a mounted camera at the entrance to capture residents' faces and compared with the database, the door will be automatically opened when the results are matched. Meanwhile, this AI system is able to distinguish the needy in order to provide suitable assistance. For instance, the needy with a wheelchair and those residents carrying a baby car will be specifically allocated to a side of elevator which can provide more spaces for them.

Nevertheless, when the AI identified there is/are visually impaired people, the voice navigation would guide them to their destination. However, all the innovative design aforementioned about are aiming to create an anti-virus, user-friendly and security, all-in-one system, so as to improve people living standard and satisfy people in needs.

AI 愛回家

我們的研發產品是一套採用了Arduino, OpenCv, Numpy 和 Time and pySerial-Transfer 等電腦及資訊科技範疇的技術製作出來的 LEGO 模型, 我們會在大廈出入口處設置人臉辨識系統, 鏡頭掃描到住客後便會自動打開大門。我們的智能系統能同時辨識出有特殊需要的住客, 例如: 我們會為輪椅人士或者推著嬰兒車的人士特別分配一部較少人的電梯, 為視障人士從大門的位置開始提供語音導航功能。

在私人住宅大廈建立一套集抗疫、照顧有需要人士和保安於一體的智能系統, 以提升住客們的生活質素。



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

ECF Saint Too Canaan College
(LEE Tsz Chun Jamie / WONG Oi Ying / YIP Tin Yee)
基督教中國佈道會聖道迦南書院 (李祉晉 / 黃藹瑩 / 葉天儀)

FlashMatch

Is the aesthetics of colour combination purely subjective? Is it possible to quantify colours or even program computers to provide us aesthetic advices? Such pondering has guided us to explore colours from a STEM perspective and constructed out project FlashMatch, a smart mirror which suggests outfit combinations based on programmed colour theories.

FlashMatch is a technological creation that unites the science of human cognition, computer vision, image processing, vector calculations and database treatment. We program FlashMatch with Python OpenCV to enable extraction and analysis of main colours on users' outfits, then calculate harmonious colour combinations based on colour theories. FlashMatch then searches within its database for outfit items to recommend.

Commercially, FlashMatch provides an interactive experience to promote sales in fashion-related businesses. In addition, it enhances the shopping experience of customers who have difficulties in seeing colours.

智能配色鏡

色彩間的和諧配搭單單是主觀的美學判斷嗎？顏色能否被量化？電腦又能否懂得人類的美學甚至為人類提供建議？這一切的疑問引領著同學把「顏色」這個課題用STEM的方式重新演繹並創作以下作品 - 智能配色鏡！

智能配色鏡是結合人類感知、電腦視覺、圖像處理、向量運算、數據庫應用等不同知識範疇所組成的一件產品。同學利用 Python OpenCV編程，閱讀及分析使用者身上衣服的主要顏色，計算出相襯的顏色組合。按建議從數據庫中抽取相近顏色的衣物組成不同的配搭，供使用者參考如何穿搭衣服。

在商業上，能為顧客提供顏色配搭建議，增加客人選購產品的機會，有助店鋪提升銷售量。另外，色弱與色盲人士在智能配色鏡的幫助下，也能配上適合的襯搭，改善生活體驗。

Student Innovation (Secondary (Junior) School) Gold Award

學生創新 (初中組) 金獎

Ju Ching Chu Secondary School (Yuen Long)
(LAU Juliana / KWOK Cheuk Yin / CHAN Yuen Hei)
裘錦秋中學 (元朗) (劉鎧琪 / 郭卓妍 / 陳菀禧)

Caelus

As Sports centres and arenas have been closed since the pandemic, we have to stay home to prevent the spread of the virus. Meanwhile, many of us have lost the motivation to exercise regularly. As a result, our physical and mental health gradually declines. To make it easier to exercise at home, we have designed a mobile game called Caelus, using artificial intelligence to recognise players' postures.

Not having to pay extra on buying new devices, players can keep and breed virtual pets by playing the motion-sensing games in Caelus. With augmented reality technology, the game also enables players to place the virtual pet in real life. We consulted a fitness trainer to select a set of straightening-up exercises that aim to improve players' postures and strengthen their core muscles. We also encourage players to do it for at least 30 minutes every day to stimulate our brains to release dopamine.

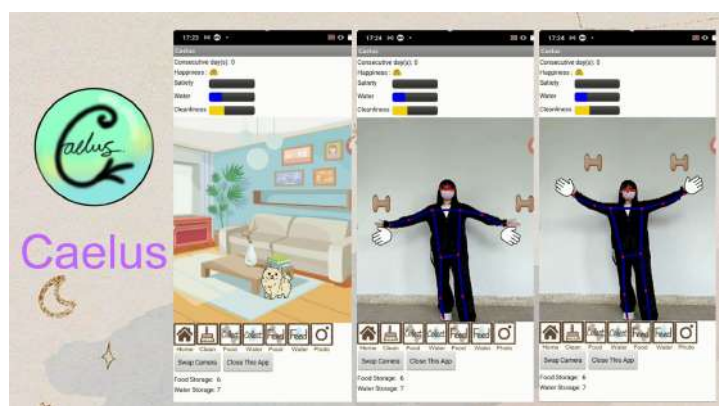
Caelus not only provides entertainment to the players but also helps them to relieve stress and anxiety. We plan to promote Caelus in primary and secondary schools. It can send students' exercise records to their schools. Meanwhile, students will get rewards if they exercise regularly through Caelus.

人工智能運動應用程式

在疫情下，運動場地關閉，市民減少外出，留家抗疫，同時也減少了做運動的決心，身心健康漸漸失去平衡。考慮到疫情影響大家的身心健康，我們利用人工智能辨識人體姿態及擴增實景技術，設計了一個無需額外硬件，只需一部智能手機便能使用的體感操作育成虛擬寵物的遊戲(Caelus)。

我們參考了護脊操和健身教練的意見，揀選一些簡單易做又能鍛鍊身體的動作，培養玩家每日進行30分鐘運動，使大腦釋放多巴胺，為玩家帶來娛樂同時舒緩疫情的壓力。

我們亦計劃將Caelus 推廣至中小學，建立數據平台，讓學校可按同學的運動表現作回饋、支持及獎勵。



Student Innovation (Secondary (Junior) School) Bronze Award

學生創新 (初中組) 銅獎

St. Paul's Convent School (CHEUNG Si Ya Elinor / CHOW Hiu Hang Kaitlyn)
聖保祿學校 (張思雅 / 周曉珩)

Laughter Catcher

Primary school students in Hong Kong are under heavy academic stress. Additional psychological stress is found because of class suspension due to COVID-19.

"Laughter Catcher" allows students to use "Laughing Yoga" to relieve stress and strengthen the relationship with their friends. Students are encouraged to practice laughter yoga at any time anywhere. As they expand their circle of friends, they can practice with each other and spread positive energy to more people. The Mood Swing Detection function can detect the emotion change of a user and send an SMS message to the person he/she trust. This can enhance communication among people.

快樂鳥

香港小學生的學習壓力非常沉重，加上學校因疫情的關係而停課，更進一步增加他們的心理壓力。

建立「快樂鳥」的目的是讓小學生利用「大笑瑜伽」紓緩壓力，加強與友人之間的聯繫，鼓勵同學們在任何時間及地方練習大笑瑜伽，把正能量傳給更多人。再加上情緒檢測功能，當「快樂鳥」檢測到用戶有負面情緒，便會發短訊通知可信任的人，鼓勵人與人之間的溝通。



Student Innovation (Secondary (Junior) School) Bronze Award

學生創新 (初中組) 銅獎

St. Paul's Convent School
(LEE Audrey / Cherene NGAI / Annie QIN / Audrey SENG)
聖保祿學校 (李曉晴 / 魏晴 / 覃麒安 / 沈鋸嵐)

CAPS Carbon Life

Food production accounts for about a quarter of global carbon emissions, which is why we created CAPS Carbon Life.

CAPS allows people like you and me, who cares about the environment, to record our food carbon footprint, so as to help us change our daily habits to achieve carbon reduction goals.

When we take a photo of our food through the "Capture" function, the program will use AI technology (Microsoft computer vision and Clarafai) to automatically recognize the kind of food, then, the program will make use of formulas from proven research to estimate the carbon footprint of the food.

The "Analyse" function provides graphs and different kinds of conversions to help us understand the impact of our food carbon footprint on the environment. We can also design carbon reduction plans for ourselves through the "Plan" function.

Last but not least, through the "Share" function, we can share our reflections about a carbon free diet or share little tips and tricks about how to reduce carbon emissions with the community.

二氧化碳排放量在近年迅速飆升，做成全球暖化，為人類的生存構成極大的威脅。而糧食生產佔全球碳排放的四分之一。

為了幫助大家實踐低碳生活，我們設計了CAPS Carbon Life - 一個利用人工智能來分析用家每餐食物碳足跡的手機應用程式。當用家透過Capture功能拍下食物照片，程式會利用AI科技和牛津大學的「用數據看世界」數據來估算食物的碳排放，幫助他選擇低碳食品。

Analyze功能會提供圖表和不同換算讓用家了解自己在飲食上的碳足跡。用家亦可透過Plan功能為自己設計減碳方案。再加上Share功所提供的環保資訊分享平台，用家便能集合群眾力量，令減碳工程事半功倍。



CAPS Carbon Life 減碳四部曲



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

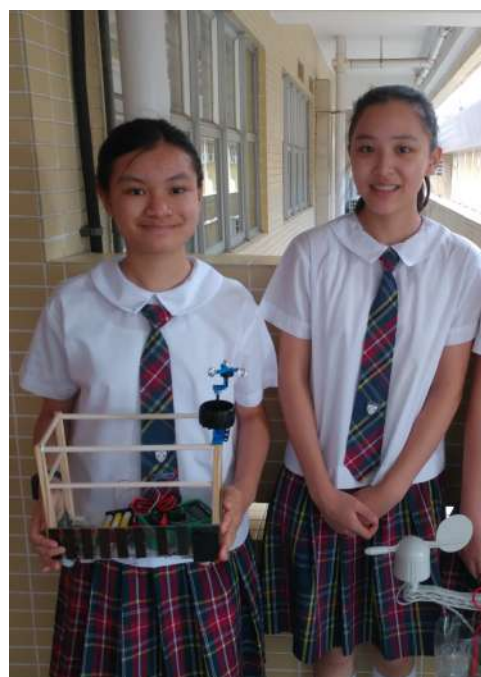
St. Paul's Convent School
(LEE Yan Lam Janice / LI Yongxuan Sophia / Samantha LAM)
聖保祿學校 (李欣霖 / 李咏萱 / 林心潔)

Gondola

Gondola is a commonly used facility for high-altitude work, regardless of the installation of windows, maintenance and decoration of the outer walls of the building and cleaning work. However, when there are strong winds and rain, and the weather conditions are poor, the gondola will always sway; in more serious cases, such as typhoons, the gondola may even be overturned. Therefore, we try to put sensors and suction cups on the gondola, and embed an electricity generation module to stabilize the gondola, so as to 1) protect the safety of workers, 2) reduce the damage to the building when the gondola swings, and 3) reach self-sufficient on the power supply.

吊船

吊船是高空工作常用的設施。當天氣狀況欠佳時，吊船總會搖擺不定。在更加嚴重的情況下，例如颱風，吊船甚至會被吹翻。我們的學生於吊船上加上感應器及吸盤，並加上發電模組，以穩定吊船，從而保障工人的安全，減少吊船搖擺時對大廈的破壞並達至在電源上自給自足。



Student Innovation (Primary School) Gold Award

學生創新 (小學組) 金獎

King's College Old Boys' Association Primary School (YE Pak Yin)
英皇書院同學會小學 (葉柏言)

AI Water Machine

Drinking water may be a simple daily activity for most people. However, it has never been easy for an intellectually disabled person. They either drink too little or too much and it increases the staff's work load to monitor them.

The main purpose of this APP is to provide an AI solution to monitor the daily water intake for intellectually disabled persons by using NFC stickers and face-recognition technology.

1. By matching the NFC ID with each user's face, the solution avoids the hygiene problem caused by mistaking the users' cups.
2. The solution provides an access control to the water machine.
3. The solution prevents the patients from overusing or underusing water by recording their consumption.
4. In case the daily total water intake is more than 2000ml, patients cannot take water without gaining a permit from staff.
5. The solution can automatically identify every user in the system. It would not limit the access to regular users

飲水小助手

飲水看似簡單，但在智障人士院舍裏的院友卻需要特別照顧，職員需定時派水給院友。因大多智障人士都有飲水過量或過少的問題；有些智障人士因受精神科藥物副作用的影響，感到口乾需常飲水，導致血液中鈉過低，甚至水中毒；而一些院友則不願飲水。所以院舍需監察他們的飲水量，並需以人手作記錄。

因此，我構思了「飲水小助手」，利用智能手機，Arduino ESP32 controller board, Pump, Flow Sensor, NFC Sticker Reader, NFC Sticker及一些環保物料組合而成。這項發明既可使院友每天飲用適量水量，又方便職員可快速地監察院友飲水量，舒緩職員沉重的工作量。

「飲水小助手」透過每隻杯的獨立NFC Sticker及水機人臉辨識功能，可達致以下目的：

1. 水杯上的NFC Sticker與水機人臉辨識配合，才可出水，避免院友取錯別人杯子，亦可維持個人生。
2. 如杯沒有NFC Sticker則不會出水，確保可記錄飲水量。
3. 可記錄每一院友的飲水量，院舍職員可定時查看院友的飲水量，提醒飲水過少院友飲水。
4. 院舍可使用「飲水小助手」代替現用水機。如院友一天飲水量多於2000ml，便不會供水給該院友，可避免飲水過量的情況。
5. 一些飲水正常院友可不受影響，不需待職員派水，感口渴時可自行取水喝。



Student Innovation (Primary School) Silver Award

學生創新 (小學組) 銀獎

King's College Old Boys' Association Primary School No.2
(LAM Zit / LEUNG Cheuk Yin / YIP Ka Po Anakin)
英皇書院同學會小學第二校 (林哲 / 梁焯彥 / 葉家寶)

Smart Bin

SMART BIN is to make the recycling bin intelligent and achieve data cloudification. Through the participation of the government, manufacturers, recyclers and citizens, waste recycling can be made more efficient.

We recommend that the government and manufacturers jointly develop a unified classification label or QR code. Then SMART BIN will scan those unified classification labels of the thrown items, and then put them into the appropriate recycling bin automatically. At the same time, data such as kinds of and the quantity of recycling items will be recorded to the cloud database.

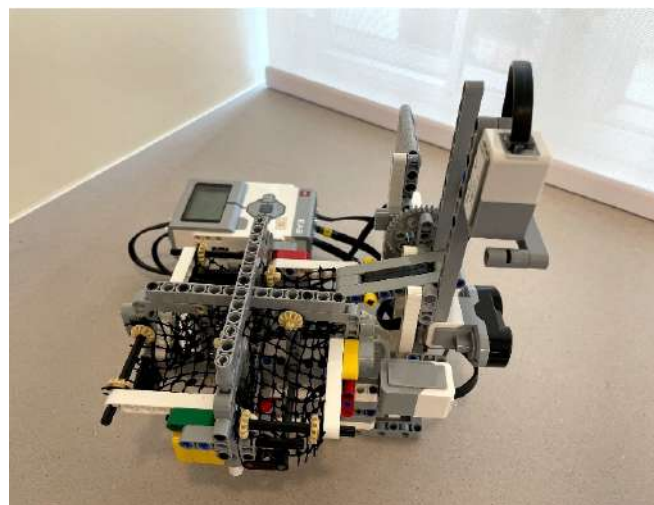
The relevant data can be used as rewards for users and for reference when planning waste recycling policies by government department, such as the location and quantity of recycling bins. In addition, when the capacity of the recycle bin reaches the upper limit, the system will automatically notify the recycler to collect, making the recycling process more efficient.

環保 Smart Bin

我們的構思的環保SMART BIN方案，是要將回收箱智能化及數據雲端化，透過政府、生產商、回收商及市民共同參與，令廢物回收更有效率。

我們建議首先由政府及生產商共同制定統一的分類標籤或二維碼，SMART BIN會掃描被投入物品的標籤，然後自動轉進行分類，投進適當的回收桶內，同時將數據紀錄在使用者的手機及雲端數據庫。

而有關數據可以用作獎勵使用者及供政府相關部門規劃廢物回收政策時參考，例如回收箱放置的地點及數量等。另外，當回收箱容量差不多到達上限，系統會自動通知回收商進行回收，使回收更有效率。



Student Innovation (Primary School) Bronze Award

學生創新 (小學組) 銅獎

Shanghai Alumni Primary School
(CHAN Siu Hang / CHAN Wai Kiu / LEE Yi Long)
滬江小學 (陳肇珩 / 陳惠喬 / 李爾朗)

Smart Trash Bin

There are a lot of recycling bins in Hong Kong. However, some of them are often overflowing with items, which causes the public to put the recyclables out of the bins. Moreover, due to the high workload, the dustmen are not always available to empty the bins once they are full.

To solve the above problem, we have invented 'Smart Trash Bin'. It is combined with three pieces of hardware, including an EV3 (control unit), a motor and an ultrasonic sensor, which are directly installed to the original recycling bins. The ultrasonic sensor is used to detect the remaining capacity of the recycling bin whereas the EV3 (control unit) is connected to the ultrasonic sensor for monitoring via Bluetooth.

When the garbage in the recycling bin exceeds 60%, the system will automatically send a message to the control center to remind the dustmen to clean up the garbage. Once the garbage has been removed from the bin, the system can operate as usual.



智慧環保回收箱

香港不少地方已設置廢物分類回收桶，可是，部分回收桶經常滿瀉，導致市民要把可回收的垃圾放在回收桶外，而清潔工人亦未能及時清理。

「智慧環保回收箱」及附設的智能系統就可以讓清潔工人實時監察廢物分類回收桶的使用情況。「智慧環保回收箱」主要以3個硬件來操控整個系統，包括：EV3、摩打及超聲波感應器。首先，我們會利用超聲波感應器來探測回收箱的使用情況，而連接超聲波感應器的控制單元(EV3)會持續透過藍牙探測回收箱內。

當回收箱內的垃圾超過60%，系統會自動向控制中心發放信號，提醒清潔工人清理垃圾。當垃圾已被清走時，系統就可以如常運作。



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

C.C.C. Heep Woh Primary School
(LEE Siu Him Cedric / LAM Man Yiu / LAU Tsz Yiu)
中華基督教會協和小學 (李兆謙 / 林文耀 / 劉子曜)

Pearl of Elderly Wisdom - Inherit the Wisdom of the Elders and Let the Wisdom of New Generation Grow

• "Our granny, our gemstones", the elderly have more life experience than the younger generation. In our daily life, the aspects that the elders are good at, such as choosing ingredients, cooking food, sewing and knitting clothes, raising fish, playing chess, repairing furniture, etc.

• Through the mobile phone app, let classmates and the elders in other families collect and record different life wisdoms in the past. Form a substantial database and share it with other "friends" with the same hobbies, and fellow classmates can also learn different general knowledge from the sharing of different elders.

"Computational Thinking (CT)" is the way to solve problems. When dealing with problems encountered in life and learning, we should understand the nature of the problem, think about solutions and present it in a way that computers and people can understand.

The chance of inheriting the wisdom is getting slim as the birth rate declines. Through inter-generational communication and combining the creativity and vision of the new generation, the experience and wisdom of the previous generations will be passed on.

We may establish a bridge of communication, let the elders and children walk out of the community together, and strengthen the integration of the two generations. We may also use technology to find the human touch in the community and share valuable experience and wisdom with others.

In the meantime, the elders can also delay memory decline using programs and reminisce and relive the good old days.

"Long for Wisdom"-Inherit the wisdom of the elders and let the new generation grow for long.

《「長」智慧》- 傳承長者的智慧， 讓新生代智慧增長

• 「家有一老，如有一寶」，年長一輩人生閱歷及生活經驗比年輕一輩多，在生活小節中，如挑選食材、烹調食物、修補及編織衣物、養魚下棋、修理家具等等，都是他們的專長和絕技。

透過手機程式，讓同學與家中長者一同搜集及記錄過去不同生活小智慧，形成大數據資料庫，分享給其他有同樣嗜好的「老友記」，而同學將來亦可從不同長輩的分享當中學習不同常識。

「運算思維 Computational Thinking (CT)」就是解決問題的方法。當日常生活及學習上遇到的問題時，能夠理解問題本質、思考出可解決的辦法，並利用電腦及人都可以理解的方式來呈現出來。

出生率下降可繼承的機會愈來愈少，最後永遠消失。透過跨代溝通，結合新生代的創意和視野，將上一代的經驗和智慧傳承下去。

建立溝通橋樑，讓長幼兩代一同走出社區，加強兩代共融。活用科技尋找社區中的人情味，將寶貴的經驗和智慧與其他人共享。

同時長者亦可以透過使用程序延緩記憶衰退，重溫昔日美好時光。

《「長」智慧》- 傳承長者的智慧，讓新生代智慧增長

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

Diocesan Boys' School Primary Division
(LAM Kin Hei Kingsley / WU Chun Ting Justin /
Michael Robert-David Kai Fung YEH / Sean LEE)
拔萃男書院附屬小學 (林見熙 / 胡俊霆 / 葉榮丰 / 李山)

Personalize 3D Face Mask Using Mobile Phone

The 3D face mask is a way of letting people engage with something as simple as a mask. The users can choose the color of the face mask, the design and even the shape! People can use this to be fashionable in public and to impress their friends with cool designs and colors. We will collaborate with scientists and doctors on how to make the mask effective against the virus. Also, did you know that the time that it takes for everyday masks to break down is 450 years? That is why we use a special material called PLA, a corn starch based biodegradable material that decomposes easily. We hope the 3D face mask becomes trendy amongst everyone and stay safe!English

利用手機裝造個人化3D口罩

個人化 3D 面罩是一種讓人們與像面罩這樣簡單的東西互動的方式。用戶可以選擇面罩的顏色、設計甚至形狀！人們可以使用它在公共場合變得時尚，並用酷炫的設計和顏色給他們的朋友留下深刻印象。我們將與科學家和醫生合作，研究如何使口罩有效對抗病毒。還有，你知道日常口罩分解的時間是450年嗎？這就是為什麼我們使用一種稱為 PLA 的特殊材料，這是一種基於玉米澱粉的可生物降解材料，易於分解。我們希望 3D 面罩成為每個人的時尚並保持安全！



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

G.T. (Ellen Yeung) College
(TSE Chung Lai / SHIH Long Ho / TAM Ho Kwong / LEE Ka Kiu)
優才 (楊殷有娣) 書院 (謝仲禮 / 施堃鎬 / 譚皓光 / 李家翹)

Find My Car

It is not uncommon to see news of private car theft on news headline everyday. The number of private car theft rate has been increased for approximately 35% from 2019-2020, this situation is worrying among road users. Sometimes, it is difficult for the public general or the police to distinguish whether a particular car is a stolen one or not even the burglar alarm is on.

To tackle this problem, we want to invent a system that can assist the car owner; its name is "Find My Car": When the car is being stolen, the owner will immediately receive a notice via APP in phone, the instant location of the car, as well as the real time image of the car compartment. Besides, the UV light embedded license plate will be turned on; the word - "STOLEN" written by UV illuminate material will be shown on the license plate, informing other road users about the incident. This invention is useful for reducing the crimes related to private car theft.

智能汽車防盜系統

在香港，我們經常在新聞報導看到犯人利用偷回來的失車犯案。根據警方的數據，在2019至2020年間，偷車罪案數目上升了接近百分之三十五。但是市民或警察日常在街道上很難判斷車輛是失車與否，加上我們在街道或停車場聽到汽車防盜警報聲的時候，很多人都會覺得是誤鳴而沒人理會。

我們的目的是希望發明一個智能汽車防盜裝置，讓車主能夠在汽車被盜時知道私家車的位置、犯人的樣貌及開啟我們設計的防盜車牌，讓道路上的人知道該汽車是失車，從而減少因汽車被盜或因此而衍生的其他罪案。



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

G.T. (Ellen Yeung) College
(WONG Chi Ping / TONG Ho Chit Torris / WONG Yu Yan / SHIH Long Ho)
優才 (楊殷有娣) 書院 (黃智平 / 湯皓捷 / 王禹人 / 施堃鎬)

Anti COVID Station

The COVID-19 pandemic is still ravaging the world, affecting millions or even trillions of people globally. Many countries have been putting an astonishing amount of man power and resources in the medical expenses. However, we all know the saying that “Prevention is always better than cure”, so we want to invent a system that can help school to prevent the entry of viruses into the campus.

This invention is called “Anti-COVID Station”, this system is connected into the school’s intranet, and it helps to measure the body temperature of students upon their arrival to school. At the same time, it recognizes students’ identity even their mask is on. If there is an individual with abnormal temperature being detected, the system would automatically send SMS and email to the class teacher and the parents, reporting the issue to them. With this system, students no longer need to measure their body temperature using the traditional temperature sensor, this prevent a long queue or cluster outside the school gate. This system is also useful in reducing the manpower needed for checking body temperate and minimizing the chances of virus outbreak at school.



學校防疫站

現時新冠肺炎疫情仍在全球肆虐，許多地方的人民都在水深火熱之中。為了醫治新冤肺炎病患者，不少國家的醫療開支都十分龐大。但正所謂「預防勝於治療」，我們發明了一個智能體溫監測系統去預防病毒進入校園。

這個系統能夠為進入學校的同學量度體溫，同時它有人臉識別功能。當探測到同學發燒，系統能夠傳送SMS和電郵通知家長及班主任，讓他們知道孩子及學生發燒，讓受影響的人士減到最低。這樣一來能夠減低老師的工作量，同時又能減低因為量度體溫而造成的人流聚集，減低感染的風險。



Student Innovation (Primary School) Certificate of Merit

學生創新 (小學組) 優異證書

King's College Old Boys' Association Primary School
(LEUNG Tsz Ying Sophia)
英皇書院同學會小學 (梁芷滢)

Anti-epidemic Game

My invention is two small games made using Micro:bit sensors and Scratch programs. As the pandemic continues to increase in seriousness, many children will have anti-epidemic fatigue and bear a large psychological pressure. Exercise time has decreased significantly, and children's development and physical fitness have been affected. I designed two small games to help children increase their exercise and remind them of the main points of fighting the pandemic.

I conducted research on the issue of less exercise and found that 83% of classmates and family members prefer to play video games at home, so I inserted elements that users need to exercise their body based on the popular game "Fruit Ninja". That is the first game: "Anti-Epidemic Ninja".

In view of the problem of anti-epidemic fatigue and people ignoring the main points of anti-epidemic, I designed a small game like the "Ghost Eater" game to replace ghosts with virus and insert masks and alcohol for players to use in the game. This is the second game "Anti-Epidemic Defense Battle". At the end of the game, small reminders will appear to remind users of different anti-epidemic tips. People can relax and understand the main points and tips of anti-epidemic prevention.

抗疫神戲

我的發明是以Micro:bit和Scratch製作，利用Micro:bit感應器加上Scratch程式製造的兩個小遊戲。由於疫情持續肆虐，很多小朋友會有抗疫疲勞，承受相當大的心理壓力。亦因為長時間在家上網課，各個運動場所又關閉，致使運動時間大幅下降，小朋友的發育和體能都受到影響。所以我希望透過兩個小遊戲，幫助他們增加運動量和提醒他們抗疫的要點。

首先我針對少運動的問題作出研究，訪問了同學和家人，發現83% 同學在家中都比較喜歡玩電子遊戲，所以我參考「水果忍者」這個受歡迎的遊戲中加插用家需要動手動腳的元素，那是第一個遊戲 -- 「 抗疫忍者」。而針對抗疫疲勞而忽略抗疫要點的問題，我設計了近似「食鬼」遊戲的小遊戲，以新冠病毒取代鬼，而加插口罩和消毒酒精給玩家拿取，這便是第二個遊戲 -- 「 抗疫保衛戰」。在遊戲的最後，會出現提示用家不同抗疫要點的小提示，希望能透過遊戲達到放鬆之餘，又可以認識抗疫要點。

「 抗疫忍者」和「 抗疫保衛戰」都加插了抗疫的元素，例如口罩、消毒酒精、新冠病毒等。這些小遊戲可以在抗疫中解悶，又可以鍛煉體魄。



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

Kowloon Tong School (Primary Section)
(LEE Yin Jun / SZE-TO Chak Yu Daniel / SIU Hong Yat)
九龍塘學校 (小學部) (李彥諄 / 司徒澤雨 / 蕭康逸)

Go Green Scan

During the pandemic, a lot of citizens order take-away that causes increase the uses of non-disposable foam boxes and worsen the environmental problems. Therefore, our students designed an app “Go Green Scan” to encourage citizens to bring their own boxes while ordering take-away.

In our design, if a citizen brings his or her meal boxes, they can receive a coupon. They can use the coupons when they order their meals later. This is a good factor to encourage citizens to support environmental protection by bringing their own meal boxes.

環保密密掃

於疫情期間，不少人叫外賣，但隨之帶來卻是即棄餐盒及食具所帶來的環保問題。有見及此，本校學生便設計了一個獎勵系統「環保密密掃」。

於設計中，會邀請不同餐廳合作，一旦市民自備餐盒到有關店舖購買外賣時，便可獲得印花，累積的印花可於任何有參與計劃的食肆領取優惠，作為支持環保的經濟誘因。

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

Kowloon Women's Welfare Club Li Ping Memorial School
(CHENG Jinting / WONG Sung Yan / POON Hiu Tung Hilton)
九龍婦女福利會李炳紀念學校 (程錦婷 / 黃崇殷 / 潘曉瞳)

Shoe Savior - Smart Sterilized Spray

Since COVID-19 around the world, public awareness of hygiene is also increasing. At present, the most common method of cleaning shoe soles is to spray diluted bleach on the floor mats. For a long time, it is necessary to dispose of used towels and floor mats.

We hope to develop an intelligent disinfection mat device. The intelligent disinfection mat device mainly uses ultrasonic sensors to detect objects. When it detects that the shoes and the sensor are less than a specified distance, the device will start spraying some mist to disinfect the upper and sole of the shoe, to avoid the virus outside from home.

When there is not much detergent left in the box, the IoT technology will send a message to remind the homeowner to add the disinfectant. Moreover, we are invited to the CMA Verification Center to use the Culture-based method for repeated experiments that to detect and test the disinfection effect of shoes.

智能消毒地墊 救救鞋子吧

現時的新型冠狀病毒全球肆虐，市民個人衛生意識亦隨即提高。現時普遍清潔鞋底的方法大多是在地墊上噴稀釋漂白水，長期下需要處理已被使用的毛巾及地墊。

我們研發一個智能消毒地墊裝置。這個裝置主要利用超聲波感應器偵測，當偵測到鞋子與感應器少於指定距離後，裝置便啟動噴霧進行消毒鞋面及鞋底，以達致全面消毒的效果，以免將街外的病毒帶回家。

當清潔劑過少時，透過IoT技術發送信息提示屋主增加清潔消毒劑。另外，我們榮幸獲得創科研展空氣科技有限公司贊助，安排前往CMA檢定中心學習使用Culture-based method 作重覆實驗，測試鞋子的消毒效果。



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

Lok Sin Tong Leung Kau Kui Primary School (Branch)
(CHEN Xin Hui / YAN Cherish / DENG Po Yi)
樂善堂梁銜琚學校 (分校) (陳新慧 / 甄雅雯 / 鄧寶兒)

Handrail Cleaning Robot

The handrail cleaning robot aims on addressing disease spreading from people-to-people contact on handrail. Handrail is a simple facility that we use everyday and yet it is the major way to spread disease just by touching. This is especially true in the covid-19 pandemic. And, we want to thanks our school janitors who spent a lot of time cleaning every seven-floors-high handrail every hour every day.

Therefore, we begin designing the handrail cleaning robot hoping to reduce their tasks at hand and to keep our school free of germs and viruses. Our design is simple. It has a focus on cleaning handrail timely and effectively with auto-run cleaning schedule, secure gripping wheels, and re-useable sanitization towel. These robotic features would reduce the extra walking needed to clean to handrail. We hope this may reduce workloads gained from the covid-19 pandemic for school janitors.

扶手清潔器

扶手清潔器的目的是重點解決病毒從樓梯扶手傳染他人的問題。在日常生活中，樓梯扶手是每人每日都必然會接觸到的工具，而它更是病毒主要的傳播媒介之一。特別是在疫情期間，到處都充滿樓梯扶手的香港對於扶手消毒更是不遺餘力。在學校裏，每天工友叔叔姨姨也每隔一小時走著三條、共7層高的學校樓梯進行清潔消毒，確保安全衛生。

為減少叔叔姨姨在疫情中增加的工作負擔，我們設計的扶手清潔器能專注清潔扶手、進行消毒工作和定時定刻清潔消毒。清潔器運用了多個滾輪來夾穩扶手，並能根據扶手角度進行改變，加上能自動填充的酒精消毒毛巾，便能簡單地自動行走連續的樓梯扶手，有效地減少清潔人員在疫情中的額外負擔。



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

The ISF Academ (LEE Tsak Ming Casey)
弘立書院 (李澤茗)

Bus Vacancy Controller

The Bus Vacancy Controller is a low-cost, user-friendly, flexible, customizable, and fully automated way to monitor and manage crowds in both public, and private venues.

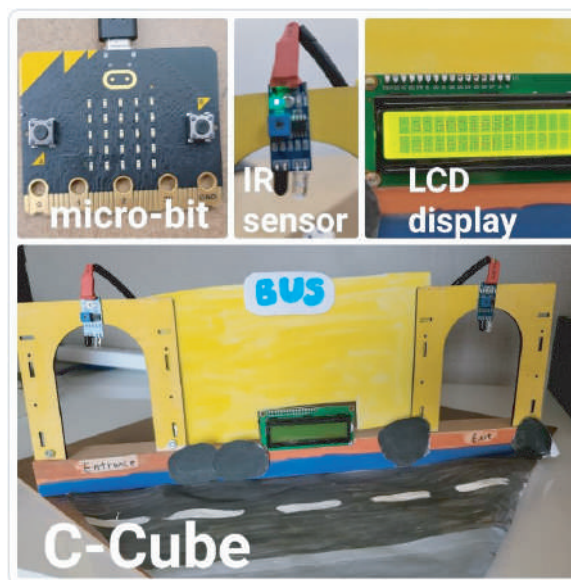
The Bus Vacancy Controller can be applied to any venue and can be used by many groups of people, including restaurant owners, show owners, concert organizers, and more! The Bus Vacancy Control is effective in managing large crowds because it can display the amount of people who are in the venue and the remaining capacity of the venue. Furthermore, when someone walks into an already full venue, a warning sound will be played until they exit the venue.

Social Distancing is important because it can help us to prevent the spread of COVID-19, and I strongly believe that the first step to having proper social distancing is to have enough space left in the venue to allow people to practice social distancing. The Bus Vacancy Control is a feasible, affordable, and customisable way to achieve that goal.

Bus Vacancy Controller 是低成本、易於操控和調節 (用戶可以自行定制/調節人數上限/或採用全自動的方式), 用於監控和管理場所內的人群, 可應用於任何場地。

設計概念源於一個周末, 一家人在行山後跳上一架非常擠迫的巴士, 在新冠疫情下, 大家都保持社交距離, 但在這車程上看到有系統的人數管轄措施。我亦發現很多場所都沒有人數管轄設備。例如餐廳, 一般以人手監控, 易於出現人為錯漏。

於是, 我設計Bus Vacancy Controller去解決以上的問題。它能顯示場地內的人數和剩餘容量, 有效管理大量人群。當有人走進已滿座的場地時, 會發出警告聲音, 直到他們離開, 藉此確保社交距離, 低 COVID-19 的傳播率。



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

VNSAA St. Hilary's School
(POON Kai Hang / FUNG Chit Rio / CHUNG Kar Tung)
漢師德萃學校 (潘啟亨 / 馮哲 / 鍾嘉彤)

Umbrella Rainwater Removing Device

On rainy days, people in Hong Kong will use disposable plastic bags for umbrellas to keep the floor dry in shopping malls and other enclosed space. Every year, more than 18 million of these bags were thrown away after using 1 minute, causing damage to our Earth. Our group has come up a solution to dry the umbrella without using plastic bags. Our project aims to promote awareness on environmental protection and reducing the unnecessary use of plastic bags in keeping the umbrellas dry.

The user will insert the wet umbrella into the Umbrella Rainwater Collection Device. The user will need step on the pedal which will make the umbrella spin. As the umbrella spins, the surface rainwater will spin out and be collected in a container. Moreover, the pedal is connected to a generator which converts kinetic energy to electrical energy. The idea is to store the electrical energy generated for other uses (such as recharging a power bank) as a source of renewable energy. After 5 seconds, the user can remove the almost-dried umbrella and walk into the shopping mall without wasting any plastic bags



環保雨傘除水器

每當下雨時，政府公共場所、商場等地方會免費派發雨傘膠袋。但根據統計，每年香港市民製造約 1800 萬個即棄雨傘膠袋垃圾，平均每個膠袋使用的時間卻只有1分鐘，對環境造成極大破壞。有見及此，我們設計一個能防止雨水沾濕地面的「環保雨傘除水器」，既不需浪費膠袋之餘，又可以把收集得來的雨水循環再用。另外，透過腳踏產生的能量轉換（動能電能），驅動發電機，為室內場所提供潔淨的能源，從而推動綠色生活。



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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Acknowledgement

鳴謝

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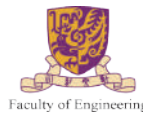


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