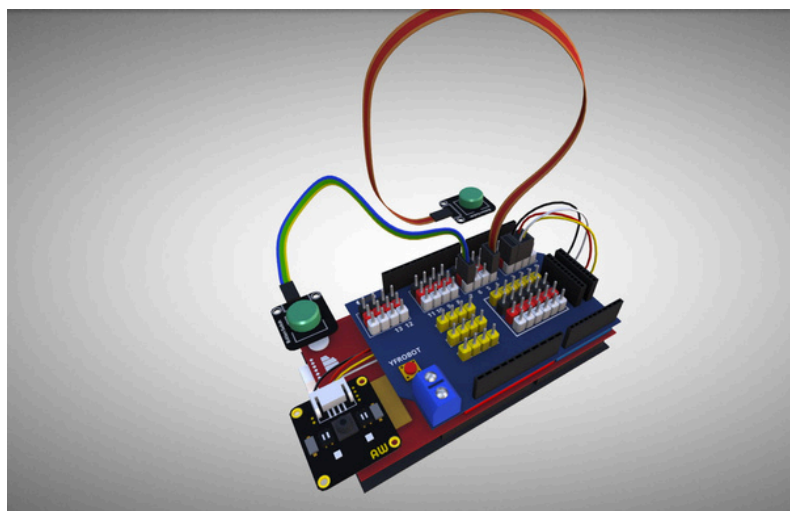


2021/22 Winning Entries

Secondary School Student Category- Gold



Buddhist Sum Heung Lam Memorial College
AI-RIS

Due to the visual impairment and the decline in cognitive function, it is common for the elderly with amblyopia and dementia to wander or even get lost away from home. These elderly people need constant attention and care in daily life, and this may cause pressure to their family members, and a sense of helplessness to the elderly themselves as they are grounded at home.

Now, with the help of artificial intelligence, these elderly people can go out independently, as the AI can recognise the surroundings of the users, and then instantly read aloud to the elderly people their live location and guide them to their destination. Family members can also remotely keep track of their whereabouts.

The elderly have undoubtedly made a huge contribution to the society, and therefore, we would like to return their favour by improving their life with the help of technology.

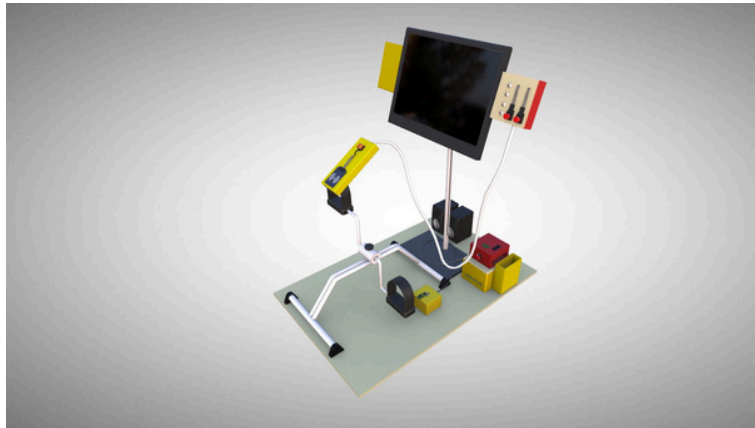
Team List

Instructor: Ho Ka Ki
Students: Ng Yu hei, Yam Ching lung, Huang Nok ka
Secondary School Student Category (2021/22)

Video: <https://youtu.be/3p6Q4rWjwWA>

2021/22 Winning Entries

Secondary School Student Category- Silver



Heung To Secondary School (Tseung Kwan O)
New Century Pedal Exerciser

Pedal machines can improve muscle strength of the legs of the elderly, but the machines may not be actively used by the elderly. During the epidemic, it is difficult for relatives and friends to visit the elderly, therefore their relationship may become estranged, and the elderly cannot know the latest situation of their family members. Physiotherapists cannot collect data on the use of Pedal Exerciser from the elderly, therefore this may delay the elderly's treatment.

The device called New Century Pedal Exerciser can solve the problems mentioned above. The exerciser uses photos, audio recordings and video clips of relatives, friends and grandchildren to attract or encourage the elderly to continue to use the pedal exercise to improve muscle strength of their legs. Physiotherapists and family members can also obtain information on the frequency of the elderly using the pedal exerciser through the Internet and mobile phones, and give the elderly appropriate advice on the use of the pedal exercise. Through the pedal exercise, elderly can know the current situation of their family through the device, so that the elderly will feel the care and their life will become happier.

Team List

Instructor: Wong Tung Shek

Students: Cheung Chi Hoi, Chu Tsz Ying, Ho Kai Yui, Ngai Ho Chun, Wu Chi Shing, Lau Yu Hin

Secondary School Student Category (2021/22)

Video: https://youtu.be/gRUbXjwU_5Y

2021/22 Winning Entries

Secondary School Student Category- Bronze



**Lung Kong World Federation School Limited Lau Wong Fat
Secondary School**

Fortune

This product aims to provide instant help for the elderly with a portable device. The design can be divided into two parts, the software and the hardware. The software is the phone app, which is used to receive messages and get the location of help seekers. The hardware is the portable device, which is mainly provided for the elderly and the user interface is clear.

Users can seek help by sending signals through the app or portable device. It is different from the existing care-on-call service, everyone can be the helper. This product may help improve social bonding, as it allows anyone to be a helper.

Team List

Instructor: Fung Wing Kin

Students: Chan Orlando, Lau Kam Yiu, Chen Ka Po, Yip Wai Yu

Secondary School Student Category (2021/22)

Video: <https://youtu.be/q7-dgydSWJk>

2021/22 Winning Entries

Secondary School Student Category- Merit



Youth College (Kwai Fong)

Care in 360 Degrees

Elderly people living alone are prone to falls. In order to maximize the chances of being rescued, we designed a robot with an AWS Deeplens camera to monitor the situation of the elderly in the house. The design will ask if the elderly needs help after a fall. Moreover, 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.

Team List

Instructor: Ng Chun Fai Clement

Students: Kwok Hau Ling, Ngo Kiu Susanna, Iu Lap, Wong Po Yu, Ho Man Hoi, Leung Tsz Kin
Secondary School Student Category (2021/22)

Video: https://youtu.be/dBvCfbO_FU0

2021/22 Winning Entries

Secondary School Student Category- Merit



Man Kwan Pak Kau College

My AI Smart Nutritionist

My AI Smart Nutritionist is a mobile app that helps elderly and the people with visual impairment to read food labels. It can help users to avoid eating foods that are expired or cause allergies. The app also saves food records and calculates their nutrition values automatically so that users can keep track of their own daily intake level. The system can analyze the food label photos uploaded by users through Cloud Vision API and convert the food labels into audio messages through Text-to-Speech. Users can know their own nutrition intake by the charts and advisors for healthy eating provided by the My AI Smart Nutritionist app.

Team List

Instructor: Lai Fu Wai

Students: Chun Tin Yik, Chan Chun Yu, Chong Hoi Ching, Wong Yin Chau
Secondary School Student Category (2021/22)

Video: <https://youtu.be/Bd8IHuQkdzM>

2021/22 Winning Entries

Tertiary Students Category- Gold



Hong Kong Institute of Vocational Education (Tuen Mun)
SmartPhy-Treatment(SPT)

AI Pose Detection Estimation:

We have made reference to the Physical Therapy Guide from a social welfare agency and adopted the MediaPipe technology to code our guidance system. We also use the voice and text to guide the users through the physical therapy exercises, step-by-step, with correct poses. The design enables users to follow the doctors' correct poses online without the doctors having to be physically present.

Information Analysis System:

The programme collects users' information such as poses and time, after the treatment. The collected data is then analyzed to assess the users' body conditions.

Timetable:

The reminder system alerts the user to undergo treatment on time. It also has a record function, allowing users to review their progress periodically.

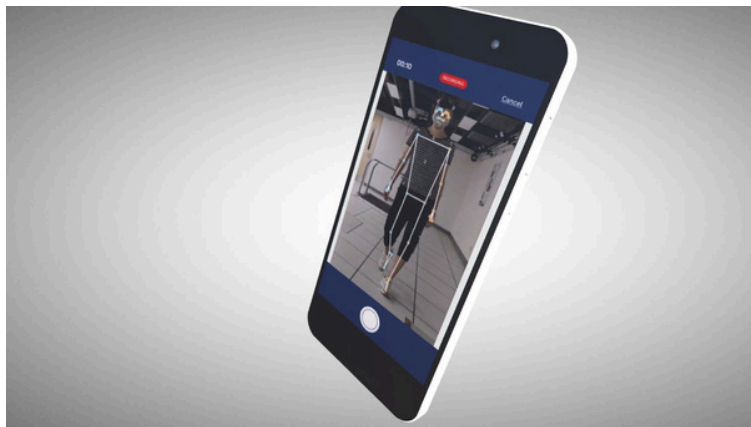
Team List

Students: Yong Man Sui, CHAN Tsz Chun, Chan Wing Chun, Chong Tsz Yeung
Tertiary Students Category (2021/22)

Video: <https://youtu.be/epal34F1HF5>

2021/22 Winning Entries

Tertiary Students Category- Silver



Hong Kong Polytechnic University
The AI-based Osteoporosis Prognostic System

Osteoporosis is a common musculoskeletal disease with no known cure, affecting an estimated 400,000 patients in Hong Kong. Unfortunately, an accurate prognostic tool is lacking, given that its precise etiology remains unknown. It is often regarded as a 'silent disease', as research has estimated that about 75% of the cases are still undiagnosed or are diagnosed only when a bone fracture occurs. Coupled with the lack of patient self-management support for both the patient and their caregivers, this flawed disease management leads to poor treatment outcomes for osteoporosis patients.

In light of these detrimental consequences and the aging population, we have developed a state-of-the-art AI-powered osteoporosis prognostic system. This system enables mass screening in the community by analyzing easily accessible predictors from patient characteristics and clinical data. To empower osteoporosis patients with a proactive mindset towards wellness, rather than a reactive approach to illness, the self-management mobile application closely follows international clinical guidelines. The app provides regular, intelligible health information and personalized education, such as lifestyle modifications, pain management, and exercise suggestions. We also offer more objective functional capability measurement via our in-app AI-powered gait video analysis. This allows users, such as clinical practitioners and their caregivers, to enjoy cost-effective and continuous functional outcome assessment.

Team List

Students: Chan Lok Chun, Li Ho Hin Toby, Chan Ho Lam, Wo Lok Yiu, Li Pik Kei Tiffanie,
Lau Sing Hin
Tertiary Students Category (2021/22)

Video: <https://youtu.be/2SvqQj0RyBU>

2021/22 Winning Entries

Tertiary Students Category- Bronze



Hong Kong Institute of Vocational Education (Tuen Mun)
Top Safety

AI Fall Detection & AI Emotion Detection

When the elderly fall to the ground due to falls or heart attacks, our system uses artificial intelligence-based body tracking and emotion detection on the camera feed to collect data. Afterward, the system analyzes the data to identify if an older person has experienced a fall, and then displays a notification message to remind their guardians or social workers to request emergency medical services.

Real-time Geographic Location Mapping

For elderly individuals who are injured during outdoor activities and do not seek medical treatment in time, our system allows guardians to view the location information of the elderly person.

Outdoor Gyro-based Fall Detection

By using accelerometers and gyroscopes built into the smartphone, our system can easily detect falls.

Team List

Students: Lee Chi Hong, Lin Man Hong, Lau Ka Ho, Liang Yi Tao
Tertiary Students Category (2021/22)

Video: <https://youtu.be/n3WeLVlxuyY>

2021/22 Winning Entries

Tertiary Students Category- Merit



Hong Kong Nang Yan College of Higher Education
Carson

"Carson" caters to the needs of the elderly. We found that the general trolley design in the market fails to ease the burden on the elderly. As a result, we developed "Carson" to improve the lives of the elderly in the following ways:

1. Add the function of lifting and lowering the platform, so that the elderly do not need to bend down to pick up or put down items.
2. Adopt a three-wheeled design, which makes it easier for the elderly to maneuver the trolley when walking on stairs.
3. Add a cover so that the elderly can sit and rest anytime and anywhere.
4. Incorporate a brake function to make it safer for the elderly to sit down.
5. Use a primarily square design to increase the size of the shopping cart's opening. This makes it easier for the elderly or users to put some bulky items inside.

Team List

Students: So Hiu Yan, Chu Yung Chui, He Lexian, Mok Tsz Hin, Tsang Tsz Kei, Hui Ying Ying
Tertiary Students Category (2021/22)

Video: <https://youtu.be/zF8D2P-yZ50>

2021/22 Winning Entries

Tertiary Students Category- Merit



**Hong Kong Institute of Vocational Education (Shatin) /
The Hong Kong University of Science and Technology
Overflow**

According to the theory of long-term wear and tear in gerontology, we have developed a comprehensive set of IoT systems to support aging-in-place. This includes not only the IoT home system but also a GPS tracking system and smart housing devices. The IoT system is divided into two parts: the intelligent reminder system and the pre-insurance system. Even in the absence of a network connection, the hardware can also operate effectively, making the equipment more suitable for diverse needs of the elderly. The GPS tracking device can give their family members peace of mind by allowing them to easily monitor their location. The final smart equipment is cognitive training fitness category. Ultimately, we hope the elderly can age-in-place, fostering harmonious coexistence between seniors and younger generations.

Team List

Students: Cheng Tsz Tsun, Ho Kar Man, Yeung Hoi Ki, Chan Yuk Lin
Tertiary Students Category (2021/22)

Video: https://youtu.be/W_OKKxWwDRM