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NEWS & ACHIEVEMENTS

HKBU COMP "Regeneration Warrior" develops easy-to-use software enabling severely disabled people to use computers

Cheung Sai-ho, Master of Science in Advanced Information Systems student in Department of Computer Science, has developed voice-control computer software for severely disabled people in spite of his own physical and speech disabilities. The software, named "Cerebral Palsy to Joy (CP2Joy)", is the first human-computer interface for severely disabled people in Hong Kong. It will enable those with severe disabilities to use the internet on their own, thereby reducing the digital divide.

Sai-ho, one of the Top 10 Regeneration Warriors recognised by the Regeneration Society in 2013-14, plans to share a trial software with a local special school with the aim of benefitting more users in need.

Cheung Sai-ho was born with Cerebral Palsy, a disorder caused by brain damage that affects speech and muscle movement. Due to his condition, he can only type on a keyboard with one finger, producing one to two Chinese characters a minute. To help address the difficulties he faces with typing, Sai-ho developed CP2Joy which mainly uses voice commands to control the computer and minimises physical movement of the user.

He said the programme needs only a joystick – that is frequently equipped on most modern wheelchairs – and the built-in microphone of a personal computer. It requires much less physical movement to operate when compared to a traditional mouse and keyboard, making it ideal for use by a disabled person.

When building the software, Sai-ho deliberately designed a "rolling character interface" which enables a user to quickly pick alphabets by applying a simple pre-recorded voice command (for example, pronouncing the sound "uh"). A user can also uses voice commands to represent a mouse action such as "double click", "move the cursor" or "move the cursor to a designated mark on a computer screen". The design enables the user to "type" accurately and efficiently with minimal motion.

Sai-ho's practicum supervisor, Dr Byron Choi Koon-kau, an Associate Professor in the Department of Computer Science at HKBU, said: "The internet has become an essential part of our daily lives. However, those with disabilities encounter a lot of difficulties when it comes to using a traditional computer, which is equipped with a keyboard and a mouse, owing to their limited body and muscle movement. This includes disorders such as Cerebral Palsy, Tetraplegic and Muscular Atrophy patients."

Dr Choi said that there are a variety of systems made for disabled people, such as on-screen keyboards, gesture control systems and eye-tracking systems, but these systems are often too stringent for severely disabled patients. He added that some of the existing systems are expensive, placing such equipment out of the financial reach of those with disabilities. Tailor-made systems for individual patients can be even more costly and stringent. In contrast, CP2Joy uses easily accessible hardware.

With the assistance of staff from the HKBU Centre for Innovative Service-Learning, Sai-ho will trial run CP2Joy in a special school with the aim of extending the system to more users in need.

The CP2Joy project is an integrated and collaborative joint project from the Department of Computer Science, the Centre for Innovative Service-Learning and the School of Business at HKBU.

Source: HKBU eNews. Retrieved from https://bunews.hkbu.edu.hk/news/people/hkbu-regeneration-warrior-

develops-easy-to-use-software-enabling-severely-disabled-people-to-use-computers

(Left) Cheung Sai-ho and Dr Byron Choi.

A diagram showing the features of the voice-control computer software.

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