

Two good wins at Inventions Geneva



After winning the first runner-up at the first Hong Kong Innovation day, **Dr Thomas Choi** took his innovative Haptic Platform for Self-care Training in Occupational Therapy to the Inventions Geneva, a world-famous international exhibition of inventions. He picked up both a category award and a special award at the event. Dr Thomas Choi tells us how he managed to beat off other exhibitors and earn two awards at the Inventions Geneva.

Q: Can you tell us more about the awards?

My project won the silver medal of the teaching methods and materials category. There were thirteen entries in this category, including the interactive animated epilepsy education programme from Malaysia; the vehicle electronics simulator from Iran; the assistive device to facilitate reading and drawing for students with disabilities from Chile; and so forth. The China Patent Information Centre of the People's Republic of China State Property Office also gave me the Honorable Mention Award to recognise the contribution of my project to the community. The awards are significant recognition to the effort of the Centre for Smart Health.

Q: What were the reasons for your project being selected?

The international jury at Inventions Geneva tends to honour innovations that can make a huge impact on human development or benefit the greatest number of people. My project lies somewhere in the middle, but it has its strength. I think that it attracted the jurors' attention in three ways: First, the haptic platform was designed for a specific group, the physically impaired, though it was not for all. Second, it is easy to use, interactive and fun. The jurors and the audience in the exhibition could try the device and experience the real-time response. Third, my presentation to the jurors was supported by preliminary statistical data to demonstrate the effectiveness and the practical value of the haptic platform to the target users.

Q: How did you get the idea to develop a haptic platform for self-care training?

For the past few years, I employed force feedback haptic device in my prototyped virtual reality simulation systems, such as cataract surgery simulator, collaborative surgical simulation system and suturing simulator. Haptic device can identify hand movement and generate forces to provide an interactive training of motor skills, but it is also challenging to use the device to emulate finer and complex motor skills, which are frequently used in clinical practice and are critical for nursing students to develop.

While searching for a solution, I began to explore how to apply haptic device and virtual reality environment into rehabilitation care. In 2011, I developed a virtual and force feedback haptic system for training the handwriting ability of children with upper extremity disability. Collaborated with a local special school, a user pre-post test study was carried out to see the effectiveness of the system. At the time, I was concerned about whether the handwriting skills developed by the children in virtual reality could be transferred to reality.

A conversation with an occupational therapist at the special school helped me understand that the students had greater need for developing self-care abilities because they would use the computer keyboard in the future! I came to realise that my research project was more than generating ideas, developing the software, testing the device, analysing the data and publishing the outcome. I needed to know more thoroughly the need of the users.

So, I decided to make use of haptic device for the training of daily life activity tasks, such as opening a door with a key, pouring water into a glass and food preparation. The system provides great convenience for the trainer as all materials are virtually presented. No door, water and food are involved, and it allows repeated training with minimal logistics.

Q: The device is ready to be placed on the market?

Many people have asked me the same question, but the system was designed to be used in an institution. We have carried out several pilot studies at the special school, and it will be great if we can extend the user network to other schools. One way

to achieve this is to set up a learning resource centre in which the system will be placed to promote the system to other special schools and facilitate student training.

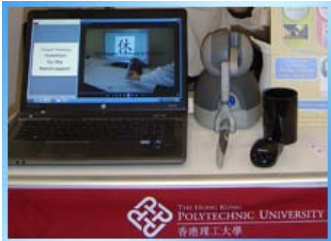
Q: What is next for the Centre for Smart Health?

We are now developing a plan for the PolyU-Henry G. Leong Mobile Integrative Health Centre (MIHC) for the coming three years. We are trying to improve the current service model in order to utilize the resource more effectively while the quality of service can also be further enhanced, with new services and reaching more needy elderly people in Hong Kong. On the other hand, we will continue to establish a research track record on rehabilitation care with computer simulation and assistive technology. We are also developing new training simulation systems for nursing education and for orthopedic surgery.

About Inventions Geneva

The 42nd International Exhibition of Inventions of Geneva was held in 2 to 6 April 2014. The Inventions Geneva features a high number of inventions in the fields of ecology, medicine and security. It has been recognised as one of the most important exhibitions of its kind in the world.

This year, 790 participants from 45 countries attended the event showcasing around 1,000 inventions.



◀ The award-winning Haptic Platform for Self-care Training in Occupational Therapy



◀ Demonstrating the innovative system to the audience at Inventions Geneva.



◀ The awards at the Inventions Geneva are significant recognition to the effort of the Centre for Smart Health.