CP2Joy IT CO. LTD

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Introduction of CP2Joy System

the author 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.

He has received a 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.

He 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, he has 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, he 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 represents 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.

Problem identifies:
- The assistive technology purpose to ensure that the disabled people can access to information technology and get connected to the world for communications, learning, work and social participation.
- Most of the Cerebral Palsy peoples have very poor hand function and speech disorder, they can only use the computer to keep contact with other people or their family via social network platform. However, there has no a sophisticated solutions to fulfill their needs.
- As Cerebral Palsy patients symptom has poor hand function and speech disorder, they are very difficult to control the mouse drag and drop function, typing characters on keyboard, the new method is needed to replace the traditional input characters in keyboard, more accuracy and efficiency.
- Avoid to do the repeat movement for opening the windows applications frequently.

Project solutions:

- The generic hardware device of Joystick user interface
  - Hijack cursor movement from joystick device without any extra driver support
  - Control cursor movement speed for faster or slower
  - Function of monitor grid
  - Reducing joystick operations error with abnormal muscle control
- Voice recognition system [compatible with the Kinect device or speaker]
  - Voice training
  - Voice commands with the mouse clicking behavior control mapping
  - Storing the information of configuration system setting in the database servers
- System menu and rolling character system
  - Rolling the three different categories characters, included digital, English characters and special symbols
  - Open the specific windows system applications, e.g. notepad, web browser, file manager etc.

System interface:

System demonstration movie clip	
2 mins System introduction movie	System demo movie
http://www.sunit2u.com/CP2JoyIT.mp4	http://www.sunit2u.com/hkbu/cpdemo.mp4