

PPT P.1

Hi everyone, how are you, my name is CHEUNG Sai Ho (Sunny), 39 years old. I have obtained the MSc in Advanced Information System in HKBU Department of Computer Science on 2019. I had worked some local IT Company and social enterprises for the past few years. Unfortunately, I'm a severity handicapped person and suffered from atheroid cerebral palsy when I born, my muscle tone is very unstable and the both hand function is very poor, it is an extremely difficult to control my four limbs movement in precisely. Moreover, my speaking is not very clearly. So, I need to put a huge extra effort and much more time to finish my work and degree course.

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In my case, the brain has damaged occur during shortly after delivery when the doctor had made wrong decision. Thus, my parents definitely were very sad and hopeless when they walked in the child ICU ward. When I was two years old, my mother found out so many abnormal situations in my body, such as could not walk and sit on the chair with steadiness. Moreover, I had several speech problems. My voice is very unclear and can only speak a single word or short sentences. She took me to see the educational psychologist and ask "what can I do?", the psychologist said "Your son has very poor physical ability and never recover from normal ability, you need to find special education school for him." As a result, I studied in the John F. Kennedy Center from P.1 to F.7. Actually, special education is very good for me and improve quality of my life. It has provided me with comprehensive life skill training for the past eighteen years. Nowadays, I can control my electric wheelchair going out with my parents or friends and use one finger typing the keyboard when I was pursed my degree course and got excellence academic result in university studied journey.

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Due to my limitation of physical ability, the most challenge part is taking the final examination in my master degree studied, because I cannot speak the English words or whole sentences very smoothly when my mouth muscle has control very poor. Especially, these voice symbols of my pronunciation 'b, d, g, t, p, s, x, m, n' are extremely difficult to understand for my amanuensis during examination when the exam time is very limited and rush, it is more difficult to control the muscles of the mouth during nervous. Thus, the amanuensis is very difficult to write down my answer in the answer book, so I need to spell for the whole words to him each character, it is very painful for me as the examination time is very limitation around 3 hours. Although, 60% of the questions are converted into multiple-choice questions [MC] and short questions, I cannot finish all questions within the special arrangement of examination time when this time allowance is according to evaluate my typing or speaking speed by the Occupational Therapist professional advice. Unfortunately, I cannot finish all questions finally, so my GPA cannot higher than 3.2 and feel a little bit frustration.

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On the other hand, the special arrangement of lecture hall, it is difficult for wheelchair students to choose suitable seats and see the projector screen in the different sizes of each lecture hall. Thus, the university has purchased the Slashtop Classroom software when it can project the screen images onto my tablet and arrange the adjustable table near the entrance of lecture hall for my wheelchair parking more easily, so I

can see clearly what the tutor is taking in the screen.

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Actually, I have already looked for many assistive technology solutions and existing input system for the people with physical disability when these systems can solve my problem, but all of them are not appropriated for me. Fortunately, I remember that early in my first semester at HKBU, the business idea of developing a voice-control system came to my mind during a meeting with my former occupational therapist, Mr. Ng Chun-Kwok, Senior Lecturer of the Department of Occupational Therapy at Tung Wah College. I learnt from Mr. Ng that the joystick software licenses for several special schools in Hong Kong had expired and the manufacturer had gone out of business. Because of this, students from these special schools could no longer use the joysticks as the relevant software was not compatible with other brands in the market.

Solutions came to my mind and he was eager to offer help. my previous work experience at Microsoft equipped me with rich knowledge and skills in programming mobile apps and system software. With the help and guidance from the professors of Department of Computer Science of HKBU, Dr Byron Choi Koon-kau and Prof Joseph Ng Kee-yin, I finally turned the concept into a real product - CP2Joy.

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During the enrolling of MSc Practicum, Professor Byron was become my supervisor and it is a project-based module, no need taking examination, instead of the other taught based modules. He had given me the flexible assessment method, system development and submit my research report during special schedule arrangement. So, I'm really heartfelt thanks for him when he allows me to start working more early around 18 months. I have a good enough time to do my best and received the excellence result in this module finally. In this period of time, I have kept to discuss with Byron the right research angle and system development methodology from time to time, including the comparison various of existing assistive technology tools pros and cons. Definitely, I'm working extremely hard, strongly problem solving skill and thinking positively as always

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For the CP2Joy business development, many local special schools and social welfare organizations have been temporarily suspended during the epidemic outbreak since 2020. As my body is not very well and avoid infection COVID19 outside, I stay at home all day long and concentrate on research and development. Although I am fortunate to have received support from the University's Innovation and Technology Fund (TSSSU Fund) for these two years and was successfully joined to HKSTP IncuTech programme in the September 2020, there is also a fund to support R&D and allow users to carry out the system test. In addition, it has also developed a "Speech Remote Learning System" in this year, which is specially designed for students with speech disabilities and ethnic minorities. unfortunately, the local speech therapy services are in shortage supply for a long time, many students are unable to integrate into campus life due to language barriers when they face up discriminated, or even bullied. So, it is a very difficult to provide face-to-face speech therapy services in order to reduce the risk of infection for both parties during the epidemic.

In the past two years, we have continued to develop new products. For example, we have developed a "Sevenkeys keyboard" to facilitate stroke or finger loss patients to input the characters, numbers, symbols and commonly used key combinations on the keyboard by their limb pressing. In addition, the CP2Joy system has developed two different versions, suitable for people with different degrees of severe physical disabilities. The first version is voice control with USB joystick instead of using traditional keyboard and mouse to input. The other version is when the user controls it, move the mouse to the desired position on the screen, and after staying for one or two seconds, the system will automatically execute the user's preset mouse click commands without the need to rely on voice control. Regarding to the HKBU KTO's patent consultation service, it has successfully obtained an eight-year short-term patent in Hong Kong, and we will apply to the State Intellectual Property Office of the Mainland for a 20-year invention patent. It has also been widely recognized by the Hong Kong society for our promotion and HKBU's social media sites.

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Finally, I would like to express sincere gratitude to various departments of HKBU and external organizations for their unwavering support and assistance. If they do not give the opportunity for me, I've never succeeded my dream. especially deeply thanks for Prof Joseph Ng and Prof Byron Choi, Department of Computer Science, HKBU, Marcus NG Occupational Therapy department in Tung Wah College, HKBU SEN Supporting unit, KTO department and Prof Howard LING in HKBU BA Department.