非一般麻雀App
助老友記遊戲中預防認知障礙症

Not Your Typical Mahjong App: Helping Seniors Preventing Dementia through Games

NeuroGym - Nathan Hui

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常言道「預防勝於治療」，有些疾病至今仍未有治療方法，預防措施就更顯重要。認知障礙症便是其中一種，現時香港每三位85歲以上長者就有一位是患者，預防工作迫在眉睫。那怎樣才算好的預防功夫？誰人都懂得說多做運動、均衡飲食，但問題是有多少人願意乖乖實行？最好的預防方法就是推廣一些大家都願意做、也會主動做的事。於是，「腦有記」（NeuroGym）團隊便從人人愛玩的「遊戲」著手，再加上人工智能和大數據的元素，達到評估、監測之效。

As people say: prevention is better than cure. In face of diseases that are still untreatable, prevention is key. Dementia is one of them; one out of three Hong Kong elderly aged above 85 suffers from dementia, making its prevention work crucial and urgent. What does it take to prevent this disease? Everyone knows the benefit of doing more exercise and having a balanced diet, but how many of them are willing to put it into practice? The best way of prevention is to promote activities that people are willing to do proactively. That is why NeuroGym's approach focuses on "games" to attract participation. It also employs elements of artificial intelligence and big data for analysis and monitoring.

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今年27歲的許天浩（Nathan）是腦有記的創辦人，訪問當日我前往他們位於科學園的辦公室。「認知障礙症與很多精神疾病有些不同，它是沒有藥能醫治的，因此只能及早診斷，及早預防。」訪問之初，Nathan先替我補習一下有關認知障礙症的知識，繼而說明腦有記的目標，「我們希望可以利用遊戲的方式，讓中老年人可以在玩的過程中，不知不覺完成訓練。透過新的科技，我們希望可以追蹤到每一個較細小的數據，例如成功率、速度、反應。」Nathan說的訓練，是指要預防和延緩認知障礙症的「認知訓練」；而數據，則是要達到評估與監測的目的。那到底有什麼遊戲能夠滿足這些要求呢？

答案就是打麻雀

「第一時間我們就想起被稱為中國國技的麻雀牌，香港人稱之為打麻雀。

打麻雀作為一種認知障礙症的治療方法，本身是有科學基礎的，

已有研究指打麻雀可成功幫助認知障礙症病人延緩病症，令他們整體記性、認知能力變好，亦都有研究顯示，打麻雀可以預防認知障礙症，所以我們第一時間就研究用麻雀來做遊戲。而我本身認識一群精神科醫生，其中一些是有參與相關研究，所以我們也邀請了他們擔任腦有記的顧問。」Nathan說。

Nathan畢業於理工大學，本科讀生物科技，大學時期他已開始關注精神病或情緒病方面的問題，畢業論文主題也是圍繞認知障礙症。畢業後，他進了一間國際精神科藥廠工作，為後來的路打好基礎，「我的工作會接觸很多精神科醫生、腦科醫生、老人科醫生，不時會跟他們探討各種問題和想法，漸漸就醞釀出利用科技去改善認知障礙症病患者的生活質素。」Nathan觀察到，華人社會始終視精神病為忌諱，即使香港在精神科方面數一數二，仍然困難處處，因此他的長遠目標，是利用遊戲去處理各種精神病或情緒病，認知障礙症只是起步。

現存評估或訓練方式守舊

Nathan留意到，坊間不少長者中心仍以傳統方式為長者評估認知障礙症風險。「通常是給一份問卷你填，但人們會覺得人好好的為什麼要填呢？又或者覺得做法低智，更重要是很悶。」除此之外，Nathan指出，這些測試不但花費人手，收集的數據有限，亦不能讓測試者在短時期內重複測試。在認知訓練方面，Nathan亦觀察到不少長者中心仍運用十多廿年前的訓練方法，「有中心仍然叫長者將一堆混在一起的紅豆、綠豆區分開，分完之後，職員又一下子混起來，我聽見都覺得難過。」自言點子多多的Nathan希望帶來革新，想到結合麻雀與科技，研發用平板電腦打麻雀的互動遊戲，兼具風險評估與認知訓練的功能，最終在2018年成為其中一隊獲Good Seed贊助的項目。

I went to Nathan's office in Science Park for our interview. The 27-year-old founder of "NeuroGym" started the interview by giving me a refresher course about dementia. "Dementia is different from many other mental illnesses, in that there is no medicine to treat it. Early detection and prevention are crucial." He then shared with me the vision of "NeuroGym". "We hope to use games to encourage seniors to participate and involve them in training without them realising it. Through new technologies, we hope to track detailed data, such as success rate, speed and reaction." The training Nathan was referring to was cognitive training that helps prevent and delay the onset of dementia. Whereas the data collection mentioned aims at analysing and monitoring the condition of the disease. So, what game can satisfy all these requirements?

Mahjong Is the Answer

"The first thing that came to mind was the Chinese national sport, mahjong. Mahjong, which is a popular entertainment in Hong Kong, is scientifically based as a treatment for dementia. Studies have shown that playing mahjong could help delay the appearance of dementia symptoms and improve patients' overall memory and cognitive ability. Research also showed that mahjong prevents the onset of dementia. That's why it was our first choice when developing the programme. I knew a group of psychiatrists who had been involved in related research, so we invited them to be our consultants," said Nathan.

Nathan graduated from the Hong Kong Polytechnic University with a bachelor's degree in Biotechnology. During his undergraduate years, he started to focus on psychiatric and mood disorders, and his thesis was about dementia. After graduation, he joined an international psychiatric pharmaceutical company, laying the groundwork for his career. "I would come into contact with a lot of psychiatrists, neurologists, and geriatricians, and I would discuss various issues and ideas with them from time to time." Nathan notes that mental illness is still a taboo in the Chinese community. Even though the psychiatric field in Hong Kong is advanced, difficulties are everywhere. Therefore, Nathan's long-term goal is to use games to deal with various mental or emotional illnesses. Dementia is just the starting point.

Existing Assessment and Training are Conservative

Nathan noticed that many elderly centres are still using traditional methods to train and assess the risk of dementia for the elderly. "They would hand out questionnaires for the elderly to fill out, leaving them wondering why so. The elderly might also find it stupid and boring." In addition to this, Nathan pointed out that these questionnaires take a lot of manpower and can only collect limited data. A long interval is also required before repeated testing. In terms of cognitive training, Nathan also noticed that many elderly centres are still using the same training methods ten to twenty years ago. "Some centres would ask the elderly to separate a mixture of red beans and green beans. Staff would mix them back up again after they had separated it. Just hearing about it made me sad."

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驟眼看他們研發出的麻雀遊戲，你可能會覺得與坊間的無異，其實魔鬼在細節。舉例，一般的麻雀遊戲會主動提示玩家「上」、「碰」、「糊」等動作，但在腦有記的遊戲中，你會看到那些動作鍵一直排列在玩家手牌之上。「玩家的所有動作都會記低，按錯也是一種有用的數據。」Nathan補充。腦有記的系統會根據玩家各種動作的數據，分析他們記憶力、集中力、執行功能等六大範疇的認知能力，從而協助評估認知障礙症的風險，又或者持續監察變化，以便作出適當介入。

一年備戰半年起飛

Nathan坦言，在整個2018年腦有記的進展相對緩慢，因為一直缺乏人手開發麻雀遊戲；團隊亦曾試過向坊間遊戲公司招手，看看能否直接將AI應用到現成的麻雀遊戲，有公司要求他們付出幾十萬才會交出遊戲的原始碼，成本太高，因此Nathan他們最終也放棄此進路，決定聘請人手自行研發。踏入2019年，他們的團隊成功進駐科學園及申請創業資助，人手及資源變得充足，在年中至年尾這段期間腦有記隨即起飛，終於做出較為完整的版本，可供長者試用。「最滿足，就是當產品做好，長者中心用得到，而長者又欣賞，畢竟已做了這麼久。」Nathan言語間滲著點點辛酸。在計劃初段，他甚至為了全情投入腦有記的發展，辭掉藥廠的全職工作，一往無前。

目前為止，腦有記除了研發虛擬麻雀遊戲，還創造出形形色色能吸引長者的小遊戲，例如虛擬書法遊戲、虛擬茶樓遊戲，務求貼近長者本身的日常生活，增加他們的興趣。在業務發展方向方面，Nathan表示未有資源發展「B to C」（Business to Customer，即商業零售），市民可以下載試用遊戲程式。有長者中心、安老院舍和復康中心等已購買腦有記的認知訓練遊戲，而Nathan亦希望這將會成為主要收入。未來，Nathan希望可以發展實體空間，例如建立一個長者的遊戲機中心，像冒險樂園一樣，玩遊戲、換獎賞，鼓勵長者在玩樂之中改善認知能力，腦有記會一直朝這個方向前進，以遊戲祝福人間。

As a creative person, Nathan wanted to change the situation. His idea was to combine mahjong with technology and develop an interactive tablet game which combines risk assessment and cognitive training. It eventually became one of the projects sponsored by Good Seed in 2018.

At first glance, the mahjong games they developed might look just like those on the market, but the ingenuity lies in the details. For example, in most mahjong games, the computer system will give hints when the player can claim a tile to match or win. But in the game developed by "NeuroGym", these action buttons are present all the times during the game. "All actions of the player are recorded—pressing the wrong button is also useful data," Nathan added. Based on the data of these actions, the system of "NeuroGym" would analyse the player's cognitive ability in six areas, including memory, concentration and executive function, to assess the risk of dementia, or to continuously monitor changes and make appropriate interventions.

A Year of Preparation and Another Half to Launch

Nathan admitted that the progress of developing the game was relatively slow in 2018 due to the lack of manpower. The team tried to recruit game companies on the market to see if they could apply the AI technology to the existing mahjong games. However, companies would ask for hundreds of thousands for the source codes of their games, and such cost was much higher than they could afford. Nathan eventually gave up this option and decided to hire their own game developer. In 2019, the team successfully moved into the Science Park and applied for startup grants. With sufficient manpower and resources, "NeuroGym" took off later that year. The team managed to develop a more complete version of the game and started a trial with seniors. "It was the most satisfying when the product was ready and the elderly started using it. They liked it and enjoyed playing it. Our hard work finally paid off," Nathan said with a slight bitterness in his tone. At the early stage of the project, he quitted his full-time job to devote entirely to the development of "NeuroGym".

In addition to developing virtual mahjong games, "NeuroGym" has also created a variety of attractive mini games for the elderly, such as virtual calligraphy games and virtual teahouse games. These games aim to attract the elderly through elements in their daily life. As for the business development direction, Nathan said that current resources are insufficient to achieve "Business to Customer", in other words, to provide direct selling services. The public can still download the app, for trial. Some elderly centres, old age homes and rehabilitation units have already subscribed NeuroGym's cognitive training game, and Nathan hopes that this will become a major source of income. In the future, Nathan hopes to develop a physical space, such as an arcade for the elderly similar to Jumping Gym, where they can improve their cognitive ability through playing games and earning points for rewards. "NeuroGym" will keep going in the same direction to bless society through fun and games.