

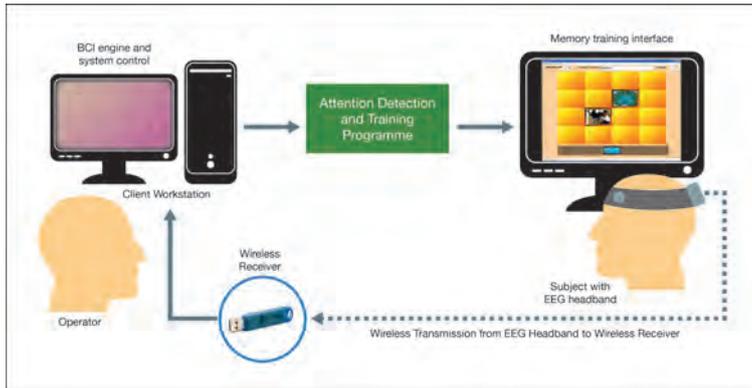


The aging population is increasing at an unprecedented rate not only in Singapore but also in many developed countries. Cognitive decline which is evidently implicated by aging has become a great public health challenge. Age-related cognitive decline (ARCD) and Mild Cognitive Impairment (MCI) are recognized clinical entities. These conditions lie along a spectrum that could lead to different severities of Alzheimer's Disease (AD) if cognitive decline is not prevented. To date, there is no intervention that can help prevent or reverse cognitive decline.

A large number of studies have demonstrated how cognitive training can affect neuroplasticity even in the elderly population. Based on this scientific principle, we have developed a novel Brain-Computer Interface (BCI) -based system to provide personalized cognitive training with neurofeedback feature in order to prevent and reverse cognitive decline.

## Features

- Personalised training system to incorporate attention functions into the memory training
- Patented technology using portable electroencephalography (EEG) headband to quantify attention level in real time
- Utilisation of decoded attention conditions to control and customise the memory training programmes
- Improvement in immediate memory, delayed memory, attention and visual-spatial construction as demonstrated in published clinical trial



## Applications

- Cognitive training for aging population
- Simultaneous memory and attention training tools
- Medical devices to help patients with cognitive decline/impairment
- Cognitive performance assessment

## Benefits

- Impact on patients  
Even though ARCD incur less costs compared to AD, the substantial number of patients suffering from ARCD and MCI increases the costs compared to AD. The cost is a result of the long period of impairment, loss of productivity and loss of independence for the patients and their caregiver. Therefore, a delay in cognitive impairment for even one year would create a beneficial multiplier effect in terms of well-being and productivity for individuals and the society.
- Impact on physicians  
To date, there are no approved prescription drugs for ARCD and MCI. Drugs approved for AD are moderately efficacious with accompanying side effects. They provide brief symptomatic relief and do not modify the disease process. This system can be part of an armamentarium for physicians to help patients with ARCD and MCI with the confidence that it has gone through rigorous assessments and trials as well as achieved regulatory approval.
- Impact on Payers  
Payers with regard to cognitive impairment and dementia include the patients, their families, insurers, and government bodies. By preventing cognitive decline or even reversing the condition with this system, there will be substantial positive effects on the country's economic and social well being.