

Neeuro

Cogo

Attention Training Programme for Children



Cogo is a digital attention training programme for ages 6-12, using neurofeedback with a non-invasive Brain-Computer Interface (BCI) game.



Our Solution

Cogo is a patented, scientifically validated game-based digital therapeutic programme that aims to effectively improve children's attention abilities. The technology is based on Brain-Computer Interface (BCI) and jointly developed by A*STAR's Institute for Infocomm Research (I²R), Institute of Mental Health, and Duke-NUS Medical School in Singapore.

Researchers have demonstrated, in various clinical trials, Cogo's efficacy. A randomised clinical trial involving 172 children with inattentive tendencies showed significant improvements and is supported by Functional Magnetic Resonance Imaging (fMRI) brain scans, results of which were published in the prestigious journal "Nature-Translational Psychiatry".

Brain scans showed positive post-training effects observed in areas associated with attention. In a more recent trial using Cogo in home-based settings, clinicians likewise observed overall improvements in 78% of children with ADHD.

PLOS ONE
RESEARCH ARTICLE
A randomized controlled trial of a brain-computer interface based attention training program for ADHD
Choon Guan Lim^{1*}, Xue Wei Wendy Poh¹, Shuen Sheng Daniel Fung¹, Cuntai Guan², Dianne Baultista^{3,4}, Yin Dun Cheung^{3,4,5}, Haihong Zhang⁶, Si Ning Yeo⁷, Ranga Krishnan⁸, Tih Shih Lee⁹

Qian et al. *Translational Psychiatry* (2018) 8:149
DOI: 10.1038/s41398-018-0213-8
Translational Psychiatry
ARTICLE Open Access
Brain-computer-interface-based intervention re-normalizes brain functional network topology in children with attention deficit/hyperactivity disorder
Xing Qian¹, Beatrice Rui Yi Loo¹, Francisco Xavier Castellanos², Siwei Liu³, Hui Li Koh¹, Xue Wei Wendy Poh⁴, Ranga Krishnan⁵, Daniel Fung⁶, Michael WL Chee⁷, Cuntai Guan⁸, Tih-Shih Lee⁹, Choon Guan Lim¹ and Juan Zhou^{10,5}

Lim et al. *Child and Adolescent Psychiatry and Mental Health* (2022) 17:15
<https://doi.org/10.1186/s13034-022-00539-x>
Child and Adolescent Psychiatry and Mental Health
RESEARCH Open Access
Home-based brain-computer interface attention training program for attention deficit hyperactivity disorder: a feasibility trial
Choon Guan Lim^{1*}, Chui Pin Soh¹, Shernice Shi Yun Lim¹, Daniel Shuen Sheng Fung¹, Cuntai Guan² and Tih-Shih Lee³



01 Portable Kit

Neeuro has packaged the solution into a portable kit that is easy to use and functions independently.

It consists of a wireless EEG headband 'Neeuro SenzeBand'* and the Cogo mobile app.



02 Read Brainwaves

The Cogo mobile app will be paired through Bluetooth with Neeuro SenzeBand*.

The brainwaves (EEG signals) are monitored safely and passively through it.

03 Detect Mental States

Machine learning algorithms will capture the mental states of the participants based on their brainwaves, and subsequently drive various challenges within the game.

*Neeuro SenzeBand or Neeuro SenzeBand 2





Onboarding

In this phase, the clinician will introduce the training programme to participants and this onboarding process will include the setup, training schedule and calibrating a personalised attention model for each participant.



01 Introduction

The clinician will explain the details of the programme, its purpose, training schedule, as well as other relevant information and instructions.

02 Training Schedule

The training schedule will be agreed upon between the clinician and participant, which will span across 24 sessions.

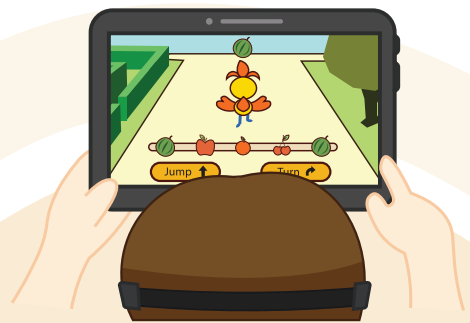


03 Calibration

A calibration session will create a personalised attention model for each participant. This calibration process will be supervised and guided by the clinician.

04 Ready For Training

Once the introduction, scheduling, and calibration is completed, the participant is ready to begin training on the Cogo mobile app.





Play Cogo Games

The training phase is conducted through BCI game sessions, supervised by the clinician or participant's parents throughout the training programme.

01 Connect Neuro SenzeBand



To get started, the Neuro SenzeBand has to be connected to the Cogo mobile app before starting each training session and should be worn throughout the duration of the training.

02 Select Session



In the training menu, sessions are made available according to the schedule set. Participants are encouraged to engage in sessions according to the schedule on a regular basis.

03 In-game Session



Each training session consists of 2 game activities. The duration of each activity is 10 minutes and has different levels of difficulty. Some sessions would include an additional MCQ quiz.

04 Post Session

After completing a session, results are shown and updated onto the system. Details of upcoming sessions are listed according to the schedule.



Game Activities

Game activities are classified into 3 different levels of difficulty: Basic, Intermediate, and Advanced. The level of difficulty increases as the participant completes different training sessions.

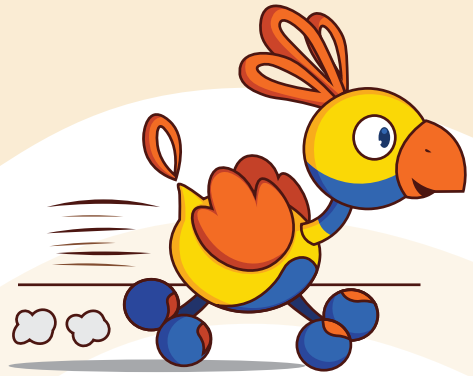
01 Controls



Through BCI, the participant moves the avatar according to his level of focus. With more focus, the faster the avatar moves. The participant can also tap on the on-screen controls to activate other movements such as jumping and turning. These movements are essential to fulfilling the objectives of the game activities.

02 Basic

The participant needs to focus on the avatar for it to run as far as possible.



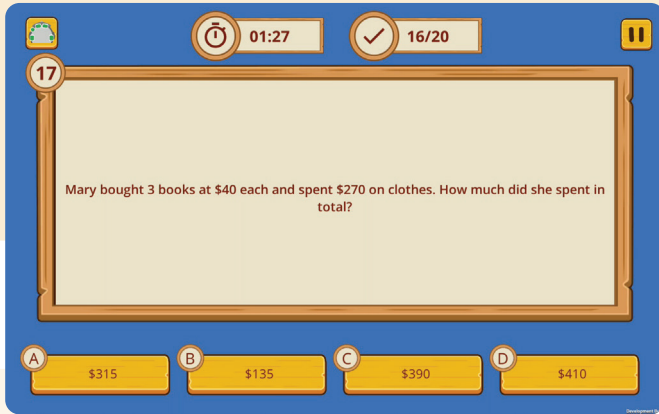
03 Intermediate

In this level, the objective is to collect as many fruits as possible from a given list while still maintaining focus.

04 Advanced

Similar to the Intermediate level, the participant now has to collect as many fruits as possible, but in the correct sequence.





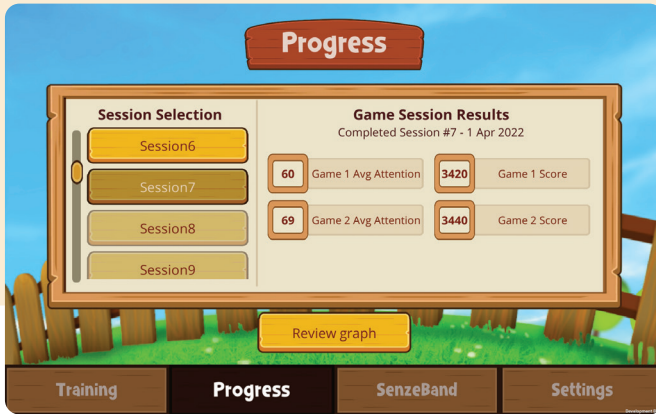
MCQ Quiz

Each multiple-choice quiz consists of 10 English and 10 Mathematics questions. Participants are given 30 minutes to complete the quiz.



Results

At the end of each activity, participants can review their performance. This helps in understanding their progress and identify areas of improvement.



Training Progress

The progress menu allows participants to compare their performance across various sessions, helping them to understand their progress and areas for improvement.

Contact Us

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