neofect

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We inspire you

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Contents

Neofect Smart Glove

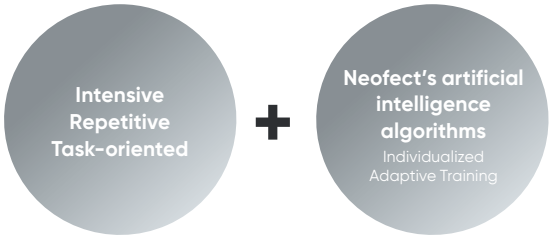

smart glove
HEXORET

Neofect Smart Glove

Neofect Smart Glove is the hand rehabilitation device developed to improve the arm and hand performance of adult patients with stroke.

Concept

Post-stroke rehabilitation often emphasizes the repetition of goal-oriented and task-specific motor skills. However, the repetitive rehabilitation process easily decreases patients' motivation and makes it hard to maintain an optimal challenging level of difficulty to induce neuroplasticity. Neofect Smart rehabilitation solution applies the 'Neofect's proprietary algorithms' to game-like exercises so that patients can remain motivated and perform exercises that are gradually challenging. Neofect's proprietary algorithms use artificial intelligence technology to adjust game difficulty in real-time. It learns what the range of motion for the patient is and continues to change throughout the exercise.



Neofect Smart Rehab Platform

Real-Time Biofeedback Device

- Lightweight, Ergonomic design
- Elastomer material
- Bluetooth technology

Gamified Exercises

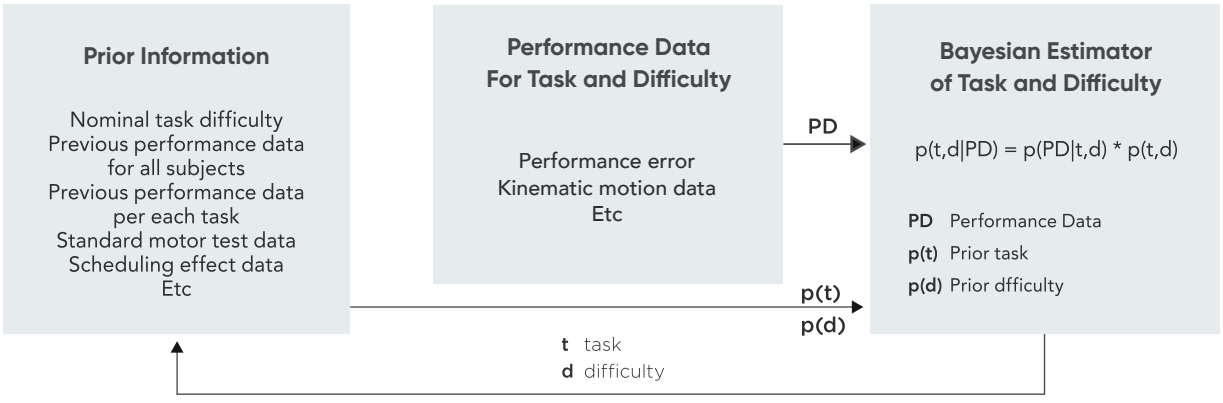
- ADL*-related tasks
- Proprietary Algorithm
- Intensive, repetitive, task-oriented training "just right challenge"

Data and Outcomes Tracking

- Training progress is monitored
- Including repetitions, ROM, coordination, and timing

Learning Schedule Algorithm for Effective Motor Learning & Constant Challenge

Neofect's artificial intelligence algorithms are designed to enhance learning multiple functional tasks by proposing an optimal task at the appropriate level for the patient. Based on the patient's data, such as their training progress, previous device sessions, personal interest, and motor function scores, it computationally selects the level of difficulty during game play. Our devices and systems have an easy to use interface, which helps patients monitor their progress in real-time.



*ROM = Range of Motion
*ADL = Activities of Daily Living

Smart Glove Hardware

Lightweight 0.3 lbs

Ergonomic Material
Designed for various joint movements
Conforms to hand posture

Elastomer Material
Form preservation
Easy cleaning

Wireless
Bluetooth technology

Sensor Technology
Bending sensors
9-axis IMU sensor

Components

- Smart Glove: 2 pairs (small/medium)
- Display System: Android Tablet or Android PC Box
- Neofect Clinic Software for Smart Glove (includes updates)
- Extra Silicone Pad: 2 pairs (small/medium)
- Extra Silicone Band: 2 pairs (small/medium)
- Charger: 2 each
- Battery: 4 each

Neofect Smart Board

Neofect Smart Board

Designed for functional arm reaching, the Neofect Smart Board works with the patient's upper limb range of motion to deliver interactive and engaging rehabilitation.

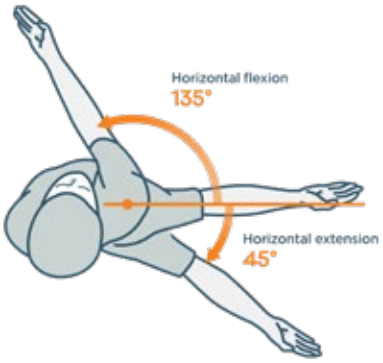
Importance of Functional Arm Reaching Training

Upper extremity function can often be impaired for stroke survivors. Up to 80% of individuals post-stroke experience paresis of the upper extremity immediately after their stroke. Rehabilitation of the upper extremity remains difficult due to limited rehabilitation resources, time constraints and the focus of early rehab on general mobility, balance and gait. An aggressive restorative program is recommended to regain function in the upper extremity. The repetitive and intensive use of novel tasks that challenge an individual's motor skills, such as those found with use of the Neofect Smart Board, assist with upper limb rehabilitation.

*Lawrence ES et al. *Stroke* 2001;32(6):1279–84 Lang CE et al. *Arch Phys Med Rehabil*. 2009 Oct; 90(10):1692–8

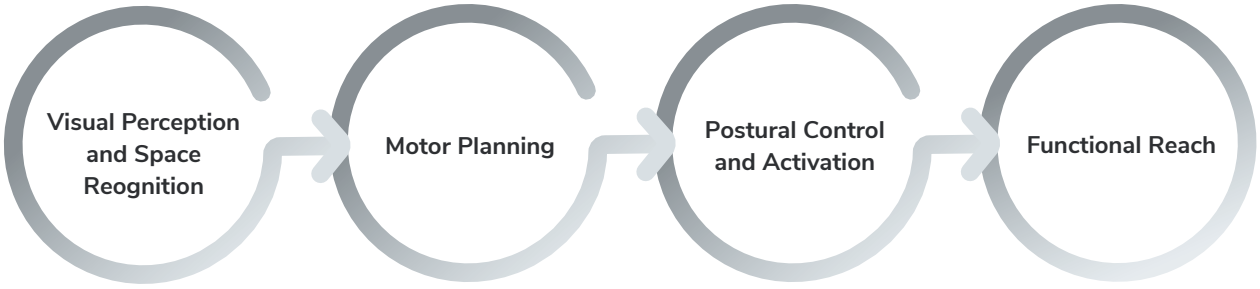
Optimization of Functional Reach

The Smart Board is designed to cover the area of an average adult's horizontal shoulder flexion and extension within 135 degrees and control the trunk as well as shoulder movement so the patient can produce quality task-oriented repetitions. The Smart Board adapts to the patient's current abilities by un-weighting the arm to increase gravity eliminated motion for reaching. Based on the set up of the Neofect Smart Board, trunk motion is controlled in a stationary position. Decreased forward bending while retraining reach increases restoration toward a normal movement pattern, straighter hand paths, more accurate reach and increased scapular motion.



Smart Board Training

Neofect Smart Board allows for task-oriented training in a gravity-eliminated environment, encouraging early mobility of the upper extremity. Unlike robotics, the set up of the Smart Board allows the therapist to guide the patient's movement and provide appropriate manual cues as the patient performs the requisite motor planning and activation to retrain functional reach. Set up time is very minimal, decreasing the likelihood of abandonment.



One recognizes the location and surrounding environment of the body and the target with acquired visual unformaion.

He or she plans on the movements that are required.

Postural control muscles, which are used to control the body posture, contract.

The muscles that move the arms and hands contradict, and the person finally starts to stretch his or her hand towards the target.

Platform & Contents

Smart board supports advanced evaluation of shoulder training and systematic rehabilitation training.

Feature

Advanced Assessment Tool

In-depth analysis of the patient's abilities with three functional movements

Real-Time Adaptive Algorithm

Rehabilitation solutions adapted to the patient's progress

Augmented Visuo-Motor Feedback

Enables sensory motor training and proprioceptive feedback with VR technology

Intuitive Data Analysis

Patient progress tracked and program modified depending on patient improvement

Task-Oriented Training

Motivational platform for upper extremity training through ADL games and leisure activities

*VR = Virtual Reality. ADL = Activities of Daily Living

Neofect Smart Rehab Protocol

Functional Movements

- **Exploration**
  motor tasks and visual feed-back operating cooperatively
- **Point to Point Reaching**
  motor planning and performances
- **Path Drawing**
  Real-time Update of Tasks (Feedback control)

Upper Extremity Movement

- Scapular protraction-retraction
- Shoulder flexion-extension
- Shoulder horizontal abduction-adduction
- Shoulder internal rotation-external rotation
- Shoulder circumduction
- Elbow flexion-extension

Goals of Treatments

- **AROM* Expansion**
  - Support for moving through the range of movement with varying degrees of assistance.
- **Improving coordinated movement**
  - Feedback on smoothness and accuracy of movement
  - Challenges to increase coordinations, speed and accuracy

Smart Board Rehab Process

Evaluation

Free exploration, destination arrival, and path drawing are evaluated. Additional evaluations of movement are derived from other movement data.

Training

Encourages the patient to continually challenge themselves by assigning tasks with the help of Neofect's algorithms.

Performance Result & Report for Printing

For each training, the progress is reported with key results and the degree of improvement that fulfills the purpose of trainings.

*AROM = Active Range of Motion

Smart Board Hardware

*AROM = Active Range of Motion

Components

- Smart Board: 1 each
- Display System: Android Tablet or Android PC Box
- Neofect Clinic Software for Smart Board (includes updates)
- Handle (with & without armrest): 2 each
- Strap: 2 each
- Stopper: 6 each
- HD Monitor (optional)

Neofect Smart Pegboard

Neofect Smart Pegboard

Neofect Smart Pegboard provides visual and auditory feedback to motivate users through gamified training as they rehabilitate.

Concept

Restoration of hand mobility is very important for the self-reliance of patients with central nervous system disorders in their daily lives. Functions of hands involve reach, grasp, grip, pinch, carry, release, in-hand manipulation and so on. The pegboard is a great device for the trainings on these functions and enables sensorimotor training and eye-hand coordination training at the same time. A repeated and regular training routine is necessary for rehabilitation to enhance and maintain brain plasticity. The Neofect Smart Pegboard provides functional training routines with engaging visual and audio feedback. Cognitive factors that will improve the patient's attention, memory, problem solving abilities are applied to the training programs. This cognitive exercise is based on the development process of cognition. While following the trainings featuring the cognitive factors, patients will not only be focused but, also have a sense of accomplishment for finishing the task.

Neofect Smart Pegboard

Digital rehabilitation

- Gamification of training
- Visual and auditory feedback
- Display of training results
- Cognitive components

Optimized for motor recovery

- Encourages repetition
- Dexterity training
- Sensorimotor training
- Eye-hand coordination

Contents

There are more than 25 functional and cognitive training options. The result includes overall time, the number of pegs in the right place, success rate, and reaction time.

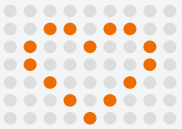
Training type	Purpose of training
Freestyle	Free Exploration
Row Completion	Task Performance
Shape Completion	Task Performance
Blackout	Task Performance
Randomizer	Task Performance
Smash a Mole	Reaction time
Snake Trap	Reaction time

Training type	Purpose of training
Visual Training 1	Visual tracking
Visual Training 2	Visual field
Shape Recognition	Shape sense
Memory Placement	Memory
Simon Says 1	Memory
Simon Says 2	Memory
Pathfinder	Problem solving ability
Find Home	Problem solving ability

Upper limb function training example

Shape Completion

Place the pegs to complete the shapes.



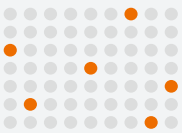
Snake Trap

Trap the snake's body with a peg while it moves.

Cognitive training example

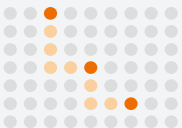
Memory Placement

Memorize the locations and place the pegs in the correct holes.

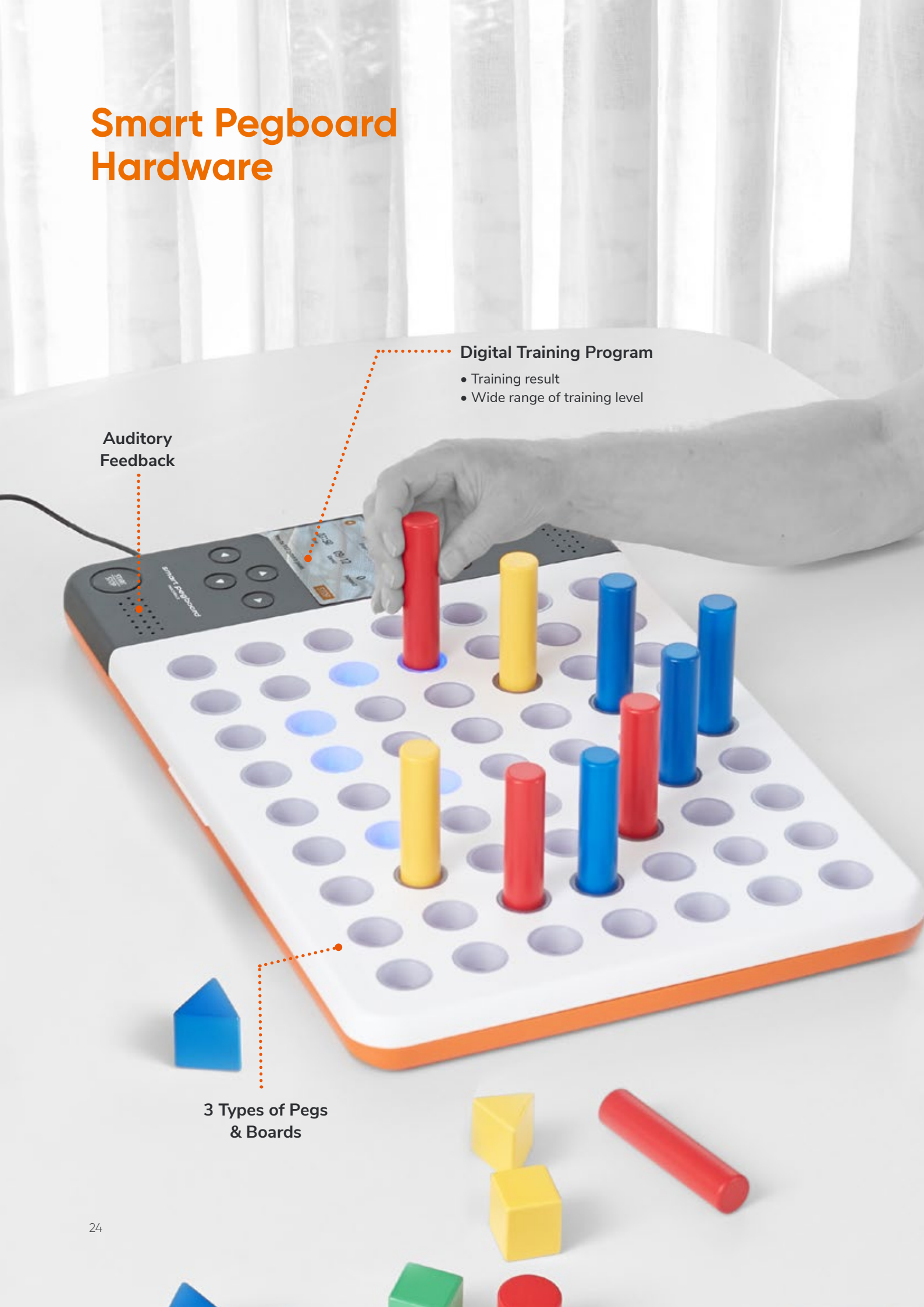


Pathfinder

Connect all three lights to make a path.

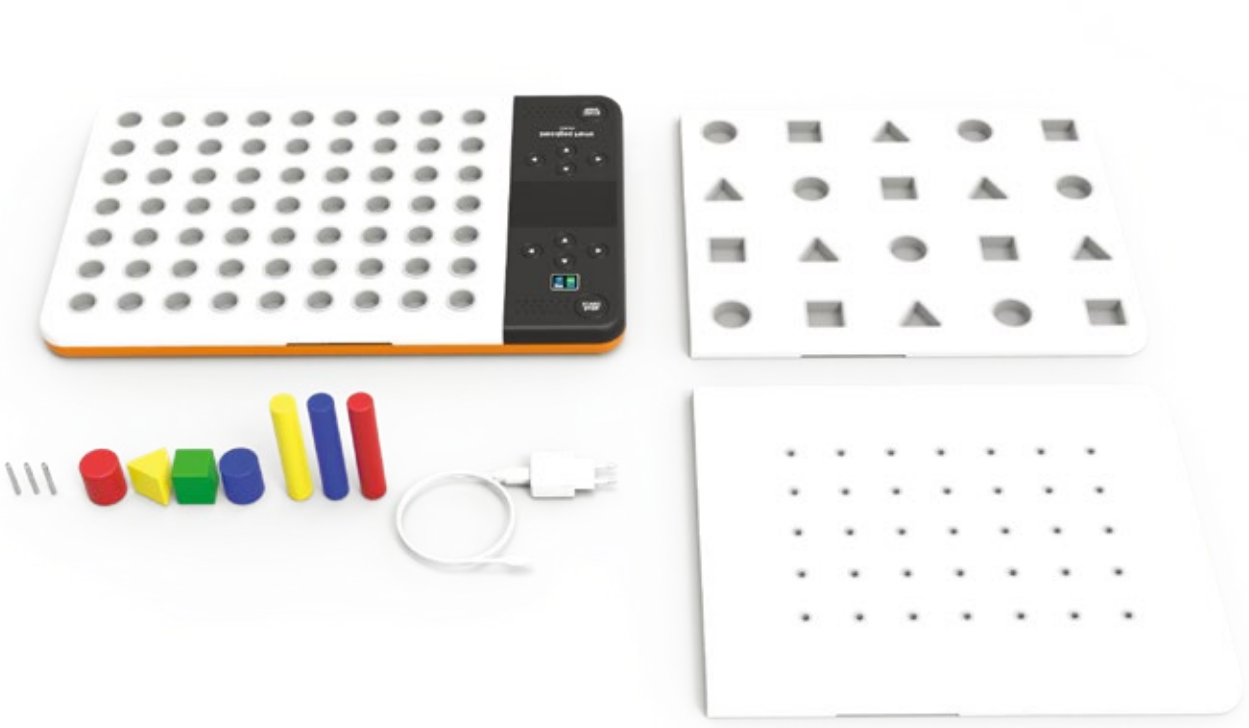


Smart Pegboard Hardware



Components

- Base Unit: 1 each
- Standard Board: 1 each
- Standard Pegs: 63 each
- Mixed Shape Board: 1 each
- Mixed Shape Pegs: 20 each
- Pinch Board: 1 each
- Pinch Pegs: 35 each
- Charger: 1 each
- Training Guide: 1 each



Neofect Neomano

Neofect Neomano

The Neomano is a soft, robotic glove that fits over the thumb, index, and middle finger to help people with hand weakness grasp items to better function in daily life.

Neomano not only assists in all daily actions of grabbing or picking up with the simple push of a button, but also increases the chances for users to participate in independent and social life. It helps patients perform daily activities, such as using a mobile phone, writing letters, eating, and walking with a dog.

Feature

Ergonomic glove

The glove is safe to use because it is made of natural leather material with a non-slip function in an open design that is easy to wear

Natural finger bending

Its motor force works from the tip of the finger to realize a natural movement of bending towards the palm

Lightweight and convenient to carry

Weighing less than one pound, it is designed to be easily worn on the arm and comfortable to carry when you are outside

Strong and detailed operation of grip

You can lift a variety of objects from pencils to cups through delicate operation with a grip force of up to 20N

Easy to use

The simple UX that you can easily operate alone with the wireless Bluetooth remote control

Neomano Hardware

Glove

- Easy to wear
- C type / Pinch Grip

Power Supply(Motor/Battery)

- Economic maintenance cost : 1 month duration(8 hours per day)
- AA x 3 Alkaline Battery

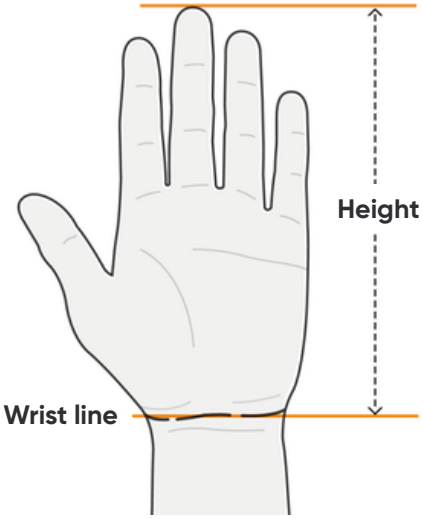
Blooth Remote Control

- AAA x 2 Alkaline Battery
- Bluetooth Pairing with Power Supply

Components

- Neomano Glove: 1 each
- Power Supply & Motor: 1 each
- Blooth Remote Control: 1 each
- Necklace Strap: 1 each

Size Chart



Size	inch	cm
XS	6.3-6.7	16-17
S	6.7-7.1	17-18
M	7.1-7.5	18-19
L	7.5-7.9	19-20
XL	7.9-8.3	20-21

Neofect Smart Balance

Neofect Smart Balance

Neofect Smart Balance measures static and dynamic balance from sitting, standing, and stepping positions to promote improved mobility independence.

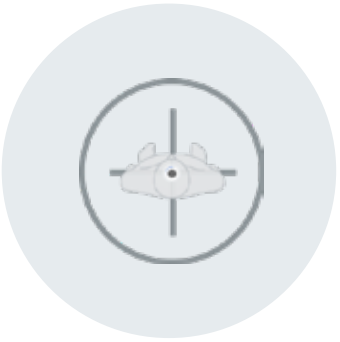
The importance of balance

The Neofect Smart Balance is a force-measuring platform device intended for medical purposes. It enables assessment, training/retraining of patients with balance disorders or instability. Balance problems may result in increased postural sway due to decrease or impairment of postural sway due to decrease or impairment of intrinsic sensory acceptability, and also cause asymmetric weight distribution, loss of weight transfer, and decline in standing ability. This causes problems with balancing ability, and walking and dynamic movements. Solving the problem of balancing is very important in order to increase the patient's functional and independent ability. To prevent this loss of balance, balance training tailored to individual patients is required.

Feature

Portable

Easy to move by using a light and detachable sensor pad



Evaluation of 4 tools

Evaluating the user's balancing ability with Romberg Test, LOS, Pressure, and Gait

From Sit to Walk

Training contents covering various postures required for functional activities

Customized Training

Providing tailored training and clinical results through adjusted options

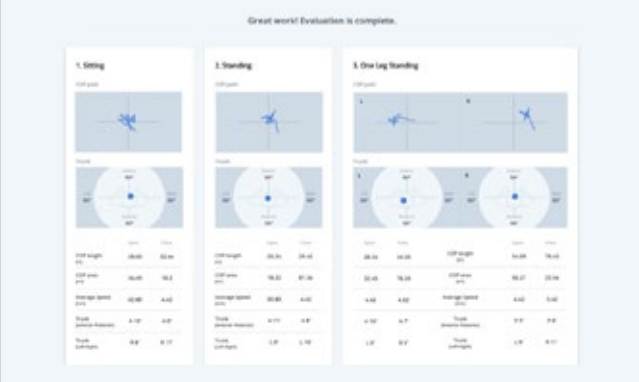
Realtime Feedback

Providing real-time feedback through the trunk sensor for the user to train in the correct posture

Static Balance Evaluation

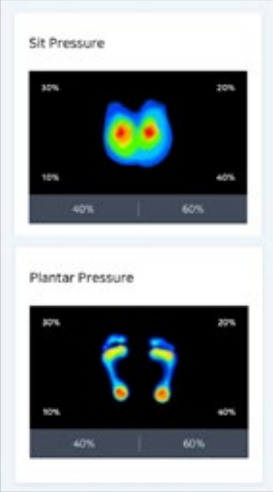
Romberg test(eyes open/closed)

It measures the change in the center of body pressure (COP) to analyze and provide the results of the COP movement path, movement length (cm), movement area (cm²), average speed (cm/s), and torso slope.



Pressure

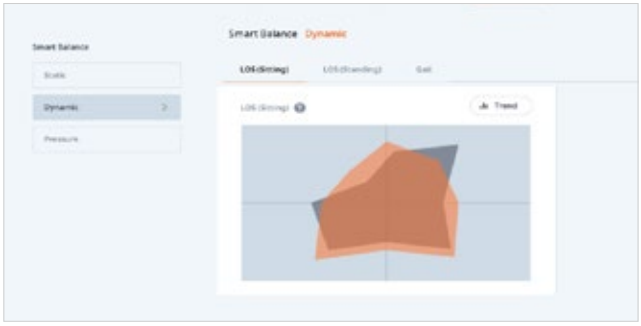
It measures the pressure on buttocks in a static sitting position, and the pressure on both feet in a standing position.
- Providing weight support rate (%) of the front, rear, left, and right of the body

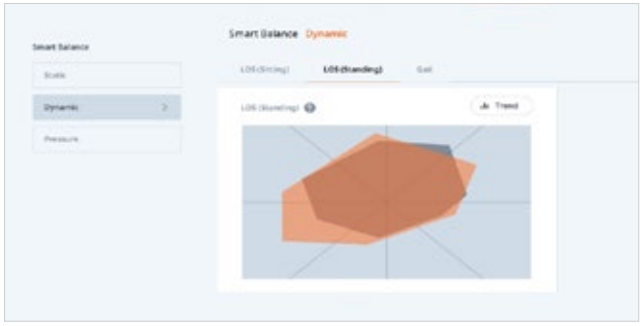


Dynamic Balance Evaluation

LOS(Limits of Stability)

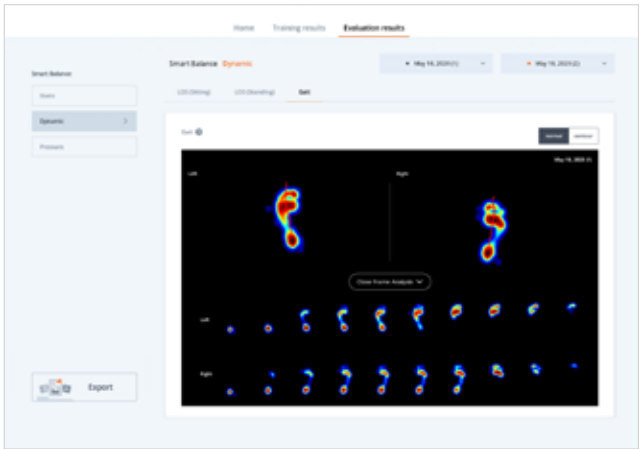
This rate is to measure the range of voluntary movement in standing and sitting positions to maintain safety. It measures the maximum range that can be moved in the direction indicated without losing balance.





Gait Analysis

It analyzes the pressure distribution of the foot and the movement path of the pressure center that forms when you step on the sensor part on the floor.
- Providing the peak point / checking the body balance by automatically generating the COP line when walking
- Providing the left and right plantar pressure images for each frame when walking



Static Training

Weight Bearing

Training to maintain the even body weight for the user who has difficulty supporting weight

Postural Stability

Training to maintain COP on targets on the screen

Dynamic Training

Weight Shift

Training to move the body according to the weight support rate controlled by moving the body back and forth or left to right

Limits of Stability

Training to promote the area where COP can be moved within the user's BOS

Sit to Stand

Training for sitting and standing by providing the body weight support rate of the right and left side of the user visually in real time

Stepping

Training from body weight transfer to lifting one leg to walking while maintaining body balance

Contents

Tailored Training

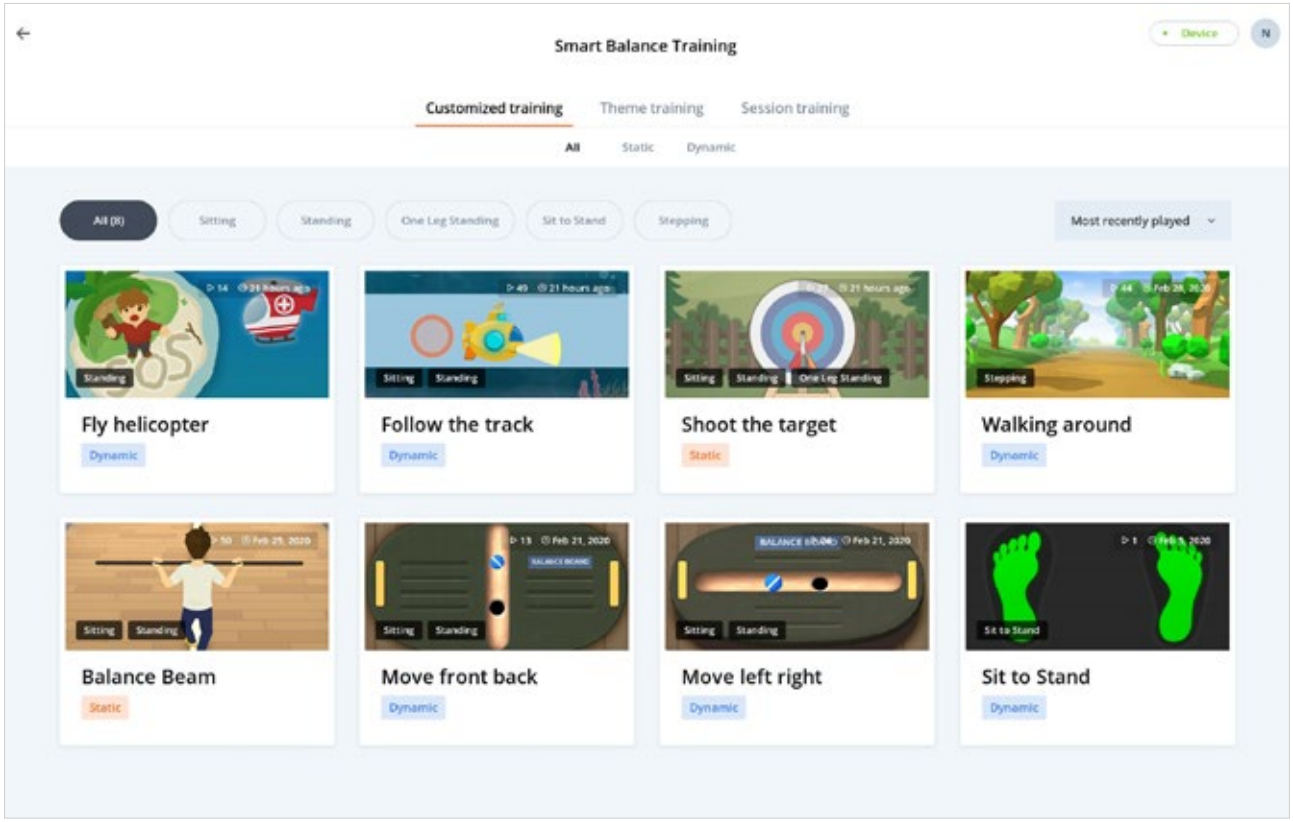
User-customized training through adjustment of various options

Theme Training

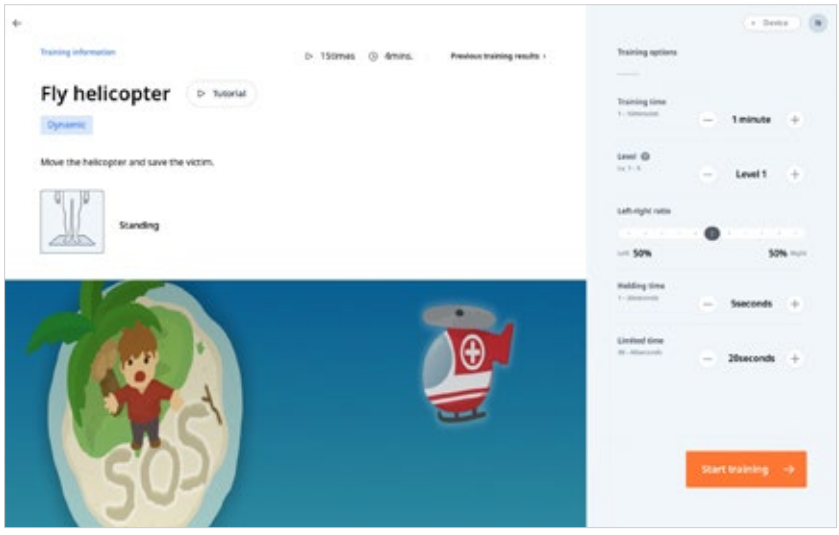
Training through the interesting, game-like content

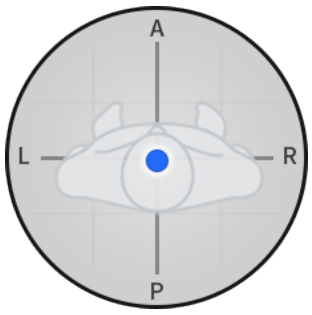
Session Training

Training to select and continue the desired content



- Providing options that can be adjusted in detail according to user functions
- Providing a voice guide for the user to easily understand the content during training

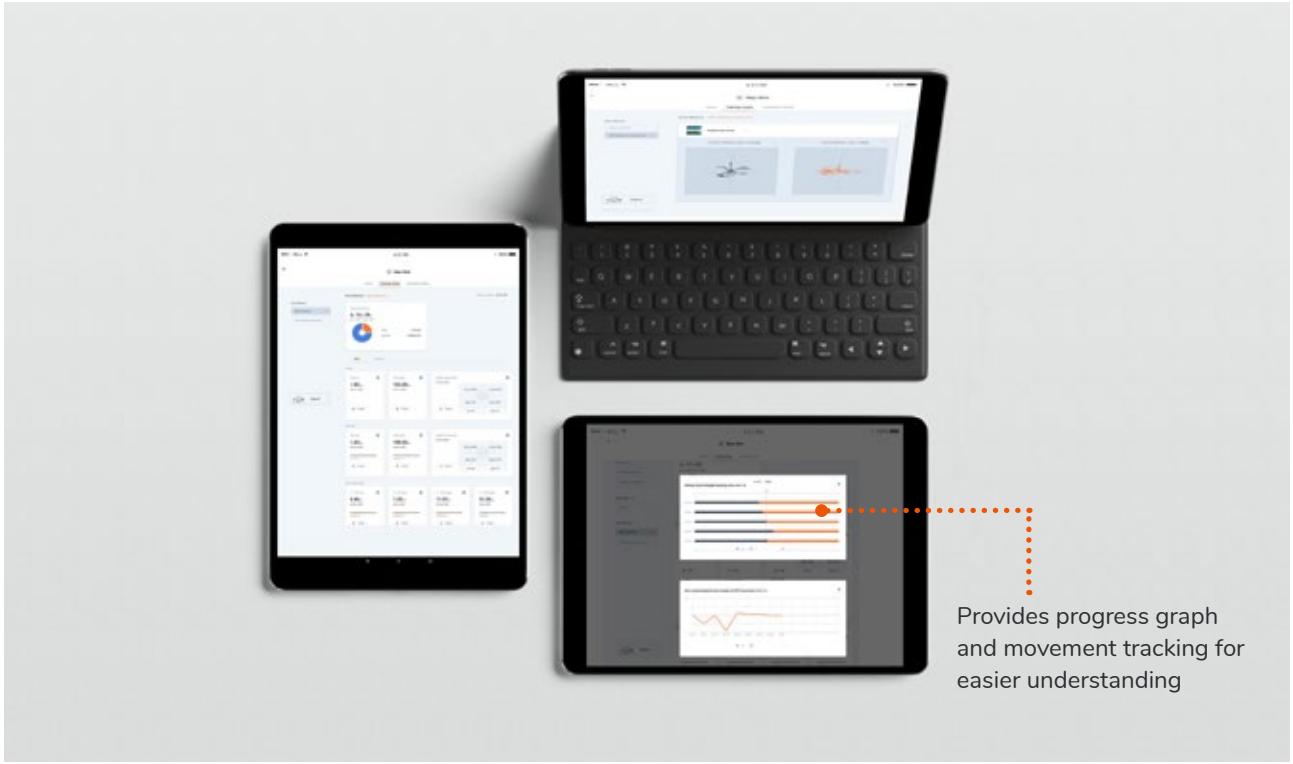




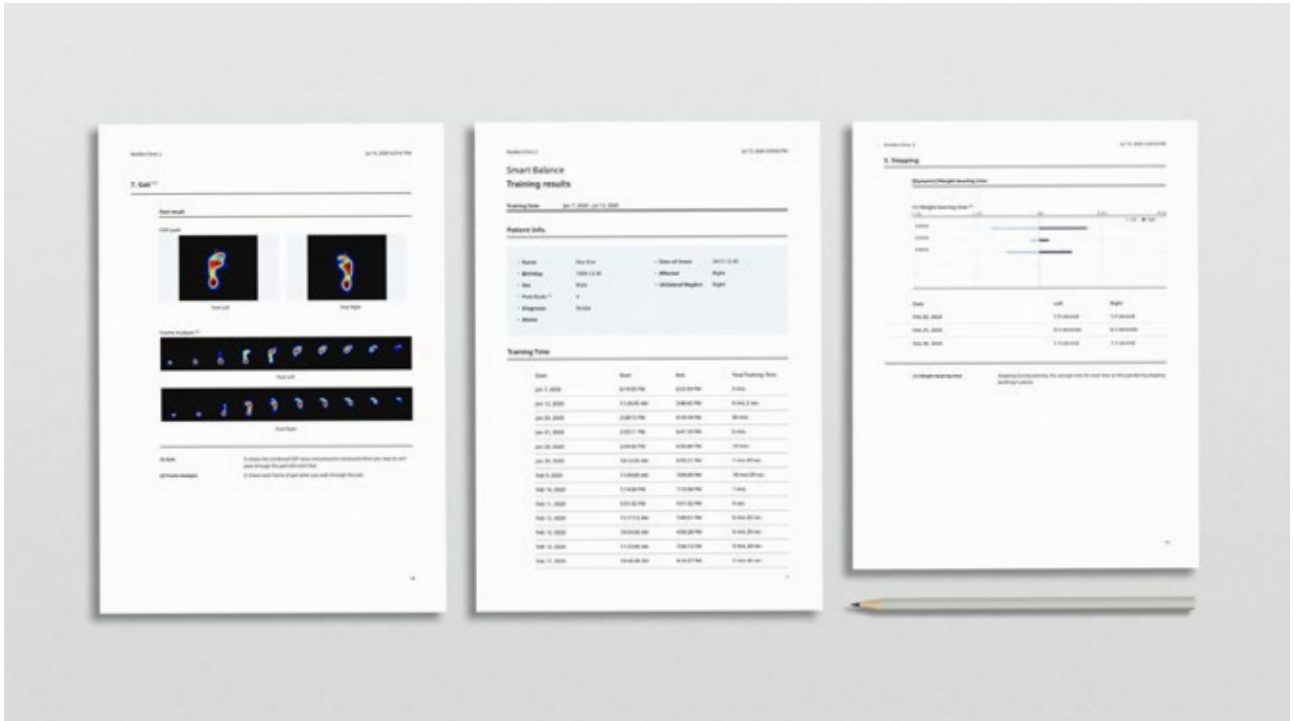
Provides visual feedback in real-time to maintain the proper position

Report

Provides training results by category / Compares for continuity purpose the results before and after training / Manages individual data



Provides evaluation and training reports



Smart Balance Hardware

Components

- Smart Balance Pad: 1 each
- Neofect Clinic Software for Smart Balance
- Handrail: 1 each
- Trunk Sensor: 1 each
- Trunk Band: 1 each
- Android PC Box: 1 each
- HD monitor: 1 each (optional)
- Rolling Monitor Stand: 1 each (optional)
- Instruction for Users: 1 each

Neofect Cognition & Group

Neofect Cognition

Neofect Cogitnion approaches cognitive rehabilitation with sprial structure, so as to promote relearning and retraining of cognitive functions.

Importance of Cognitive Rehabilitation

Cognitive function refers to the intellectual activities that encompass memory, reasoning, attention and language. Damage to cognitive function can cause difficulties in ones' daily life. Promoting brain neuroplasticity is a key element to the rehabilitation process after a brain injury. Neuroplasticity is a concept that states that the brain will essentially rewire itself to compensate for the area of injury or damage. Cognitive rehabilitation focuses on the importance of retraining the brain.

Basic Approach to Cognitive Rehabilitation

It is shown that in order to be successful with cognitive training it is best to progress using a bottom up approach; progressing from simple to more complicated activities. Neofect Cognition designs its cognitive rehabilitation around the Hierarchical Approach, which focuses on attention, perception, discrimination, organization and memory.

Concept

CACR(Computer Assisted Cognitive Rehabilitation) that is designed to assist with memory, problem solving, and attention training. It maximizes the concentration of patients with a new design and a way to touch the screen, collaboratively developed by the experts from different disciplines.

Coherent Repeated Learning
Standardized repeated learning adapted to all therapists and patients.

Stepwise Refinement of Difficulty Level
Provide automatically customized difficulty level to individual patients

Instant Feedback
Provide immediate feedback on performance

Cure Effect Quantification
Determine the effect by an accurate note and analysis on patients' performance

+

Collaborative Expert R&D
Developed by the experts from different disciplines: clinicians, therapists and engineers

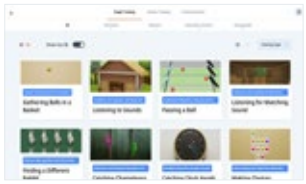
Training Design Reinforcement
Improve interest and concentration by changing contents and graphic in regard to the purpose

Instinctive User Experience
UX reinforced for therapists and patients to have a good understanding of progresses and results of the training.

All touch Screen
Improve interest and concentration by changing contents and graphics in regards to the purpose

Cognition Rehab Process

1. Instinctive Selection



Training Selection

2. Convenient Use

Touch Input

3. Training Immersion

Instinctive Images Screen

Training Managing Widget

4. Training Performance & Report

Difficulty Segmentation

Core Result per Each Training

Contents Instruction

Attention Training

Collecting Balls

· Basic visual perception
· Visual attention strategy training

Catching Chameleons

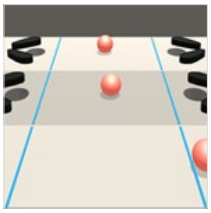
· Complex attention discrimination
· Reaction training to complex visual stimuli

Hearing Sounds

· Basic auditory perception
· Attention discrimination training on auditory directions

Grabbing Hands of Clock

· Complex attention discrimination
· Visual and auditory complex attention training



Holding Balls

· Maintaining attention
· Visual attention strategy training

Making Choices

· Complex attention discrimination
· Visual and auditory complex attention training

Catching Sounds

· Maintaining attention
· Attention discrimination training on auditory directions

Playing Darts

· Complex attention discrimination
· Visual and auditory complex attention training

Determining a Different Rabbit

· Attention discrimination
· Visual attention discrimination training

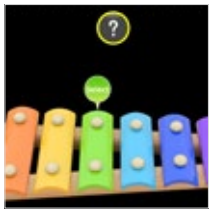
Finding a Face

· Emotional attention
· Sympathy training

Memory Training

Matching Cards

· Recognition memory
· Space memory ability training



Playing a Musical Instrument

· Sequential recalling
· Sequential recalling training by auditory stimuli

Linking Names

· Sequential recalling
· Establishing memory strategy by auditory stimuli

Connecting Sounds

· Sequential recalling
· Establishing memory strategy by auditory stimuli

Collecting Stuff

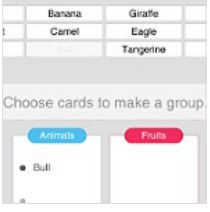
· Space memory
· Remembering features/Location of visual stimuli

Connecting Numbers

· Associate memory
· Verbal-Non verbal complex memory training

Selecting Tiles

· Space memory
· Remembering features and location of visual stimuli



Group Memory

· Verbal categorizing memory
· Memory training by categorization

Making a Call

· Sequential recalling
· Establishing memory strategy by sequential memorizing

Story Memory

· Language integration
· Memory improvement by video training

Executive Function Training (Optional)

Organizing Food

· Fluency
· Cognitive fluency training

Matching the Color and Character

· Attention
· Cognitive control ability and reaction suppression ability training

Arithmetic Operations with Symbols

· Memory
· Working memory, calculation skills and symbol recognition training

Apple tree

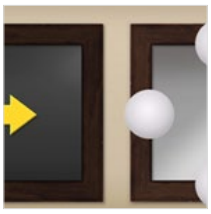
· Planning
· Working memory and problem solving training

Categorizing Items

· Concept formation
· Cognitive shifting training

Finding Rule

· Concept formation
· Reasoning training



Matching the Direction

· Concept formation
· Working memory and sequencing training

Making a finished product

· Memory
· Working memory and sequencing training

Find mole

· Concept formation
· Working memory and Visuospatial cognitive control training

Press the signal

· Concept formation
· Visuospatial cognitive control and cognitive shifting training

Visuospatial Training (Optional)

Matching Shape

· Attention
· Simple visual perception training

Finding Hidden Pictures

· Attention
· Visual closure training

Finding the Same Object

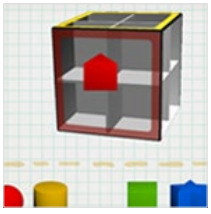
· Scanning
· Form consistency training

Categorizing

· Scanning
· Specific stimuli reaction training

Finding the Stars

· Scanning
· Visual scanning training



Completing the Cube

· Concept formation
· Spatial relationships perception training

Find the Right Thing

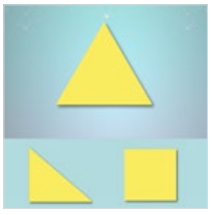
· Concept formation
· Visual perception function (foreground-background) training

Completing the Screen

· Scanning
· Spatial relationships perception training

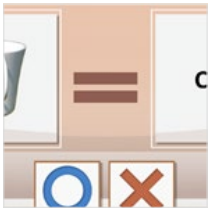
Take pictures

· Scanning
· Visual discrimination training



Find the Same Picture

· Scanning
· Form consistency attention training



Finding the Object Name

· Scanning
· Form consistency attention training

Finding the Right thing for the Situation

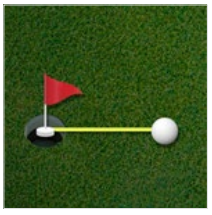
· Scanning
· Form consistency attention training

Racing

· Scanning
· Visual scanning training

Wiping windows

· Scanning
· Visual scanning training



Dividing Line

· Scanning
· Visual scanning training

Neofect Cognition Group

Neofect Cognition Group is a computerized group therapy program for cognitive rehabilitation, which can help promote self-esteem and emotional stability as well as professional cognitive training through competition and cooperation among members.

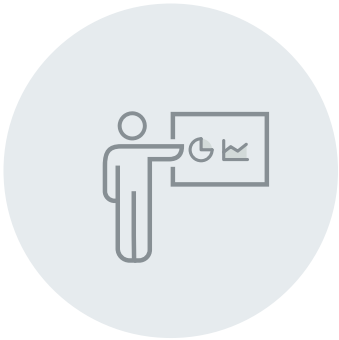
The importance of cognitive rehabilitation

Our computerized group therapy model for cognitive rehabilitation provides objective data and immediate feedback, inducing interaction between members to promote a sense of purpose and voluntary participation to help successful rehabilitation.

Cognition Group, developed based on clinical usefulness of Cognition and effectiveness of group therapy, can be found not only in hospitals, but also in communities such as public health centers and dementia relief centers.

Central System

Running content, providing detailed result reports on the admin tab



Dual Training Mode

Supporting both personal and group modes

Dementia test function

Providing a simple mental status test for dementia screening

Providing diverse difficulty levels

Providing diverse difficulty levels that can be used from cognitive impairment prevention groups to diagnosed groups

Recall training

Self-recall training
Image management possible

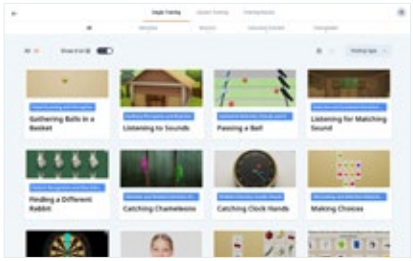
Platform & Contents

Admin app

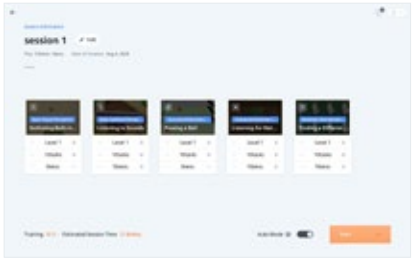
- Remote control of all contents in the platform including single training, session training, and recall training
- Simultaneous access and management of up to 30 users
- Real-time checking of access status and training progress
- Providing user scores and rankings within the group
- Intuitive interface considering the administrator's usability

Main Screen

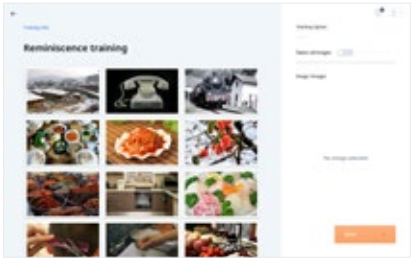
Mini-Mental State
Examination Screen



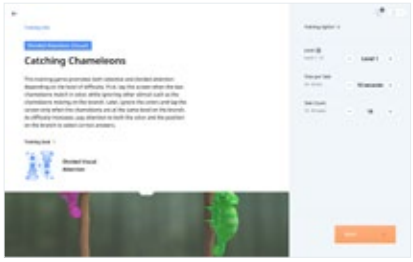
Single Training Screen



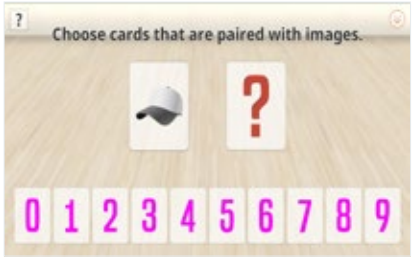
Session Training Screen



Reminiscence Training Screen



Option Screen



Training Screen

Control Screen during Training

Post Training Screen

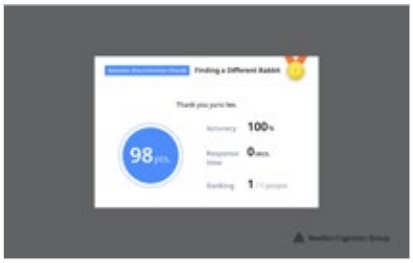
User app

- Providing two training modes, group and individual
- Using graphics optimized for training purposes
- Contents developed by professional medical staff using big data analytics

Training mode selection screen

Wait screen before training

Training screen



Result screen after training

Cognition-Group Process

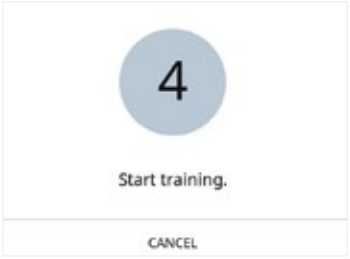
Admin App

Training setting and wait screen

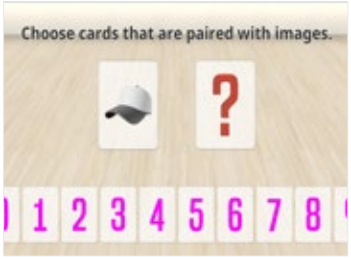
Training and control screen

Total reporting screen after training

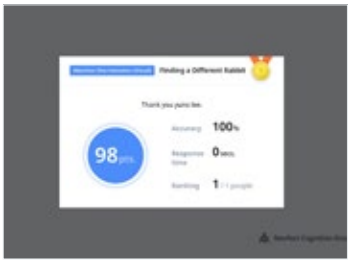
User App



Wait screen before training



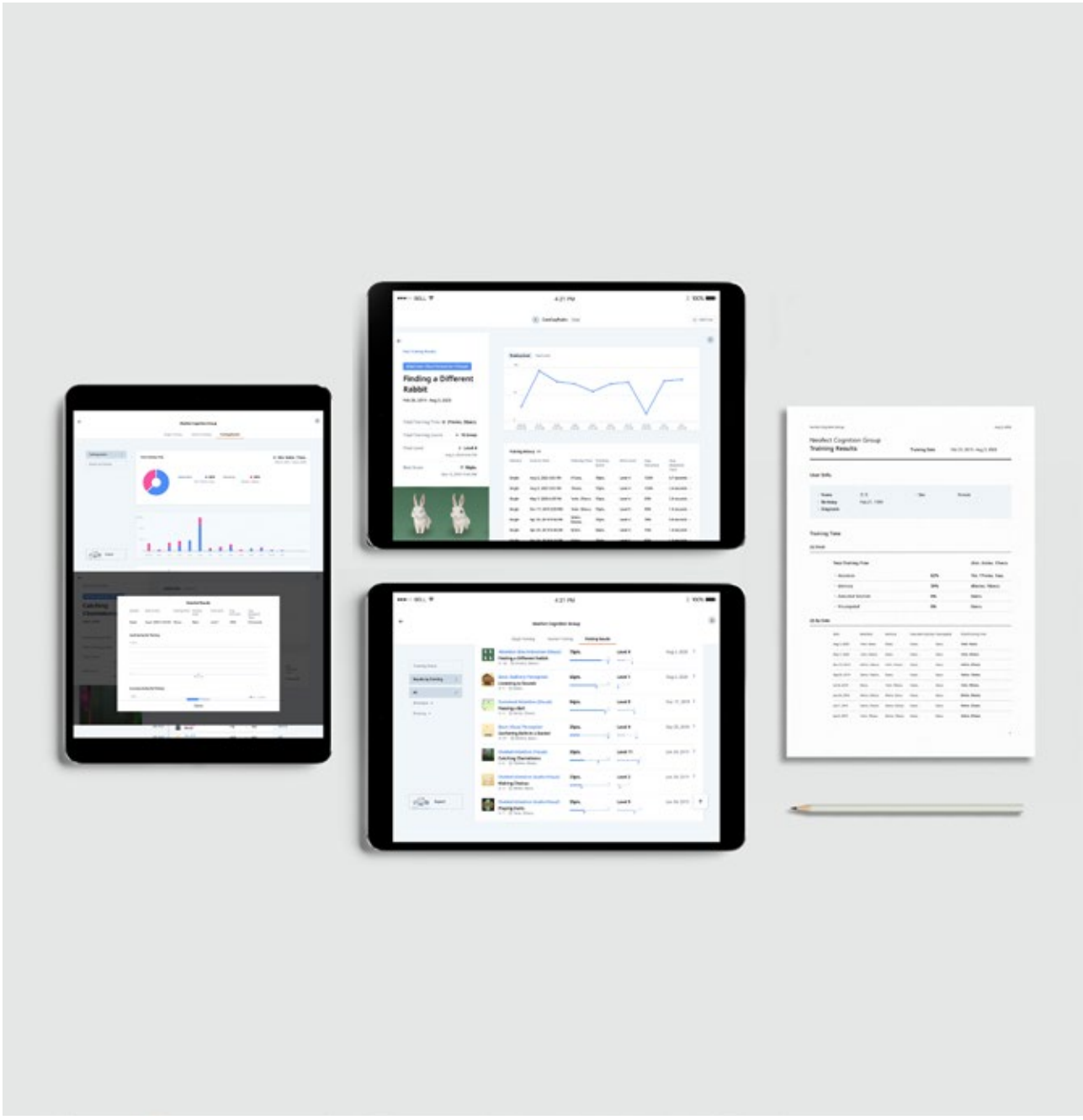
Training screen



Personal results screen after training

Report

- Providing information on the training rate by area and training status by timetable
- Analyzing information on training scores, tendency of training level, and details
- Saving and outputting training data for each user
- Providing the results analysis screen using charts and graphs



Components

Cognition

- Neofect Cognition Software
- Display System
- Instruction for Users

Cognition Group

- Neofect Cognition Group Software
- Display System (Admin / User)
- Wifi Router
- Instruction for Users

About Neofect

Neofect was founded on the belief that all patients benefit from a sense of hope as they work through their physical rehabilitation. Through innovative products and technologies, we offer high-quality, affordable solutions that make meaningful impacts in our patients' lives as they continue their journey toward recovery.

Awards

reddot award 2019
best of the best

Media

Selected Publications

Effects of virtual reality-based rehabilitation on distal upper extremity function and health-related quality of life: a single blinded, randomized controlled trial

Joon-Ho, Shin, Mi-Young Kim, Yu-Jin Jeon, Suyoung Kim, Soobin Lee, Beomjoo Seo and Younggeun Choi; *Journal of NeuroEngineering and Rehabilitation* 2016 Feb, 24 13:17 doi: 10.1186/s12984-

Virtual Reality Rehabilitation with Functional Electrical Stimulation Improves Upper Extremity Function in Patients with Chronic Stroke: A Pilot Randomized Controlled Study

SH Lee, JY Lee, MY Kim, YJ Jeon, JH Shin; *Arch Phys Med Rehabil*. 2018 Aug;99(8):1447-1453.e1. doi: 10.1016/j.apmr.2018.01.030. Epub 2018 Mar 2.

Effects of digital smart glove system on motor recovery of upper extremity in subacute stroke patients

H. Kim, A. Lee, W.H. Chang, K.H. Koo, H. Seong, Y.H. Kim; *Annals of Physical and Rehabilitation Medicine* 61 (2018): 28

Clinical Partners

We inspire hope
We inspire you

No matter the challenges you may face, you still deserve to be the hero of your own life. You deserve to be happy.

Neofect exists for those who strive for the best life they can possibly live. Using breakthrough research and innovative technology, we can help you rediscover your purpose and live your best life.

Let us help you live your life on your own terms. You deserve it.

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