REF **GeoboardVR**

CE Class I Medical Device

User manual

Distribution mode

Available for direct download at
http://virtualisvr.com/espace-client/
Use under license

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1. GENERAL

1.1. Description

GeoboardVR is an immersive software program for the active rehabilitation of cognitive functions (executive functions, memory, learning disorders, spatial perception) and upper limbs (hand-eye coordination), placing the patient in front of different models they have to reproduce. The patient is asked to reproduce the geometric shapes proposed in 2D or 3D according to various instructions: duplication, mirror, multiple mirror rotation, and multiple rotation.

The patient must connect the points corresponding to the model using a controller. The complexity of the shapes and the transformations required can be adapted to the patient's therapeutic objectives and level of rehabilitation.

1.2. Indications

Rehabilitation of cognitive functions, hand-eye coordination, and upper limb function.

1.3. Contraindications

Epileptic patients, children under 15 years of age, pregnant women.

1.4. Software field of application

This software enables the patient to exercise executive functions: planning, organization, attention, flexibility, and inhibition, as well as working memory (short-term memory), procedural memory, and all aspects of hand-eye motor coordination.

1.5. Intended user

Healthcare professionals: physiotherapists; occupational therapists; neuropsychologists; ENT doctors; neurologists; PMR doctors (physical medicine and rehabilitation), etc.

Research Centers: CNRS, CHU, INSERM, etc.

1.6. Warnings and caution

Immersion in Virtual Reality is a powerful tool, especially for stimuli that can-induce sensory conflicts.

WARNING

These stimulations can potentially cause certain disorders: vagal discomfort, epileptic seizures, migraines, vomiting, malaise, dizziness, syncope etc.

This type of re-education must be approached progressively, particularly in Virtual Reality where the stimulation is "powerful".

The contraindications are identical: Mainly epilepsy and migraines.

RECOMMENDATION

As postural reactions can be spectacular, we STRONGLY recommend that you place the patient in a secure environment and stay close to him/her throughout the session to anticipate any loss of balance or discomfort caused by the use of virtual reality.

RECOMMENDATION

It is also recommended to increase the duration and intensity of stimulation very gradually after an initial short session to ensure the patient's tolerance to this type of type of stimulation

Motion sickness is treated by "habituation", so you need to recreate the symptoms experienced during transport.

WARNING

It is essential to stop the session when the first symptoms appear, generally "sweating".

Define a working area of about 3m² to allow for risk-free movements.

Take a 10-to-15-minute break every 30 minutes of use.

It would be counterproductive to take into account the fact that some motivated patients may wish to go further. It's up to the professional to "dose" immersion so as not to provoke neurovegetative symptoms. This type of symptom can intensify in the hour following the session.

Nor can Virtualis be held responsible for any disturbances suffered by patients during or use of their software.

The accessories required to use the software may emit radio waves that can interfere with the operation of nearby electronic devices. If you have a pacemaker or other implanted medical device, do not use the product until you have taken advice from your doctor or the manufacturer of your medical device.

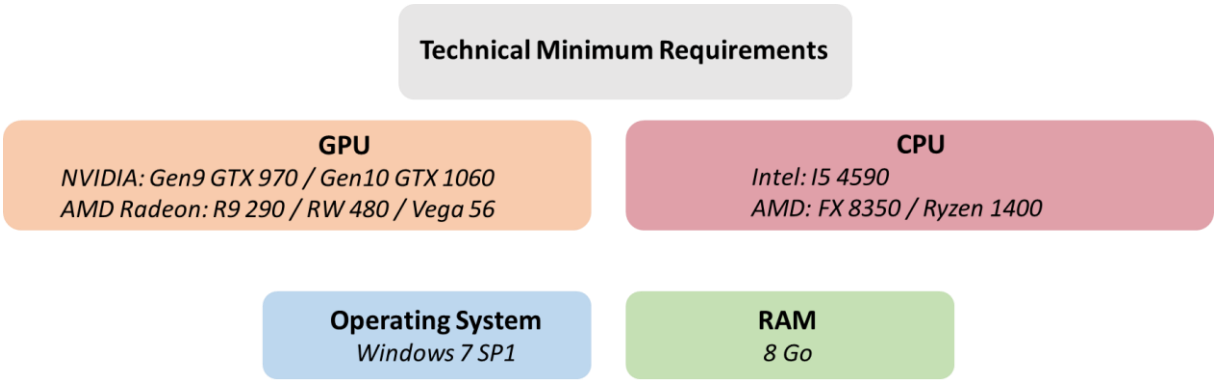
Any serious incident should be notified in writing to qualite@virtualisvr.com

1.7. Hardware and minimum configuration requirements

Hardware required to use the system:

- VR Ready PC
- VR System: HTC VIVE, HTC VIVE Pro or compatible system
- Lighthouse bases (HTC VIVE tracking)

To install and use our virtual reality applications, we recommend a configuration equal to or higher than the system requirements:



1.8. Required accessories

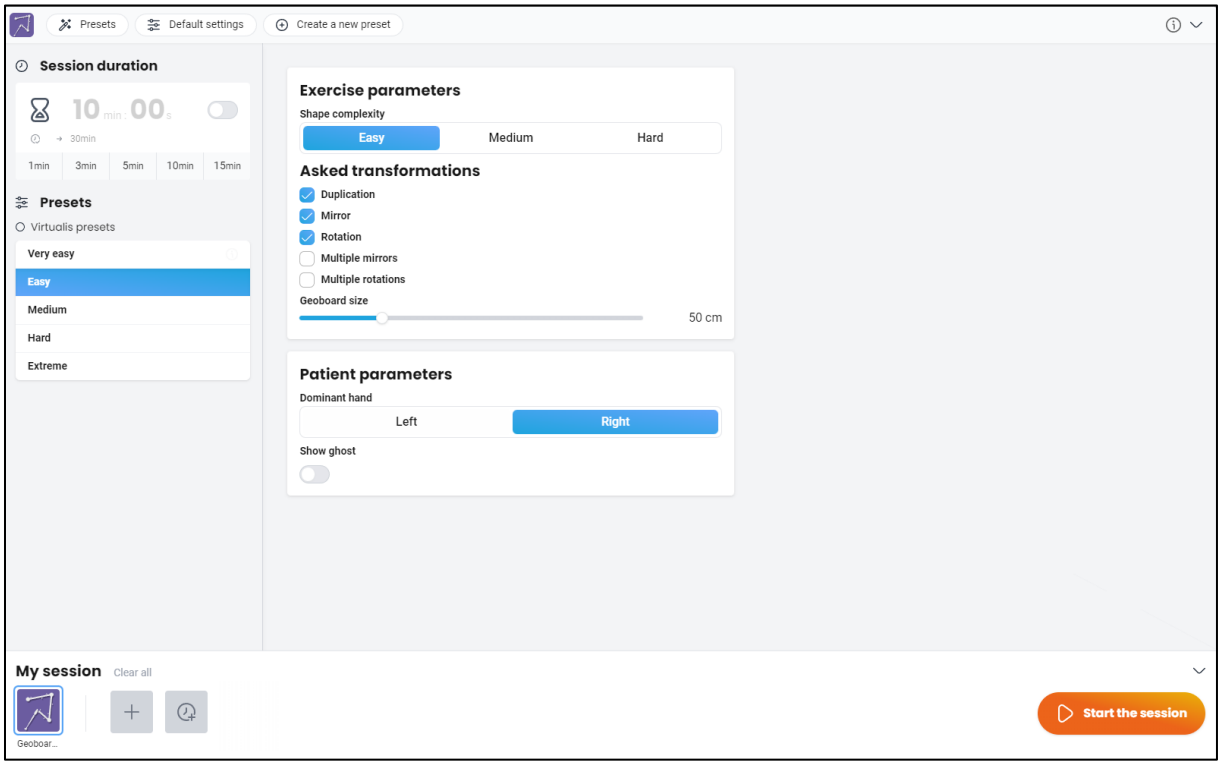
Headset, 1 or 2 controllers.

2. SOFTWARE USE

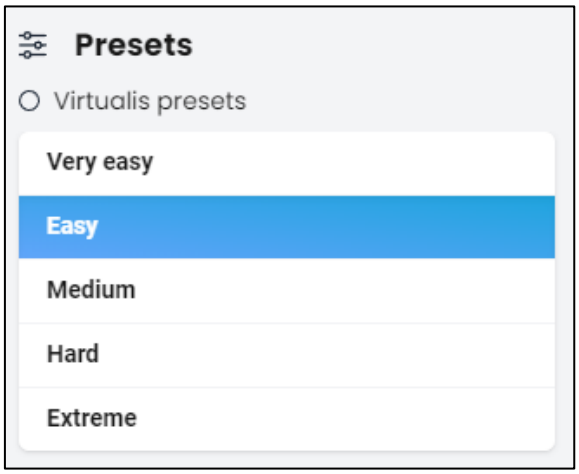
2.1. Patient setup

The patient can be seated or standing.

2.2. Session settings



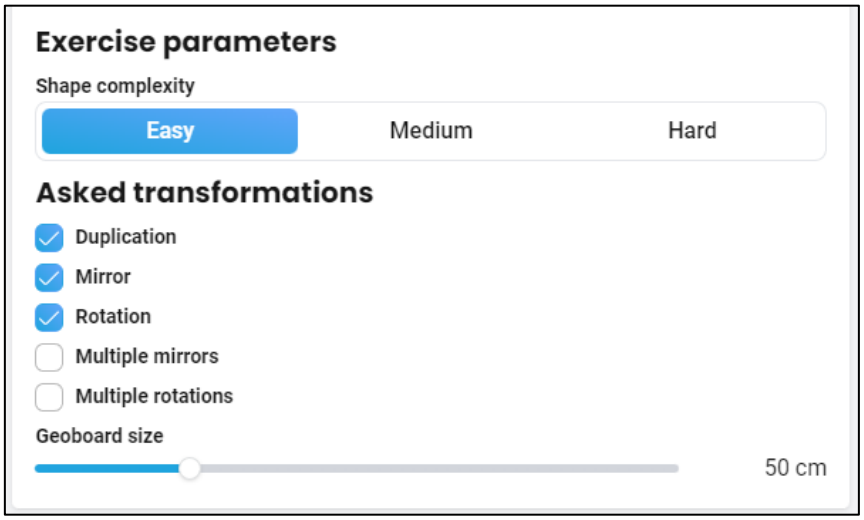
2.2.1. Presets



5 different protocols are available. Each protocol corresponds to specific settings.

The choice of preset ranges from "**Very Easy**" with simple duplication to "**Extreme**" with multiple rotations.

2.2.2. Exercise parameters



Shape complexity:

3 options are available: Easy, Medium, or Hard.

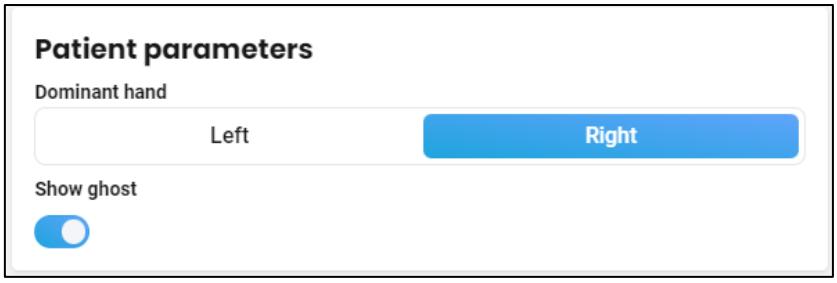
Asked transformations:

These range from simple **duplication** to more complex proposals such as **mirror**, **rotation**, **multiple mirrors,** and **multiple rotations**. Select the transformations by ticking the corresponding boxes.

Geoboard size:

Value: 35 to 100 cm.

2.2.3. Patient parameters



Dominant hand:

- Right.
- Left.

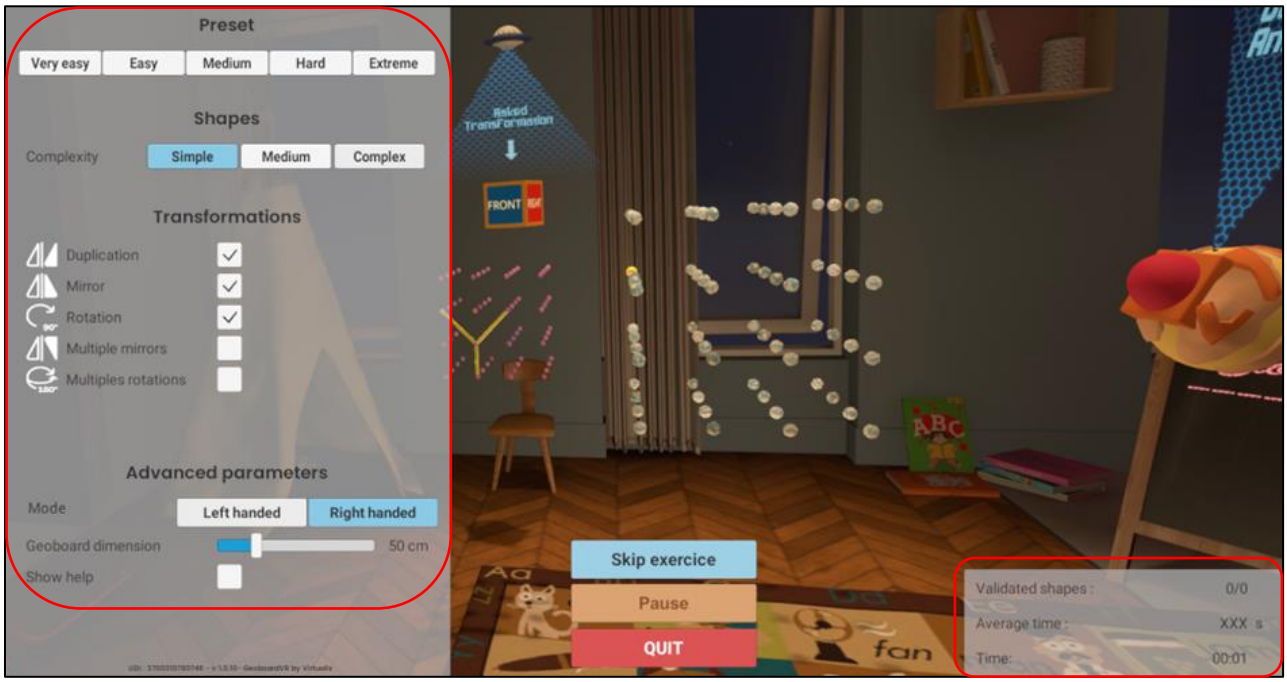
Show ghost:

Used to show the patient the solution.

2.3. Session

Once the presets have been selected, launch the virtual interface by clicking on the "**Start the session**" button in the bottom right corner of the screen.

User interface:



During the session, the user can modify the parameters from the **left side of the screen**. They are not visible to the patient.

In the bottom right corner of the screen, the user can view the results of the session in real-time.

Patient interface:

To reproduce the required shape, the patient draws a line by placing the controller on a dot. They can then click and hold down the trigger, move to another dot, and release the trigger.

If the patient feels he or she has made a mistake, he or she can delete a drawn line by placing the controller on it and pulling the rear trigger.

To validate their answer, the patient must press a red button on his right or left side (depending on his dominant hand) for the required time.

2.4. Shortcuts

List of shortcuts:

Press the "**C**" **key** on the keyboard or the "**Menu" button** of the Xbox controller to recenter the patient's view.

Press the "**Space bar**" on the keyboard to Start / Pause the exercise.

Press the "**F**" key on the keyboard to display the number of frames per second (FPS).

Hold down the **controller trigger** to draw a line on the shape.

Place the controller on a drawn line and **press the trigger** to delete it.

2.5. Results

At the end of the exercise, users get a score representing the number of validated shapes, the total of drawn shapes, and the average time per shape.

2.6. Data processing

Data retrieval and analysis uses the Patient Management software (see dedicated user manual).