Optical Flow

Module tutorial

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1. GENERAL

1.1. Description

Optical Flow is a software used for balance disorder rehabilitation using linear or curved visual scrolling.

The patient is placed in a tunnel that the therapist can move forward, back or even turn.

1.2. Required accessories

Headset only **OR** Headset and StaticVR force platforms or MotionVR dynamic posturography platform.

1.3. Patient setup

These are simple, limited numbers of tips drawn from the literature.

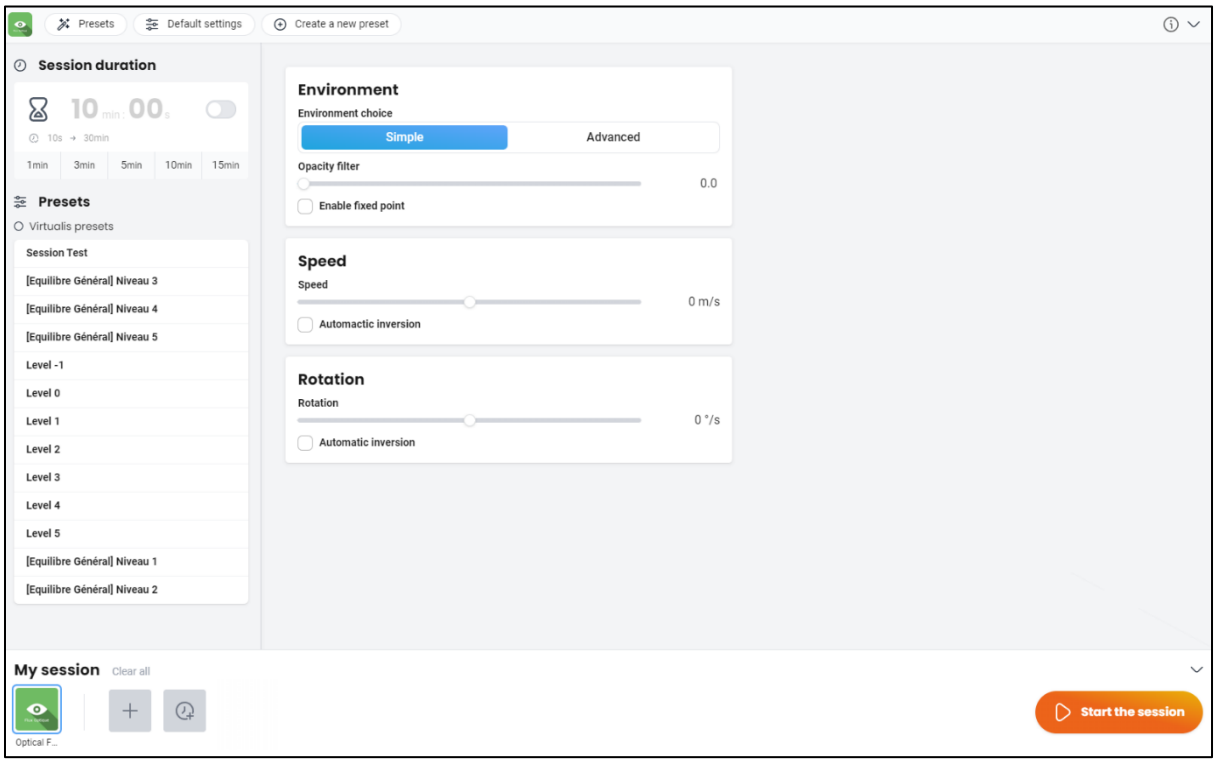
Except in special cases, prefer the standing position. The use of a foam block can direct the re-education towards more "posture/proprioception" type work, mainly with the "Advanced" environment by varying the turn tilts.

RECOMMENDATION

Stay in contact with the patient who is at risk of falling during vertical stimulations, even if they are standing on a dynamic posturography platform.

2. Settings

2.1. Session settings



2.1.1. Presets

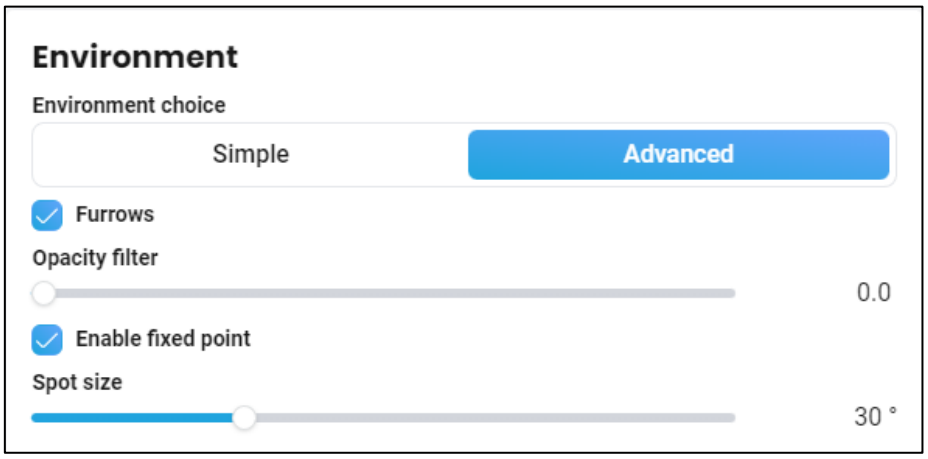
Several different protocols are available. Each protocol corresponds to specific parameters.

RECOMMENDATION

Start with a "test session" to measure patients' tolerance to the stimulation and the proposed VR environment.

For each proposed protocol, the different options are already set. Just validate the selected protocol to launch the application.

2.1.2. Environment



Environment choice:

- **Simple**: radial optical flow, linear, without turn possibilities. 3D elements (asteroids) can be activated/deactivated using the "**Q**" key (See Shortcuts).
- **Advanced**: used to orientate the tunnel with bends to strengthen balance, proprioception, and work on the patient's posture.

Furrows:

Enabling this setting is possible for the "**advanced**" tunnel.

Used to have a less smooth texture of the scenery.

Opacity filter:

Allows the stimulation to appear progressively for the most sensitive patients.

Varies the transparency of the environment.

Value: 0,0 to 1,0.

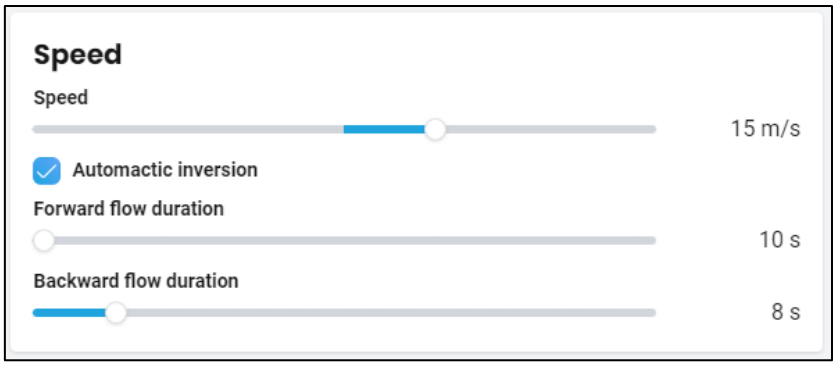
Enable fixed point and point size:

Allows a fixed point to appear in the patient's field of vision.

The point's size can be adjusted using the slider.

Value: from 5 to 90°.

2.1.3. Speed



Speed:

Scenery backward or forward scrolling speed.

Value: -50 to 50 m/s.

Automatic inversion:

Used to program changes in the scrolling direction by indicating a **forward** and **backward flow** duration.

Forward flow duration:

Value: 10 to 120 s.

Backward flow duration:

Value: 5 to 30 s.

ATTENTION

The inversion causes significant anteroposterior postural reactions, and a high risk of falling.

2.1.4. Rotation

Rotation:

Backward or forward scenery rotation. By convention, anticlockwise rotations are negative and clockwise rotations are positive.

Automatic inversion allows the direction of rotation to be programmed by indicating a duration.

Value: -30 to 30°/s.

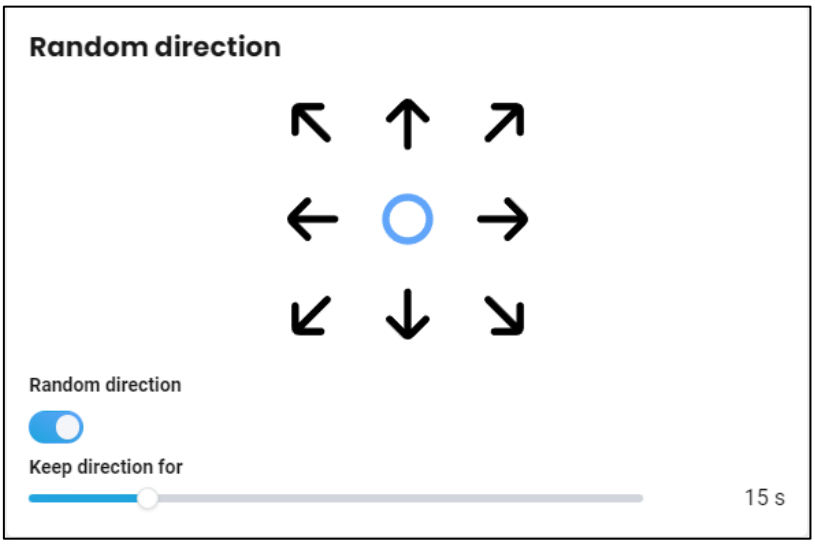
Automatic inversion:

The automatic reversing function allows you to program changes in the direction of rotation by selecting a time with the slider.

Rotation duration:

Value: 10 to 120 s.

2.1.5. Random direction



Random direction:

Sets the tunnel orientation randomly for a given time.

Make sure to select at least two directions **by clicking on the corresponding arrows** (to deactivate a direction click on the arrow again) to see the effects of this setting.

This setting can be modified during the session (see Shortcuts).

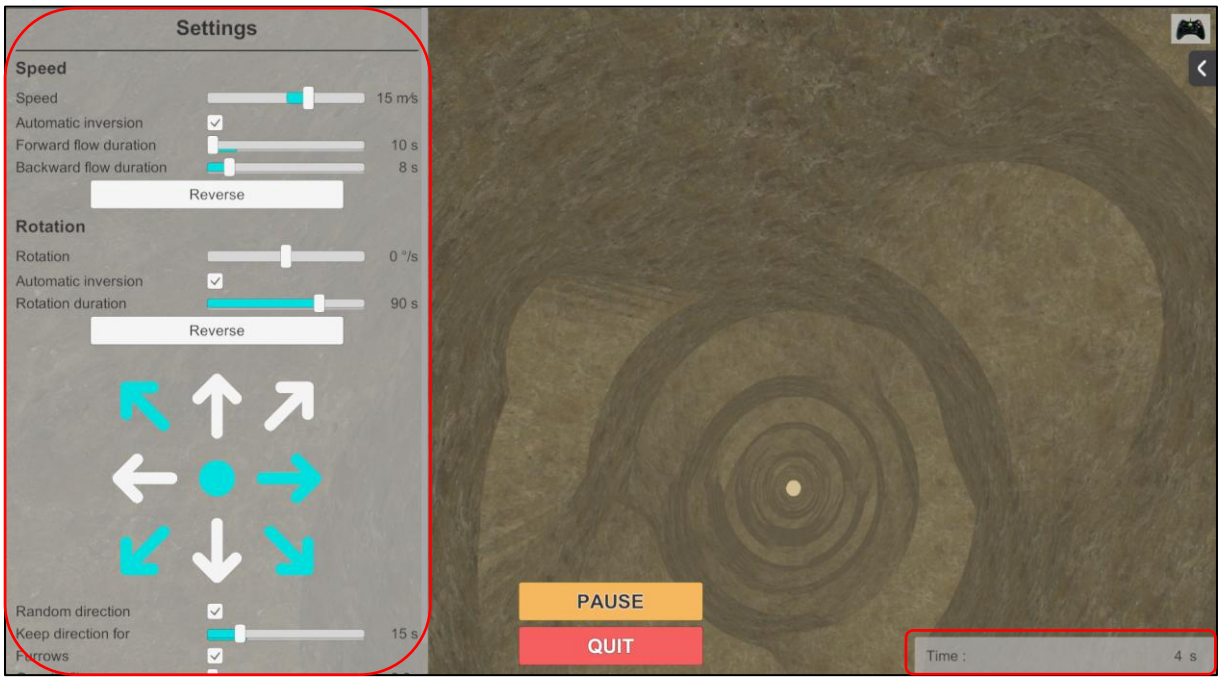
Keep direction for:

Value: 5 to 60 s.

3. Module

3.1. Session

Once the presets have been selected, click on "**Start the session**" in the bottom right of the screen.



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

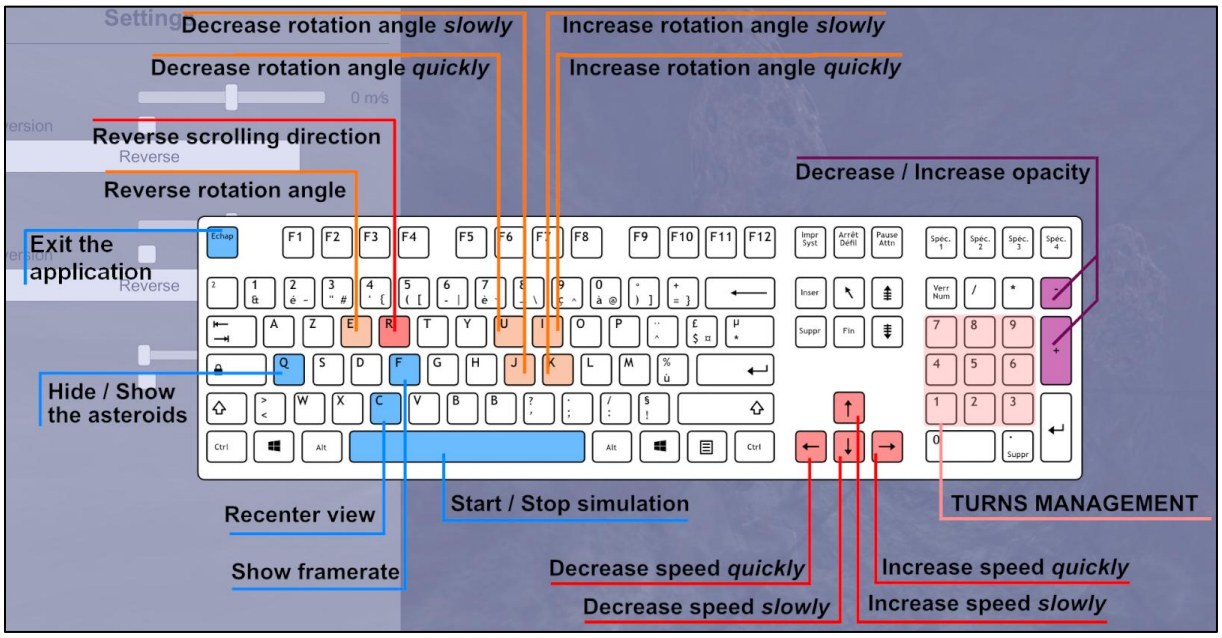
In the bottom right of the screen, the user can observe the results of the session live.

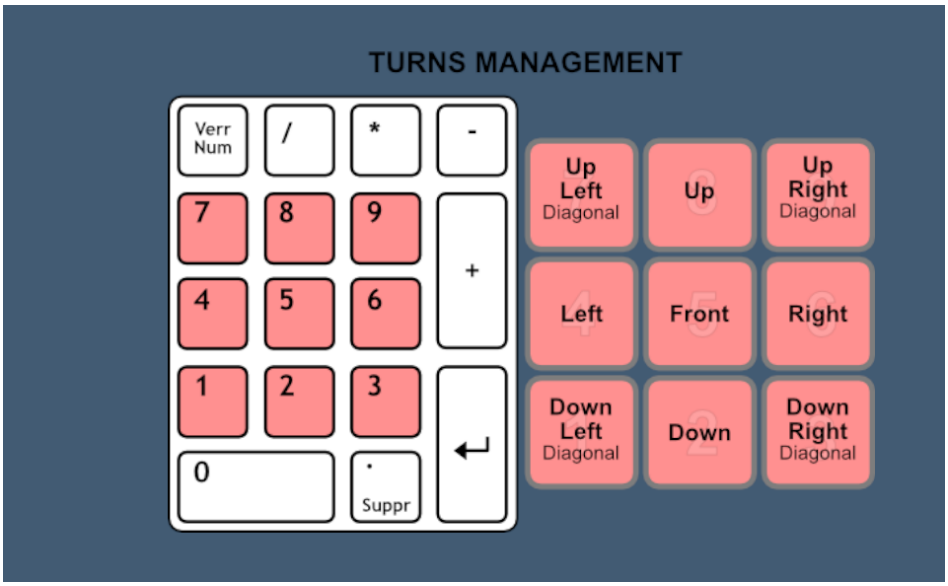
3.2. Shortcuts

During the session, the shortcut list is found by clicking on the Xbox controller icon in the upper right corner of the screen.

3.3. Results

Once the session is over, you can view the results.


Decrease rotation angle slowly
Decrease rotation angle quickly
Increase rotation angle slowly
Increase rotation angle quickly
Reverse scrolling direction
Reverse rotation angle
Decrease / Increase opacity
Exit the application
Hide / Show the asteroids
Recenter view
Start / Stop simulation
TURNS MANAGEMENT
Show framerate
Decrease speed quickly
Decrease speed slowly
Increase speed quickly
Increase speed slowly

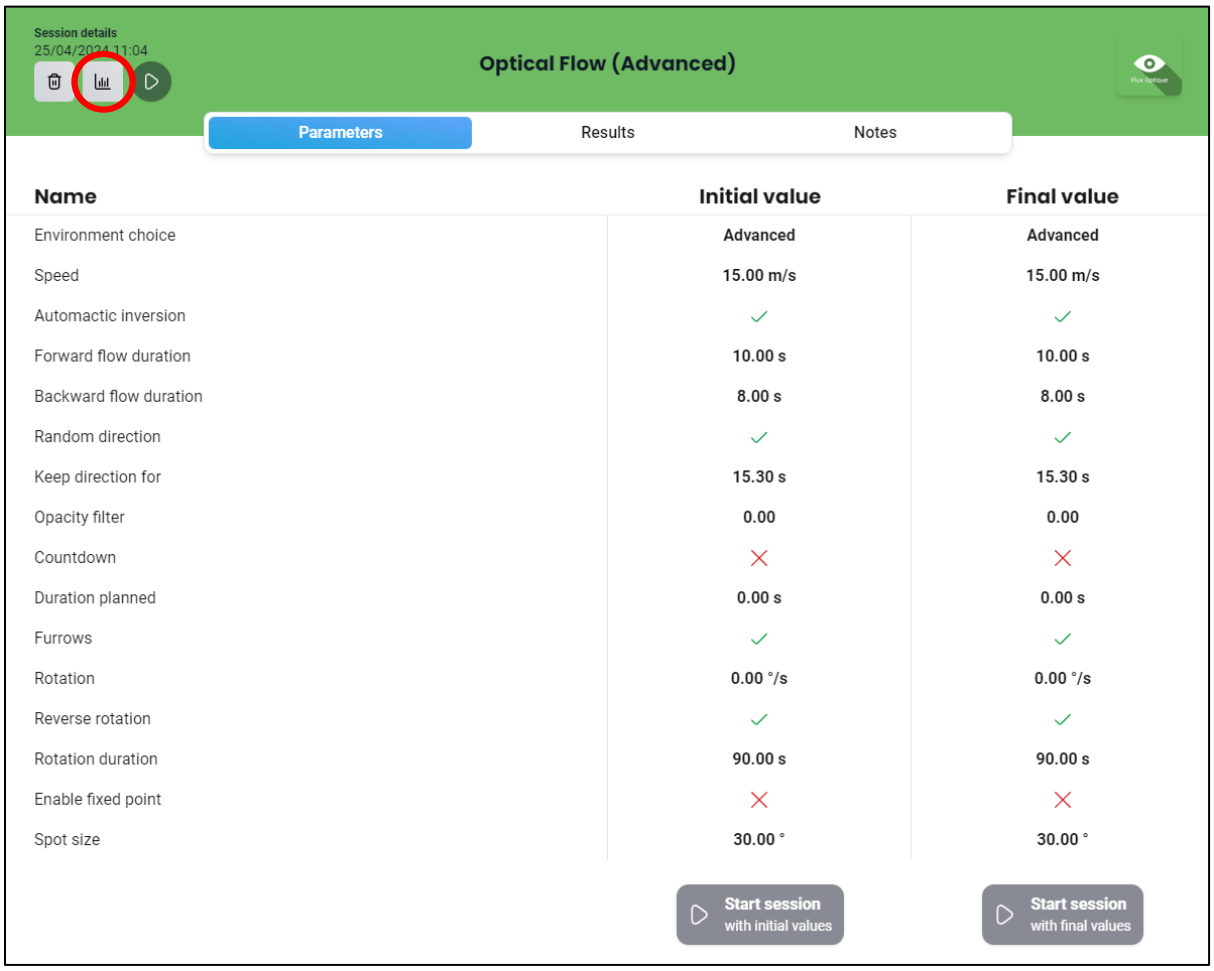

TURNS MANAGEMENT
Verr Num
/
*
-
7
8
9
+
4
5
6
1
2
3
0
Suppr
Up Left Diagonal
Up
Up Right Diagonal
Left
Front
Right
Down Left Diagonal
Down
Down Right Diagonal

3.3.1. Summarized results

Summarized results are not available for this module.

3.3.1. Graphs and report

To find the detailed results and to generate a report, click on the histogram icon.


Session details
25/04/2024 11:04
Optical Flow (Advanced)
Parameters
Results
Notes
Name
Initial value
Final value
Environment choice
Advanced
Advanced
Speed
15.00 m/s
15.00 m/s
Automactic inversion
Forward flow duration
10.00 s
10.00 s
Backward flow duration
8.00 s
8.00 s
Random direction
Keep direction for
15.30 s
15.30 s
Opacity filter
0.00
0.00
Countdown
Duration planned
0.00 s
0.00 s
Furrows
Rotation
0.00 °/s
0.00 °/s
Reverse rotation
Rotation duration
90.00 s
90.00 s
Enable fixed point
Spot size
30.00 °
30.00 °
Start session with initial values
Start session with final values