Claims

1. A device (10) for selective application of stimulus light (66) to an optic nerve head (36) of one of a left eye (30) and a right eye (30) of a user, the device (10) comprising:
   at least one light emitting source (60) configured to position emitted stimulus light (66) to impinge onto the optic nerve head (36) based on a determined location of the optic nerve head (36) with respect to the user's gaze (33);
   at least one screen (50) configured to fixate the user's gaze (33) by engaging the user with content displayed on the at least one screen (50);
   a processor (80) for selecting the stimulus light (66).

2. The device (10) of claim 1, wherein the emitted stimulus light (66) is configured to stimulate melanopsin, optionally wherein the emitted stimulus light (66) is blue light.

3. The device (10) of one of claims 1 to 2, wherein the emitted stimulus light (66):
   - flickers at a frequency in a frequency range between 6 and 20 Hz; and/or
   - has an illuminance of more than 20 melanopic lux, preferably approximately 60 melanopic lux.

4. The device of one of claims 1 to 3, wherein the at least one light emitting source (60) is further configured to position the emitted stimulus light (66) to impinge on one of the left eye (30) and the right eye (30) of the user.

5. The device (10) of one of claims 1 to 4, wherein the at least one light source (60) is further configured to dimension the emitted stimulus light (66) to impinge on a portion of the optic nerve head (36) corresponding in size to 80% of the optic nerve head (36).

6. The device (10) of one of claims 1 to 5, wherein the at least one screen (50) is:
   - arranged normal to the user's gaze (33); and/or
   - arranged at a constant distance from the left eye (30) and the right eye (30); and/or
   - is the light emitting source (60).

7. The device (10) of one of claims 1 to 6, wherein the at least one screen (50) is configured to display the content within at least one target area (52) of the at least one

screen (50), the at least one target area (52) corresponding to an area having a diameter of 1.0 to 5.0 degrees in a foveal region (39) of the left eye (30) and the right eye (30) when the gaze (33) is fixated on the at least one target area (52); optionally wherein the at least one target area (52) is arranged at the center of the at least one screen (50); and further optionally, wherein the at least one target area (52) is configured to fixate one of the left eye (30) and the right eye (30) of the user.

8. The device (10) of one of claims 1 to 7, wherein the device (10) is or comprises a smartphone (50, 60) or is a virtual reality headset, or wherein the device comprises a smartphone and a virtual reality headset, wherein the smartphone (50, 60) is insertable into the virtual reality headset.

9. The device (10) of claim 8, wherein the virtual reality headset comprises at least one lens for forming a two-lens system with at least one of the left eye (30) and the right eye (30) of the user.

10. The device (10) of one of claims 8 or 9, wherein the virtual reality headset comprises one optical path extending between the at least one screen (50) and the left eye (30) and comprises another optical path extending between the at least one screen (50) and the right eye (30).

11. The device (10) of one of claims 1 to 10, wherein the left eye (30) and the right eye (30) of the user are directed straight ahead when the user's gaze (33) is directed at the content with which the user is engaged.

12. The device (10) of one of claims 1 to 11, further comprising a game controller configured for the user to engage with the content displayed on the at least one screen (50); optionally wherein the game controller is further configured to adjust a position (60x, 60y) of the stimulus light (66) within the screen (50) during calibration.

13. The device (10) of one of claims 1 to 12, further comprising a memory device configured to store data relating to the location of the optic nerve head (36), the data being obtained from one of user-controlled calibration, input into the device (10) of fundus image data, and population data.

14. The device (10) of one of claims 1 to 13, wherein the light emitting source (60) is the at least one screen (50), and wherein the processor (80) comprises and executes software for positioning blue stimulus light (66) on the screen (50) and for providing content displayed on the screen (50), optionally wherein the content is a game displayed on the screen (50) of the device (10).

15. The device (10) of one of claims 1 to 14, wherein the light emitting source (60) is configured to:
    a. emit the stimulus light (66) for a stimulus duration of at least 1 minute and up to 20 minutes, preferably for between 8 and 10 minutes; and/or
    b. emit the stimulus light (66) with one or more breaks in emission; preferably wherein the break is at least 15 seconds; and/or
    c. emit the stimulus light (66) over a stimulus duration of at least 1 minute, and up to 20 minutes, or preferably for between 8 and 10 minutes; and/or
    d. emit the stimulus light (66) for at least 30 to 120 seconds before a break; and/or
    e. emit the stimulus light (66) over a session of use of the device (10), wherein the duration of a session of use is at least 1 minute, and up to 30 minutes, or preferably 12 to 15 minutes, wherein a session of use is the time from turning on of the device to the turning off of the device.

16. A method of selectively applying stimulus light (66) on at least one optic nerve head (36) of one or more eyes (30) of a user, the method comprising
    positioning (130) at a position (60x, 60y) at least one light emitting source (60);
    fixating (150) the user's gaze (33) by engaging the user with content shown on at least one screen (50);
    emitting (170) with respect to the user's gaze (33) stimulus light (66) by means of the at least one light emitting source (60) such that the stimulus light (66) impinges on the at least one optic nerve head (36).

17. The method of claim 16, further comprising locating (110) the at least one optic nerve head (36) of the user with respect to the user's gaze (33); optionally wherein the locating of the at least one optic nerve head (36) comprises one of receiving a result

from a user-controlled calibration, receiving an input of fundus image data, and processing population data.

18. The method of one of claims 16 or 17, further comprising showing the content on the at least one screen (50) within a target area (52) of the at least one screen (50) corresponding to an area having a diameter of 1.0 to 5.0 degrees in a foveal region (39) of the one or more eyes (30), when the gaze (33) is fixated on the at least one target area (52); optionally wherein the content is shown to a single one of the one or more eyes (30) of the user; and further optionally wherein the content shown on the at least one screen (50) is a video game.

19. The method of one of claims 16 to 18, further comprising generating the stimulus light (66) by means of the at least one screen (50).

20. The method of one of claims 16 to 19, further comprising stimulating melanopsin at the at least one optic nerve head (36), optionally wherein the stimulus light (66) is blue light.

21. The method of one of claims 16 to 20, wherein the stimulus light (66):
    - has an illuminance of more than 20 melanopic lux, preferably approximately 60 melanopic lux; and/or
    - flickers at a frequency in a frequency range of 6 to 20 Hz; and/or
    - is emitted such that the stimulus light impinges on one of the left eye (30) and the right eye (30) of the user.

22. The method of one of claim 16 to 21, further comprising dimensioning the emitted stimulus light (66) to impinge on a portion of the at least one optic nerve head (36), preferably corresponding in size to about 80% of a size of the at least one optic nerve head (36).

23. The method of one of claims 16 to 22, wherein the method is performed for a session duration of at least 1 minute and up to 30 minutes, preferably for 12 to 15 minutes, optionally wherein the method is performed for the session duration up to five times a day, preferably up to two or three times a day.

24. The method of claim 23, wherein the emitting (170) of the stimulus light (66) is performed for a stimulus duration of at least 1 minute and up to 20 minutes, preferably for between 8 and 10 minutes; optionally wherein the emitting (170) of the stimulus light (66) is interrupted by one or more interstimulus intervals, preferably wherein the interrupting occurs after 30 to 120 seconds of the emitting (170) of the stimulus light (66); and further optionally wherein the one or more interstimulus intervals individually last for at least 15 seconds.

25. The method of one of claims 16 to 24, further comprising blocking light other than the stimulus light and the light representing the content, from reaching the left eye (30) and the right eye (30); and/or further comprising determining a performance score for the user for assessing the efficacy of the method.

26. A computer program product which when executed by a processor will cause the processor to carry out the method of one of claims 16 to 25.

27. A computer program product which when executed by a processor will cause the processor to complete the following steps comprising: positioning (130) at a position (60x, 60y) at least one light emitting source (60); initiating the at least one light emitting source (60) to emit (170) a stimulus light (66); and delivering the stimulus light (66) to at least one optic nerve head (36) of a user.

28. The computer program product of claim 27, wherein the computer program product will cause the processor to complete the further step of displaying content on at least one screen (50) to fixate the user’s gaze (33).