

Sensory Eye-FX V1.2.0
User Guide



About Us



Sensory Guru is a UK based software vendor specialising in eye gaze applications for the Tobii range of Eye Gaze products. Sensory Eye FX software is currently sold via the Tobii reseller network on every continent and has proven to be an effective eyegaze learning resource for hundreds of people worldwide.

The company has been developing specialist eyegaze software content for Tobii eye tracking devices since 2011. During this time Sensory Guru has created a range of resources to help users develop their eyegaze skills, and has pioneered the concept of collaborative interaction using eyegaze and gesture control, allowing eyegaze users to play games together with able-bodied peers.

As well as eyegaze software, Sensory Guru, specialises in the design and development of Multi-Sensory products and environments. We have a fantastic range of interactive sensory learning systems, to include the Magic Carpet and Magic Mirror interactive projection systems.

If you have purchased Sensory Eye-FX software, we would like to thank you for doing so, and hope that it proves to be as valuable a learning resource for you, as it has been for so many others. If you have any user stories, questions or comments you would like to share with us, or feature requests you would like to see in the future, we would love to hear from you.

To learn more about Sensory Guru please logon to www.sensoryguru.com

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Sensory Eye-FX Software

What is it?

Sensory Eye-FX is a set of software applications designed to:

1. provide users with opportunities to learn, develop and enhance their eye gaze skills.
2. provide facilitators with an assessment tool to help measure eye gaze suitability.
3. help practitioners with cognitive assessment

What is the criteria for success?

From a facilitator's perspective, determining whether a learner is going to be able to develop or possesses the skills required to use eyegaze for computer access, early stimulation activities and simple games is relatively straight forward. The learner will need to notice the stimuli presented on the monitor – this does not necessarily mean that they are controlling things at this stage, but there needs to be an awareness that something is happening on the screen. It may take some time or several sessions before you arrive at a definite answer. It is important to evaluate what has been demonstrated, experienced and perceived, and use the data collected during the sessions to inform judgements.

Understanding your users and knowing how they respond to a range of stimuli is essential in helping to determine early outcomes!

Please take time to read through this manual before launching into Eye-FX.

Cause & Effect

Understanding the cause and effect association of eyegaze can be a very difficult task, so facilitators must approach it thoughtfully and cautiously. It should be noted from the outset: EYE GAZE IS NOT SUITABLE FOR ALL USERS, and careful observation is required at the early stages. If learners show potential then the road beyond Sensory Eye-FX is well established with a clearly defined progression route into Alternative and Augmentative Communication (AAC). Read about the Tobii Eyegaze Learning Curve here:

www.sensoryguru.com



Sensory Eye-FX V1.2.0

Notes in this guide pertain to V1.2.0

This version can be downloaded here:
www.sensoryguru.com/eyefx-v1-2-0/



Blank Screen Engagement
Moving the Flare



Functional Visual Field
Splodge Painting



Displacement
Harriet enjoying a game of Splat

Eye Gaze and Complex Needs

Early Eye Gaze is the term used to describe eyegaze access for users at an early stage of cognitive development. It does not mean that users are necessarily young in age. In the UK the term 'profound and multiple learning disability' or PMLD is used to describe individuals who have a profound cognitive impairment alongside multiple disabilities including physical, sensory and/or health-related difficulties (Cartwright and Wind-Cowie, 2005; World Health Organization, 1992).

When assessing whether eyegaze is suitable for a user we must do so on the basis of the evidence obtained from trialling the technology, and not, on the presupposition that eyegaze is beyond the intellectual capabilities of any PMLD/Complex Needs labelled user.

We have been developing eyegaze software applications for three years and during this time we have met hundreds of PMLD users; several have gone on to demonstrate abilities far in excess of their perceived limits. It is for this reason that we would urge practitioners to try the technology out with as broad a selection of users as possible. It may transpire that you find some users to be significantly higher functioning than previously identified.

It is important to remember that users at an early cognitive level need to learn the skills of eyegaze, and this, like all things, will take time, practice and patience. It may be that some flourish and develop quickly, whilst for others, progress will be slow or just not possible, due to eye conditions and processing difficulties.

Evaluate everything!

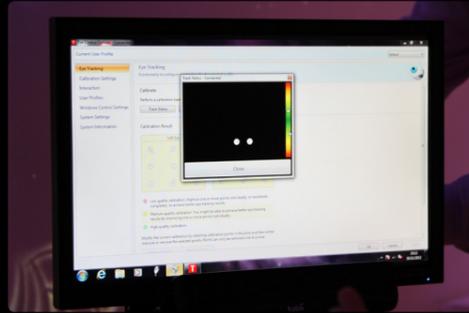
Make sure that you take notes and create a profile for each user that you trial eyegaze with. Record every nuance of the session including the duration, screen engagement intervals, the applications that you use, notes about the environment, learners eye profile, position and disposition. This will enable you to chart and assess progress.



Assessment Environment
Make sure it is as distraction free as possible



Positioning
Use a flexible mounting solution



Track Status
Displays what the Eye Tracker sees and helps get the positioning right



Monitor



User



Facilitator

Environment

Things to consider

There are a variety of factors that will influence an eyegaze session. Some of these factors fall under the facilitator's sphere of influence, such as, environment, the positioning of equipment, which activity you choose to challenge your users, and others that facilitators have no control over, such as learner eye profile and cognition.

To ensure that the best possible results can be achieved for the widest number of users, we would recommend facilitators pay particular attention to the following factors.

Distractions

For early eyegaze access it is important to remove as many distractions as possible, for this reason it is recommended that a dark, quiet location is used. Ideally, we want the monitor to be the dominant source of light in the room. With early eyegaze users it can be difficult to determine if there is a visual impairment to contend with. Reducing all unnecessary sources of light and visual clutter will give you the best starting point for success.

It is also important that we pay attention to sound levels and make efforts to minimise all unwanted sounds so that the user can focus their attention on the screen. We also recommend that only the people that need to attend the session are present.

Think about:

| Position | Disposition | Light Level |
|----------|-------------|-------------|
| | | |
| | | |
| | | |
| | | |
| | | |

Positioning

Monitor

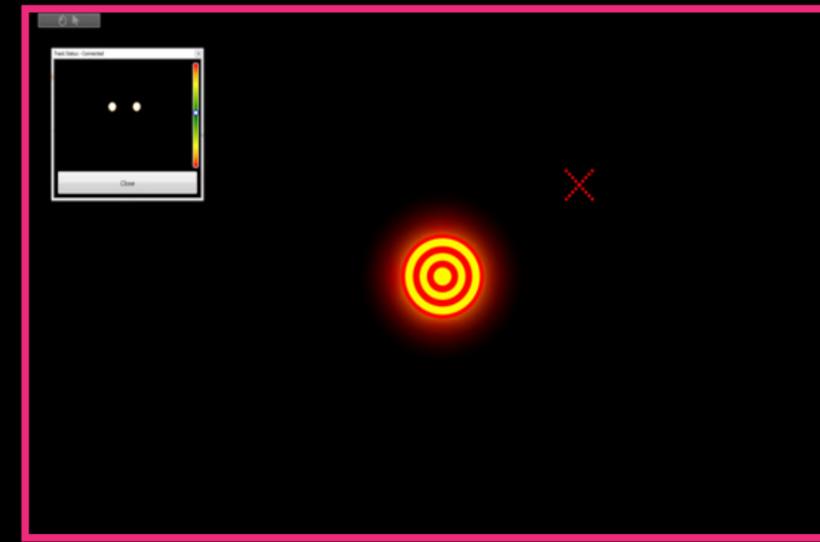
It is useful to have a mounting solution that offers flexibility in the positioning of the monitor. We recommend Rehadapt Floor Stands (whilst other stands exist these are currently the best in our opinion) as they can be used to position a monitor for a user that is laying on the ground or a user that is more than 6 feet tall in a standing frame. This level of flexibility means that it is easy to position the monitor at the optimum height and distance for use with any user. Another, major benefit is that we can orientate the monitor in the optimum position relative to the user without interfering with their natural position (comfortable position) such as, when a users head is tilted to the side etc.

User

If you have available an adaptable/flexible monitor mounting solution as described, the user can be positioned almost anywhere. There are a few considerations that we make when we first encounter a new user. Position should be comfortable for the user. It is especially important that during the first few encounters the user is not required to have to sit in a particular way in order to access the technology. The objective is for the user to have fun and to have opportunities to succeed and not be deterred. We have successfully tracked users laying on waterbeds, interactive floors, suspended in hoists (proceed with caution), laying on their backs, sitting in chairs and so on... Whatever suits the user goes! You may wish to involve Occupational Therapists, Physiotherapists and other members of your multidisciplinary team to help ascertain a good solution going forward.

Facilitator

It is important for the facilitator's head not to be next to the user's, as the eye tracker will track the facilitator's eyes rather than the user's, making it difficult to ascertain who is controlling events. It is recommended that the facilitator should be positioned either behind or slightly to the side of the monitor. This way, the user is more likely to engage with the screen as the facilitator will be visible and prompts / vocalisations will be coming from an area close to the visual source. Please do not place yourself behind the user as this can be very distracting. Alongside the user is fine, but do not make too much noise as it is likely that you will inadvertently divert the user's attention away from the screen.



Calibration Offset

Target stimulus is the users true gaze point - the X denotes the location that the mouse pointer is located and where the eye tracker thinks the user is looking.

What to look out for

Please remember that an eye tracker does not discriminate between eyes that can see and eyes that cannot. It is easy to misinterpret what is happening so we need to break things down and evaluate each outcome as a set of incremental steps:

- Do learners attend to content on the screen?
- Do they look around the screen seemingly aware that something is happening?
- Do they appear to be interested?
- Are they engaged?
- What applications are you using?
- How much time do they spend looking?
- Are they fixating, scanning, tracking, targeting and so on?

Try to suppress the urge to verbally encourage or prompt too much – it can be hard to do, but this is important in helping learners work out the cause and effect association /eye screen relationship. When a user diverts their gaze away from the screen, wait until you are sure they are not going to voluntarily re-engage with the screen before intervening. We must allow time for users to look and look away – the more they do this, the more they are likely to be working out and processing for themselves. Blank Screen Engagement activities focus on teaching that something can happen when you look at a blank screen.

Do not try to cover too much, too soon, and resist the urge to swap between apps too quickly. What you, as a facilitator/practitioner, find basic and easy to process will be completely different for your early eyegaze users. Repetition is very important so prepare for lots of it.

Calibration

Calibration is the process by which the eye tracker measures characteristics of the eyes in order to accurately calculate gaze direction.

Understanding Calibration

Whilst obtaining a good calibration is important when it comes to accurate eye control in a Windows environment, it is not so important when we are using large targets and less so when we are using applications suitable for early eyegaze users. Sensory Eye FX software can be seen as a training tool that may help a user build the skills necessary to achieve a calibration, but more importantly, it can be viewed as a tool that does not require any user specific calibration; early users accessing Blank Screen Engagement activities can use any calibration.

Calibration Offset

When using someone else's calibration settings there will always be a slight offset from the users natural gaze point and the target on the screen (see diagram above). This can be anything from a small distance where gaze proximity is so close so as not to be noticed by the user, or, in some circumstances, as much as 200mm out. With this in mind it is particularly important that you use Blank Screen Engagement activities to observe a user's functional visual field and the Tobii Gaze Evaluator application when users have demonstrated some calibration potential.

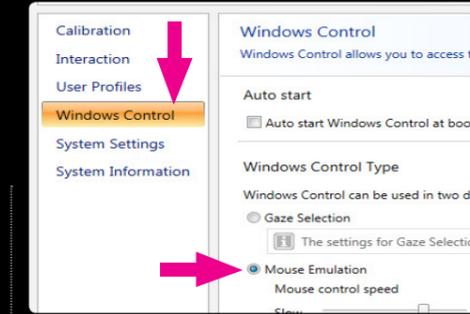
Keyboard step-through

Tobii Gaze Interaction Settings provide a range of custom options to help achieve a calibration. One of the often neglected functions is the keyboard step through. This function enables the facilitator to control each calibration step manually as opposed to the standard auto cycle. This can really help with sensory learners as you trigger the calibration step when you know the learner is looking at it. Info about this can be found in the [Gaze Interaction Settings manual Here](#)

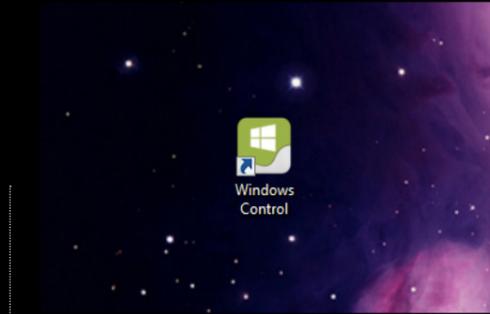
Eye Gaze Methods



Gaze Interaction Settings
Launch via the red icon on the desktop



Mouse Emulation
Select from the Windows Control tab (fourth down on the left) and click 'Apply'



Windows Control
Launch from the green icon on the desktop

Eye-Enabled Software

Tobii Eye Enabled Software

Tobii Eye Enabled Software introduces a proximity based method for controlling mouse events based on a grid or matrix of cells. Eye enabled software will compensate for less accurate eye control by snapping the mouse to the centre of a cell as soon as a users gaze is detected anywhere within the cell frame. This is very useful for communication based eye control software such as Tobii's Sono Suite as it reduces the need for pinpoint accuracy.

If a user is predominantly using communication based software it is not necessary to develop high levels of accuracy. If, on the other hand, a user is looking for computer access within a non-eye-enabled Windows environment, accuracy becomes significantly more important. To navigate effectively in a Windows environment a user will need to learn to control their gaze in a precise manner.



Windows Control

Tobii Windows Control allows users to move and execute mouse functions in exactly the same way as they would if they were using an ordinary mouse.

Sensory Eye-FX utilises the Tobii Windows Control method. The software requires Windows Control to be active as the applications are designed to develop mouse control skills. The reason that this software is not Eye-enabled like Tobii Communicator is because we are interested in having events activate linearly across the screen – this enables us to quickly workout a user's functional visual field and determine how eye movements influence events on the screen.

For example – if you were to use the application Splodge, from the Blank Screen Engagement app set, you will be able to tell very quickly how the eyes fixate, saccade and see a visual representation of a users functional field of vision. This information is very useful for determining how we present content to a user in future sessions, about the screen size we should be using and the best positioning / location of the device.

Using Windows Control

Open Tobii Gaze Interaction Settings and select Windows Control from the list on the left. Under the 'Windows Control Type' heading ensure that you have the 'Mouse Emulation' radio button selected then click 'Apply' followed by 'OK'. Now launch Windows Control from the Windows Control icon as shown above.

Sensory Eye-FX

The Sensory Eye-FX Graphical User Interface (GUI) consists of 30 applications divided into 5 Levels of exploration.

Level 1 - Blank Screen Engagement

Level 2 - Object Displacement

Level 3 - Zoned Focusing

Level 4 - Active Exploration

Level 5 - Controlled Targeting

New to version 1.2.0 is the ability to customise applications. Details relating to the applications and parameters that can be customised are explained in the following pages.



Launching Sensory Eye-FX (PCEye + PCEye GO Win 7/8 PC)

Following installation the above software icon shortcut will be placed on your desktop.

If, for any reason, you do not have this icon visible on your desktop, you can launch the software from the Windows Start Menu - All Programs - Sensory Eye-FX

Launching Sensory Eye-FX (Tobii I-Series only)

Sensory Eye-FX installer is located within the Learning Curve folder which is visible on the desktop. When you run the installer, the program will be installed and a icon will be placed on the desktop.

When you launch Sensory Eye-FX you will be invited to TRY, BUY or ACTIVATE the software. Click the relevant box and continue. If you click purchase you will be taken to our web purchase portal.

Sensory Eye-FX for I-Series can be trialed for 30 days and is preloaded on to every I-Series.

Launching an App

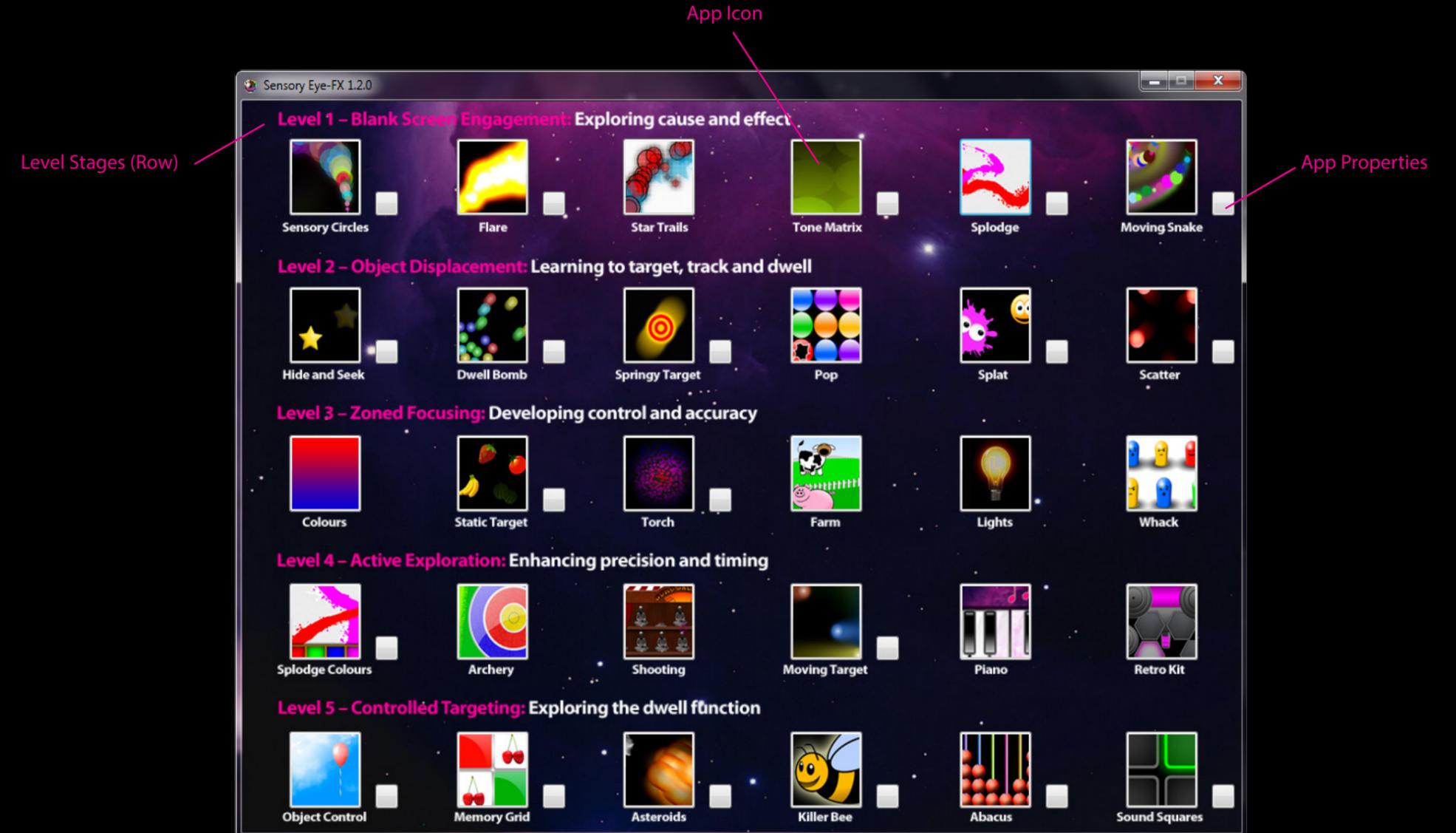
To launch an application click the app icon. The app will then launch full screen.

Closing an App

To close an app you can either:

- Press ESC key on a keyboard
- Double click, hold and release the very top right hand corner of the screen holding for 1 second - only works with touchscreens! Windows 7 and Windows 8 Operating Systems.

Sensory Eye-FX V1.2.0 - Graphical User Interface



Customising Applications

Twenty of the thirty applications in the Sensory Eye-FX suite offer some level of customisation. Some apps allow you to alter background and stimulus images. It is important that you use content that is likely to help users engage with the activities.

Pictures of family members can be particularly motivating, as can well known cartoon images etc. (We do not advocate the infringement of Copyright, but if there is one image above all else that will assist a user to engage it is worth seeking permission from the copyright holder).

Files and Formats

Background Images

All Background images for use with Sensory Eye-FX should be in either PNG or JPEG format. The minimum size should be the native resolution of your monitor. For a Tobii I-series this will be 1024x768 Pixels.

- JPEG or PNG
- Size = native resolution of your monitor (check display settings to find out your screen resolution - Right Click Desktop and open Screen Resolution)

Images that are smaller than the resolution of your monitor will be scaled up. Depending on the size, this can make things look stretched and grainy. Larger images will be squashed and this again will make the image look odd.

Stimulus Images

All Foreground or Stimulus images for use with Sensory Eye-FX should be in PNG format. The size of these images should be somewhere in the region of 128x128 - 512x512 pixels.

- PNG - format provides a transparency filter which means that you only see the icon or image and not a surrounding frame (see glossary for a detailed explanation)
- Size = no larger than 512x512 pixels

Images that are Larger than 512x512 pixels will take up a larger area of the screen. in some circumstances this could be beneficial.

Sounds

All sounds used with Sensory Eye-FX should be in MP3 format.

- MP3 format
- Sound length - all sounds used in the applications are tied to the motion and triggering of the stimulus images so they should be very short. Sounds should generally be no longer than 1 second other wise you will find that they continue on after the action, which may confuse the user.

Gathering Resources

Finding images to use with the applications can be tricky if you do not know where to look or what format or size to look for.

Thankfully Google image search exists to provide you with a huge variety of premade image content perfect for use with Sensory Eye-FX applications. Make sure you only use images that are copyright free or you may risk prosecution.

App Content

Think of an image that you would like to find and search google images ensuring you remain explicit about the criteria. To find a car image to be used as a stimulus run the following search:

Google Images type - Car png 256x256

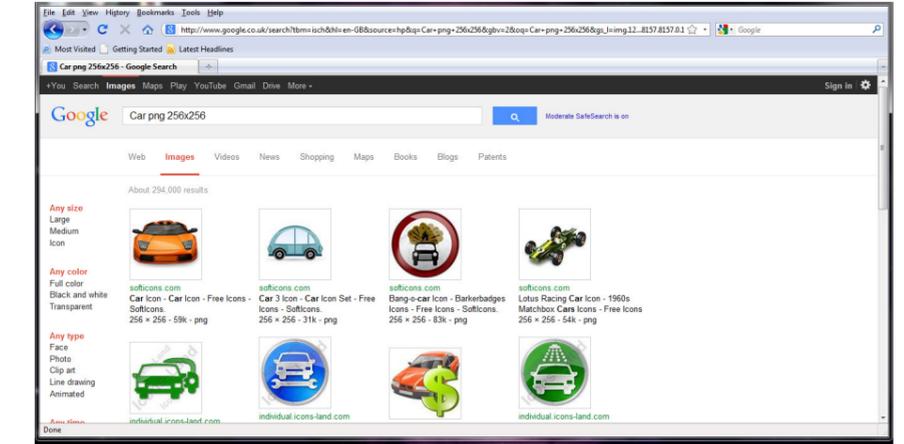
This search translates as: car images in PNG format at 256x256 pixels in size. The results will be perfect for use in the apps. Locate the copyright free images and simply click on the image, then right click and choose 'Save image as.. Save in an easy to remember location on your computer.

When you browse for the image later on you will be able to load it straight into the app.

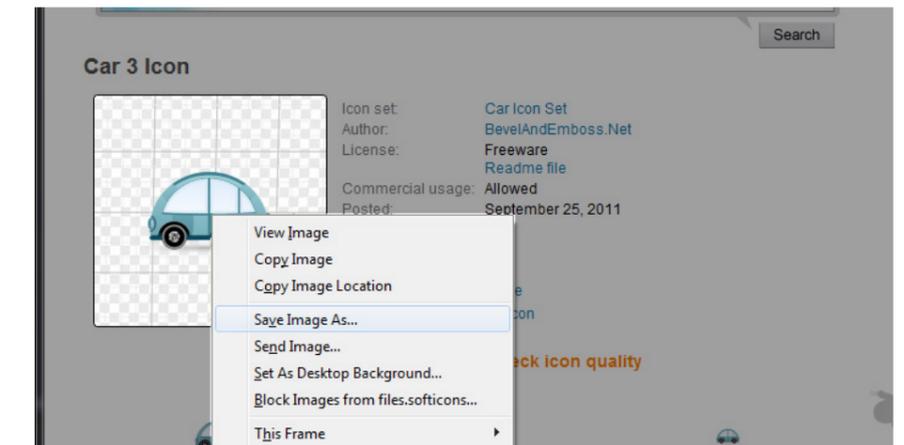
If you stick to conventional icon sizes you will find thousands of images that you can easily use with Sensory Eye-FX apps:

Standard PNG sizes for Eye-FX

64x64, 128x128, 256x256, 512x512



A search for "Car png 256x256" using Google Images



Click through to the image, right-click and select "Save Image As"

Level 1

Blank Screen Engagement

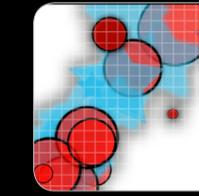
Blank Screen Engagement activities allow users to explore cause and effect - when they look - something happens, when they look away - it stops. This concept is fundamental to learning eyegaze and needs to be explored in some detail. Looking produces results!



Sensory Circles



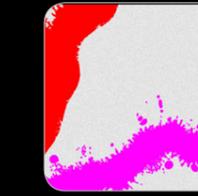
Flare



Star Trails



Tone Matrix



Splodge



Moving Snake



Sensory Circles

Sensory Circles is a gentle particle emitting effect that produces a trail of colourful discs in response to eye/mouse movement – the effect is accompanied by chiming musical notes that play whilst a user looks around the screen. When the user diverts their gaze away from the screen the sounds stop and the circles gently dissipate leaving a slow fading visual residue on the screen.

Sensory Circles can be used to develop and explore the following:

- Screen engagement/looking
- Fixations
- Scanning
- Visual field
- Auditory dominance
- Cause and effect

Customisable Properties



Size of stimulus :

A stimulus size of between 1 and 10 can be selected. 1 being the smallest and 10 being the largest.



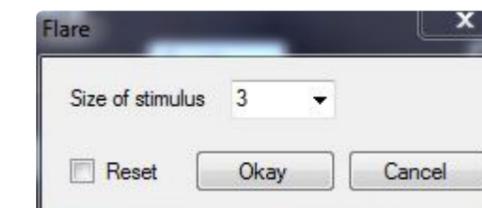
Flare

Eye movements activate a vibrant yellow flame-like effect which appears against a neutral black background. The visual effect is accompanied by a dynamic swishing sound. The visual immediacy of the flare effect can be very helpful when working with users with reduced visual acuity – the shift between light and dark is dramatic, especially when used in dark environments; it is likely that most sighted learners will notice this effect. Flare can be very useful for increasing screen engagement times with early users. **Note:** The sound effect may startle some users if it is too loud, please proceed with caution.

App can be used to develop and explore the following:

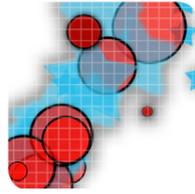
- Screen Engagement/Looking fixations
- Scanning
- Visual field
- Auditory dominance
- Visual hyper/hyposensitivity
- Cause and effect

Customisable Properties



Size of stimulus :

A stimulus size of between 1 and 10 can be selected. 1 being the smallest and 10 being the largest.



Star Trails

Red circles and blue stars scatter around the screen in response to eye/cursor movement. Musical sounds play when the eyes are moving and stop when a user's gaze is diverted. This effect fades to black quicker than any of the other Blank Screen Engagement apps - shorter visual effect fade time usually means users shift their attention back to the screen more quickly, which may mean the overall period the user spends actively looking at the screen is increased.

Star Trails can be used to develop and explore the following:

- Screen engagement/looking
- Fixations
- Scanning
- Visual field

Customisable Properties

No options available for release 1.2.0



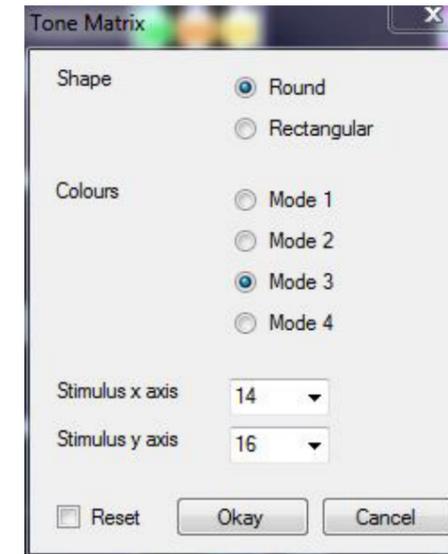
Tone Matrix

Tone Matrix is a colourful music app that triggers a sequence of delayed musical notes and bright oval/rectangular images. The downward cascading colour wash effect produced by looking at the screen is designed to stimulate a learner to move their eyes up and down on the vertical axis and explore the changing colour and musical steps. If a user maintains consistent linear movement along the horizontal axis it will produce a flood of colour across the entire screen.

Tone Matrix can be used to develop and explore the following:

- Screen engagement/looking
- Horizontal and vertical linear scanning
- Visual field
- Auditory dominance
- Cause and effect

Customisable Properties



Shape:

Choose either a circle or square shape for the main stimulus

Colours:

There are four colour modes to choose from which set the colours of the oval stimulus images

Stimulus x axis:

This is the number of stimulus images that are displayed horizontally. Choose from between 4 and 14.

Stimulus y axis:

This is the number of stimulus images that are displayed vertically. Choose from between 4 and 16.



Splodge

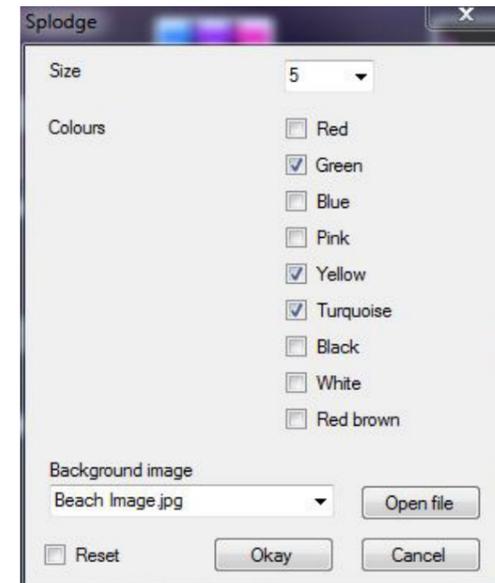
Splodge is ideal for determining how user's eyes move; slow movements (fixations and pursuits) produce larger splodges of colour; rapid movements (saccades) produce thin lines. Splodge also benefits from a clear screen button located bottom right of the page – as the user moves over the button and fixes their gaze for one second, a dwell animation will activate the clear screen function.

The most valuable thing about Splodge is that it provides a real-time visual map of a user's functional visual field. Once we can determine the screen regions that users can access we can begin to develop customised activities in areas of strength and explore options to assist with areas of deficit.

Splodge can be used to develop and explore the following:

- Screen engagement/looking fixations
- Exploration of the dwell function
- Visual field
- Cause and effect

Customisable Properties



Size:

A brush size of between 1 and 10 can be selected. 1 being the smallest and 10 being the largest.

Colours:

Choose the colours you wish to paint.

Background image:

Select an image you would like to use as the main background.



Moving Snake

Colourful balls follow a path that a user directs with their eye movements. When the snake stops the tail gradually catches up with the front until all of the balls overlap in a rest position. This app provides valuable information about where a user is looking and how they scan around the screen. Rapid saccades will make the snake zip all over the screen. We have programmed the sound to stop and start with the movement and gradually increase in pitch the longer the user engages with the screen. Another interesting thing about this application is the way the moving tail can entice a user to look back at the screen if they look away; it is still there in the peripheral visual field wriggling around inviting more screen engagement!

App can be used to develop and explore the following:

- Screen Engagement/Looking fixations
- Tracking + Smooth Pursuit
- Visual field
- Auditory dominance
- Cause and effect

Customisable Properties



Speed :

Adjust the speed at which the stimulus reacts from between 2 and 10. 2 being the slowest and 10 the fastest.

Scale:

A stimulus size of between 0.5 and 10 can be selected. 0.5 being the smallest and 10 being the largest.

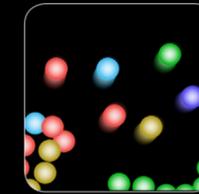
Level 2

Object Displacement

Object displacement activities introduce some of the methods of eyegaze such as dwell functions and basic targeting - here users may begin to gain greater awareness as to how their gaze proximity activates a response from content located in a certain area of the screen.



Hide and Seek



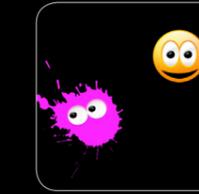
Dwell Bomb



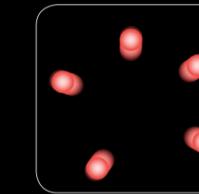
Springy Target



Pop



Splat



Scatter



Hide and Seek

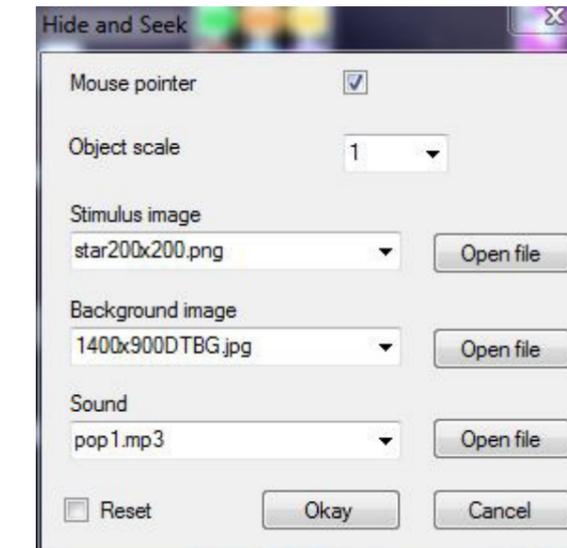
Here a yellow star image appears against a black background – when a user looks at the star it makes a sound, disappears and reappears again in another area of the screen. The idea is to make the user aware that their gaze is producing the effect. This is the time for positive verbal encouragement: “where is the star? Can you find it”, etc. Get excited if your user is hitting it. Get very excited if they are repeatedly hitting all over the screen - as they are basically proving to you that they have calibration potential and a good degree of visual stimulus processing. The mouse cursor is visible in this application to provide a visual reference point as to where the user is looking in relation to the stimulus – this can help you work out if there is a significant calibration offset to contend with (see page 9).

Hide and Seek can be used to develop and explore the following:

- Reflex fixations
- Calibration skills
- functional visual field
- Cause and effect
- Targeting
- Visual processing
- Anticipation

Hide and Seek continued...

Customisable Properties



Mouse Pointer:

Check the box to show the mouse pointer or uncheck the box to hide it.

Object Scale:

Set the size of the stimulus object. 0.25 being the smallest and 2 the largest.

Stimulus image:

Choose an image you wish to use. See Customising Applications and Gathering Resources (pages 14 & 15).

Background image:

Select an image you would like to use as the main background.

Sound:

Choose a sound you wish to use.



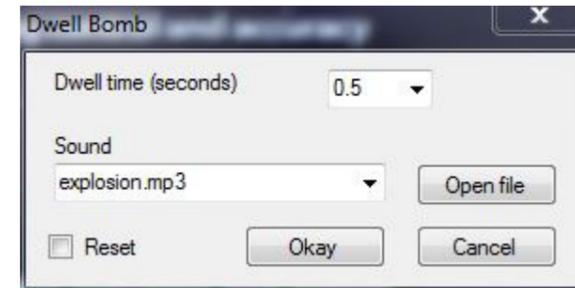
Dwell Bomb

Dwell Bomb presents a very simple cause and effect dwell scenario that activates when a user fixes their gaze in any area of the screen for a period of 1 second. As the dwell function activates - signified by a growing onscreen circle animation - coloured balls are sent flying all over the screen. This app is great for cause and effect. If your user is likely to be startled by a sudden animation and sound, please proceed with caution as this app has startled some users.

Dwell Bomb can be used to develop and explore the following:

- Screen engagement/looking fixations
- Tracking
- Visual field
- Auditory dominance
- Visual hyper/hyposensitivity
- Cause and effect
- Dwell function

Customisable Properties



Dwell time (seconds):

Choose the number of seconds desired for the dwell time, between 0.2 and 3.

Sound:

Choose a sound you wish to use for the explosion.



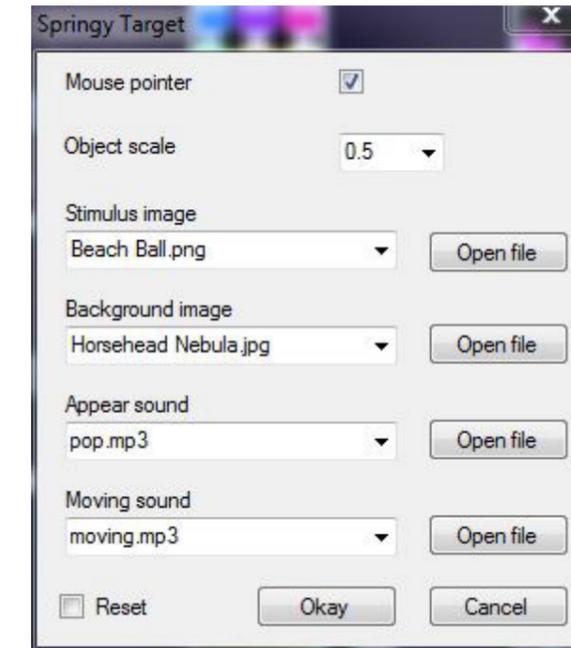
Springy Target

Springy Target is designed to exert pull on a user's gaze by randomising to different areas of the screen. Before the object comes to a stop it quickly springs back and forth to provoke the user to look at it in its new location. If a user is hitting the stimulus rapidly all over the screen they are demonstrating to you that they can see and react to rapidly moving visual data and target effectively. Now it is time to attempt a calibration. Learners that struggle with this type of targeting but demonstrate ability with Level 1 activities should be observed closely – pay attention to the mouse cursors proximity to the stimulus – it may be that the calibration they are using is not suitable for their eye profile (see page 9).

Springy Target can be used to develop and explore the following:

- Targetting
- Visual processing times
- Tracking
- Visual field
- Accuracy + Calibration offset

Customisable Properties



Mouse Pointer:

Check the box to show the mouse pointer or uncheck the box to hide it.

Object Scale:

Sets the size of the stimulus object. 0.25 being the smallest and 2 the largest.

Stimulus image:

Choose an image you wish to use. See Customising Applications and Gathering Resources (pages 14 & 15).

Background image:

Select an image you would like to use as the main background.

Appear sound:

Choose a sound you wish to use for when the stimulus images appears.

Move sound:

Choose a sound you wish to use for when the stimulus images moves.



Pop

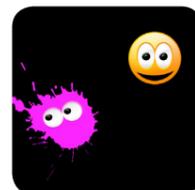
Pop presents a series of coloured circles that burst as a user looks around the screen. There is no timer and the objective is not necessarily to pop every ball before they return. Exploration of the screen should be the main aim. Facilitators need to be looking at the way the eye behaves: does the user move slowly and cluster fixations in a certain area of the screen; do they seem to work to the outer edge of the screen. What we want to see from this app is whether or not a user can make use of the full screen.

Pop can be used to develop and explore the following:

- Screen regions
- Fixations
- Scanning
- Visual field
- Cause and effect

Customisable Properties

No options available for release 1.2.0



Splat

Smiley faces randomly float around the screen – when a user targets one of the heads it splats and slides down the screen. This animation is accompanied by a squelching sound. Whilst this app is a lot of fun, it is also very informative. If a user is squashing heads all over the screen they are again proving an ability to see, track and focus on a moving stimulus – good full screen targeting with Splat is proof that a user can be calibrated (it may be difficult but it is possible). The way a user approaches this application can tell us something about their ability to anticipate, use short term memory and strategise. Maximum effect for minimum effort would be to wait in the centre of the screen and target the faces as they appear from the bottom

Splat can be used to develop and explore the following:

- Screen engagement/looking fixations
- Scanning
- Fixations, tracking and targeting
- Memory, anticipation and strategy

Customisable Properties

| Stimulus | Alive image | Splat image | Splat sound | Size | Speed | Active |
|----------|-------------|---------------|---------------|------|-------|-------------------------------------|
| 1 | Bomb.png | Explosion.png | explosion.mp3 | 0.5 | 7 | <input checked="" type="checkbox"/> |
| 2 | sum.fw.png | answer.fw.png | hit2.mp3 | 1 | 3 | <input checked="" type="checkbox"/> |
| 3 | Aa.fw.png | Apple.png | hit3.mp3 | 1 | 4 | <input checked="" type="checkbox"/> |
| 4 | 2.png | 2-splat.png | hit4.mp3 | 0.7 | 6 | <input checked="" type="checkbox"/> |
| 5 | 1.png | 1-splat.png | hit5.mp3 | 0.9 | 8 | <input checked="" type="checkbox"/> |
| 6 | 2.png | 2-splat.png | hit6.mp3 | 0.5 | 7 | <input checked="" type="checkbox"/> |

There is the option for up to 6 stimulus objects / images.

As you can see from the standard settings, their properties are set on each line from 1 to 6.

Below are explanations of the different options which apply to all 6 lines.

Alive image:

Choose the un-splatted image you wish to use .

Splat image:

Choose the splatted image you wish to use.

Splat sound:

Choose the sound you wish to use for when the image splats.

Size:

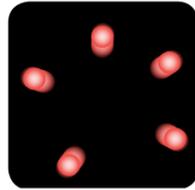
Choose the size of the stimulus image.

Speed:

Choose the speed of the stimulus image.

Active:

Choose whether the stimulus object is visible or not. Check the box for on, uncheck the box for off.



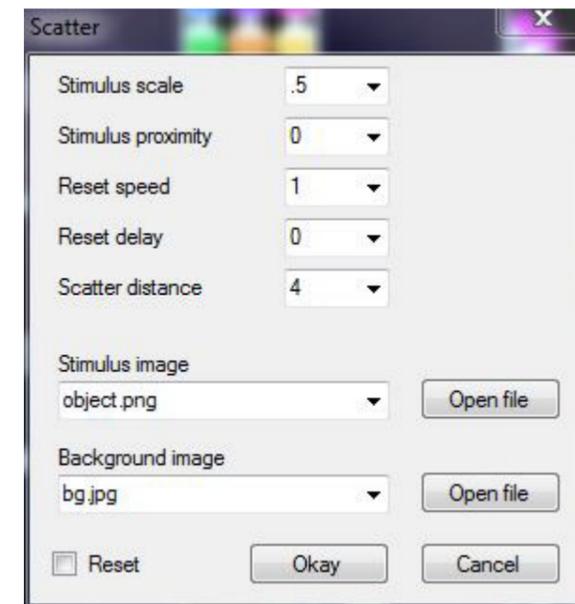
Scatter

icons are arranged in rows covering the full screen. As users look around the screen a gravity force is applied making the icons move away from the area of fixation. The localised icon motion can be useful for helping users understand cause and effect and to prompt exploration of the wider screen. Icon movement is accompanied by a subtle collision sound.

Scatter can be used to develop and explore the following:

- Screen engagement/looking fixations
- Scanning
- Visual field
- Tracking

Customisable Properties



Level 3

Zoned Focusing

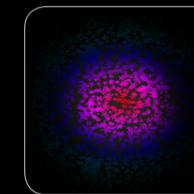
Zoned focusing - an ability to target specific areas of the screen is an important step in learning to control the mouse cursor, now we want users to begin to fix their gaze in order to achieve a greater level of control and accuracy. At this point we are developing skills necessary to achieve a successful calibration.



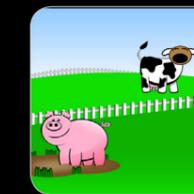
Colours



Static Target



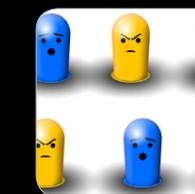
Torch



Farm



Lights



Whack



Colours

The Colours application is a very basic colour morphing program. When a user looks to the top of the screen the screen turns green, when they look left it turns yellow, red is produced by looking to the right and blue is located at the bottom of the screen – other colour variants are produced as the user navigates from one side to another. This application can be interesting for exploring screen access regions and for determining a user's ability to perceive and understand colour. This is another app where verbal reinforcement/explanation of what is occurring onscreen can be helpful – ask users to find red etc.

Colour can be used to develop and explore the following:

- Screen engagement/looking
- Fixations
- Scanning
- Visual field
- Explore understanding of colour

Customisable Properties

No options available for release 1.2.0



Static target

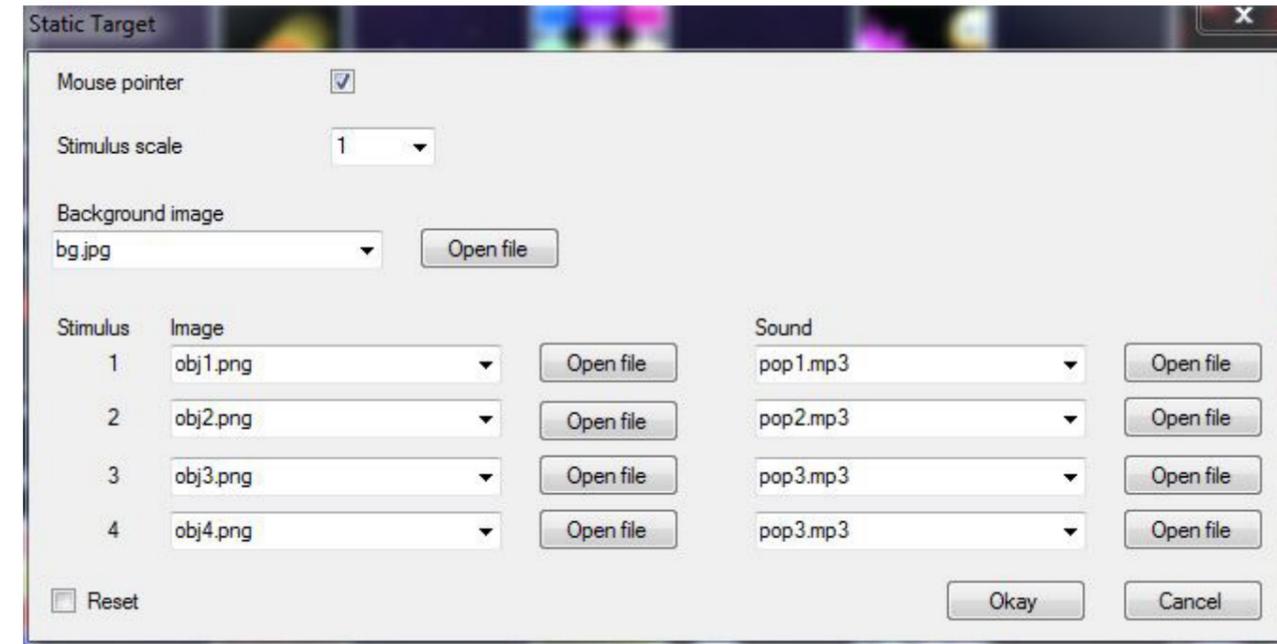
Static Target starts with a single target image on the screen. When the user looks at the image it disappears and incrementally randomises 4 additional targets across the screen with a 0.5 second delay – a sound is tied in to reinforce the appearance and targeting of each image. We now want users to develop automatic fixation abilities – something appears in our foveal, para-foveal or peripheral visual fields and we shift our gaze immediately to that location. For people with good visual acuity and cognitive abilities this is a reflex action.

Pay attention to the mouse cursor and be aware of calibration offsets. This level of targeting will require some level of calibration. Fruit has been chosen as the stimulus in this application due to its ubiquity as an early learning stimulus. Joint attention can also be explored, whereby the practitioner prompts learners to target specific fruits sequentially etc.

Static target can be used to develop and explore the following:

- Screen engagement/looking fixations
- Scanning
- Visual field
- Cause and effect

Customisable Properties



Mouse Pointer:

Check the box to show the mouse pointer or uncheck the box to hide it.

Stimulus scale:

Set the size of the stimulus object. 0.25 being the smallest and 2 the largest.

Background image:

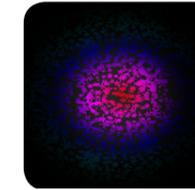
Select an image you would like to use as the main background.

Image:

Choose an image you wish to use as the stimulus. See Customising Applications and Gathering Resources (pages 14 & 15).

Sound:

Choose a sound you would like to use for the stimulus.



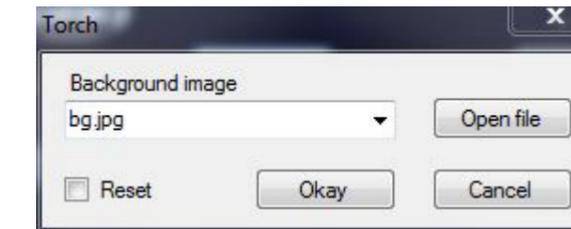
Torch

A spotlight shines through a black foreground revealing a collection of colourful images below – these images can also be found in some of the other Sensory Eye-FX applications. As a user looks around the screen, the different images come into view. This app is great for exploring a user’s ability to recognise and recall the location of some of the most common nouns, such as bee, pig, banana and apple. Torch encourages users to explore the screen and invites questions from the practitioner to prompt the user to explore the screen.

Torch can be used to develop and explore the following:

- Screen engagement/looking
- Image recognition
- Scanning
- Visual field
- Memory

Customisable Properties



Background image :

Choose an image you would like to use as the main background.



Farm

Meet the animals on the Farm – Pig, Horse, Cow, Cockerel and Sheep are all present on the screen, when the learner looks at one of them it responds by moving and activating a sound. This application can be very motivating for users especially when they get feedback and acknowledgement from their communication partner. We are now moving into the territory of early communication and stimulus recognition.

Farm can be used to develop and explore the following:

- Screen engagement/looking
- Image recognition
- Memory
- Receptive language function
- Cause and effect

Customisable Properties

No options available for release 1.2.0



Lights

Lights is a zone orientated exploration app. Here light bulbs light up and trigger a musical note when activated. The different lights play different notes which can produce a range of melodic phrases. The idea is to see if a user can access all regions of the screen.

Lights can be used to develop and explore the following:

- Screen engagement/Looking fixations
- Scanning
- Visual field
- Auditory dominance
- Visual hyper/hyposensitivity
- Cause and effect

Customisable Properties

No options available for release 1.2.0



Whack

Whack is based on the game whack-a-mole only we have done away with the timer and score counter. This app is great for developing quick targeting skills and can also be used to help users identify colours.

Whack can be used to develop and explore the following:

- Screen engagement/looking fixations
- Scanning
- Colour recognition
- Reflex targeting
- Cause and effect

Customisable Properties

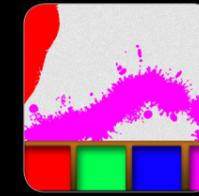
No options available for release 1.2.0



Level 4

Active Exploration

It is important that users are motivated to engage with the screen. Active exploration activities encourage users to engage with the wider area of the screen and have fun using their eyes.



Splodge Colours



Archery



Shooting



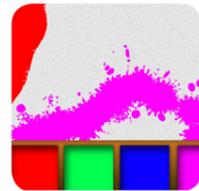
Moving Target



Piano



Drumkit



Splodge Colours

Splodge Colours is a fun painting application - here users can select a range of different colours from the colour pallet at the bottom of the screen and splodge paint around. As with Splodge in Level 1 – this app is very helpful as it will display a real-time map of a user's visual field as they look around the screen. We would expect a user to have achieved a reasonable calibration by this point, so the displayed visual field will be more accurate than it would have been if a user had been using Splodge without a user specific calibration– accessing the colours from the pallet requires a higher degree of accuracy.

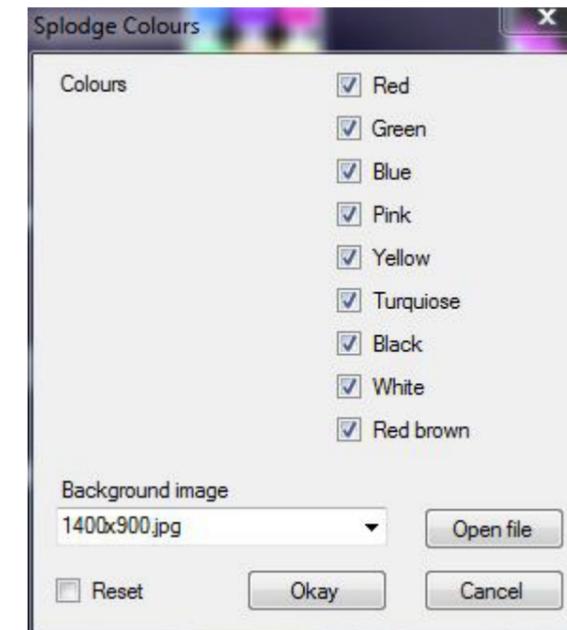
Taking a screenshot of a user's efforts and printing off an image is recommended.

Splodge Colours can be used to develop and explore the following:

- Screen engagement/looking
- Colour selection and choice making
- Scanning
- Visual field

Customisable Properties

The options for this app are the same as Splodge (Page 20) however, unlike Splodge, this app allows you to choose a colour to use while the app is running.



Archery

Archery is a fun targeting application designed to get users looking to specific regions of the screen. Here we have targets arranged in three rows across the screen. When a user looks at the target an arrow is shot to the centre and the target topples over. After a short period the target will spring back up. Again practitioners should be noting how well users target and anticipate.

App can be used to develop and explore the following:

- Screen engagement/looking fixations
- Scanning
- Visual field
- Auditory dominance
- Reflex targetting
- Zoning
- Strategy

Customisable Properties

No options available for release 1.2.0



Shooting

The idea of this app is to get users to control their vision and look along the horizontal plane. This skill is very important moving forward as it has implications for using communication pagesets and reading information presented linearly on the horizontal plane. Almost all symbol and written communication is presented in this format. It is also interesting to see how users develop strategies for targeting the images – do they rapidly shift their gaze from top to bottom in a random fashion. Or do they work out that maximum effect for minimum effort is to wait until all images are visible before shifting their eyes rapidly along one tier and then repeating on the second?

Shooting can be used to develop and explore the following:

- Screen engagement/looking
- Strategy
- Scanning
- Steady eye control
- Horizontal scanning/pursuit

Customisable Properties

No options available for release 1.2.0



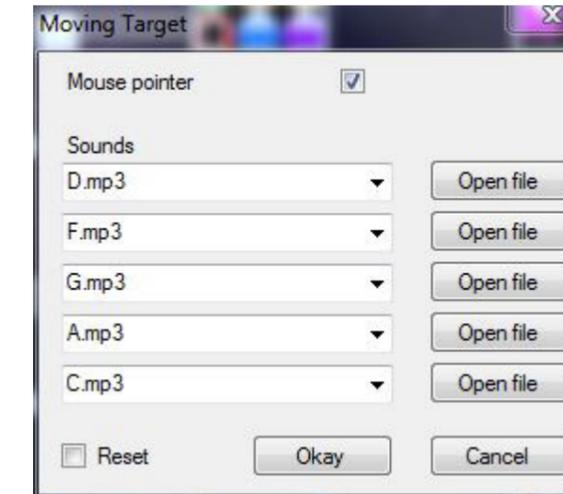
Moving Target

Moving Target is all about horizontal and linear scanning. Here coloured balls move rapidly across the screen. When users target a ball it will disappear and a sound will trigger. The idea here is not necessarily to hit every ball, it is far more important for users to see and track the balls. Pay attention to the mouse cursor and how the user tracks a ball – do they get easily distracted by other balls? Or do they select one and chase it? This is a difficult app, from an eye control perspective, as it is fast and there is a lot going on visually to distract users. This is intentional as we are now seeking to learn more about the way a learner focuses their attention and filters out peripheral stimuli when choosing to target one specific object.

Moving Target can be used to develop and explore the following:

- Screen engagement/looking
- Scanning
- Visual field
- Vertical and horizontal tracking
- Choice making

Customisable Properties



Mouse Pointer:

Check the box to show the mouse pointer or uncheck the box to hide it.

Sounds:

Choose sounds to use for the moving stimuli. You may choose up to five different sounds, one on each line.



Piano

Piano continues the theme of horizontal scanning. Here users can play a piano with their eyes – as they look at the notes sounds play. This app can be a great motivator and definitely one to use if you are getting little response using other apps in the Sensory Eye-FX suite.

Piano can be used to develop and explore the following:

- Screen engagement/looking fixations
- Scanning
- Visual field
- Cause and effect

Customisable Properties

No options available for release 1.2.0



Retro kit

Retro Kit is a drum kit application – look around the screen to activate the drums. This can be a very motivating application and is designed to help users realise that eye control can be fun. This app could be used by an eyegaze user as part of a music session – music is very motivating and can be a great way to explore social interaction and communication in a group situation.

RetroKit can be used to develop and explore the following:

- Screen engagement/looking fixations
- Zoning
- Fun
- Visual hyper/hyposensitivity
- Cause and effect

Customisable Properties

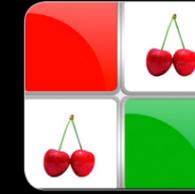
No options available for release 1.2.0

Level 5 Controlled Targeting

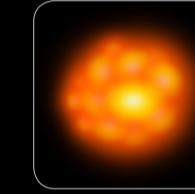
Controlled targeting activities can help users achieve greater control, a higher degree of accuracy and a more detailed understanding of the dwell function.



Object Control



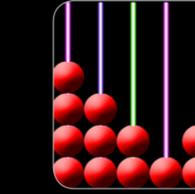
Memory



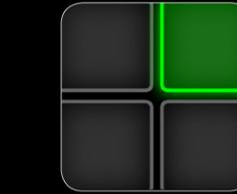
Asteroids



Killer Bee



Abacus



Sound Squares



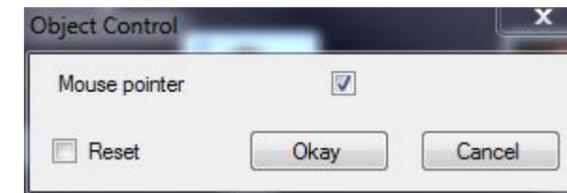
Object Control

Object Control requires a learner to dwell and use smooth pursuit in order to achieve the goal of targeting and controlling the balloon. Here a balloon appears at the top of the screen and gradually floats down – when the user looks at the balloon the mouse latches on to it and it can be moved around the screen. When the user shifts their gaze the balloon become detached from the mouse cursor and floats down to the bottom of the screen. If the user does not re-engage with the balloon it will pop when it hits the bottom edge of the screen and immediately reappear at the top of the screen – this animated visual shift is designed to bring the user back to the screen.

Object Control can be used to develop and explore the following:

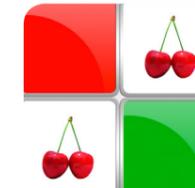
- Screen engagement/Looking
- Attention
- Smooth pursuit
- Visual field
- Targeting

Customisable Properties



Mouse Pointer:

Check the box to show the mouse pointer or uncheck the box to hide it.



Memory

Memory is a variable size grid app with hidden fruit images behind colourful tiles – the idea here is for users to develop their ability to use the dwell function. Each tile is programmed for a 1 second dwell time so the user will need to achieve stillness of gaze for this period for the tile to flip. This is a fun matching game which provides a big cheer when a user matches all pairs. This application is designed to randomise the content after each cycle so it not the same second time around.

It is possible to upscale the difficulty level very quickly using the editable properties. Facilitators can switch from a simple 1x2 grid arrangement all the way up to 4x4 in a matter of seconds. This helps to set the correct difficulty level for each user and provide the right level of challenge.

App can be used to develop and explore the following:

- Targeting
- Dwell
- Mouse control
- Memory
- Attention

Memory continued...

Customisable Properties

Memory Grid

Number of tiles (x-axis) 3

Number of tiles (y-axis) 2

Dwell time 1

Flip time 0.5

Background image
bg.jpg Open file

Image pairs

| | |
|--------------------------|---------------------------------|
| apples.png Open file | coconut.png Open file |
| bananas.png Open file | cherry.png Open file |
| kiwi.png Open file | grapefruit.png Open file |
| lemon.png Open file | strawberry.png Open file |
| watermelon.png Open file | yellow-watermelon.png Open file |

Sounds

| | |
|----------------------------------|---------------------------------|
| On load pop.mp3 Open file | Flip flip.mp3 Open file |
| Correct success.mp3 Open file | Incorrect fail.mp3 Open file |
| Win cheering.mp3 Open file | Dwell over.mp3 Open file |

Reset Okay Cancel

Memory continued...

Number of tiles (x-axis):

Choose the number of horizontal tiles, between 1 and 4.

Number of tiles (y-axis):

Choose the number of vertical tiles, between 1 and 4.

Dwell time:

Choose the time required to dwell on a tile before it flips over, between 0.25 and 2.5 seconds.

Flip time:

Choose how fast a tile flips, between 0 and 2 seconds.

Background image:

Select an image you would like to use as the main background.

Image pairs:

Select the images you would like to use for the Memory game.

Sounds:

On load:

Choose a sound you would like to use for when the tiles initially appear.

Flip:

Choose a sound you would like to use for when tiles are flipped.

Correct:

Choose a sound you would like to use for two tiles are matched.

Incorrect:

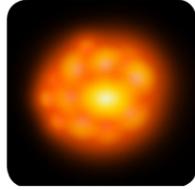
Choose a sound you would like to use for incorrect matches.

Win:

Choose a sound you would like to use for when the game is won.

Dwell:

Choose a sound you would like to use for the dwell function.



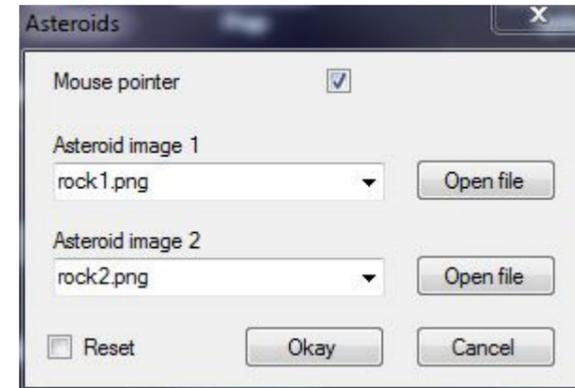
Asteroids

This is possibly the hardest of the Controlled Targeting applications. It requires users to be very accurate with their targeting skills. The asteroid images appear from a single point in the centre of the screen and grow larger as they move toward the user. The asteroids are programmed to cover all areas of the screen and explode on mouse impact.

Asteroids can be used to develop and explore the following:

- Tracking
- Accuracy
- Visual field
- Auditory dominance
- Cause and effect

Customisable Properties



Mouse Pointer:

Check the box to show the mouse pointer or uncheck the box to hide it.

Asteroid image 1:

Choose an image you would like to use.

Asteroid image 2:

Choose a second image you would like to use.



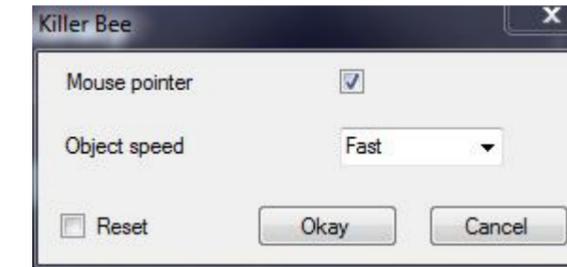
Killer Bee

Killer Bee is the most politically incorrect application as it encourages users to chase a Bee around the screen in order to splat it. It is amazing how motivating this activity can be! The Bee enters the screen one side and floats across to the opposing side shifting up and down as it moves. The trajectory is different each time. When a user hits the Bee an appealing smash screen animation is activated and the Bee slides down the screen looking slightly displeased – don't worry though, this Bee is like the Phoenix and will rise again – ad infinitum!

Object Control can be used to develop and explore the following:

- Targeting
- Accuracy
- Mouse Control
- Smooth Pursuit
- Tracking

Customisable Properties

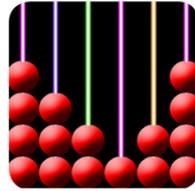


Mouse Pointer:

Check the box to show the mouse pointer or uncheck the box to hide it.

Object speed:

Choose how fast you would like the stimulus object to move around the screen.



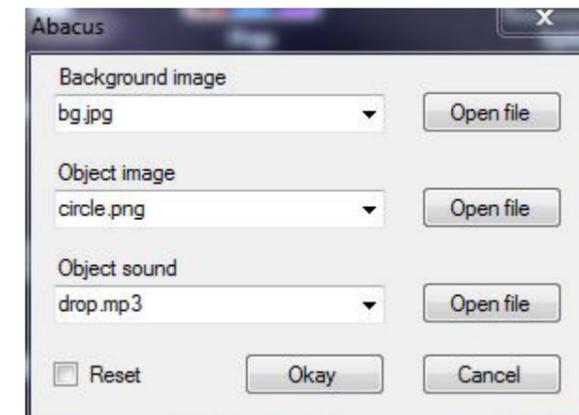
Abacus

Abacus is the Dwellers paradise – here users are introduced to a 1 second dwell time and lots of targets. The idea is to focus attention on each target for 1 second until all targets have disappeared. This is very repetitive, but will help to reinforce the concept of dwelling.

Object Control can be used to develop and explore the following:

- Dwell
- Scanning
- Visual field
- Mouse control
- Stamina
- Cause and effect

Customisable Properties



Background image:

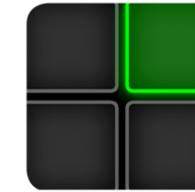
Choose an image you would like to use as the main background.

Object image:

Choose an image you would like to use as the main stimulus object.

Object sound:

Choose a sound you would like to use for the main stimulus object.



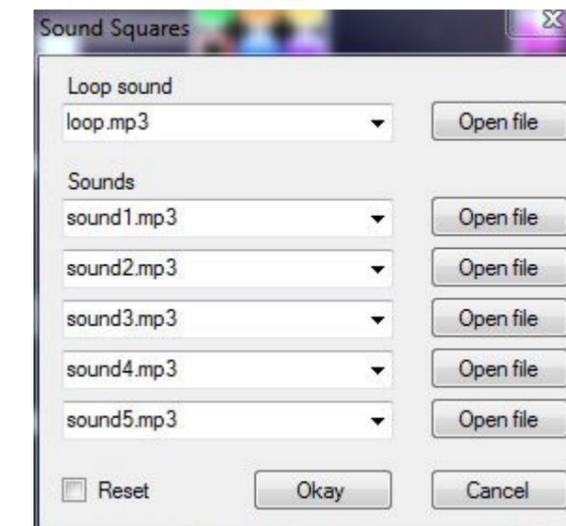
Sound Squares

Sound Squares is a set of 6 sound cells. Each cell has as sound and colour assigned to it. The uppermost left cell has a dwell function which acts like a toggled switch – when activated this will trigger a drum loop backing track, it can be stopped by dwelling over it again.

Object Control can be used to develop and explore the following:

- Screen engagement/looking fixations
- Scanning
- Visual field
- Auditory dominance
- Visual hyper/hyposensitivity
- Cause and effect

Customisable Properties



Loop sound:

Choose a sound you would like to use for the Loop square. This is the upper most left square that requires to be dwelled upon to turn on, and dwelled upon once again to turn off. Once on, it will play the sound on a loop, so is suited to a longer sound that would play well

Sounds:

These five options set the sound for each remaining square. These squares are triggered instantly (without dwelling) so lend themselves more to shorter sounds.

Assessment

Sensory Eye-FX Assessment Template

The assessment template (see page 53) can be a helpful aide memoire when meeting or trialing a new user. The details relate to specific outcomes that users should demonstrate/achieve to ensure that eyegaze access is effective. On the right of the template we have added a section so facilitators can quickly mark off the position, environment and disposition of the user.

There is also a section that details some of the possible issues / difficulties that you may have to work with, such as Ptosis, Dilated Pupils and Head Support, amongst others. It is very helpful to detail as much information as you can in the first few sessions and cross reference it each time to measure progress.

The track status box has been added to enable you to approximate the track status achieved and help you to determine optimum positioning. Please note, it can be difficult to get a perfect track status if the user does not look at the screen, has poor head control, has a significant divergant squint or ambient light levels are too high. Please see notes on positioning on page 5 for further guidance.

When using this template in assessment situations we are keen to see as many outcomes as possible. The outcomes provided in each level do not necessarily relate to each application. For example, Notices Stimuli, could be witnessed when a user engages with any of applications. Other outcome criteria does relate more specifically, such as, colour recognition etc.

It is also unlikely that you will explore every app in every category with every user. More likely, you will perhaps run two or three from each level as you explore a user's access. We usually circle the app icons we use and tick specific outcomes, making sure we add comments about engagement time, distractions, areas of deficit etc, as we go.

The list of outcomes is not exhaustive and you may find that you have additional criteria that you would like to add to the template to assist with your own records and work flow.

When to Calibrate

Knowing when to attempt a calibration with a user can be tricky. We would recommend that you see some level of targeting with level 2 applications before attempting it. Pay close attention to the mouse cursor on apps like Hide and Seek, Springy Target and Splat. If the user is engaged with the activity but does not seem to be hitting the stimuli, it is likely that the calibration offset is hampering efforts. This would be a good point to try a calibration. 2 or 5 point in the first instance. See calibration tips on page 8 for more details.



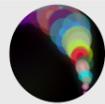
Sensory Guru Eyegaze Assessment

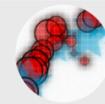
Learner Name: _____

Session Date: _____

Session Duration: _____

Level 1








Notices Stimuli Stares/Fixates Scans Visual Field/Splodge Tracks Engagement Time _____

Notes: _____

Level 2





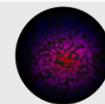



Targets Dwells/Fixates Reflex Targeting Calibration Offset Est mm _____ Screen Coverage _____ Anticipates

Notes: _____

Level 3





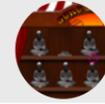
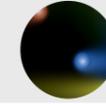


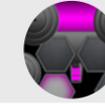

Colour Recognition Automatic Targeting Smooth Pursuit Stimulus Recognition Full Screen Engagement Enjoyment

Notes: _____

Level 4





Splodges Targets Zones Horizontal Scanning Vertical Scanning Targets Moving Stimulus Enjoyment

Notes: _____

Level 5








Target/Dwell Control/Smooth Pursuit Memory Precision Targeting Tracks Bee Dwell Repetitions Toggles Cell

Notes: _____

Track status: 

Learner Eye Profile:

Normal

Visual Impairment

Nystagmus

Strabismus

Glasses

Pupil Dilation

Eye Dominance L R

Ptosis

Hypersensitivity

Hyposensitivity

CVI

Auditory Dominance

Head Supported Y N

Visual Field: 

Monitor Size: _____

Disposition



Light Level



Installation Guide

Step 1: Insert Eye-FX software DVD

Insert the DVD into your computer's DVD disc drive. Once the disc has loaded, it should begin to run automatically. If it does not, navigate to your computer's DVD drive and manually run the disc by double-clicking it.

You will be presented with a welcome screen (figure 1). Click "Next" to proceed.



Figure 1

Step 1: Enter your information

The next screen you will see will ask for your User Name, Organisation and Serial Number (figure 2). Your User Name should match that of your computer. The Organisation should be the name of your school, hospital or your name if you are a private individual. Use the Serial Number for your software. This can be found on a label stuck to the inside of the software case. If you get the message "Serial Number Incorrect" make sure you have entered it correctly, ie; you have not entered the letter O instead of the number 0, or the number 1 instead of the letter l.

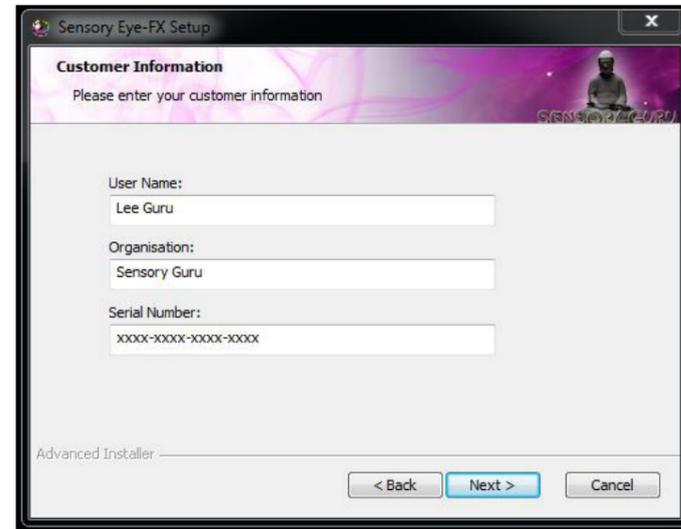


Figure 2

Step 3: Licence Agreement

Confirm you have read, understood and agree to the End-User License Agreement by selecting the "I accept the terms in the License Agreement". Once you have done this, the "Next" button will become available. Click "Next" to proceed.



Figure 3

Step 4: Confirm install

The software will now confirm that it is ready to be installed. Click "Install" to proceed.

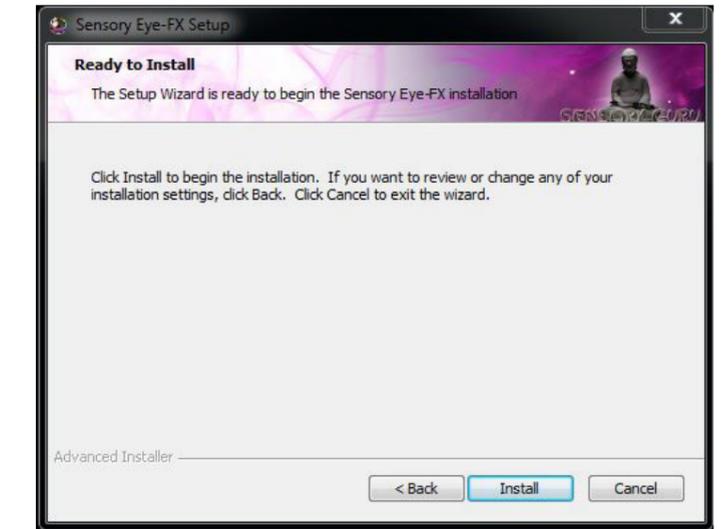


Figure 4

Step 5: Install

The install wizard will now install the software. This procedure should take a few minutes. Once it is complete, a shortcut icon will be visible on the desktop, launch the software by double clicking the icon (see page 12).

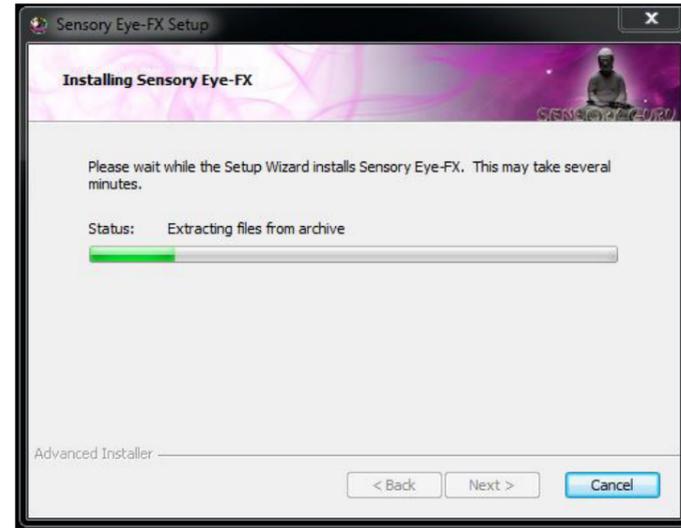


Figure 5

Step 6: Install

Following installation of Sensory Eye-FX an activation page will open in your web browser. Please take time to fill out your details so we can keep you informed about updates and fixes. If the page fails to load please navigate to www.sensoryguru.com/activate-eyefx

Deactivating Sensory Eye-FX Software

1. Click Windows Start Icon
2. Select Control Panel from the list on the right
3. Select Programs and Features
4. Scroll down the list and locate Sensory Eye-fx
5. Click on it then choose to Uninstall
6. Once the software has uninstalled a deactivation page will open in your web browser. Enter the email address you used to register and your Sensory Eye-FX license code. If the page fails to load navigate to www.sensoryguru.com/deactivate-eyefx



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