

Eye Gaze Positioning for Calibration



Introduction

- Eye tracking, or gaze interaction, uses the eyes to access technology.
- The eye tracker interprets light reflected off the eyes to know where the person is looking on a screen.
- Calibration is the process to set-up tracking eye movements for accurate targeting on a screen. There are many options for calibration, and care is needed to select the most appropriate calibration software for the task.
- Positioning the eye gaze technology to fit the person is essential for good calibration.

Integration Ideas

- When positioning and calibration are set-up, the person can interact with technology to engage and learn that their eyes are powerful to affect the world around them.
- Eye gaze skills are developed progressively, from sensory experiences to use of technology for communication, to demonstrate the person's knowledge and to socially connect with others.

Student Positioning

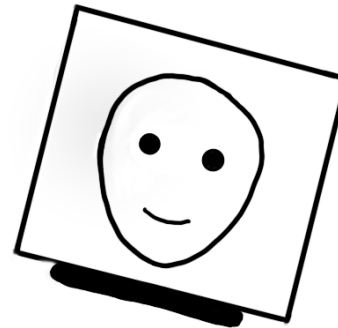
1. Positioning the student is critical for efficient gaze interaction. Ideally, the student is in a supportive position to keep the body and head relaxed while the eyes move freely to look at desired targets.
2. The eye tracker must have an unobstructed view of the student's pupils. Consider eye health and lighting in the room arrangement. Check that clean glasses are worn if the student needs them.

Consult the school therapist(s) about the set-up of medical equipment, such as a wheelchair, standing frame or walker, and how to handle and move the student. Therapists may also consult with the student's seating and positioning team to give specific instructions on positioning. Follow the suggested degree of tilt, recline, lying or standing angle, as well check the head rest, chest or pelvic straps and other positioning equipment prior to set-up of eye gaze equipment.

3. Students will continue to grow and develop, so periodic updates on positioning, in partnership with the school therapist(s), are needed to maintain efficient gaze interaction.

Eye Gaze Equipment Positioning

1. Eye gaze equipment consists of a camera on a bracket attached to a tablet or laptop, or an integrated device that includes an eye gaze tracker and computer. Devices may also have a wedge plate on the back for connecting to a mount. Other devices will need a cradle to provide the plate for mounting.
2. The eye tracker should be 50-75 cm (20-29 inches) away from the eyes. The distance depends on the size of the device screen being viewed.
3. The top of screen should be slightly above eye level.
4. Device position might be angled and/or tilted depending on the student.

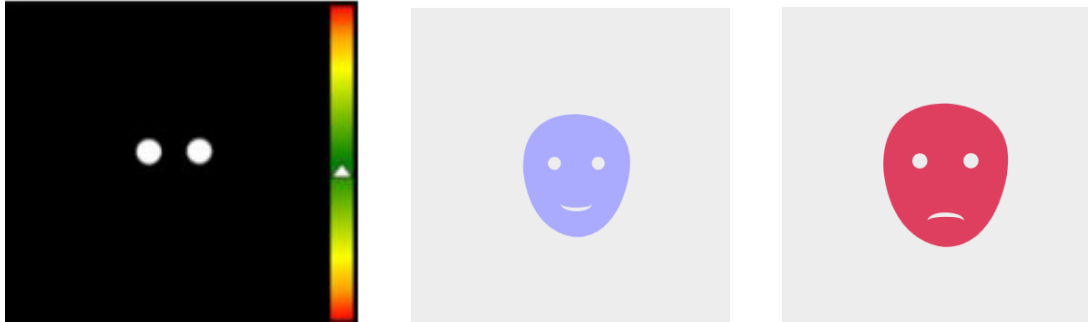


Match tilt of the screen to the position of the head.

Image source: SET-BC

5. Select the appropriate calibration software and launch track status. Move the eye gaze equipment, not the student, to set the distance and centre the eyes on the screen. Tracking status is typically a box with dots to represent eyes, a silhouette of a head with eyes, or it is the camera image of the eyes. Refer to the specific software instructions for how to perform calibration.
6. In general, aim to centre the head in the track status box. For distance, move the device closer or farther away until the small white triangle on the right bar in the green zone, or the image of the face happy.

Examples of track status:



Example of track status using camera:

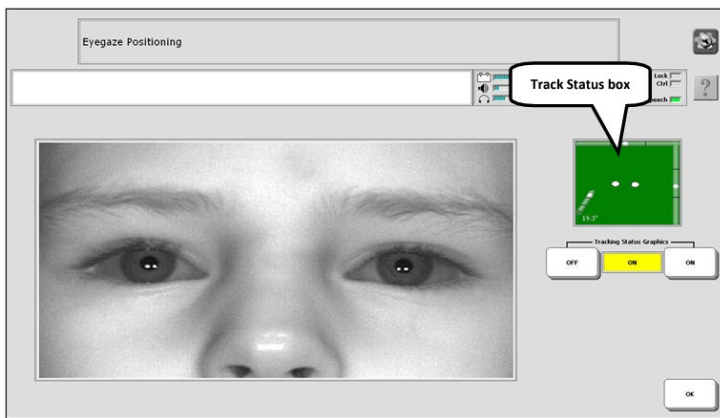


Image sources: Tobii, Grid 3, PRC NuEye

Mounting Equipment

1. Eye gaze equipment can use a built-in kick stand or sit on a desk. Other options include connecting the device to a table stand, table clamp, floor stand or mounting system for a wheelchair (or other positioning equipment).
2. Determine the type of mount needed based on the user's positioning, the environment(s) in which eye gaze will be used, and the activities or people involved. For example, if the user is in a hospital bed, and in a classroom on a different floor of a school, the needs may be different than if a student is positioned at a table or in a stander.
3. Consult the school occupational or physical therapist about mounting. The SET-BC occupational therapist can be available to collaborate and determine the most appropriate mounting system.

Where Can I Learn How to Use It?

- https://issuu.com/inclusivetechnology/docs/eye_gaze_in_the_classroom_2015
Inclusive Technology, Eye Gaze in the Classroom: Your Essential Guide
- <https://us.tobii-dynavox.com/blogs/support-articles/how-can-i-position-the-device-to-get-a-better-calibration>
Tobii Dynavox eye gaze positioning and calibration

Where Can I Get Ideas on How to Use It with Students?

- https://www.zytech.com.au/selection-guide/eye_gaze
Webinar: Eye Gaze selection and Eye Gaze in the Classroom
- <https://www.indigosolutions.org.au/resources/access-methods-for-technology/unlocking-abilities>
Indigo Solutions: Developing Eye Gaze Skills for Learning and Beyond

What If I Want to Know Even More?

- https://connect.tobii.com/s/article/how-to-position-participants-and-the-eye-tracker?language=en_US
Tobii Pro instructions on positioning for eye gaze
- <https://www.tobii-dynavox.com/pages/eye-gaze-pathway>
Tobii Dynavox Eye Gaze Pathway
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4867850/>
Longitudinal study on eye gaze performance for children with severe physical impairments