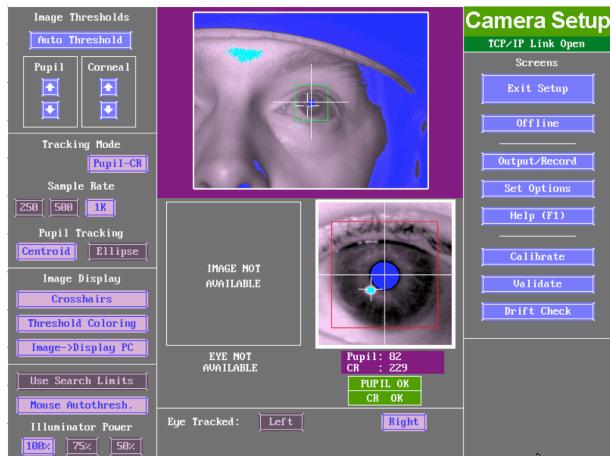


Setting up your participant

September 16, 2021

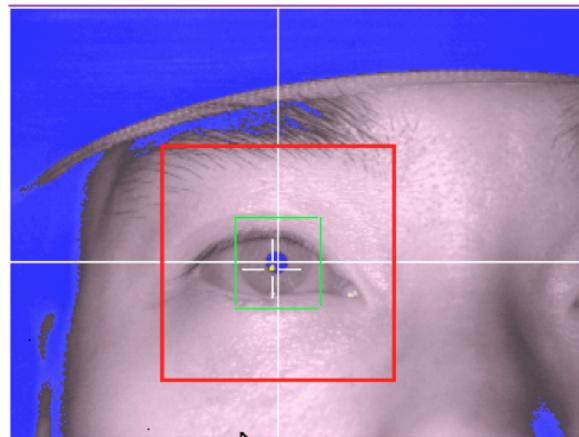
1 Pre-calibration Setup

- (1) Turn on the Host and Display PC
- (2) If the CD C:\ELCL \EXE prompt comes up on the host PC press "t" followed by "enter".
- (3) Begin your experiment on the host PC
- (4) When you get to the set up camera (usually after you have given directions, etc) press "Enter" ..the screen on the host PC should look something like this...

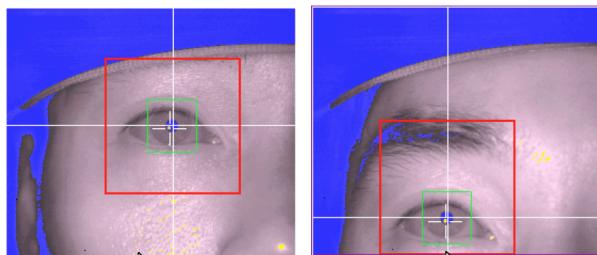


- (I) set the height of the chair and chinrest so your subject is comfortably seated and looking at the top of the monitor. The forehead rest should be just above the eye brow. Here is an optimal eye position:

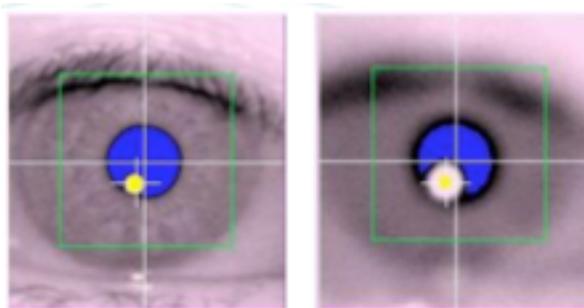
1 PRE-CALIBRATION SETUP



The left figure below shows that the subject is seated too high or too low (right).

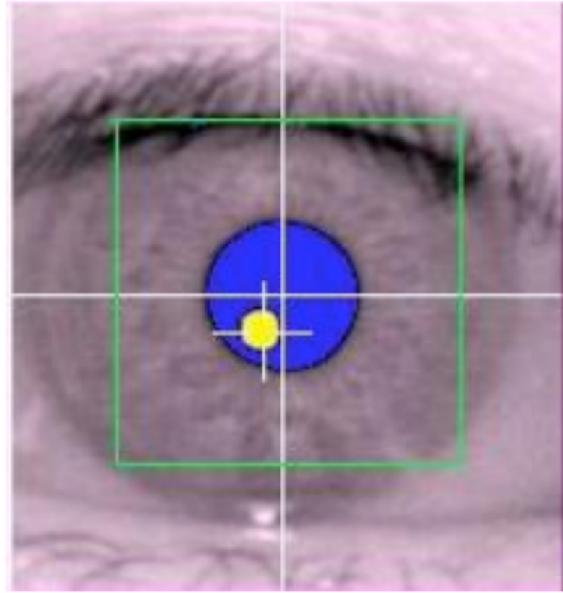


- (II) adjust camera angle and position to get a good view of the eye(s)
- (III) click pupil in the global view to autothreshold (Host or Display PC)
- (IV) focus the camera - minimize size of yellow Corneal Reflection (CR) circle. A well focused eye will look like the left image below, while a poorly focused eye will look like like the right image below. Try to make the eye lashes as sharp as possible.

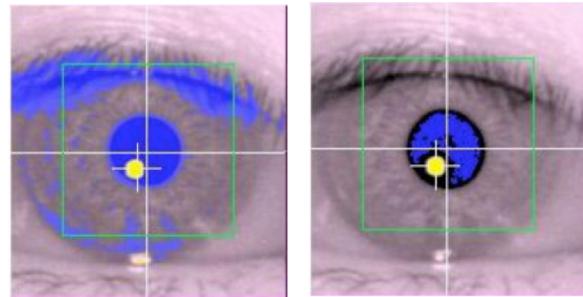


- (V) Autothreshold and if necessary, adjust pupil and CR thresholds.

- (A) The pupil threshold can be adjusted automatically, through the Auto-threshold command, or manually, through the up/down arrow. Here is a good pupil threshold

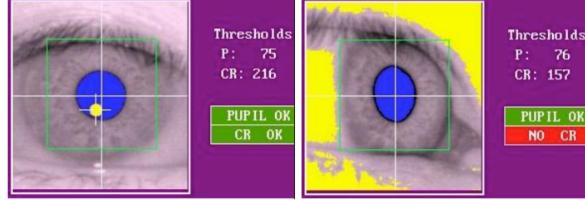


A pupil threshold too low will result in shadows (right) while a threshold too high will result in a noisy signal (left).

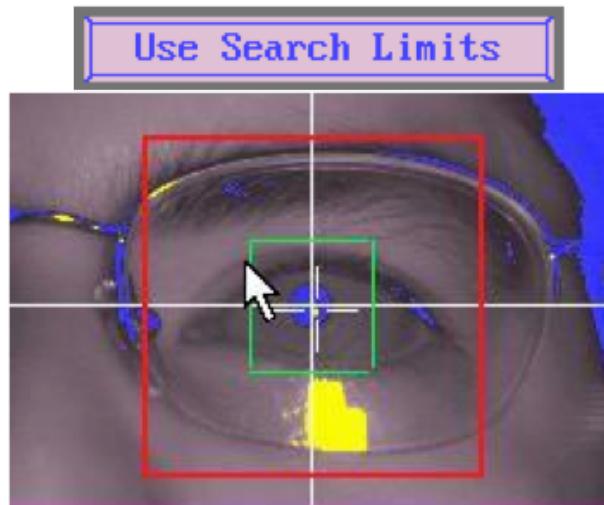


- (i) The auto threshold should almost always set the correct CR threshold (you should see a yellow circle appear near the pupil) (see image on left below).
- (ii) if the threshold is too high or too low (see for example image on the right below) use the CR threshold buttons, or the + and - keys, to manually adjust the CR threshold. Have the subject slowly look along the edges of the display surface and ensure that the corneal reflection does not get lost. If the CR does get lost, a red warning message will appear below the small camera image for the eye indicating No CR on the Host PC.

2 NOW WE ARE READY TO CALIBRATE!



- (VI) search Limits (red box) can be used to reduce the area of the image that is searched to find the eye normally Search Limits is not needed, however with some participants glasses it can be used to exclude regions of the camera image that may otherwise be detected as a pupil or CR



- (VII) Monitor the status of camera image of the tracked eye throughout setup, calibration, validation and recording phases.

(A) PUPIL

- (i) OK (green): Pupil present and can be tracked at selected sample rate

- (ii) SIZE (yellow): Occurs when the pupil size is larger than the maximum allowed pupil size

- (iii) MISSING (red): Pupil not present

(B) Corneal (only operational in Pupil-CR mode)

- (i) OK (green): Corneal reflection is present and can be tracked

- (ii) MISSING (red): Corneal reflection is not present

2 Now we are ready to calibrate!

Almost all eye-movement research requires information on the subject's point of gaze on a display of visual information, such as a screen of text. To compute this,

2 NOW WE ARE READY TO CALIBRATE!

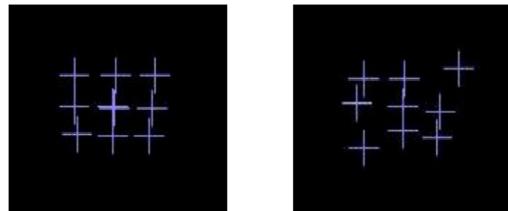
we need to determine the correspondence between pupil position in the camera image and gaze position on the subject display. We do this by performing a system calibration, displaying several targets for the subject to fixate. The pupil - CR position for each target is recorded, and the set of target and pupil - CR positions is used to compute gaze positions during recording.

- (1) To begin calibration press "c".
- (2) A target will appear in the middle of the screen, when the participant is ready press the "space bar"
- (3) The participants will have to attend to the calibration targets as they appear on the screen.
- (4) The position on the display PC that the participants attend to as the targets appear on the screen will be visible on the host PC (see below).



A poor calibration will look like the image on the below right and a good calibration will look like the image on the below left.

- (5) use backspace (to redo a target) and manual accept mode (spacebar twice) to only sample the eye position when the subject is stably fixating the calibration target. Here is what the process looks like from the host PC



4 NOW YOU ARE READY!!

3 Now we are ready to validate!

It is important that problems with the calibration be identified and corrected before eye-movement recordings are ruined. By running a validation immediately after each calibration, the accuracy of the system in predicting gaze position from pupil position is scored. If performance is poor, the calibration should be immediately repeated.

- (1) When you are ready to validate press the "v" button.
- (2) The procedure will be similar to calibration procedure
- (3) Press the space bar to begin the validation procedure (the participant must be attending to the fixation point to begin)



- (4) Validation messages
 - (I) GOOD (green background): Errors are acceptable.
 - (II) FAIR (grey background): Errors are moderate, calibration should be improved.
 - (III) POOR: (red background): Errors are too high for useful eye tracking.
- (5) Repeat steps as necessary until you have good calibration and validation! Sometimes it may take a few tries!
- (6) My rule of thumb is to keep the error under 1 degree of error!

4 Now you are ready!!

If all that worked press "o" (for output) and your study will start!!

5 More information

- (1) To quit during the study you can do clt+alt+Q to quit completely (but you will get no data)
- (2) When the study is over do not press anything as the edf is transferring!! You may lose all of that data
- (3) do not move the camera, as it is set to the right distance for accurate eye tracking!

6 Short list

- (1) turn on computers
- (2) get study up and ready
- (3) during camera set up press "ENTER"
- (4) focus the eye
- (5) set the pupil and CR threshold
- (6) calibrate by pressing "c" ("space" to begin process)
- (7) validate by pressing "v" ("space" to begin process)
- (8) repeat 4-7 as necessary
- (9) begin study by pressing "o"