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Supplemental Information

Microscopic Eye Movements Compensate for Nonhomogeneous Vision within the Fovea

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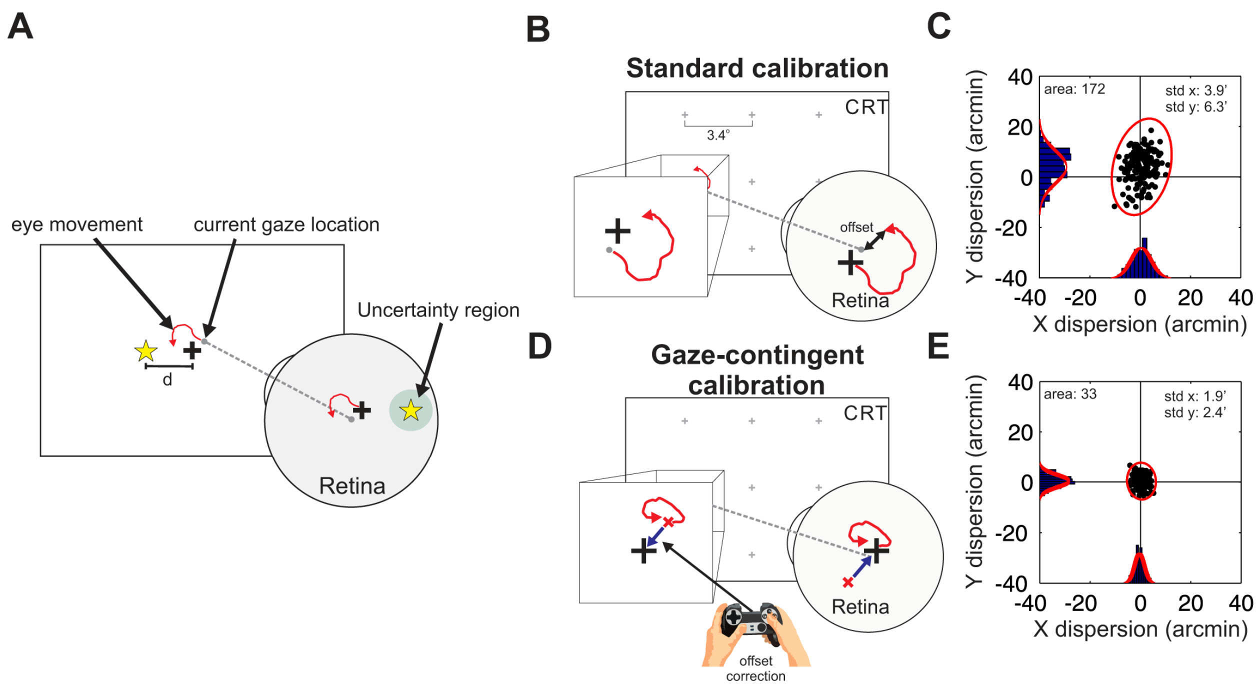

Figure S1. Precise Localization of the Line of Sight, Related to Figure 1

(*A*) Since the eye is always in motion (red line) while fixating on a marker (black cross), a stimulus (star) briefly flashed at a given position on the screen will appear at a different retinal location at every trial, yielding a region of uncertainty about its exact position on the retina (green circle).

(*B* and *C*) This uncertainty also persists during eye tracking, as the standard calibration procedures used to convert eye movement measurements into screen coordinates suffer from the same problem.

(*B*) Standard calibrations use the eye positions measured during fixation on a grid of points. However, as in *A*, eye movements perturb the gaze position measured at each fixation point, yielding uncertainty in the determination of the line of sight.

(*C*) An example of the gaze positions measured at one of the grid points during multiple repetitions of a standard calibration procedure. The 95% confidence ellipse with its area (arcmin^2) and Gaussian fits of the marginal distributions with their standard deviations are also shown.

(*D* and *E*) The gaze-contingent calibration used in this study.

(*D*) Following a standard calibration on a 3×3 grid, the subject fixated again on each of the points of the grid, while the estimated center of gaze was displayed in real time on the monitor (red cross). The subject corrected for possible offsets (blue arrow), and these corrections were then incorporated into the eye-to-pixel mapping.

(*E*) This operation significantly improved the precision of gaze localization. Same data as in *C* after the corrections inserted by the observer.