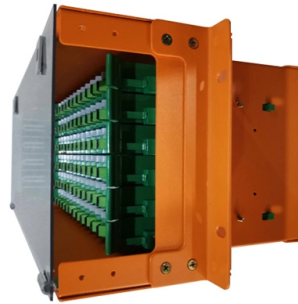


Working principle diagram of an eye tracker



AI Overview

An eye tracker works by illuminating the eyes with infrared light, capturing reflections with cameras, and calculating gaze direction using the pupil center and corneal reflection. Key Components and Process

1. Infrared Illumination Eye trackers use near-infrared light to illuminate the eyes. This light is invisible to humans but creates a high-contrast reflection on the pupil and cornea. The reflection from the cornea is often called a glint, and together with the pupil center, forms the Pupil Center Corneal Reflection (PCCR), which is essential for determining gaze direction.
2. Camera Sensors Specialized cameras sensitive to infrared light capture images of the eyes and the reflections. These cameras are positioned to have a clear view of the eyes, either in front of a monitor (screen-based trackers) or integrated into wearable glasses or VR headsets.
3. Image Processing and Analysis The captured images are processed using advanced algorithms to estimate the 3D position of the eyes and the vector between the pupil center and corneal reflection. This vector is then translated into gaze coordinates on a screen or within a 3D environment.
4. Calibration Before tracking, the system is calibrated by having the user follow a dot or target on the screen. This step maps the individual's eye geometry to screen coordinates, ensuring accurate gaze estimation.
5. Data Output Once calibrated, the eye tracker continuously records gaze data, including fixations (where the eyes pause), saccades (quick eye movements), and dwell time. This data can be used for research, usability testing, VR interaction, or accessibility applications.

Types of Eye Trackers

- Screen-based: Small devices attached to monitors, ideal for studying visual attention on screens.
- Wearable glasses: Track gaze in real-world environments, useful for behavioral research.
- VR-integrated: Embedded in headsets to enhance immersive e...

Article Content

Tobii Eye Tracking Guide — common eye tracking

Eye trackers work by directing invisible near-infrared light into a person's eyes and then measuring the reflection of this light with high-definition cameras to

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Figure 1 shows how a screen-based eye tracker works. The basic eye tracking components are the illuminators, eye cameras, and the processing unit containing the image detection, 3D eye model,

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Eye tracking

Eye-trackers measure rotations of the eye in one of several ways, but principally they fall into one of three categories: measurement of the movement of an object

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How Eye Tracking Works Most modern eye trackers use infrared light. A small emitter shines near-infrared beams toward your eyes, creating a reflection pattern on the cornea. A camera

Schematic diagram of the eye-tracking system. (A) A ...

(A) A photograph of the eye tracking system, showing the camera assembly (camera, lens, and infrared LED illuminators) mounted on the motorized stages used to move the camera around the eye of...

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