tobii pro/fusion

Reach further with your research

Envision human behavior

Tobii Pro Fusion

Tobii Pro Fusion is the next generation of compact high-performance eye trackers from Tobii Pro, that allows to take your research to subjects that would otherwise be hard to bring to the lab. With sampling frequencies of up to 250 Hz, two eye tracking cameras, and two pupil tracking modes (bright and dark pupil), Pro Fusion enables you to adapt your data collection setup to different research populations, scenarios, and data requirements.

What's new in a compact format:

- More detailed data with sampling frequencies of up to 250 Hz.
- More tolerance for head movement with two new eye tracking cameras and improved eye tracking algorithms.
- No external processing unit required, which ensures timing consistency as the data is processed autonomously in three internal processors.
- Support for new PC ports: USB Type-C.
- Pupil size data reported at the selected sampling rate.
- Eye images provided.

Collect your data where your subjects are available

Recruiting test subjects is an obstacle all researchers face. Certain test populations are more difficult to recruit and test in the lab, and some individuals might even feel uncomfortable in this environment.

The size and shape of Pro Fusion allow you to put together a compact mobile lab which enables you to take your data collection to where your subjects are available and feel more comfortable, without compromising on data quality and granularity.

The patented Tobii eye tracking algorithms and robust subject calibration ensures that the eye tacker produces reliable data across different indoor environments.

Support for different data collection scenarios

The success of your research lab lies in surrounding yourself with great collaborators and students, and providing good support for existing projects which includes the eye tracking equipment you use in your lab. If you have a busy lab with students running different projects, it's likely that each project will have different demands on the eye tracking setup. Pro Fusion provides a flexible solution that supports different research scenarios and study designs.

Pro Fusion has a slim design that integrates well with different stand-alone and laptop screens up to 24 inches in size. The eye tracker can also be mounted on tripods and coupled with a scene camera so it can be used in study setups that use real-world stimuli such as physical objects or scenes. The sampling speed of up to 250 Hz allows you to capture data for a wide range of experimental paradigms (fixation, smooth pursuit, and saccade based). The different sampling frequencies and associated bright and dark pupil tracking modes allow you to adapt the performance to your study design and test population.

The Tobii Pro Eye Tracker Manager – a configuration and setting utility – guides you through the setup procedure and manages different setup configurations. This application is available free of charge

High standards of data quality

The Pro Fusion is designed to provide high data quality and tracking robustness.

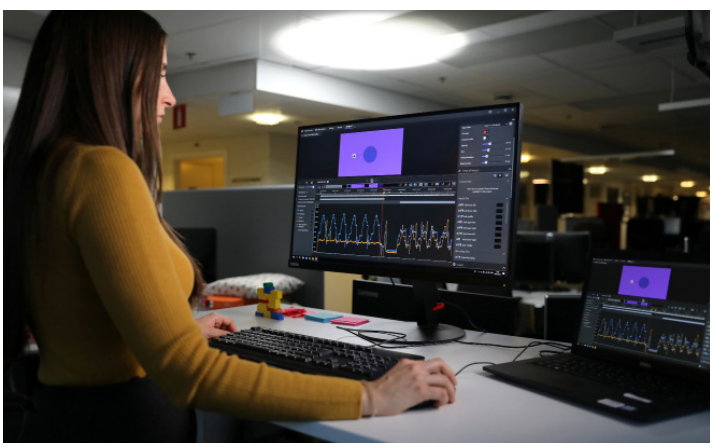
- Tobii's patented 3D eye model delivers superior gaze data, including wide gaze angles and all corners of the screen.
- Demonstrates extremely robust tracking capabilities, regardless of ethnicity, age, or corrective lenses.
- Maintains high accuracy, precision, and tracking robustness during subjects' natural head movements and in different lighting environments indoors.

Software options

Tobii Pro Fusion works with Tobii Pro Lab providing a visual user interface and dedicated software features that guide and support the researcher through the different phases of data collection and processing during an tracking eye tracking experiment – from stimulus setup and test recording to preparing the data for further analysis.

Pro Lab is built on a platform that ensures precise and consistent timing accuracy. You can rely on full transparency - with access to both the gaze data and processed eye movement data (fixation filters), as well as insights into metric calculations. It can be also used to sync eye tracking data with other biometric data streams to like EEG, GSR, and EKG.

Tobii Pro SDK provides access to the full set of advanced gaze data streams that are relevant to your research, and advanced timing support compensates for time differences in real-time, between the eye tracker and the computer running the SDK application, providing high synchronization accuracy. It also offers multi-platform support (including the latest versions of Windows, Linux, and Mac) and API bindings for several programming languages (.NET, Python, and Matlab).



Technical specifications

Eye tracking specifications

Eye tracking technique	Video-based pupil- and corneal reflection eye tracking with dark and bright pupil illumination modes.[1] Two cameras capture stereo images of both eyes for robust accurate measurement of eye gaze and eye position in 3D space, as well as pupil diameter.
Sampling frequency	60, 120 & 250 Hz or 60 & 120 Hz, depending on the hardware version
Precision[2]	0.04° RMS at optimal conditions[3] 0.2° RMS in optimal conditions (raw signal)
Accuracy[2]	0.3° at optimal conditions
Binocular eye tracking	Yes
Total system latency	3 frames (<12 ms at 250 Hz)
Blink recovery time	1 frame (immediate)
Gaze recovery time	250 ms
Data sample output[4]	Timestamp Gaze origin Gaze point Pupil diameter
Eye image data stream	Eye image data stream frequency is approximately 4 Hz (one image per eye). Zoomed-in eye images available in tracking mode. Full-frame camera images are available in gaze recovery mode.
TTL input stream	Not available
Tracker and client time synchronization	Integrated between the eye tracker time domain and the client computer time domain.

[1] Dark pupil tracking is supported in all sample frequencies.
Bright pupil tracking is supported at 60 and 120 Hz.

[2] Tobii Pro uses an extensive test method to measure and report performance and quality of data. Please download the Data quality test report for more detailed information.

[3] Applying Savitzky-Golay filtering (settings in Tobii Pro Data quality test report)

[4] For the complete list of available data and the supplementary data stream, download the Pro SDK documentation from Tobii Pro's website.

Hardware versions

	120 Hz 250 Hz

Setup

Head movement tolerance	Excellent -Dual-camera system, with more images than a one camera system, gives a more accurate data calculation and the best level of precision and robustness for head movement.
Freedom of head movement[5] (at 65 cm distance)	Width × height: 40 cm × 25 cm (15.7" × 9.84") (At least one eye tracked)
Freedom of head movement[5] (at 80 cm distance)	Width x height: 45 cm x 30 cm (17.7" x 11.8") (At least one eye tracked)
Operating distance (mounted on screen)	50–80 cm (19.69"–31.49") from the eye tracker
Tracker setup options	Tracker mounted at tripod, allows for even larger screens and physical objects to be tracked.
Optimal screen size	24" (16:9 aspect ratio)

[5] Describes the region in space where the participant can move his/her head and still have at least one eye within the eye tracker's field of view (trackbox) at the specific distance.

Software and framework compatibility

Software and framework compatibility	Tobii Pro Lab Tobii Pro Eye Tracker Manager Tobii Pro SDK Any application built on the Tobii Pro SDK
Operating system	Windows, Mac, Linux[6]

[6] Linux to come 2021

Eye Tracker Unit

Dimensions (L x H x W) in cm/inches	37.4 × 1,8 x 1.37 (14.72" × 0.70" × 0.53")
Weight	168 g (5.9 oz.)
Connectors	USB Type-C, USB Type-C to USB Type-A adapter AC power
Data Processing	3 Tobii EyeChip™ ASIC with fully embedded data processing
Eye tracking cameras	2
Illuminators	Dark pupil Illumination Modules, Bright pupil Illumination Modules
Power consumption	Typical power consumption: 4.3 W Max. rated power consumption: 9 W
Power options	Directly via USB Type-C connector, or With provided AC power adapter, when using a computer with USB 2.0 Type-A port

Tobii Pro provides eye tracking research solutions and services designed to deepen understanding of human behavior. Headquartered in Sweden, with local teams active on six continents, we help business and science professionals to further their research.

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