

Tobii Studio™

**Comprehensive eye tracking
analysis and visualization software**



News in
**Tobii Studio
3.0**

- Dynamic AOI tool handles moving and transforming AOIs
- New Data Export tool

Tobii Studio™ Eye Tracking Software

In Tobii Studio you can process unfiltered raw data, gathered by Tobii eye trackers. Use tools such as filters, AOsIs for statistical analysis, visualizations, or export to third-party software tools for further analysis.



Heat map from the interactive TV format The Space Trainees. iDTV Lab at Åbo Academy in Finland tested the format using eye tracking.

Perform a broad spectrum of studies

Tobii Studio enables users of Tobii eye trackers to perform eye tracking studies without having to develop their own software tools. Use it to analyze human behavior and vision with regard to a wide variety of research objects and stimuli setups.

The entire workflow in one tool

Tobii Studio provides comprehensive support through all stages of your research project, from preparation to data collection, analysis and presentation of the results. The software ties together the entire eye tracking workflow in a single tool, eliminating the need for separate software for different stages or types of studies. Design your study, run sessions, replay the eye tracking record, visualize the results

and calculate statistics—all in one tool. Involve peers and colleagues in your eye tracking research with remote live-test session viewing.

Powerful, yet easy to use

Tobii Studio is easy to learn and user-friendly. Getting started and performing eye tracking studies is straightforward. Intuitive workflow allows a variety of researcher profiles, including students, to work with the system without extensive training. Large amounts of data can easily be processed for meaningful interpretation and presentation to give you results in a short time frame.

“ The software is user friendly to the extent that essentially anyone can be up-and-running in less than an hour. We were immediately convinced and have only become more enthusiastic.”

Rik Pieters, Professor of Marketing Faculty of Economics and Business, Tilburg University, Netherlands

The following pages take you through the Studio workflow.

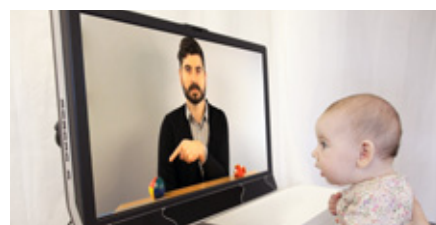


Tobii Studio works together with all Tobii eye trackers for a wide spectrum of studies and experiments. It is used in fields spanning from cognitive, experimental, developmental, social and comparative psychology research to psycholinguistics, HCI, usability, marketing, shopper, sports, and vision research.

Screen-based stimuli setups

Tobii's eye tracking monitors (T series) can be used to display images, text, videos and other screen-based content, thus enabling presentation of both static stimuli and dynamic test elements. Widescreen eye trackers allow for presentation of

large stimuli and distribution of stimuli elements within the test subject's visual field. Example studies include psychology studies related to attention, perception, learning, and memory, and studies of websites, software and computer games.



Large tolerance to head movements makes Tobii eye trackers particularly suited for research that involves infants or children.

Real-world stimuli setups

Tobii's standalone eye trackers (X series) enable research on real-world objects as well as live scenes, affording researchers the ability to perform a broad selection of paradigms without being restricted to a monitor. They also accommodate stimuli

presentation on monitors, televisions, projection screens and other external video screens. Example studies include studies involving printed magazines, mobile devices, control panels, simulators, and interactive displays.



Dedicated solutions allow for testing of mobile devices like tablet PC's or e-readers in natural setups.

Research in real environments

Tobii Glasses is a mobile eye tracker that provides opportunities to conduct studies in real environments while allowing test subjects the freedom to move about in their physical setting without restrictions.

Example studies include qualitative studies of group dynamics, driving, sports, and in-store shopper research.



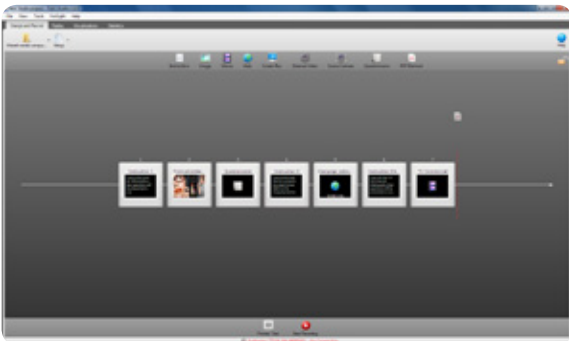
Discreet, ultra-lightweight design enables unobtrusive research in real-world environments.

1 Design

Create complete eye tracking tests quickly and easily, using a wide variety of stimuli.

Test design and stimuli presentation tools

- Types of stimuli: text instructions, images, PDFs, videos, live screen capture, web pages, physical objects or scenes using a scene camera and video feeds from external devices.
- Easy setup routines for attention-grabbing stimuli containing video and audio for low-attention span test subjects.
- Custom coding schemes for logging events and actions.
- Basic questionnaire feature integrated with test subject-independent variables.
- Automatic generation of scenes based on events sent by E-Prime from PST.



Drag and drop stimuli to the workspace timeline.

2 Record

Record and calibrate from within Studio and integrate eye tracking data with other data, such as mouse clicks and key strokes, for a holistic view of test subject behavior.

Record numerous types of study data

- Records eye gaze and pupil data, screen content, web pages, user camera video, microphone sounds, mouse clicks, keystrokes, manually logged events, questionnaire responses, scene camera, external video input, timestamps and distance to the eye tracker.
- Web recording feature captures full-size snapshots of web pages and automatically factors in scrolling and page folds.

Fast and automatic calibration procedure

- Fast, fully automatic calibration procedure takes less than a minute and provides rapid and unobtrusive test session setup.
- Customized calibration routines for infants and other low-attention span test subjects.
- Stable calibrations can be reused for repeat sessions with the same participant.
- Tobii eye trackers' robust tracking capability allows you to track a large portion of the population.

Integration with other tools

E-Prime® Extensions for Tobii

E-Prime® Extensions for Tobii enables integration of Tobii eye trackers and E-Prime® from PST. E-Prime® features include programmable experiments, precise stimulus timing and integration with

various data sources such as response boxes and EEG devices. E-Prime® Extensions for Tobii allows E-Prime® (Professional version) to communicate directly with Tobii eye trackers so users can control Tobii eye trackers directly

from E-Prime®, create eye tracking experiments using E-Prime® and integrate E-Prime®'s experiment design and stimulus presentation, timing and flexibility with Tobii Studio's visualization and statistics tools.

3 Observe

Remote observation of the eye tracking session as it takes place provides immediate insight into test subjects' experiences and behavior. It is ideal for delivering live presentations to different stakeholders in the project and for preparing post-interview sessions.

Remote live viewing

- Follow test sessions in a separate room utilizing remote live viewing over a LAN connection. Gain insight into test subjects' eye movements, comments, facial expressions and interactions, on screen or with physical objects.
- Local live viewing of recording sessions with dual screen setup for controlling and moderating a session from a separate monitor in the same room.



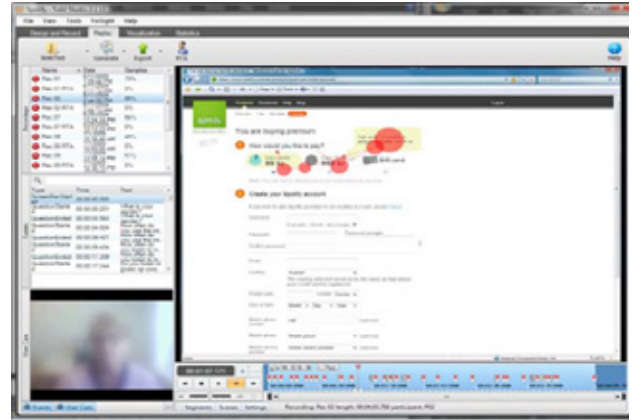
Remote live viewing of eye gaze displayed on the stimulus and user camera.

4 Replay

Selective replay of recorded sessions provides a tool for in-depth qualitative analysis, and is useful for sharing highlights with fellow researchers.

Replay of test subject session

- Replay test subject recordings with gaze points superimposed over the presented stimuli and optional user sound and user camera.
- Post-session logging of events and comments or searching for events such as key strokes and mouse clicks logged during the test.
- Export of video clip replays, optionally with sound and user camera as picture-in-picture.



The Replay tool shows a playback of the recording session including test subjects gaze point, comments and facial expressions.

“ A particularly useful feature for this type of research is that Tobii Studio can calibrate a test subject in less than a minute, plus it saves the calibration for future use with the same test subject.”

Dr Pier Ferrari, Assistant Professor, University of Parma, Italy

5

Visualize

Graphical visualizations of test subjects' gaze behavior provide intuitive insight into your data, making it easier to understand. These qualitative representations are a powerful way to present your findings to colleagues or in your research paper.

Interpretable and convincing visualizations

- Visualization through gaze plots, heat maps, gaze opacity maps, clusters, and bee swarms.
- Static visualizations can be saved in image file formats that can then be easily embedded in reports and presentations.
- Animated visualizations can be exported as AVI video clips.
- Data filtering based on test subject profiles, demographic data and group variables.

“*Tobii Studio analysis tools such as heat maps, gaze plots and cluster analyses instantly gave us an overview of the data and an important base for further and more detailed analysis.*”

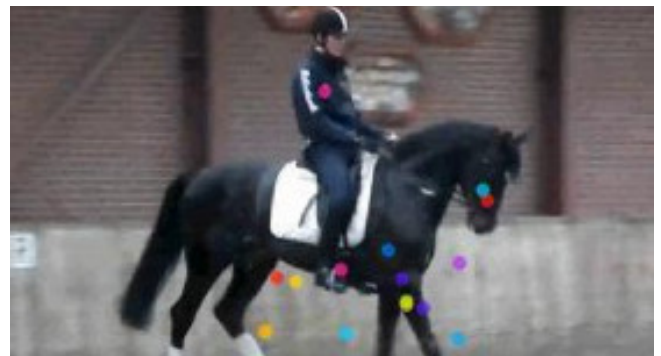
Dr. Natalie Hofer at the Institute for Advertising and Marketing Research, WU Vienna, Austria



Heat maps display gaze data from one or several recordings as a colored pattern. Giving an aggregated view of the results, they provide an efficient tool for multi-person analysis.



Gaze plots display gaze data from one or several recordings as individual gaze points, fixations and gaze paths. The order and length of fixations can also be visualized.



Bee swarms replay videos showing the gaze points of several subjects simultaneously over time. They allow efficient comparison of several recordings and interpretation of participant dropout.



Clusters display areas with a high concentration of gaze points as polygons and can easily be transformed into areas of interest (AOI) for statistical analysis.

Data Processing

Tobii Studio provides different options to filter and process gaze data. Utilize the flexible data export tool, the new AOI tool which supports both static and dynamic stimuli, and run statistics either using the embedded tool or in any third party software.

Export data

- Export raw data or filtered data for further statistical analysis.
- Data can be exported to a text file that can easily be imported into Excel, SPSS, MATLAB, and most other statistical software suites for further analysis and significance testing.
- Batch export multiple recordings or media, either into one single file or multiple separate files.

Areas of Interest (AOIs)

- Definition of AOIs within your stimuli, for statistical analysis of specific features within specified time intervals.
- The new dynamic AOI tool handles both static and dynamic (moving and transforming) AOIs within a broad range of stimuli, such as images, movies, scene camera videos, screen recording, web pages and web recordings, and more.



Use the **AOI definition tool** to define static, moving and transforming AOIs within your stimuli for statistical analysis of specific features within the stimuli.

- The shapes and behaviors of dynamic AOIs are defined in keyframes. In between keyframes, Tobii Studio interpolates the shape and position of the AOI.
- Grouping of AOIs allows for aggregation and comparison of data within and across stimuli and tests, thus supporting a scientific research trial structure.

Statistics

- The embedded statistics tool calculates eye tracking and mouse-click metrics, based on AOIs and AOI groups. View data in tables and charts to structure, overview and flexibly mine your data. Export AOI statistics to dedicated statistical software for further analysis.

Studio fixation filters

Tobii Studio offers well-documented fixation filters that are based on fixation identification algorithms commonly used in scientific research papers. Three adjustable fixation filter implementations (the ClearView Fixation Filter, the Tobii Fixation Filter and the I-VT Filter) are available for eye movement classifications. Users can also choose to use unprocessed (raw) gaze data with or without noise reduction and gap interpolation.

The I-VT Filter chain can be customized to better suit the particular study, improve performance of fixation classification from recordings using different eye trackers and compensate for different levels of noise. This is done by changing the data processing function parameters, which can be saved to a file and loaded and applied later. Data processing functions include:

- Noise reduction functions: Two low-pass filter implementations are available – a symmetric moving average filter and a moving median filter. The resulting data appears smoother than the raw data and allows for more accurate fixation classification of data in which high levels of noise are present.
- Gap interpolation function: This function fills in data where valid data is missing. For example, it prevents a fixation in which a few samples are missing being interpreted as two separate fixations.
- Remove short fixations: Very short fixations are usually a result of noise or other imperfections in the data rather than actual physiological reactions. The remove short fixation function is available both in the I-VT and the Clearview filter

and allows for removal of fixations with a shorter duration than a set threshold.

The I-VT Filter is based on the eyes' angular velocity and operates on eye movement data rather than gaze point pixel locations. As a result, the data is independent of screen resolution, screen size and the distance between the eyes and the stimulus. This means that more of the data is classified correctly as fixations, saccades or unclassified.

More information about the I-VT and other Tobii fixation filters can be found at www.tobii.com.



Complete solutions for eye tracking

Tobii Studio is available in three versions: Basic, Professional and Enterprise editions. Non-recording and student licenses for teaching courses are available. For a complete list of features, please refer to our detailed Tobii Studio product description.

Tobii Studio can be used together with Tobii's complete range of eye trackers. For more information about Tobii eye trackers, please refer to our separate hardware product brochures.

Tobii products are available for either purchase or rental. Webinars, courses and customized training provide you with the knowledge you need to start and perform various kinds of eye tracking studies.

Free Tobii SDK download

If you want to develop your own applications, the Tobii Software Development Kit (Tobii SDK) is available as a free download. Tobii SDK provides a comprehensive toolbox for developing software applications to control and retrieve data from Tobii eye trackers. This is useful for highly customized experimental routines as well as many varieties of interaction applications based on eye tracking. Tobii SDK contains different level application programming interfaces, well-documented code samples and a comprehensive Developer's Guide.

Application Market for Tobii Eye Trackers

To support the scientific community, Tobii has created an application market for the sharing of applications that build on the Tobii Software Development Kit (Tobii SDK): appmarket.tobii.com.

System recommendations

For optimal Tobii eye tracking hardware and software performance, Tobii recommends using computers that meet certain specifications. For more information, please refer to our separate Systems Recommendations document.

Tobii Studio™ is compatible with the following operating systems:

- Windows XP® (only 32-bit edition)
- Windows Vista® (32-bit and 64-bit)
- Windows 7® (32-bit and 64-bit)

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