Eye Tracker ATV-1

Gaze point and pupil's reactions are detected in real time with high frequency and accuracy

Real time data on the gaze point and the gaze movement by recording the pupil's position for each eye.

Analysis of affective responses and cognitive load based on high speed recording the pupil's reactions.

Application scope: computer interface ergonomics and advertising effectiveness, scientific research in neuromarketing and neuropsychology, cognitive and developmental psychology, sociology, etc.

High-tech electronic optical-mechanical system of Eye Tracker:

Modification ATV-1K

Desktop application with individual monitor

Modification ATV-1S

Placed on the stand and applied with a big screen.

Option of simultaneous work with several participants in the network mode.

- video record of eyes with frequency of 500 or 1000 Hz and calculating the gaze point with high accuracy of 0.4°;

- steady eye tracking (even with glasses and lenses) in daylight and low light conditions and also quickly restarting the tracking after blinking, head turns or moving head in or out of headmovement box (work zone);

- calculating of gaze data without a special chin rest, in natural environment with high accuracy of registration in widened headbox;

- detect saccades, fixations, tracking and blinking on base data from video cameras on the face position and eye movements with the help of powerful computing processor and original efficient high-precision algorithm;

- automatic eyetracker calibration - for monitor, large TV or wall-mounted projector;

- detecting automatically the spatial coordinates of a big screen in relation to Eye Tracker using an additional back side camera of the ATV-1S modification;

- using eye tracker with additional registration devices (with high accuracy of synchronization) for analysis and interpretation of physiological data with data of Eye Tracker.

Main eye tracker features

Eye tracking technique	Monocular or binocular, "dark pupil".
Scan rate	500 or 1000 Hz
Accuracy	0.4°
Resolution	0.15°
Headmovement box	The distance from eye tracker to eye – 50-80 cm. The range of head movement 40x40 cm (at a distance of 60 cm.)
Dimensions	500 x 150 x 85 mm
Weight	3200 g
Open interface	API, LSL (Lab Stream Layer) provides a streaming mechanism for real-time data transmission and storage.
Ability to work with systems of physiological signals registration	Medicom MTD Ltd., Russia: Electroencephalographs "Encephalan-Next" (24- and 36-channel EEG-headset with bio wristband etc)
Monitor screen size	24"
The size of a large TV screen or projector screen	The angular size should be within +/- 20°

Some software features

Measurable characteristics	Coordinates of gaze point and pupil size for each eye with selected scan rate, distance to each eye.
Data export	XDF (Extensible Data Format) and CSV (Comma-Separated Values).
Statistical parameters by eye tracking events	The total duration and number of long and short fixations for a given time interval and selected "areas of interest", the total duration and number of saccades, the number of blinks for a given time interval.
"Area of interest" (AOI) editor	Manual and automatic setting of AOI of static and dynamic visual objects.
Visualization of service data (to control the correctness of eye tracking process)	Video of 2 eyes close up with the allocation of pupils and corneal reflex, general face view with automatically selected characteristic points, gaze tracks with sliding window (for each eye individually and/or averaged track on both eyes), calibration results
Additional functions	Configuration of the network, server and content screen parameters, calibration pattern editor, automatic determination of the spatial coordinates of the common screen relative to each eye tracker, printing of results.

Ways to visualize the gaze spatial characteristics in relation to the content

● **Heat map (1)** is the overlay of a translucent color image on the content; the color corresponds to the duration of viewing different areas of the presented content: blue – no gaze fixation, red – preferential fixations.

● **Fog map (2)** is an overlay of an "illuminating" mask that hides the content with a black background, but some areas of the background have transparency proportional to the duration of the gaze fixation a given area of the image.

● **Scan path (3)** is visualization of gaze spatial movement over the presented visual content, wherein the gaze fixation points are displayed as circles which size is proportional to the duration of gaze fixation.

● **"Areas of interest" report**

To generate a report on video content, using the editor "areas of interest", the application first marks areas to control the level of focused attention of respondents.

For each "areas of interest", the total duration, number of fixations and other statistical parameters reflecting the preferences of respondents are analyzed. As a result of the analysis, a report is generated for each of the "areas of interest" in tables or charts.
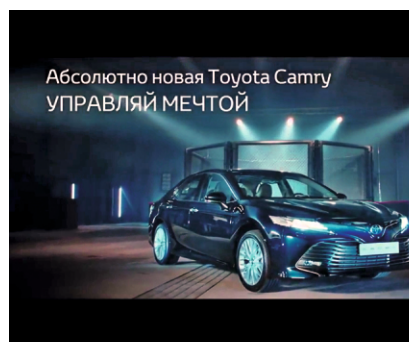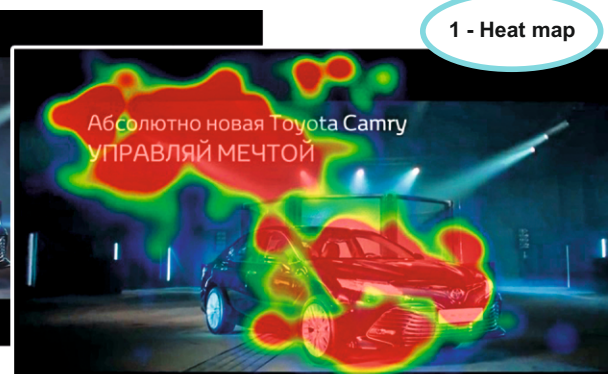
1 - Heat map

Source content
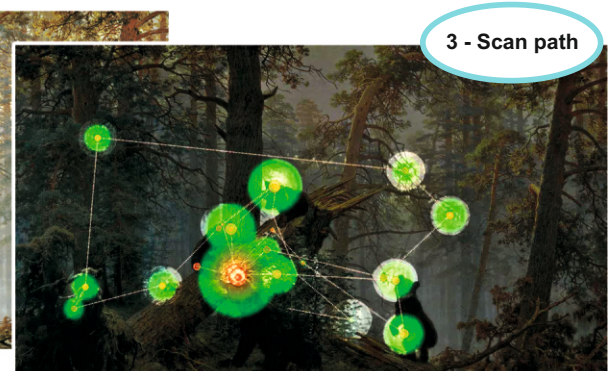

2 - Fog map

Source content

3 - Scan path

Source content