

eSmart OPU - DK

<http://testeyetracing.zzz.com.ua>

Manual user



About this manual

Thank you for using our eSmart OPU - DK mobile app. The advanced technologies of eSmart will allow you to study human eye movements and their movement trajectories, which allows you to reveal the structure of the individual's relationship with the environment, the relationship of the oculomotor system with the central nervous system, and helps to study the mechanisms of the brain and their disorders.

This guide is intended to help you understand the functions and characteristics of the application.

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What the company does

The company is working on the study of human eye movement and the trajectory of their movement, which makes it possible to reveal the structure of an individual's development with the environment, the relationship of the central nervous system's ophthalmology, and helps to study the mechanisms of the brain and their disorders.

Analysis of the relationship between the oculomotor system and the central nervous system of psychology, studying the mechanisms of the brain and their disorders, the identified dynamics and physiological states of a person, the patterns of perception, thinking, ideas, differentiation of goals and attitudes of the individual. The increasingly widespread use of eye tracking hardware in experimental studies of neural processes makes the software required for determining the coordinates of the pupil of the eye in video frames obtained during eye tracking. Used software tools that automatically recognize the pupil of the eye and calculate their coordinates. An important feature of information technology.

Is the simplicity of the hardware. The experiment can be carried out using a modern smartphone equipped with a video camera with a resolution of 12Mpx at least 120 frames per second and a processor with a clock frequency of 1800 MHz for data processing

Areas of use

Practical application and information technologies for diagnosing a psychophysiological state using eSmart and the developed tools for its support are advisable in:

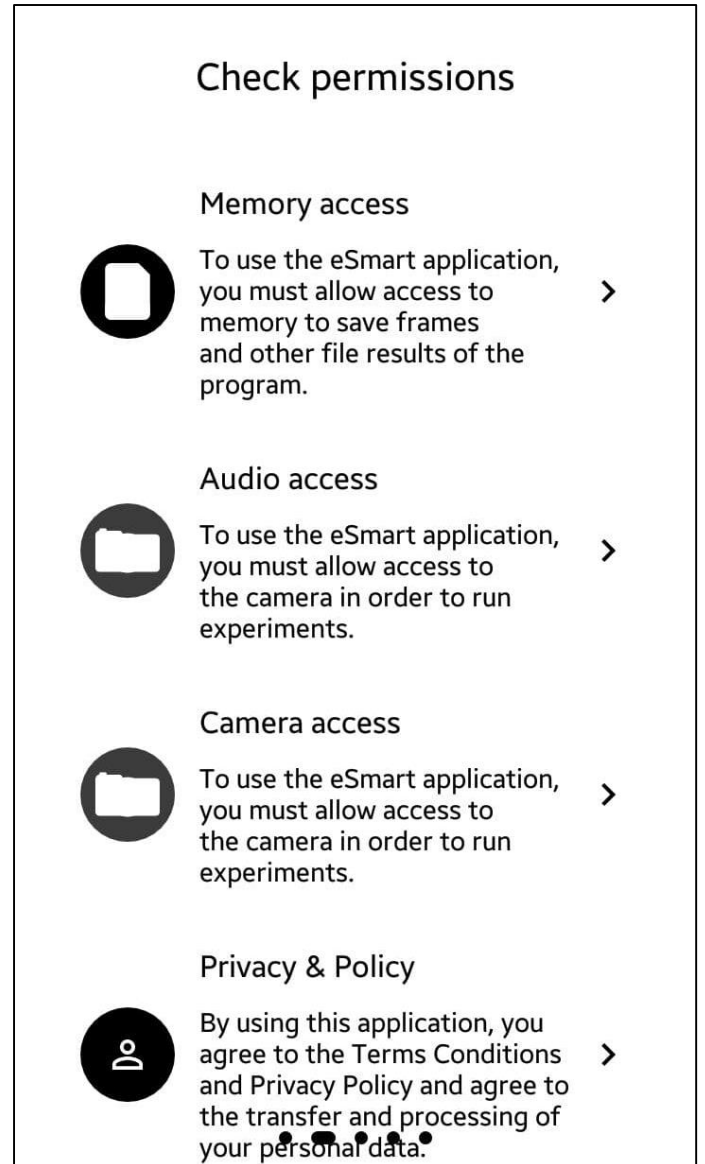
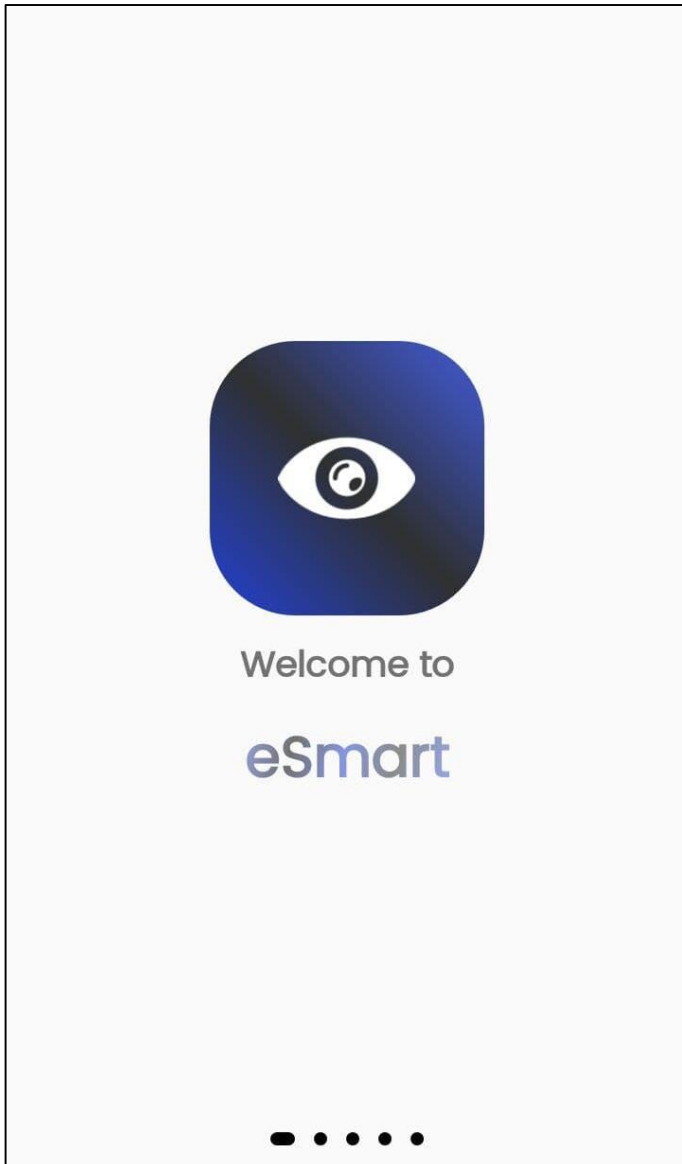
- medical organizations (for the diagnosis of the degree and depth of post-traumatic stress disorder of a person in neurology and ophthalmology)
- agency (for objective control of the condition before the flight in order to reduce the risk of the human factor)
- military structures (for professional selection in special forces, in aviation)
- educational institutions (for psychodiagnostics of personality, cognitive processes)
- sports organizations (in high-performance sports - the training process of athletes in preparation for competitions), etc.

Uses include: cognitive research, medical research;

- studies of adult patients
- study of adolescents
- study of elderly patients
- sports training
- communication systems for completely paralyzed people
- detection of viability

Application functionality

Welcome screen



Please confirm all permissions for the correct operation of the application.



eSmart

This application is used in medical studies of human eye movement and the trajectory of their movement, which allows you to reveal the structure of the individuals relationship with the environment, the relationship of the oculomotor system with the central nervous system, contributes to the study of the mechanisms of the brain and their disorders.

In order to carry out experiments on tracking the movement of the oculomotor apparatus, you need to have software for generating test signals. Therefore, you need to download the Signal Manager application, with which you can create test signals of various behaviors.

[Download](#) [Share](#)
[Signal Manager](#) [signal manager](#)

For a complete patient examination, you need to run the Signal Manager program, the program generates a visual stimulus, which the eye must follow.

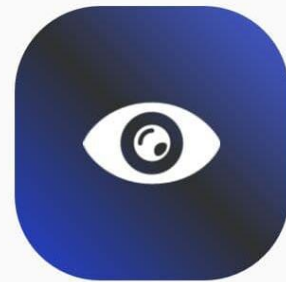
With this mobile application, you can download or send the program to any service to use it.

Get in touch if you need help with a project

Ukraine

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eSmart

Get started

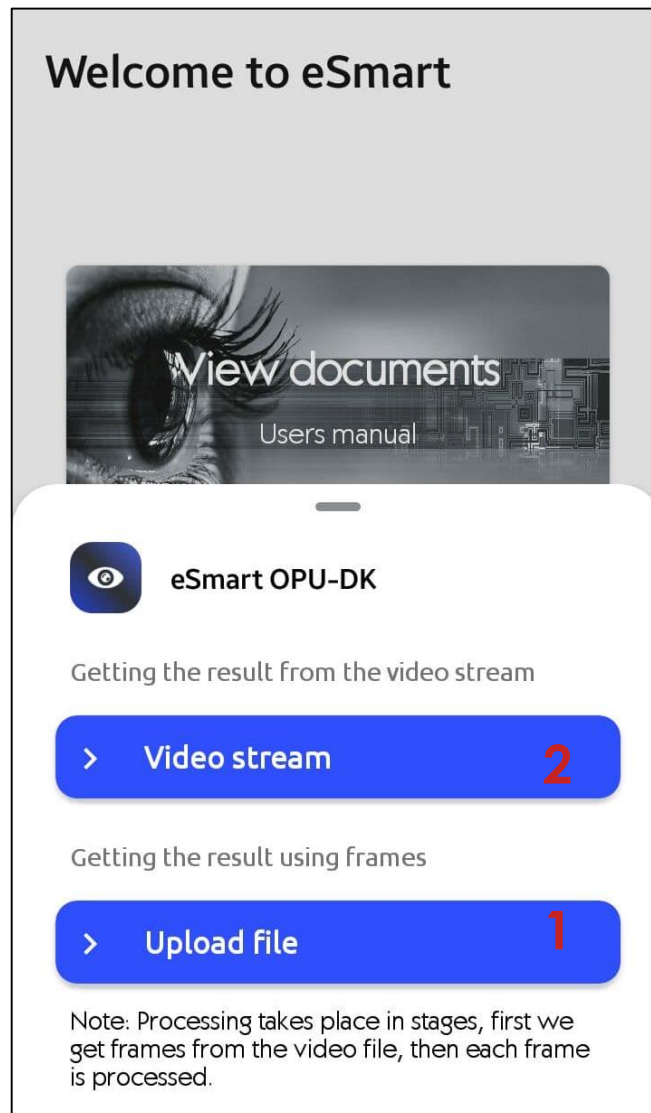


Receiving input data

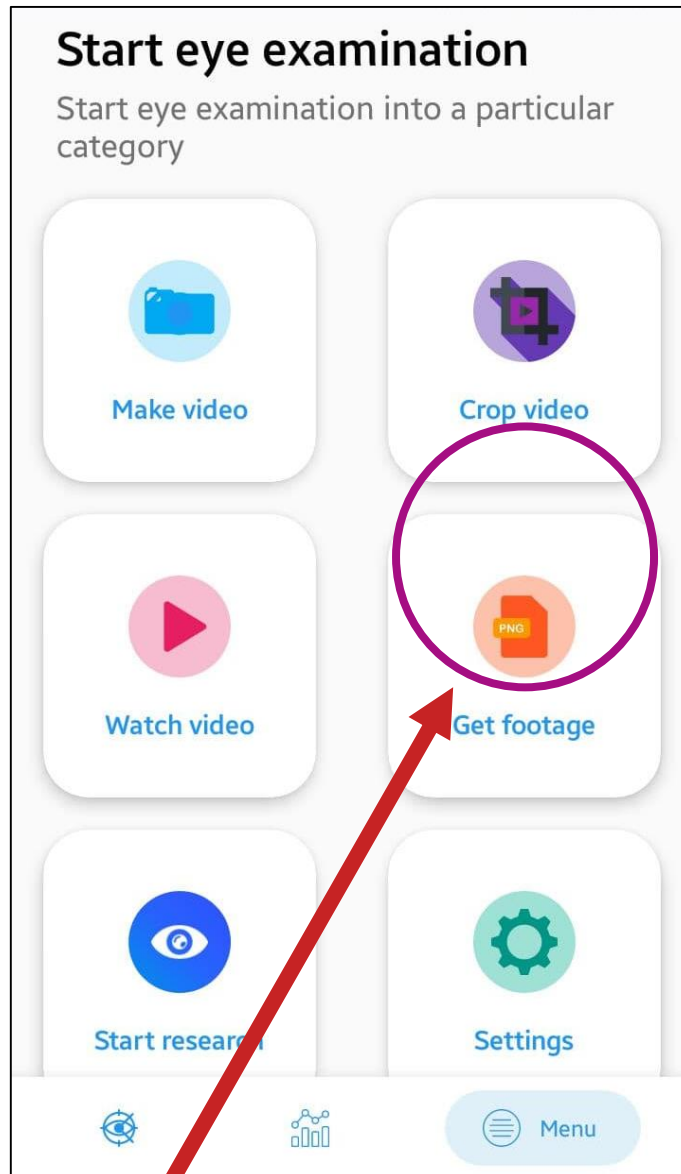
To examine a patient, you need to obtain input data for processing them.

There are 2 options for receiving input data:

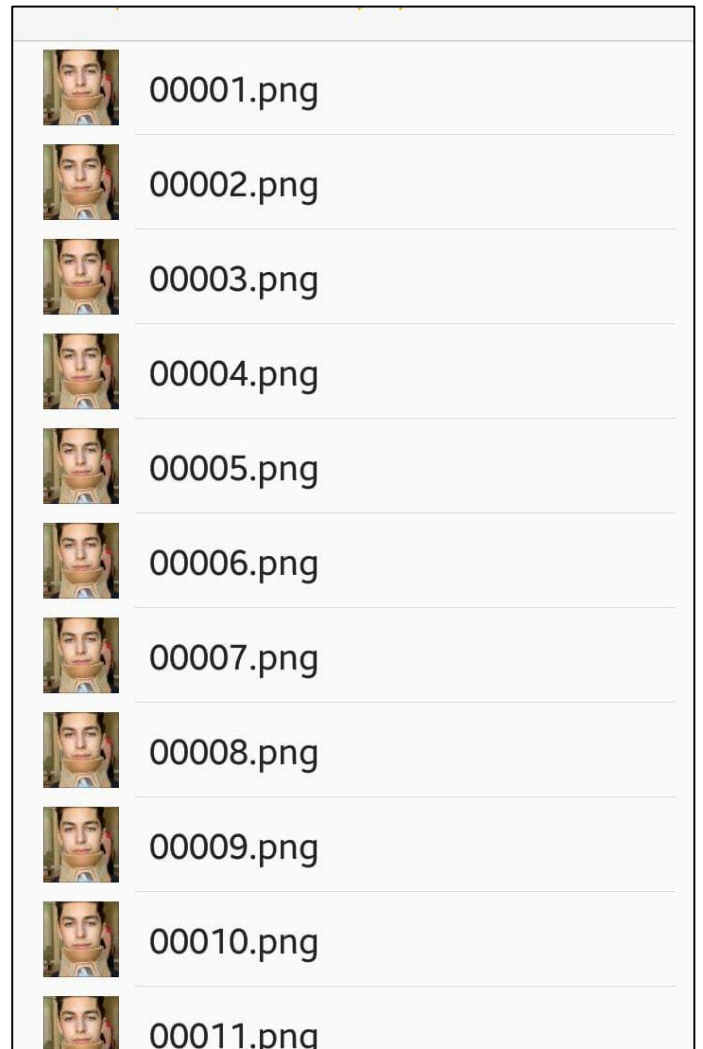
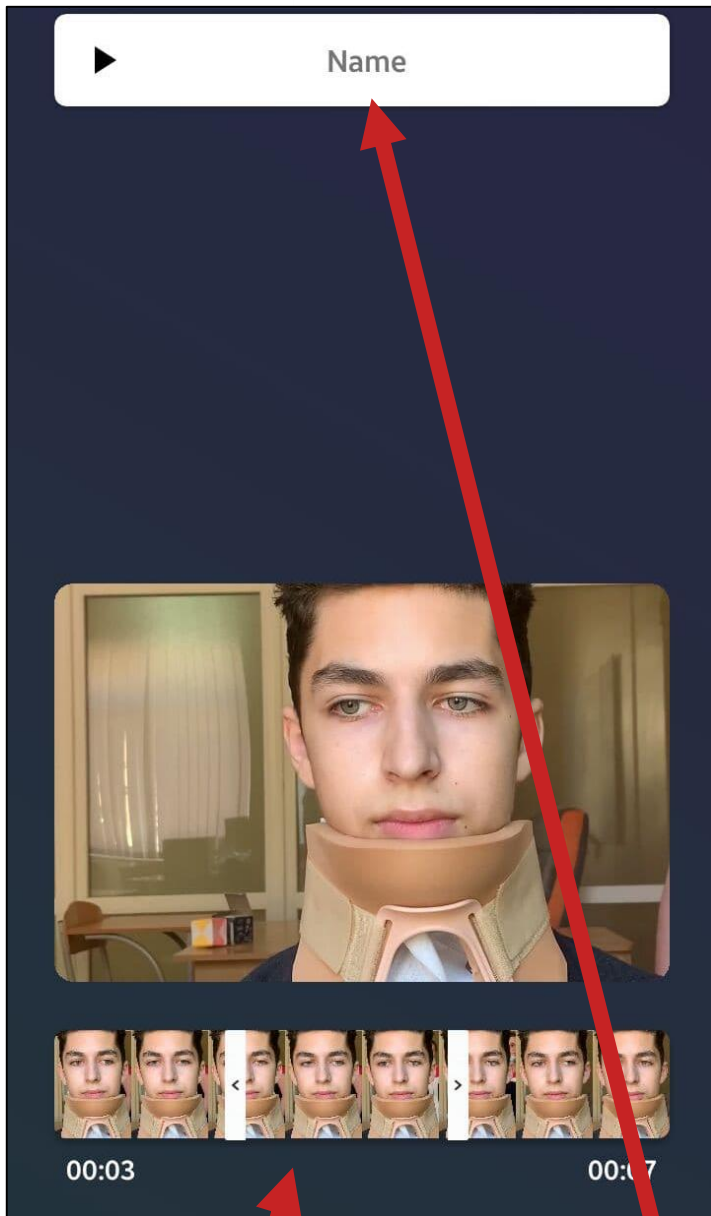
1. Crop video into frames
2. Video stream



1 Crop video into frames



Click on the button and select a video.



Choose the interval you want.

Enter the name of the folder where the frames will be stored.

1 Video stream

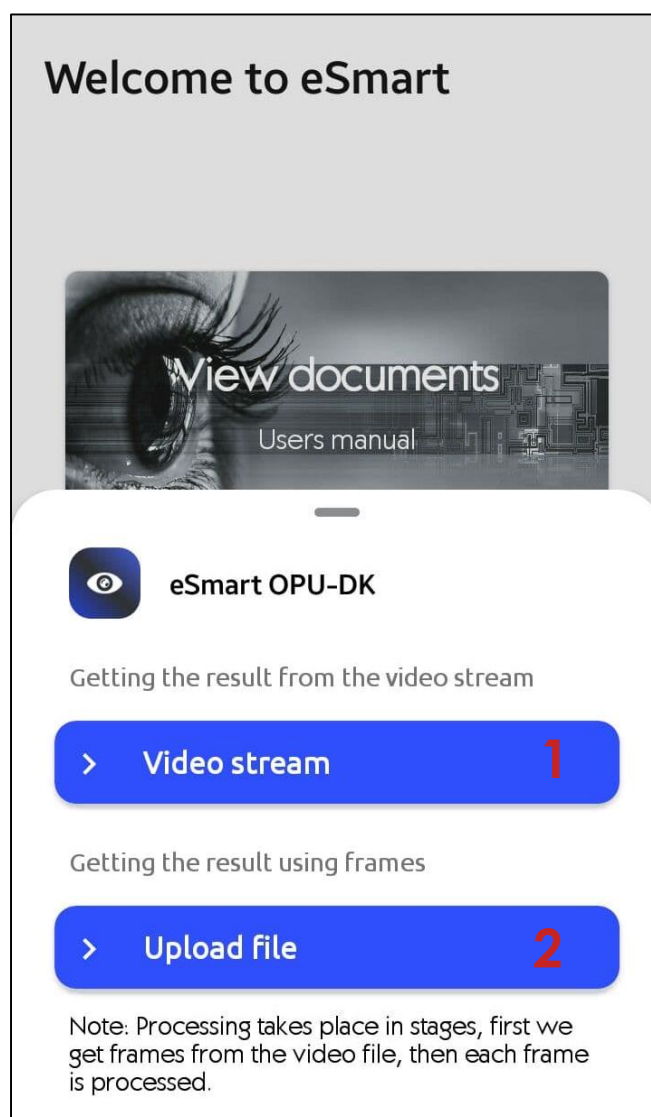
For this method, you need to click the “Video stream” button, select a video and process.

Processing algorithms

There are 4 processing algorithms, to choose one of the algorithms go to settings.

Next, choose one of the methods for obtaining the input data.

Once you have received your input, choose how you want to process it.




1. Input data as a video stream.
2. Input data in the form of a folder with frames.

< Add new data ✓

ID 1605853493770



Account name

Write here 

Data description

Here you can briefly write a description of this study

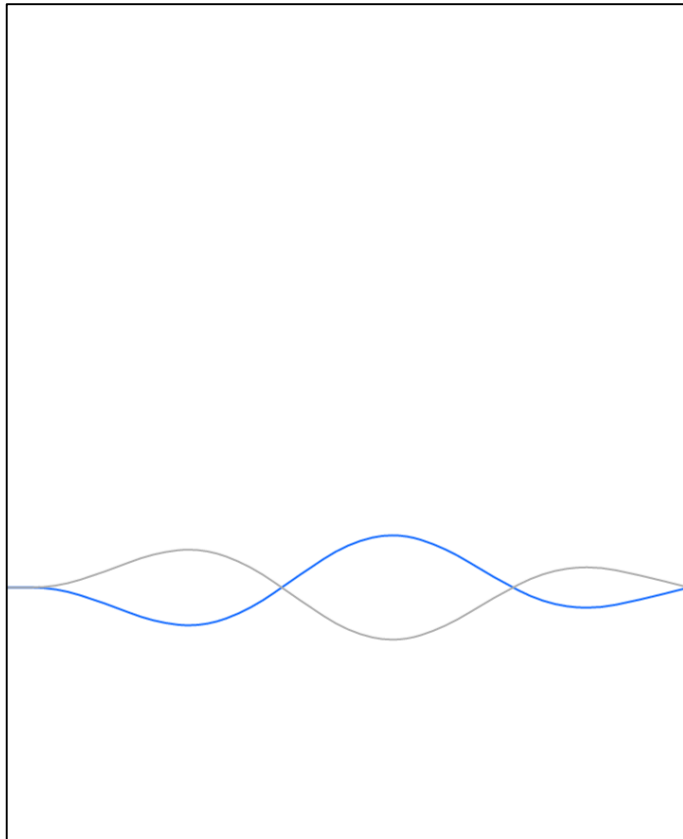
Attachment

 Enter the name of the folder where the frames 

Note: here you can enter the name of the directory in which the images for processing are stored, by clicking the plus button you can select a video for processing.

Next, fill out the form.

Getting the output data



25%

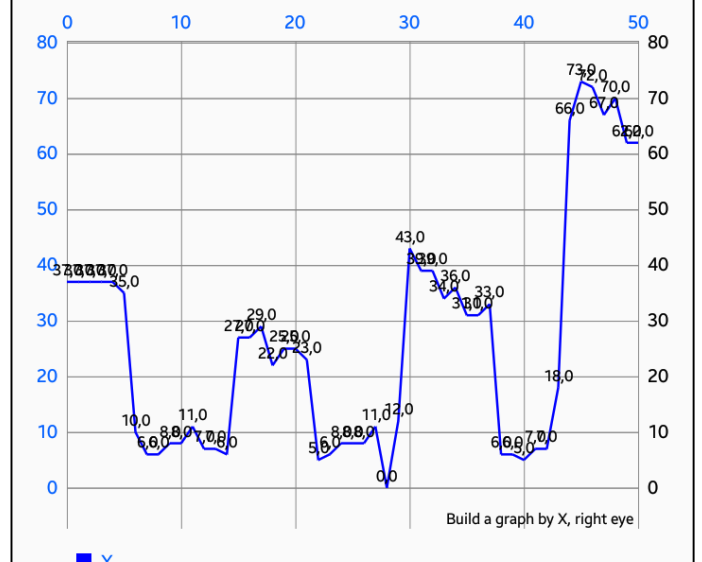
Please wait while processing!

processed images 1 out of 5
Free Memory 687.0 MB

← ID 1598197127434 AA

Chart, left eye Chart, right eye Data, left eye

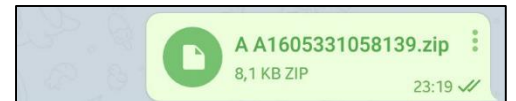
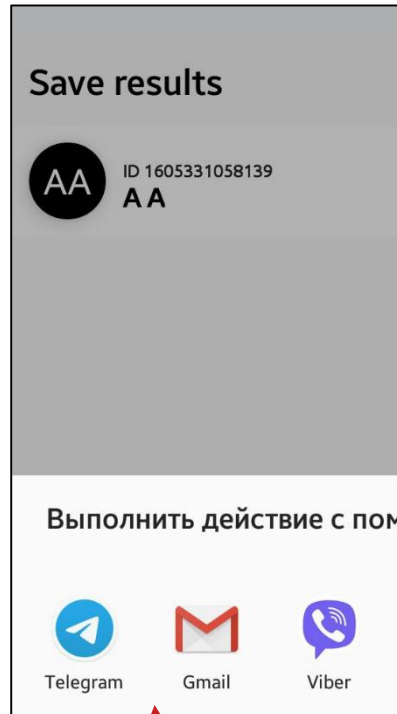
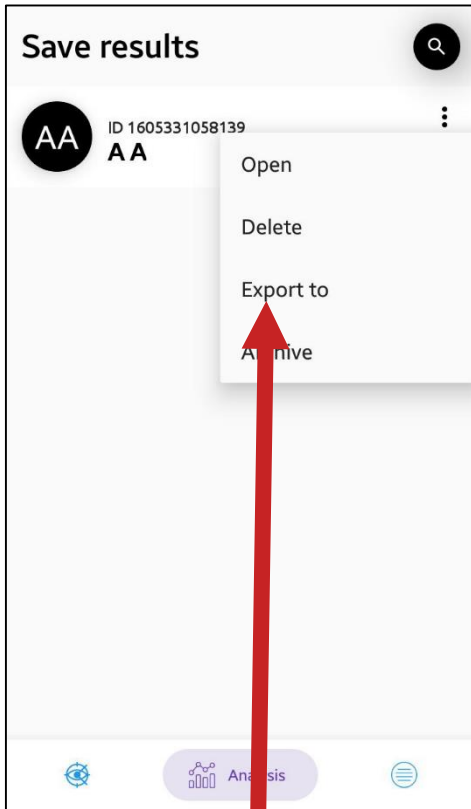
Edit Make anti-aliasing | Smoothing degree 10



Build a graph by X, right eye

Automatic data generation disabled

Share data

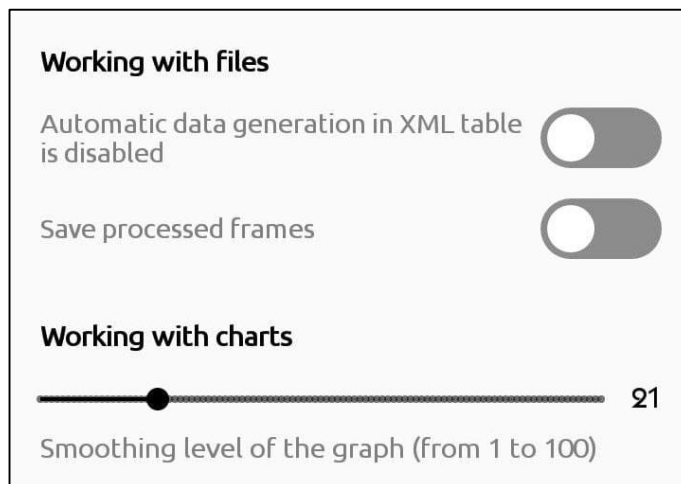


Click on the button to send the data.

And select the service where you want to send.

Settings

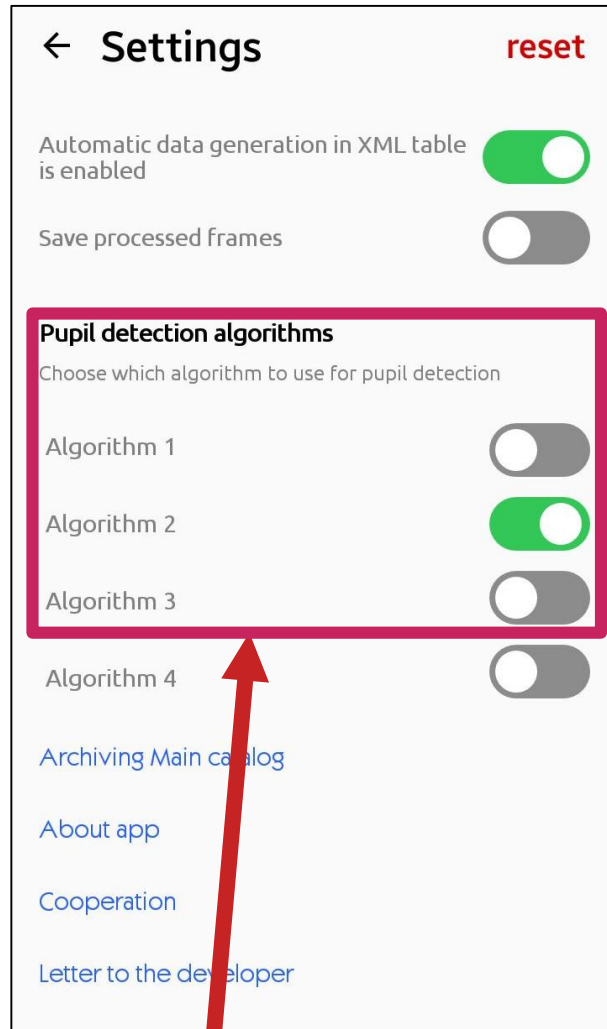
Working with files



You can select the item in the settings so that the generation in the xml file is automatically reproduced.

You can select the item in the settings so that the processed frames are saved to a folder.

Pupil detection algorithms



There are four algorithms, you have the opportunity to choose which algorithm to analyze.

Archiving results folder

To send all patient results, you first need to zip the folder by clicking "Archive Main Directory".

[Archiving Main catalog](#)

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Feedback

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How conduct to test

Before starting the test, make sure you are in a well-lit area. Make sure the light does not shine on the smartphone camera lens.

- 1) Run the Signal Manager program
- 2) The patient is positioned in front of the recording device (smartphone camera). The patient's head is fixed with special equipment. A computer monitor is placed in front of the patient, where, thanks to the program we have written (Signal Manager), at certain intervals, a test signal appears on the screen in the form of a bright point (light spot) called a stimulus.



At the same time, a video camera is turned on to record eye movements from the start to the final position, determined by the coordinates of the light spot.

3) After filming at various test signal amplitudes (distances to the light spot). The eye movement video file is saved in the device memory. Next, choose which algorithm you want to analyze and select the input file. After all the steps taken, choose how to get the output data.

4) The analysis result is saved in a folder. Where there are two CSV files with coordinates.

The result.csv file contains coordinates and their smoothed coordinates.

The resultRegeneration.csv file contains the coordinates processed by a special algorithm and their smoothed coordinates.

eSmartResults > A A1605331058139 > 1607784601886_28-11-2020_21_36_35 > Coordires



result.csv



result.csv

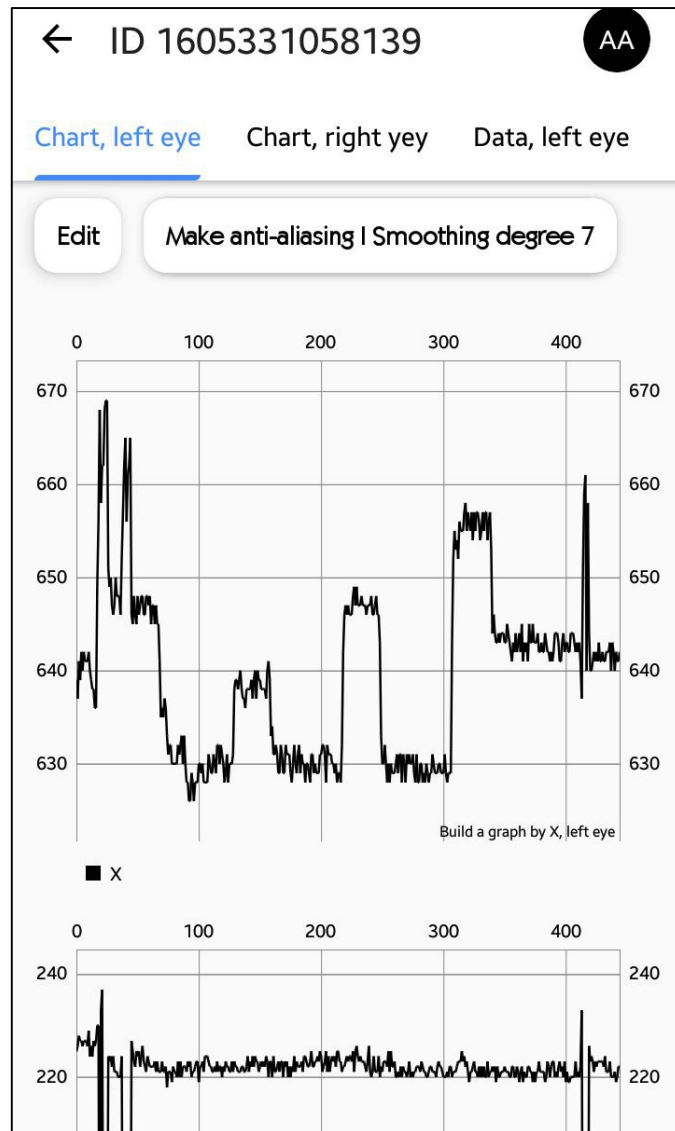


resultRegeneration.csv

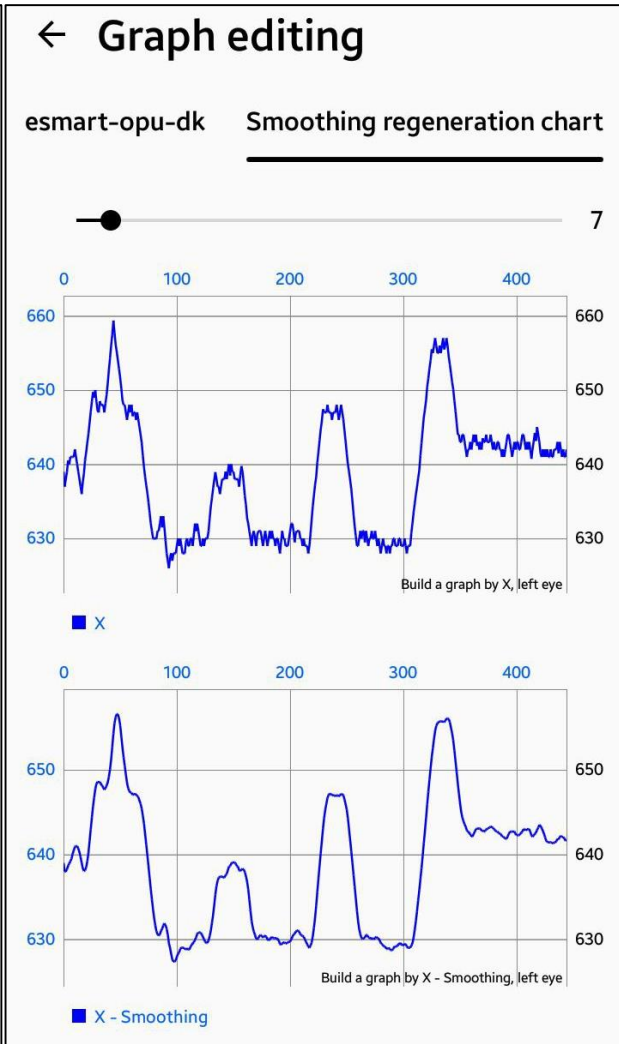
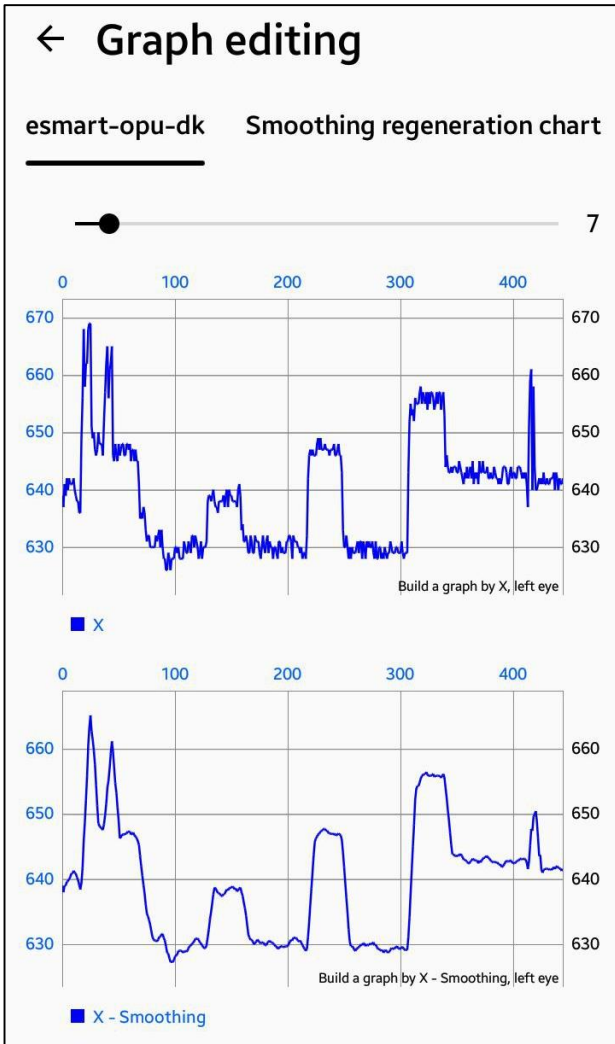


resultRegeneration.csv

The result is in the application.



Press the “Edit” button to select the smoothing level.
Activation will then open.



Where you need to choose the level of anti-aliasing for each array of values.