

EyeFaceGUI

User Guide

Version 4.6.0912.1



ADVANCED COMPUTER VISION SOLUTIONS

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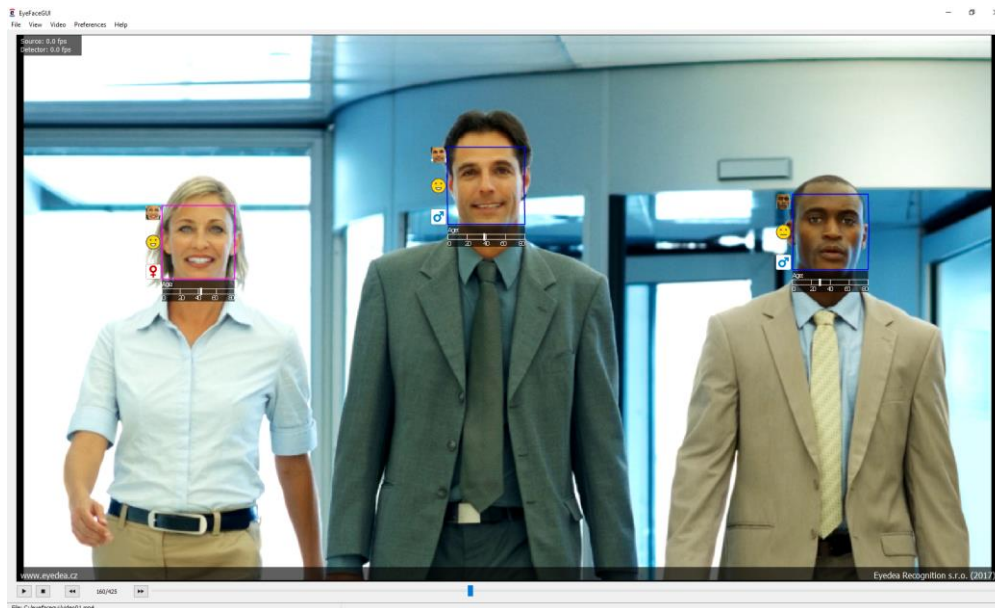
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1 Introduction



The software EyeFaceGUI is a desktop application, which demonstrates the use of EyeFace SDK, the software library for face detection, face analysis and face landmark detection. The program processes videos in various formats, resolution, and quality, it detects faces in them and applies advanced detection functions. Allows to use three types of video sources: video file, USB camera and IP stream.

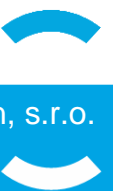
This software enables above all:

- Open and play video files, USB camera streams, IP video streams.
- Detect human faces in video, run face analysis (gender, age, ID) and detect face landmarks (eyes, eyebrows, nose, mouth, and chin) all in real-time.
- Grab video frames to file.
- Demonstration of EyeFace SDK functionality and performance.

EyeFace SDK version info

Each version of EyeFaceGUI reflects the used version of EyeFace SDK. Four version digits are used, first three are the same as used version of EyeFace SDK has, and the fourth digit is the version of EyeFaceGUI itself.

This guide is written for the operation system Microsoft Windows 10, 64b, in English, in the default setting. Some of the described procedures and legends of the control elements of the operation system can differ for other operation systems.

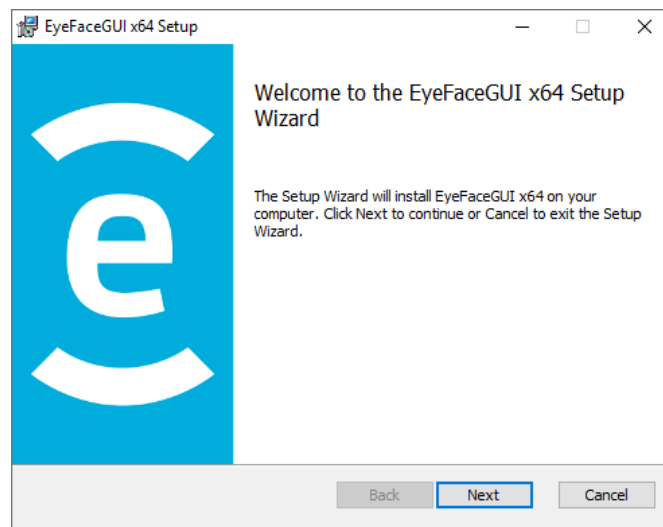


2 Installation and Uninstallation of the Program

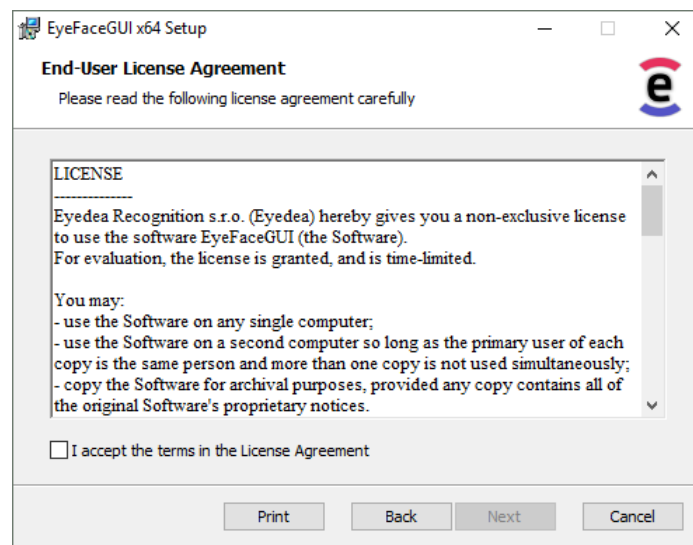
2.1 Installation of the Program

If you have installed the previous version of the application EyeFaceGUI, proceed in the same way as in the case of the first installation. Updating of all necessary files takes place during the installation.

Installation of the program will start running the file EyeFaceGUISetup64.exe. After the installation of the required dependencies the following window will be displayed, it will inform on initiation of the installation process.



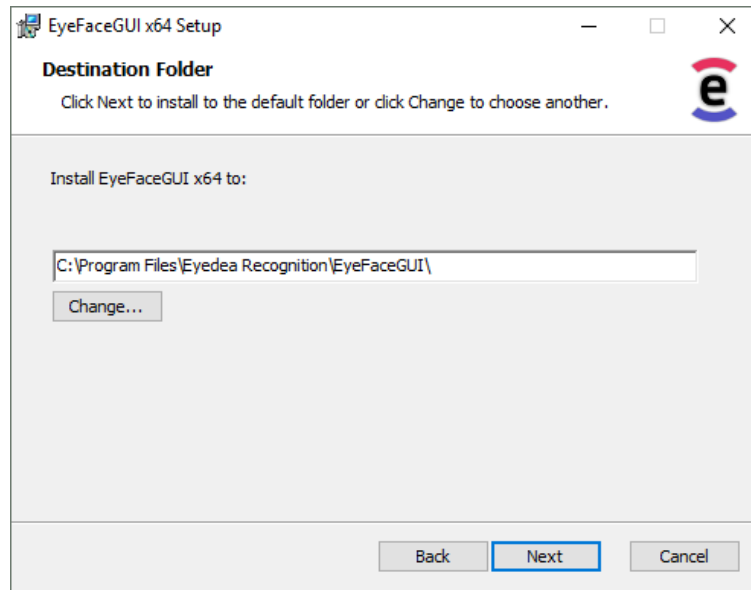
Next, we will get using the button **Next**, a License Agreement will be displayed.



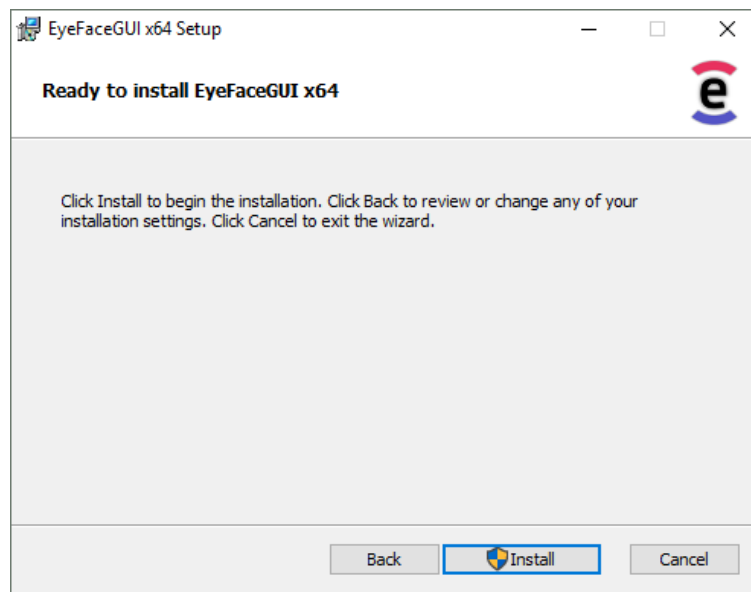
After reading of the License Agreement and confirmation of the consent to it using the choice I accept the terms in the License Agreement it is possible to come to the next step using the Next button.

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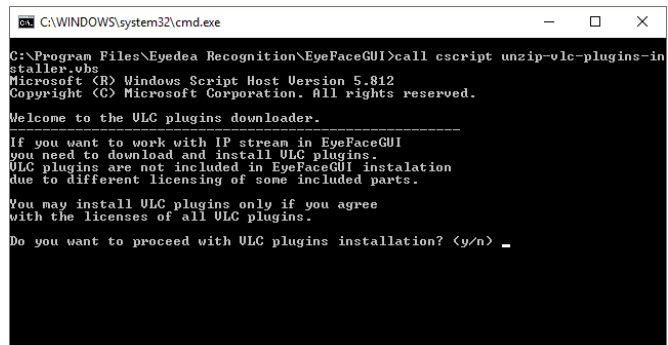
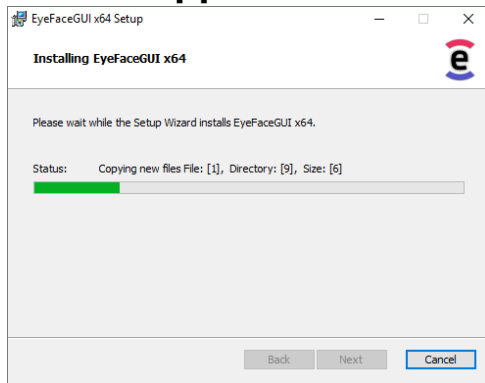
In this window, it is possible to change the folder alternatively, where the program will be installed, and using the button **Next** to come to a recapitulation before the installation.



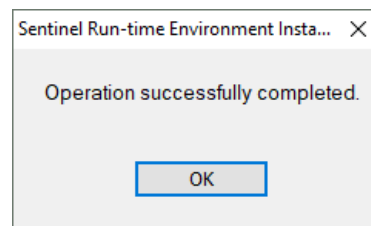
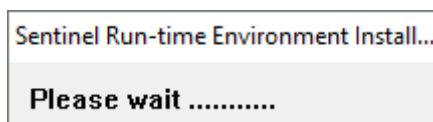
Now it is possible to start the installation itself with the button **Install**. This installation will copy all necessary files and if needed, it will also install a driver of a hardware key *Sentinel*.

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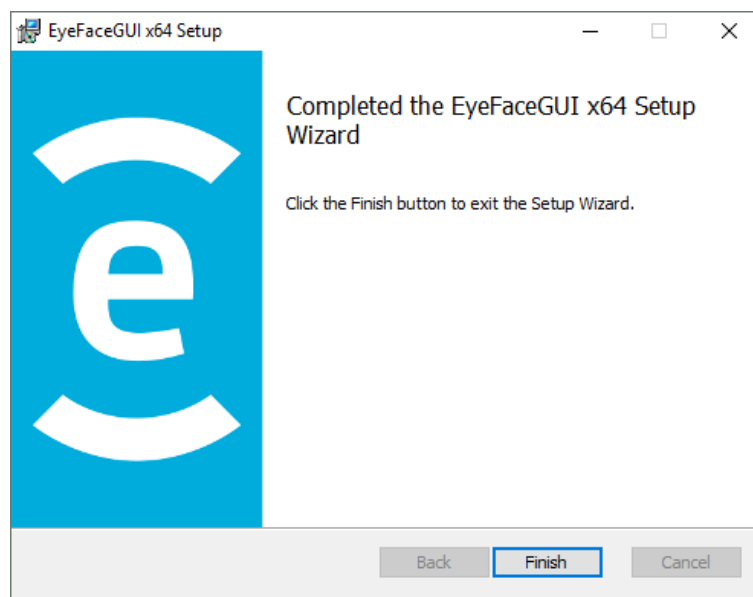
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If you want to use the IP stream as a video source, you need to install the VLC plugins. Due to different licensing conditions, VLC plugins are not the part of the EyeFaceGUI installation. Install the VLC plugins only if you agree with all the licenses. You can use the application without these plugins, but you will not be able to use the IP stream as a video source.



The installation of the driver of the hardware key takes place automatically, but it requires a click a dialog after finishing the installation.



The installer will display the following window after finishing the installation and it is possible to quit the installer using the button Finish.

Now the program is installed and prepared for the first use.

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2.2 Uninstallation

It is possible to uninstall the program EyeFaceGUI using the shortcut in the menu Start (Start Menu → All Programs → Eyedea Recognition → EyeFaceGUI → Uninstall EyeFaceGUI), alternatively, using the Control Panel (Start Menu → Control Panel → Programs and Features). The driver for the hardware key (Sentinel Hardware keys 1.2.0 (English)) will not be uninstalled during uninstallation of the program, because this part can be used also by other applications.

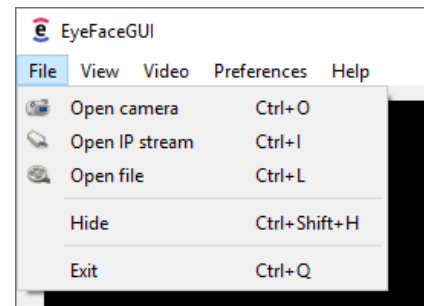


3 Main Features

This chapter contains all main features of the application EyeFaceGUI. All supported types of video sources are described also with detailed instructions how to use them. Face detection, results displaying and EyeFace SDK settings are described below together with video configuration, video snapshots creation and application preferences.

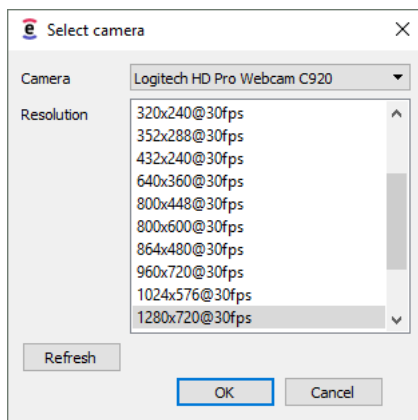
3.1 Open Video Source

Three different types of video sources are available in EyeFaceGUI. First is USB camera, where all standard webcams are supported. Second is video IP stream, where all formats decodable by VLC are supported. The last one is video file, where all formats and containers decodable by FFmpeg are supported. All sources can be used to open and play video content along with performing face detection and analysis.



3.1.1 Open Camera

This type of source allows to open, play, and grab image data from a standard USB webcam. One of attached cameras can be selected as a video source also with one of the supported resolutions and frame rates.



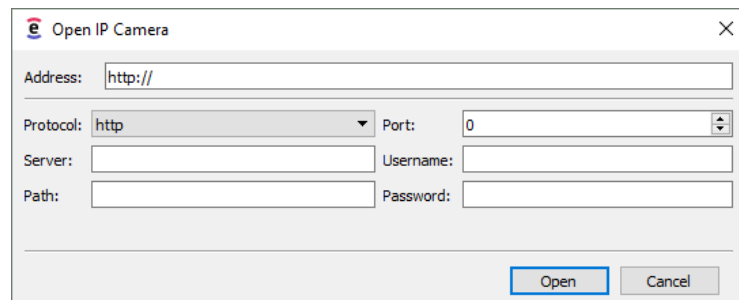
Camera dialog which is used for specific device and resolution selection can be opened using the action File → Open camera or by using the shortcut Ctrl+O. Dialog shows combo box used for camera device selection and the list containing all resolution supported by the current camera device. Selected setting can be confirmed using button OK. Then the video stream will be opened.

If you connect the camera device when the dialog is already shown, you can refresh the camera list by pressing the Refresh button.

3.1.2 Open IP Stream

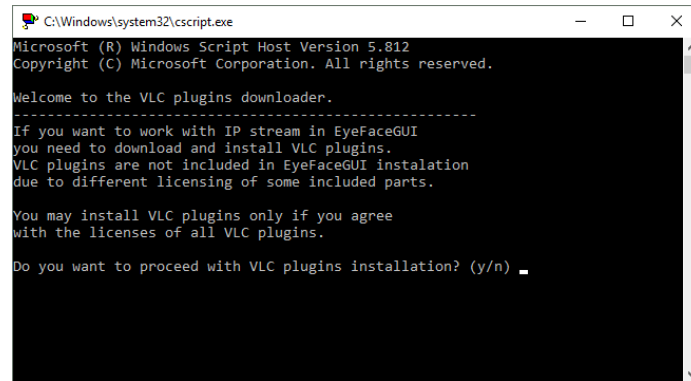
EyeFaceGUI allows you to use a video IP stream as a video source, where HTTP, RTP, RTSP and MMS protocols are supported. The IP stream dialog can be opened using the action File → Open IP Camera or using the shortcut Ctrl+I. The source URL can be entered directly in the field Address, or separately per each address part in fields Protocol, Server, Path, Port, Username, and Password.

The stream will be opened and played after confirming the inserted values by pressing the button Open.



Install VLC plugins

The IP stream playback functionality is provided by the libVLC library where the VLC plugins are required for basic functionality. These plugins are not the part of the EyeFaceGUI installation because of different licensing. If you want to use these plugins, you will need to download them during the installation otherwise you will be prompted to do so after opening IP stream in the application. Download and install the VLC plugins only if you agree with all the included licenses.



The installation is performed automatically in command window after you confirm the acknowledgment. You need to be connected to the internet if you want to run the VLC plugins installation. You can start using the IP stream immediately after successful installation. If you do not agree with VLC plugins license terms or you do not want to install the plugins, you will be able to run the application, but the IP stream source will not be available.

3.1.3 Open Video File

Video file can be opened using the action File → Open file or using the shortcut Ctrl+L. Standard system file dialog opens and source video file can be selected. Immediately after the confirmation the playback starts. All video codecs and containers supported by FFmpeg are also supported by EyeFaceGUI.

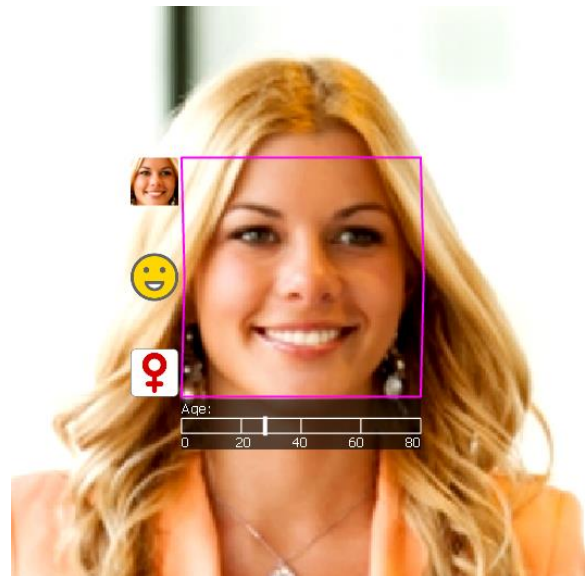
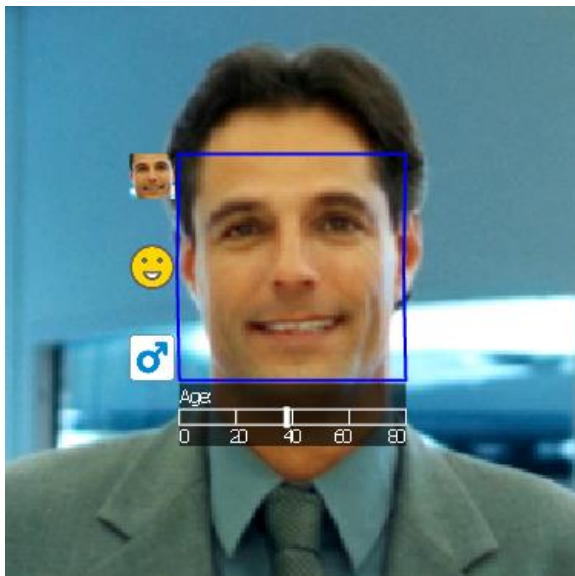
3.2 Face Detection and Attributes Recognition

EyeFaceGUI allows to analyze video stream and detect faces in it using the EyeFace SDK. Included advanced algorithms provides recognition of gender, age, and identity. All these operations are performed per frame and in real-time. All results are rendered in played video. The application also has an editor of EyeFace SDK ini files.

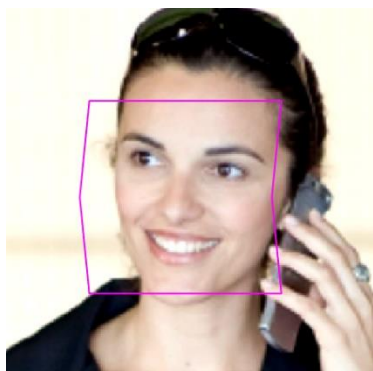
3.2.1 Display Face Detection Results

Face detection results displaying can be divided into four parts. Yaw angle of the face is described in Face detection. Whether the person looks into the camera belongs to the part Face attention. Face info contains data about gender, age and ID. Detecting important points on person's face is described in Face landmarks.

The Bounding rectangle is used for defining the rectangle of interest where the detector will look for faces. Advantage of this feature is the increase of detector performance due to smaller search space.



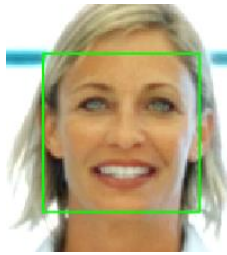
Face Detection



Face detection indicates the face itself and the yaw angle. It is the angle between the frontal face position and detected rotation. It is drawn as a rectangle around the detected face. The color of the rectangle depends on the detected gender, where male gender face has blue rectangle and female face has pink rectangle.

Vertical sides of the rectangle are divided into two parts in the middle. These parts are skewed in response to the detected face angle. The higher the angle is the more the horizontal parts are skewed.

This feature can be turned on and off using the menu Video → Show face detection.



Face Attention

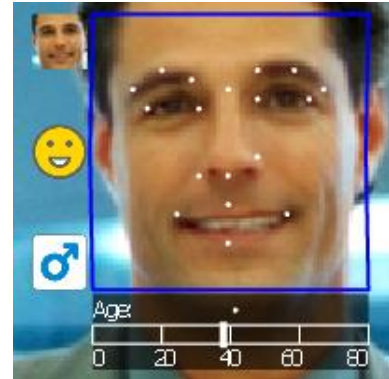
Face attention feature indicates whether the detected face looks into the camera. This feature can be turned on and off using the menu **Video** → **Show face attention**. The attention is indicated by the green rectangle around the detected face. The user can set an angular threshold on yaw angle (see the EyeFace SDK documentation), so that if the yaw angle is less than the threshold, the person is said to be in attention.

Face Info

Face info includes several detected values displayed together around the detected face. It can be turned on and off using the menu **Video** → **Show face info**.

Detected age is placed below the face. The scale is used to show the detected age. It contains values between 0 and 80 indicating the detected age in years.

Other recognized face attributes are placed next to the face on the left. On the top is the photo of the person which identifies the current face. EyeFace SDK contains a simple tracker to merge detections in subsequent images into tracks. The tracks aggregate information about detection and recognition in all previous frames. After a face disappears from the image, the tracks are stored. In case that a new face appears, the identity recognition tries to link it with previous tracks.



The smile detection is placed under the identity photo. It shows whether the face is smiling or not using simple emoticon. On the bottom, the gender recognition result is displayed. The icon shows three possible gender signs: female, male and unknown gender.

The detected distance from camera together with the ID of the person can be displayed below the age using the menu **Video** → **Show additional info**. Distance from camera indicates the approximate distance between the detected face and the camera in meters.



Face Landmarks

Facial landmarks such as eyes, nose and mouth can be detected using the EyeFace SDK. Currently 19 landmarks can be detected and displayed in EyeFaceGUI as white points on the detected face. Three points are located on each eyebrow, two points lies on each eye, four points define the nose and mouth and one point is located on the chin.

This feature can be turned on using **Video** → **Show face landmarks** and must be enabled in the EyeFace SDK config file (see the EyeFace SDK Documentation).

Bounding Rectangle

Bounding rectangle allows the user to select the area where the detection should take place. It can be done by pressing the right mouse button on the video to define one corner of the rectangle and without releasing the button move the mouse to the position where the second corner defining the rectangle should be placed. After releasing the right mouse button, the rectangle is created.

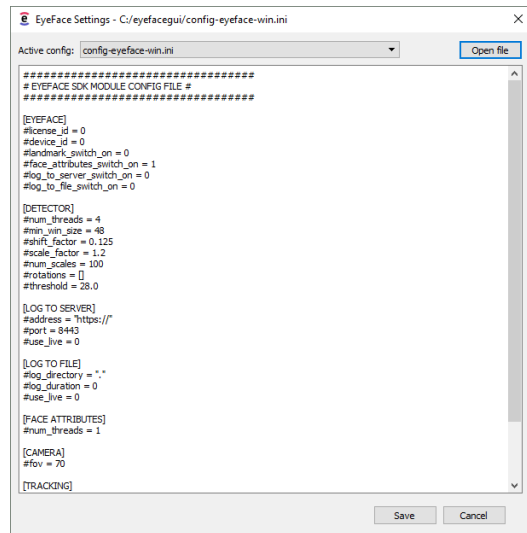
The bounding rectangle can be disabled by right clicking the video, using the action **Video** → **Reset bounding box** or using the shortcut **R**.



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3.2.2 EyeFace SDK Settings

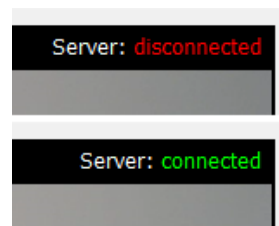
EyeFace SDK allows to set many parameters which affects the recognition process (see the EyeFace SDK documentation). This configuration takes place in the ini file specified in the EyeFace SDK initialization. In EyeFaceGUI you can manage and modify these ini files and select the one which is used to initialize the EyeFace SDK.



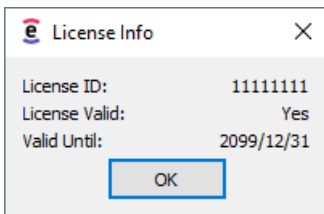
This configuration can be done using the action Preferences → EyeFace Settings which opens the ini file editor and manager. Using the combo box Active config, you can select the current ini file from the history which will be used. Button Open file allows you to select another ini file which will be opened in the editor below. All changes made to the ini file in the editor can be saved using the button Save. This action also reinitializes the EyeFace SDK with the currently selected ini file.

3.2.3 Logging server

EyeFace SDK contains a remote logging module, which enables the client to send the results using a HTTP POST requests over a network to a remote server. The server can be specified in the configuration file with several other options (see the EyeFace SDK documentation). This feature allows you to use remote server to log all faces tracked by the EyeFaceGUI.



The server connection status is displayed in the top right corner of the video player surface. When the application is connected to server the status 'connected' is displayed.



3.2.4 License Information

The EyeFace SDK can be used with valid license only (see the EyeFace SDK documentation). To check the currently installed license, use the action Help → License info. The dialog will open where License ID and License Validity is displayed.

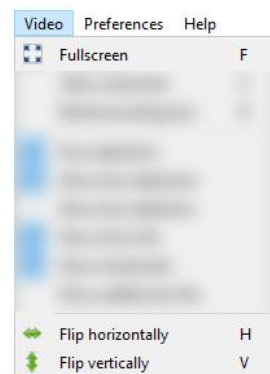
3.3 Video Display Configuration

Played and analyzed video can be modified using several actions which allows to display it in clearer and more comfort way. Video can be displayed in fullscreen and can be flipped both horizontally and vertically. All these features are available using the menu Video.

3.3.1 Fullscreen



The fullscreen feature allows you to display the video covering the full area of the screen to get clearer and detailed view of the analyzed video. Fullscreen can be turned on and off using the action Video → Fullscreen or using the shortcut F.



3.3.2 Horizontal and Vertical Flip



Each played and analyzed video can be horizontally and vertically flipped. While the video frames are flipped right after reading from the source, this modification affects also the detection process. This feature is useful when source video is flipped around one or two axes due to physical position and configuration of the source camera.

Horizontal flip can be turned on or off using the menu **Video** → **Flip horizontally** or using the shortcut **H**. Vertical flip can be activated using the menu **Video** → **Flip vertically** or using the shortcut **V**.

3.4 Video Snapshots

EyeFaceGUI allows to select between two methods of creating the video snapshots. First allows to take the screenshot of the video frame with all the information and graphics displayed. Second method grabs the raw source video frame in original resolution.

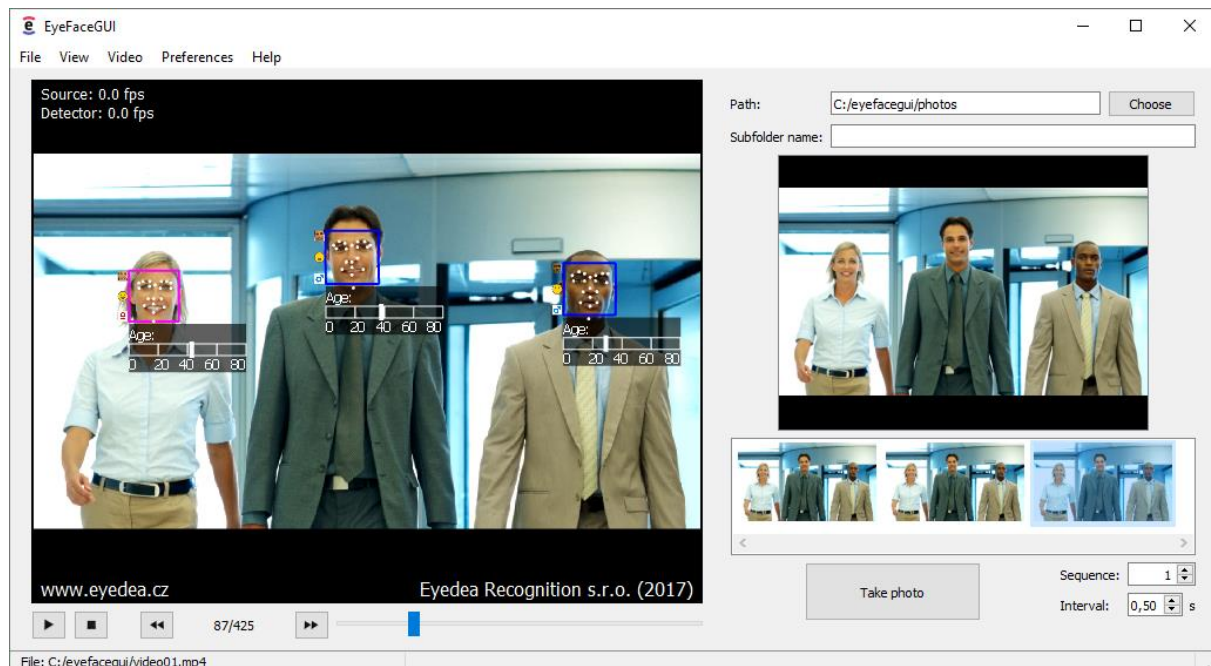
3.4.1 Screenshot

Screenshot action can be used to save the current video frame with all the displayed detections. Image is saved in JPEG format to the location specified in the Preferences (see the Chapter 3.5). Screenshot is saved in the resolution of the video rendering surface. This action can be activated using the menu **Video** → **Take screenshot** or by the shortcut **S**.

3.4.2 Grab Video Frames

The video frames can be grabbed using the special panel. This panel can be displayed and hidden using the menu **View** → **Show photographing tab** or by the shortcut **P**. This panel consist of several control elements.

At the top is the input line where the **path** for saving the grabbed video frames can be selected using the button **Choose**. The input line for defining the **subfolder** is placed below.



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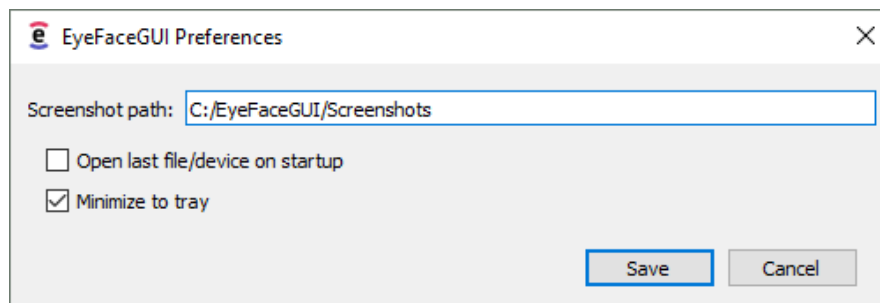
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In the middle of the panel the photo preview surface and the list of saved video frames are placed. List contains all the photos saved to the current path. Currently selected photo from the list is showed on the preview surface.

At the bottom of the panel the elements controlling the grabbing are placed. The frame grabbing is started using the button **Take photo**. The grabbing parameters can be set using the two spinners placed on the right of the button. The spinner **Sequence** sets the number of the frames which should be grabbed in a sequence. The spinner **Interval** sets the interval between the grabbed frames in the sequence. All grabbed frames are saved separately in the PNG format.

3.5 Application Preferences

Several settings related to the application itself can be modified in the application preferences available under **Preferences** → **Preferences** or using the shortcut **Ctrl+P**. The default screenshot path (see the Chapter 3.4.1) can be defined, whether the last file/device should be opened on the application startup or whether the application should minimize to tray (see the Chapter 3.6).



3.6 Tray Icon

The tray icon serves as an indicator that the application is running. When the **Minimize to tray** is enabled (see the Chapter 3.5), the application always minimizes to the tray. EyeFaceGUI can be restored or hidden using the tray icon context menu or by double clicking the tray icon.

