



# **VeriLook Surveillance Algorithm Demo 1.1**

User's guide

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# 1 Introduction

VeriLook Surveillance Algorithm Demo 1.1 application is designed with aim to demonstrate the capabilities of Neurotechnology VeriLook Surveillance algorithm for face identification using live video streams. VeriLook Surveillance is intended for real-time identification of faces from high-resolution digital surveillance cameras, which can be mounted in airports, retail stores, on the street or in other locations where passers-by may not be looking into the camera.

VeriLook Surveillance Algorithm Demo 1.1 features:

- **Adding templates to database** (enrollment). Software processes face image, extracts features and writes them to the database.
- **Live recognition**. Software finds enrolled subjects and displays them on screen.
- **Multiple face tracking**. Once detected, the faces are tracked in all successive frames from the video source until they disappear from camera field of view.
- **Tracking information display**. Software displays tracking information about subjects: appearance and disappearance time.
- **Watch list**. Software saves enrolled subjects in the watch list and allows to view them.
- **Video files support**. VeriLook Surveillance Algorithm Demo 1.1 supports enrolling subjects from video files.

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## 1.1 System Requirements

**Minimum requirements:**

- 128 MB of RAM, 1Ghz CPU, 50 MB HDD space for the installation package
- Microsoft Windows 2000/XP/Vista/7
- DirectX 8.1 or later. You can download DirectX upgrade from Microsoft web site
- (Optionally) Video capture device (web camera or IP camera)
- (Optionally) DivX codec pack. Video codecs are required to open video files

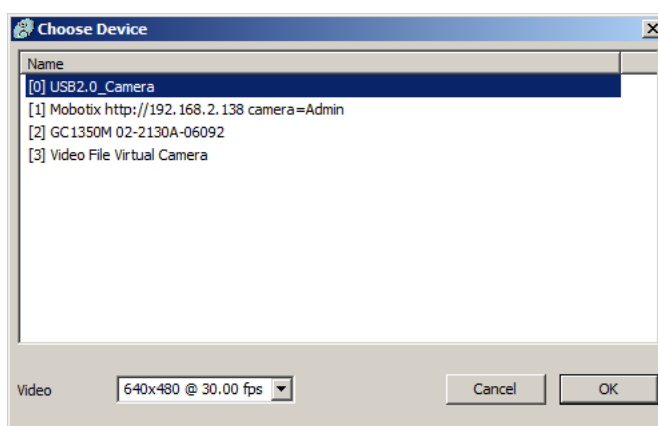
## 2 Application

VeriLook Surveillance Algorithm Demo 1.1 incorporates Neurotechnology live faces recognition algorithm. Using this demo application subjects can be added to internal database from video streams (from cameras) or video files and live recognition can be performed.

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### 2.1 Choose Device Window

VeriLook Surveillance Algorithm Demo 1.1 application is started by launching exe file. After application was started, *Choose Device* window is shown:



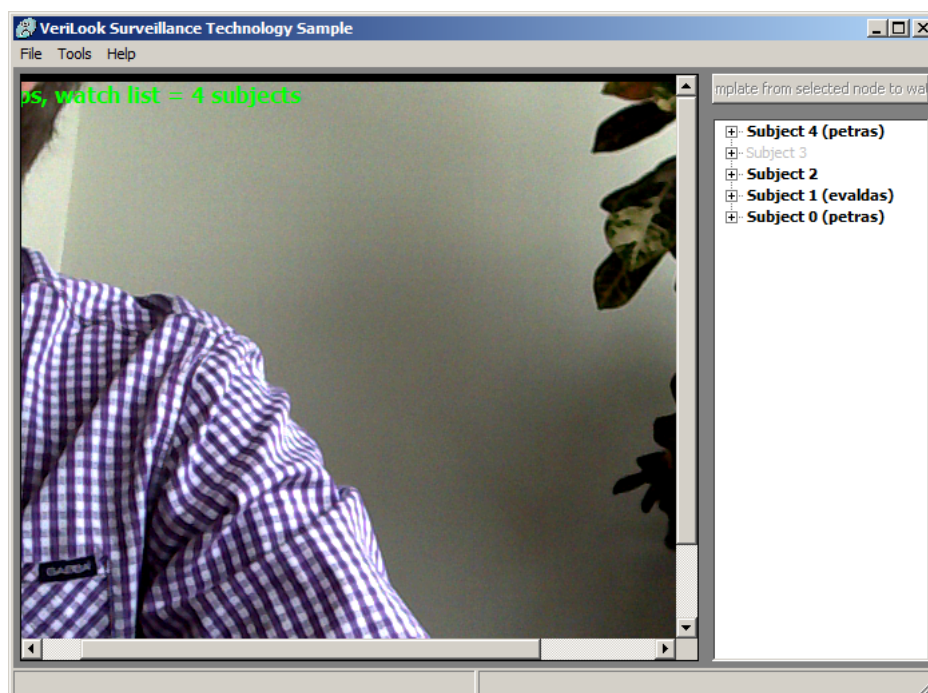
All installed cameras (web or IP cameras) are displayed in this window. You should select video device and resolution for this device in this window. If you want to use video files, select option *Video File Virtual Camera*.

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### 2.2 Main Window

The main application window has two-pane layout, where the left pane is used for displaying video stream and the right pane is used for displaying tracked subjects. Menu commands are used to control application.

The main VeriLook Surveillance Algorithm Demo 1.1 window after 5 subjects were tracked:

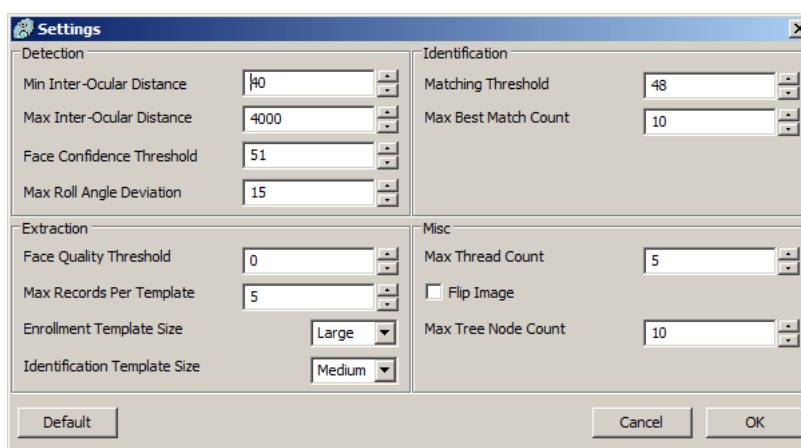


Tracked subjects are displayed in the right panel. If the subject was enrolled to database previously, his Id is shown in brackets. All list items (found subjects) in the right panel can be expanded. When list items are expanded, the time of subject's appearance and disappearance is shown for each subject.

New subjects are enrolled to database by selecting list item in the right panel and pressing button *Add template from selected node to watch list*. When adding templates to watch list, subject Id for located face should be entered.

## 2.3 Settings

Application settings can be accessed by choosing menu item *Tools->Settings*. This allows to change Detection, Identification, Extraction and other application settings:



### Detection

- *Min Inter-Ocular Distance* - minimum distance between eyes in a face. Faces which have smaller distance between eyes than this parameter, won't be returned by the face detection routines. Must be in range [10..10000]. The default value is

40.

- *Max Inter-Ocular Distance* - maximum distance between eyes in a face. Faces which have greater distance between eyes than this parameter, won't be returned by the face detection routines. Must be in range [10..10000]. The default value is 4000.
- *Face Confidence Threshold* - specifies the threshold which is considered when looking for faces in an image. For each face candidate confidence parameter is calculated. With higher threshold value faces are selected more strictly by the face detection routines. Must be in range [0..100]. The default value is 51.
- *Max Roll Angle Deviation* - defines maximum roll angle deviation from frontal face in degrees which is considered when looking for faces in an image. Must be in range [0..180].

#### Extraction

- *Face Quality Threshold* - specifies the threshold which is considered when extracting facial features from the image. With higher threshold better quality of face image is required to successfully extract facial features. The value of this parameter can be in range [0..255]. The default value is 128.
- *Max Records Per Template* - defines maximum number of records which can be saved in one template. The value of this parameter can be in range [1..16]. The default value is 5.
- *Enrollment Template Size* - size of face image templates. Can be used Large, Medium or Small template. It is recommended to use large template size. This parameter is used when generating a template from tracked subject.
- *Identification Template Size* - default size of face image templates when performing identification. Can be used Large, Medium or Small template. It is recommended to use medium template size.

#### Identification

- *Matching Threshold* - specifies matching threshold. Value should be more than 0.
- *Max Best Match Count* - Maximum length of the list which is returned by each identification. The default value is 10.

#### Misc

- *Max Thread Count* - specifies the number of concurrent surveillance threads. Recommended value is "number of logical processors on CPU" plus one. Must be in range [3..8]. The default value is 5.
- *Flip Image* - mirrors horizontally image received from video camera or video file.
- *Max Tree Node Count* - maximum number of items in tree node. Defines how many subjects should be displayed in the right panel. Default value is 10.

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## 2.4 Simple Usage Examples

In this section simple basic scenarios of using VeriLook Surveillance Algorithm Demo 1.1 application are described in a step by step fashion.

### Enrolling

#### From camera

1. First, camera to be used as the capture device must be selected from *Choose Device* window. When camera was chosen, video stream should be visible in the left panel. If you are using IP camera, do not forget to configure it correctly.
2. Faces found in the video stream are outlined in the capture image by green rectangle (the green rectangle outlines the face that best fits the matching requirements of the Neurotechnology Faces algorithm).
3. To enroll a subject from video stream, select corresponding item in the right panel and press button *Add template from selected node to watch tree*. Program will enroll face into the database of the demo program with a dialog asking for the person's Id.

#### From video file

1. Open *Choose Device* window (File->Choose Device) and select *Video File Virtual Camera*.
2. *Select a file* window is shown. In this window you should locate a video file which contain subjects and select it. DivX

codecs should be installed when working with video files. Otherwise, program will not be able to read video files.

3. Subjects from video files are enrolled in the following way as from camera (by pressing button *Add template from selected node to watch tree* and entering subject's Id).

### **Detection**

Detection from both cameras and video files are performed in real time in the left pane (results are shown in the right pane). Detected subject faces are outlined in green rectangle with subject's Id visible at the rectangle's bottom.



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