



# VeriEye Algorithm Demo 2.2

User's guide

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# 1 Introduction

Iris recognition is acknowledged as the most accurate, stable and scalable non-invasive biometrics. This document is user's guide for Neurotechnology VeriEye Algorithm Demo 2.2 application. The purpose of this demo application is to demonstrate the speed and accuracy of Neurotechnology iris recognition engine interactively.

## 1.1 System requirements

### Windows

There is no special requirements for Windows OS.

### Linux

The following libraries are required:

- expat 0.4.0
- gtk+-2.0

**(Note:** Irises scanners are not supported under Linux)

## 1.2 Iris Scanners

Using VeriEye Algorithm Demo 2.2 it is possible to capture live iris images (often both irises simultaneously) for further features extraction. The following eye iris scanners and capture devices are supported:

Name	Specifications
Cross Match Scan 2	<ul style="list-style-type: none"> <li>• <b>Manufacturer:</b> <a href="#">Cross Match Technologies Inc</a></li> <li>• <b>Connection:</b> USB 2.0</li> <li>• <b>Supported OS*:</b> Microsoft Windows (32bit)</li> <li>• <b>Sensors:</b> 2 x 1.3 Megapixel cameras</li> <li>• <b>Image size:</b> 2 images, 480 x 480 pixels each</li> <li>• <b>Eye-illumination:</b> Near-infrared</li> <li>• <b>Size:</b> 152 x 152 x 48 mm (6.0" x 6.0" x 1.9")</li> <li>• <b>Weight:</b> 0.5 kg (1.1 lbs)</li> <li>• <b>Operating temperature range:</b> 0°C ~ +49°C</li> <li>• <b>Operating humidity range:</b> 10-90 % (non-condensing)</li> </ul>

Retica Mobile-Eyes	<ul style="list-style-type: none"> <li>• <b>Manufacturer:</b> <a href="#">Retica Systems, Inc</a></li> <li>• <b>Connection:</b> USB 2.0</li> <li>• <b>Supported OS*:</b> Microsoft Windows (32bit)</li> <li>• <b>Image size:</b> 2 images, 640 x 480 pixels each</li> <li>• <b>Eye-illumination:</b> Near-infrared</li> <li>• <b>Size:</b> 175 x 205 x 71 mm. (6.9" x 8.1" x 2.8")</li> <li>• <b>Weight:</b> 1.1 kg (2.5 lbs)</li> <li>• <b>Operating temperature range:</b> 0°C ~ +49°C</li> </ul>
VistaFA2 Multimodal Iris & Face Camera	<ul style="list-style-type: none"> <li>• <b>Manufacturer:</b> <a href="#">Vista Imaging, Inc.</a></li> <li>• <b>Connection:</b> USB 2.0</li> <li>• <b>Supported OS*:</b> Microsoft Windows (32bit)</li> <li>• <b>Image size:</b> 640 x 480 pixels</li> <li>• <b>Eye-illumination:</b> Multi wavelength infrared</li> <li>• <b>Size:</b> 94 x 94 x 54 mm (3.7" x 3.7" x 2.1")</li> <li>• <b>Weight:</b> 180 grams (0.4 lbs)</li> </ul>
Vista MT Multimodal Biometric Device	<ul style="list-style-type: none"> <li>• <b>Manufacturer:</b> <a href="#">Vista Imaging, Inc.</a></li> <li>• <b>Connection:</b> USB 2.0</li> <li>• <b>Supported OS*:</b> Microsoft Windows (32bit)</li> <li>• <b>Drivers:</b> \bin\Win32_x86\ICmm\ICmmVistaMT.dll</li> </ul>

\* These operating systems are supported by the Neurotechnology. Device manufacturers may have different lists of supported operating systems.

# 2 Application

This simple application demonstrates capabilities of Neurotechnology iris recognition engine. It can answer to several questions: how fast Neurotechnology iris extraction is (creation of iris template from one iris image), and how fast matching is (how many templates of irises are compared per second) on some particular machine, how much memory it will use for these operation, and finally, how accurate it will be with some particular data. The following common tasks are implemented:

- Enrollment - iris image is converted to a compact representation called template which is further saved in the database for rapid identification or verification.
- Identification - newly created iris template is compared to each previously saved iris template and all matching database entries are showed.

Verification task is not implemented and there is no need for that because it is the same as identification in the database with one record using Neurotechnology SDK.

Additionally, all the parameters of iris template extraction and matching algorithms can be changed interactively.

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## 2.1 Windows

VeriEye Algorithm Demo 2.2 application in Windows OS can be started from `IrisesAlgorithmDemo.exe`.

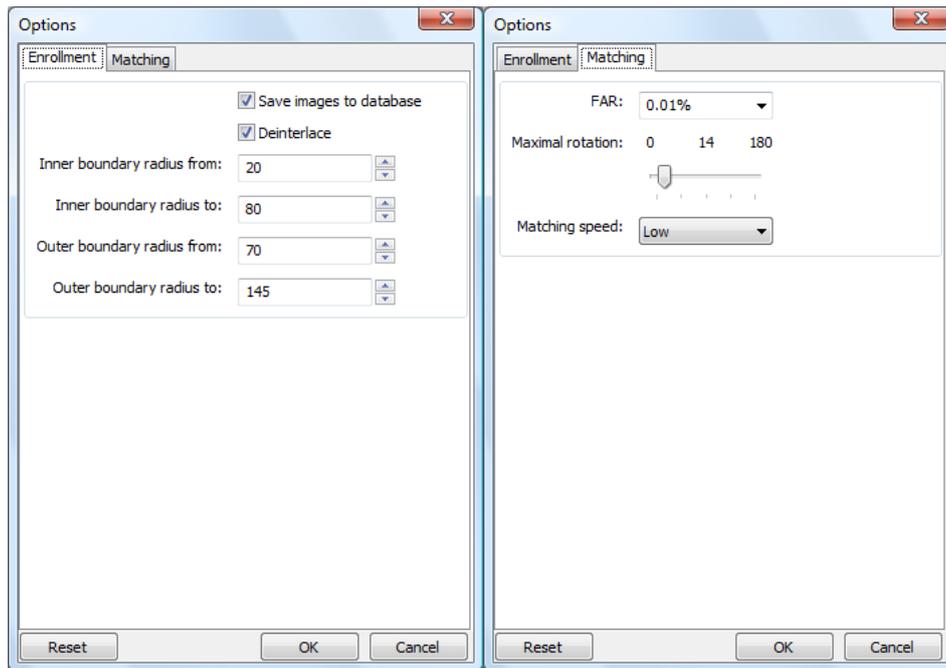
---

### 2.1.1 Main Window

When you want to enroll an iris image to a database you should press an Enroll button. If the enrollment succeeded you will see a window like this:



changed interactively in these dialogs:



### Enrollment options

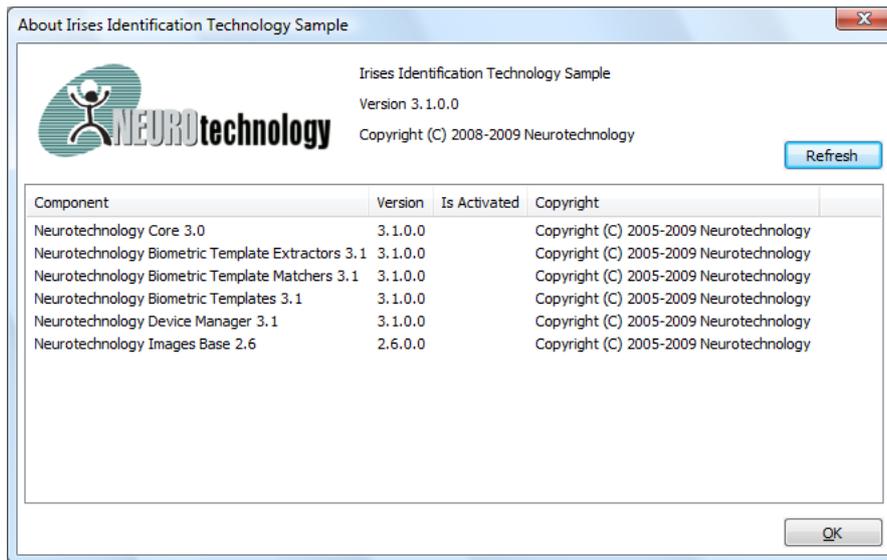
- *Save images to database* - saves enrolled iris images to database. Saved images can be used to display identification results. Default value is true (checked).
- *Deinterlace* - extractor parameter used to define whether deinterlacing should be used during extraction process. In addition to eliminating interlacing effect in images which are usually captured from live stream, it can speed up extraction process significantly, because it just ignores half of the frame when set to true. Default value - true (checked).
- *Inner Boundary Radius From* (in pixels) - extractor parameter used to guide segmentation process, specifies the radius of circle which can fully fit inside the iris inner boundary. Default value - 20.
- *Inner Boundary Radius To* (in pixels) - extractor parameter used to guide segmentation process, specifies the radius of circle inside which the iris inner boundary will fully fit. Default value - 80.
- *Outer Boundary Radius From* (in pixels) - extractor parameter used to guide segmentation process, specifies the radius of circle which can fully fit inside the iris outer boundary. Default value - 70.
- *Outer Boundary Radius To* (in pixels) - extractor parameter used to guide segmentation process, specifies the radius of circle inside which the iris outer boundary will fully fit. Default value - 145.

### Matching options

- *FAR* - matcher parameter used to define chosen false acceptance rate (FAR). Actually, controls matching threshold to make a decision whether compared iris templates were created from the same eye. Default value - 0.01%.
- *Matching Speed* - matcher parameter used to define chosen matching speed. Matching speed can be one of the following: low (best quality), medium or high. Default value - low (best quality).
- *Maximal rotation* - maximum in-plane rotation angle of iris image which controls until which angle iris images will be identified. **Note:** the bigger *Maximal Rotation* value is, the slower identification task will be.

## 2.1.4 About Dialog

It is accessible via "Help » About" menu. All Neurotechnology components that were used to create this application are listed in this dialog.



## 2.2 Linux

VeriEye Algorithm Demo 2.2 application on Linux can be started from `IrisesAlgorithmDemo` file. There are separate distribution for 32 bits and 64 bits operating system. See Windows (see page 3) part to find out how to use this application.

## 2.3 Mac OS X

VeriEye Algorithm Demo 2.2 application on Mac OS can be started from `IrisesAlgorithmDemo.app` file. See Windows (see page 3) part to find out how to use this application.

## 3 Support

If you encounter problems while installing or using Neurotechnology Iris Recognition Algorithm Demo application, please contact Neurotechnology ([support@neurotechnology.com](mailto:support@neurotechnology.com)) or your local distributor.

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