



**NEURO**technology



Iris identification  
for stand-alone  
and  
Web solutions

**VeriEye SDK**



# VeriEye SDK

## Iris identification for stand-alone and Web solutions

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VeriEye iris identification technology is designed for biometric systems developers and integrators. The technology includes many proprietary solutions that enable robust iris enrollment under various conditions and fast iris matching in 1-to-1 and 1-to-many modes.

VeriEye is available as a software development kit that allows development of stand-alone and Web-based solutions on Microsoft Windows, Linux, Mac OS X and Android platforms.

- Rapid and accurate iris identification, proven by NIST IREX.
- Robust recognition, even with gazing-away eyes or narrowed eyelids.
- Original proprietary algorithm solves the limitations and drawbacks of existing state-of-the-art algorithms.
- Available as multiplatform SDK that supports multiple programming languages.
- Reasonable prices, flexible licensing and free customer support.



## VeriEye Algorithm Features and Capabilities

*Performance numbers are provided for a PC with Intel Core 2 Q9400 processor (2.67 GHz).*

Neurotechnology began research and development in the field of eye iris biometrics in 1994. In 2008, Neurotechnology released **VeriEye iris recognition algorithm**. The next year VeriEye was **recognized by NIST** as one of the most reliably accurate iris recognition algorithms.

The proprietary algorithm implements advanced iris segmentation, enrollment and matching using robust digital image processing algorithms:

- **Robust iris detection.** Irises are detected even when there are obstructions to the image, visual noise and/or different levels of illumination. Lighting reflections, eyelids and eyelashes obstructions are eliminated. Images with narrowed eyelids or eyes that are gazing away are also accepted.
- **Automatic interlacing detection and correction** results in maximum quality of iris features templates from moving iris images.
- **Gazing-away eyes** are correctly detected on images, segmented and transformed as if it were looking directly into the camera (see Figure 1).
- **Correct iris segmentation** is obtained even under these conditions:
  - **Perfect circles fail.** VeriEye uses active shape models that more precisely model the contours of the eye, as iris boundaries are not modeled by perfect circles.
  - **The centers of the iris inner and outer boundaries are different** (see Figure 2). The iris inner boundary and its center are marked in red, the iris outer boundary and its center are marked in green.
  - **Iris boundaries are definitely not circles and even not ellipses** (see Figure 3) and especially in gazing-away iris images.
  - **Iris boundaries seem to be perfect circles.** The recognition quality can still be improved if boundaries are found more precisely (see Figure 4). Note these slight imperfections when compared to perfect circular white contours.
- **Fast matching.** Configurable matching speed varies from 60,000 to **548,000 comparisons per second** on a PC. See technical specifications for more details.
- **Reliability.** VeriEye 2.9 algorithm shows excellent performance when tested on all publicly available datasets. Especially good results are achieved on the recent **NIST ICE2005 Exp1** database with iris images of intentionally degraded quality (see *Reliability and Performance Tests Results* section).

Figure 1

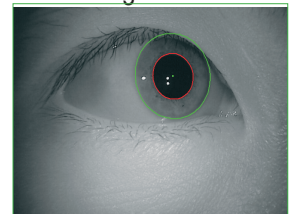


Figure 2

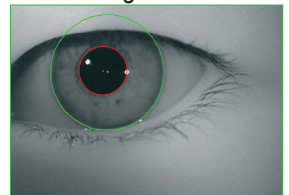


Figure 3

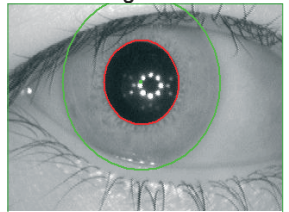
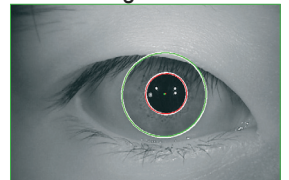


Figure 4



*All iris images are taken from CASIA Iris Image Database V2.0 and CASIA Iris Image Database V3.0 collected by the Chinese Academy of Sciences Institute of Automation (CASIA) (<http://www.cbsr.ia.ac.cn/english/IrisDatabases.asp>).*



## Contents of VeriEye 2.9 Standard SDK and Extended SDK

VeriEye SDK is based on VeriEye iris recognition technology and is intended for biometric systems developers and integrators. The SDK allows rapid development of biometric applications using functionality from the VeriEye algorithm that ensures reliable fast iris identification. VeriEye can be easily integrated into the customer's security system. The integrator has complete control over SDK data input and output.

VeriEye SDK includes the Device Manager library for working with the supported iris cameras. Integrators can also write **plug-ins to support their iris cameras** or other devices using the plug-in framework provided with the Device Manager.

VeriEye is available as the following SDKs:

- **VeriEye 2.9 Standard SDK** is designed for PC-based, embedded or mobile biometric application development. It includes Iris Matcher and Extractor component licenses, programming samples and tutorials, iris scanner support modules and software documentation. The SDK allows the development of biometric applications for Microsoft Windows, Linux, Mac OS X or Android operating systems.
- **VeriEye 2.9 Extended SDK** is designed for biometric **web-based** and network application development. It includes all features and components of the Standard SDK. Additionally, the SDK contains Iris Client component licenses for PCs and Android devices, sample client applications, tutorials and a **ready-to-use matching server** component.

The table below compares VeriEye Standard SDK and VeriEye Extended SDK. See the licensing model for more information on specific license types.

Component licenses included with a specific SDK		
	VeriEye 2.9 Standard SDK	VeriEye 2.9 Extended SDK
• Iris Matcher	1 single computer license	1 single computer license
• Embedded Iris Matcher	1 single computer license	1 single computer license
• Iris Client <sup>(1)</sup>		3 single computer licenses and 1 concurrent license
• Embedded Iris Client		3 single computer licenses
• Iris Extractor	1 single computer license	1 single computer license
• Embedded Iris Extractor	1 single computer license	1 single computer license
• Matching Server		+

(1) Iris Client component includes Iris Extractor and Iris BSS components, which can be also obtained separately. The concurrent Iris Client license may be also used for running the Embedded Iris Client on multiple Android devices.

VeriEye 2.9 SDK includes programming samples and tutorials that show how to use the components of the SDK to perform face template extraction or matching against other templates. The samples and tutorials are available for these programming languages and platforms:

	Microsoft Windows	Linux	Mac OS X	Android
<b>Programming samples and tutorials</b>				
• C/C++	+	+	+	
• C#	+			
• Sun Java 2	+	+	+	+
• Visual Basic .NET	+			



## Biometric Components Description

### Iris Matcher

The Iris Matcher performs iris template matching in 1-to-1 (verification) and 1-to-many (identification) modes on PC or Mac platform. Also the Iris Matcher component includes fused matching algorithm that allows to increase template matching reliability by:

- matching templates that contain 2 iris records;
- matching templates that contain fingerprint, face, voiceprint and/or iris records (note that matching fingerprints, faces and voiceprints requires Fingerprint Matcher, Face Matcher and Voice Matcher components correspondingly - see *VeriFinger SDK*, *VeriLook SDK* and *VeriSpeak SDK* brochures for more information);

The Iris Matcher component matches **40,000 irises per second** and is designed to be used in **desktop** or mobile biometric systems, which run on PCs or laptops with at least Intel **Core 2 Q9400** (2.67 GHz) processor.

One Iris Matcher license is included with VeriEye 2.9 Standard SDK and VeriEye 2.9 Extended SDK. More licenses for this component can be purchased any time by VeriEye 2.9 SDK customers.

### Embedded Iris Matcher

The Embedded Iris Matcher has the same functionality, as the Iris Matcher. It matches **3,000 irises per second** and is designed to be used in **embedded** or **mobile** biometric systems, which run on **Android** devices based on at least **Snapdragon S4** system-on-chip (**Krait 300** processor with 4 cores running at 1.51 GHz).

One Embedded Iris Matcher license is included with VeriEye 2.9 Standard SDK and VeriEye 2.9 Extended SDK. More licenses for this component can be purchased any time by VeriEye 2.9 SDK customers.

### Iris Client

The Iris Client component is a combination of the Iris Extractor and Iris BSS components. It is designed for the systems that need to support all functionality of the mentioned components on the same PC. Using these licenses allows to optimize component license costs as well as reduce license management.

The Iris Client extracts a single iris template in **0.6 seconds**. The specified performance requires a **PC or laptop** with at least Intel **Core 2 Q9400** (2.67 GHz) processor.

Three non-concurrent licenses and one concurrent license for the Iris Client component are included with VeriEye 2.9 Extended SDK. More non-concurrent and concurrent licenses for this component can be purchased any time by VeriEye 2.9 Extended SDK customers.

### Embedded Iris Client

The Embedded Iris Client component has the same functionality as the Iris Client and is designed to run on **Android** device based on at least **Snapdragon S4** system-on-chip (**Krait 300** processor with 4 cores running at 1.51 GHz). The component extracts a single iris template in **1.2 seconds**.

Three non-concurrent licenses for the Embedded Iris Client component are included with VeriEye 2.9 Extended SDK. More non-concurrent licenses for this component can be purchased any time by VeriEye 2.9 Extended SDK customers.

The concurrent Iris Client license may be also used for running the Embedded Iris Client on multiple Android devices.



## Iris Extractor

Iris Extractor creates iris templates from eye images.

The component extracts a single iris template in **1.34 seconds**. The specified performance requires a **PC or laptop** with at least Intel **Core 2 Q9400** (2.67 GHz) processor.

One Iris Extractor license is included with VeriEye 2.9 Standard SDK and VeriEye 2.9 Extended SDK. More licenses for this component can be purchased any time by VeriEye 2.9 SDK customers.

## Embedded Iris Extractor

The Embedded Iris Extractor has the same functionality as the Iris Extractor and is designed to be run on **Android** devices based on at least **Snapdragon S4** system-on-chip (**Krait 300** processor with 4 cores running at 1.51 GHz). The component extracts a single iris template in **1.34 seconds**.

One Embedded Iris Extractor license is included with VeriEye 2.9 Standard SDK and VeriEye 2.9 Extended SDK. More licenses for this component can be purchased any time by VeriEye 2.9 SDK customers.

## Iris BSS (Biometric Standards Support)

The Iris BSS (Biometric Standards Support) component allows to integrate support for iris image format standards and additional image formats with new or existing biometric systems based on VeriEye SDK.

These biometric standards are supported:

- **BioAPI 2.0** (ISO/IEC 19784-1:2006) (Framework and Biometric Service Provider for iris identification engine)
- **CBEFF** (Common Biometric Exchange Formats Framework)
- **ISO/IEC 19794-6:2005** (Iris Image Data)
- **ISO/IEC 19794-6:2011 with Cor. 1:2012**
- **ANSI/INCITS 379-2004** (Iris Image Interchange Format)

The component is designed for applications that run on hardware with at least Intel **Core 2 Q9400** (2.67 GHz) processor. It can be used from C/C++, C# and Java applications on all supported platforms. .NET wrappers of Windows libraries are provided for .NET developers.

Licenses for the Iris BSS component can be purchased anytime by VeriEye 2.9 Extended SDK customers.



## Matching Server

The Matching Server is ready-to-use software intended for building moderate size web-based and other network-based systems like local single- or multi-biometric identification system. The Server software runs on a server PC and allows to perform the biometric template matching on server side using Iris Matcher component.

**Multi-biometric matching** can be enabled by running components for iris, fingerprint, face and voiceprint matching on the same machine.

**Client communication module** that allows sending a task to the Matching Server, querying status of the task, getting the results and removing the task from server, is included with MegaMatcher 5.1 SDK, VeriFinger 7.1 SDK, VeriLook 5.6 SDK, VeriSpeak 2.2 SDK and VeriEye 2.9 SDK. This module hides all low level communications and provides high-level API for the developer.

The components and database support modules with source codes included for Matching Server component are listed in the table below. Custom modules for working with other databases can also be developed by integrator and used with the Matching Server software.

The table below shows what components are available with Matching Server software.

Components	Microsoft Windows 32 & 64 bit	Linux 32 & 64 bit	Mac OS X
• Matching server software	+	+	+
• Server administration tool API	+	+	
• Source code of sample web server software	+		
<b>Database support modules</b>			
• Microsoft SQL Server	+		
• PostgreSQL	+	+	
• MySQL	+	+	
• Oracle	+	+	
• SQLite	+	+	+
<b>Programming samples</b>			
• C# client	+		
• Visual Basic .NET client	+		
• Sun Java 2 web client	+	+	+
<b>Programming tutorials</b>			
• C/C++	+	+	
• C#	+		
• Visual Basic .NET	+		

The Matching Server component requires a **special license** that allows to run the component on all machines that run the fingerprint, face, iris, voiceprint or palm print matching components obtained by an integrator. The Matching Server software is included with VeriEye 2.9 Extended SDK.

Also the Matching Server component is included with these Neurotechnology SDKs (see their brochures for more info):

- MegaMatcher 5.1 Standard or MegaMatcher 5.1 Extended SDK;
- VeriFinger 7.1 Extended SDK;
- VeriLook 5.6 Extended SDK.
- VeriSpeak 2.2 Extended SDK.



## Supported Iris Cameras

The table below explains which iris scanners are supported under different versions of Microsoft Windows.

Integrators or scanner manufacturers can also write **plug-ins** for the Device Manager from the VeriEye SDK to **support their iris cameras** using the provided plug-in framework. The SDK documentation contains more information about the plug-in framework.

	Microsoft Windows XP / Vista / 7 / 8		Linux (32-bit only)	Android
	32 bit	64 bit		
• Cross Match I Scan 2	+	+(1)		
• IrisGuard IG-AD100	+			
• Iritech IriShield USB MK 2120U / IriShield-USB BK 2121U	+	+	+	+
• Iritech IriMagic1000BK	+			
• UBKEY Mirrorkey Mirrorkem	+			
• VistaFA2 / VistaFA2E / VistaEY2 / VistaEY2-02 iris & face cameras	+	+		
• VistaEY2H iris camera	+	+		

Notes:

(1) Can be used on 64-bit OS, but only in 32-bit applications.





## System Requirements

- **PC or Mac specific:**
  - PC or Mac with **x86 (32-bit)** or **x86-64 (64-bit)** compatible processors. 2GHz or better processor is recommended.
  - At least **128 MB of free RAM** should be available for the application. Additional RAM is required for applications that perform 1-to-many identification, as all biometric templates need to be stored in RAM for matching. For example, **50,000 templates** (each containing 2 iris records) require about **223 MB of additional RAM**.
  - **Free space on hard disk drive (HDD):**
    - at least 1 GB required for the development.
    - 100 MB required for VeriEye components deployment.
    - Additional space would be required in these cases:
      - VeriEye does not require the original eye iris image to be stored for the matching; only the templates need to be stored. However, storing eye iris images on hard drive for the potential future usage is recommended.
      - Usually a database engine runs on a separate computer (back-end server). However, DB engine can be installed on the same computer for standalone applications. In this case HDD space for templates storage must be available. For example, 50,000 templates (each containing 2 iris records) stored using a relational database would require about 223 MB of free HDD space. Also, the database engine itself requires HDD space for running. Please refer to HDD space requirements from the database engine providers.
- **Smartphone and tablet specific:**
  - A smartphone or tablet that is running **Android 4.0 (API level 14)** OS or newer. If you have a custom Android-based device or development board, contact us to find out if it is supported.
  - ARM-based **1.5 GHz processor recommended** for iris processing in the specified time. Slower processors may be also used, but the iris processing will take longer time.
  - At least **20 MB of free RAM** should be available for the application. Additional RAM is required for applications that perform 1-to-many identification, as all biometric templates need to be stored in RAM for matching. For example, **1,000 templates** (each containing 1 iris record) require about **2.5 MB of additional RAM**.
  - **Free storage** space (built-in flash or external memory card):
    - 30 MB required for embedded iris components deployment for each separate application.
    - Additional space would be required if an application needs to store original iris images. VeriEye does not require the original eye image to be stored for the matching; only the templates need to be stored.
- **Iris scanner:**
  - VeriEye SDK includes support modules for several iris scanners under Microsoft Windows and Android platforms. See the previous chapter.
  - Iris images in **BMP, JPG or PNG** formats can be processed thus almost any third-party iris capturing hardware can be used with the VeriEye technology if it generates images in the mentioned formats.
  - Integrators may also write **plug-ins to support their iris cameras** using the plug-in framework provided with the Device Manager from the VeriEye SDK. The integrators should note, that **regular cameras**, like webcams or the cameras build-in into smartphones or tablets, are **not suitable** for iris capture, as it requires **near-infrared** illumination and an appropriate scanner.



- **Database engine** or connection with it. VeriEye templates can be saved into any DB (including files) supporting binary data saving. VeriEye Extended SDK contains the following support modules for Matching Server:
  - Microsoft SQL Server (only for Microsoft Windows platform);
  - MySQL (for Microsoft Windows and Linux platforms);
  - Oracle (for Microsoft Windows and Linux platforms);
  - PostgreSQL (for Microsoft Windows and Linux platform);
  - SQLite (for Microsoft Windows, Linux and Mac OS X platforms).
- **Network/LAN connection (TCP/IP)** for client/server applications. Also, network connection is required for using Matching Server component (included in VeriEye Extended SDK). Communication with Matching Server is not encrypted therefore, if communication must be secured, a dedicated network (not accessible outside the system) or a secured network (such as VPN; VPN must be configured using operating system or third party tools) is recommended.
- **Microsoft Windows specific requirements:**
  - Microsoft Windows XP / Vista / 7 / 8 / Server 2003 / 2008 / 2008 R2 / 2012, 32-bit or 64-bit.
  - Microsoft .NET framework 3.5 or newer (for .NET components usage).
  - One of following development environments for application development:
    - Microsoft Visual Studio 2008 SP1 or newer (for development under C/C++, C#, Visual Basic .Net);
    - Sun Java 1.6 SDK or later.
- **Android specific requirements:**
  - Android 4.0 (API level 14) OS or newer.
  - PC-side development environment requirements:
    - Java SE JDK 6 (or higher)
    - Eclipse Indigo (3.7) IDE
    - Android development environment (at least API 14 required)
    - Apache Maven 3.1.x or newer
    - Internet connection for activating VeriEye component licenses
- **Linux specific requirements:**
  - Linux 2.6 or newer kernel, 32-bit or 64-bit.
  - glibc 2.11.3 or newer
  - wxWidgets 3.0.0 or newer libs and dev packages (to build and run SDK samples and applications based on them)
  - Qt 4.8 or newer libs, dev and qmake packages (to build and run SDK samples and applications based on them)
  - GCC-4.0.x or newer (for application development)
  - GNU Make 3.81 or newer (for application development)
  - Sun Java 1.6 SDK or later (for application development with Java)
  - pkg-config-0.21 or newer (optional; only for Matching Server database support modules compilation)
- **Mac OS X specific requirements:**
  - Mac OS X (version 10.7 or newer).
  - XCode 4.3 or newer (for application development).



## Technical Specifications

**64 pixels** is the minimal radius of circle containing full iris texture, that is required for iris template extraction.

**Near-infrared** spectral region is recommended for iris image capture.

All iris templates should be loaded into RAM before identification, thus the maximum iris template database size is limited by the amount of available RAM.

VeriEye biometric template extraction and matching algorithm is designed to run on **multi-core processors** allowing to reach maximum possible performance on the used hardware.

VeriEye 2.9 iris engine specifications				
	Android-based platform <sup>(1)</sup>		PC-based platform <sup>(2)</sup>	
Template extraction components	Embedded Iris Extractor	Embedded Iris Client	Iris Extractor	Iris Client
Iris template extraction time (seconds)	1.34	1.20	1.34	0.60
Template matching components	Embedded Iris Matcher		Iris Matcher	
Matching speed (Irises per second)	3,000		40,000	
Single iris record size in a template (bytes)	2,328			

Notes:

(1) Requires to be run on Android devices based on at least Snapdragon S4 system-on-chip with Krait 300 processor (4 cores, 1.51 GHz).

(2) Requires to be run on PC or laptop with at least Intel Core 2 Q9400 quad-core processor (2.67 GHz) to reach the specified performance.



## Reliability Test Results

We present the testing results to show VeriEye 2.9 template matching algorithm reliability evaluations. Iris images from several **standard databases** were used for testing, thus the testing results can be compared with testing results of other algorithms. All databases contained iris images with 640 x 480 pixels size.

Iris image databases used for VeriEye 2.9 algorithm testing			
Database name	Images quantity	Persons quantity	Unique eye quantity
ICE2005 Exp1 iris image database (Right Iris)	1,425	124	124
University of Notre Dame, ND-IRIS-0405	64,980	356	712
University of Bath, IRISDB1600 <sup>(1)</sup>	24,361	624	1,231

(1) The full IRISDB1600 database contains 31,997 images (image size 1280x960 pixels), representing 799 unique persons and 1,598 unique irises. A subset used in this test was preprocessed similar to NIST IREX experiments ([www.nist.gov/itl/iad/ig/irexi.cfm](http://www.nist.gov/itl/iad/ig/irexi.cfm)):

- (a) Images were downsampled to 640x480 via 2x2 neighborhood averaging.
- (b) All images containing irises with diameters larger than 340 pixels were removed.

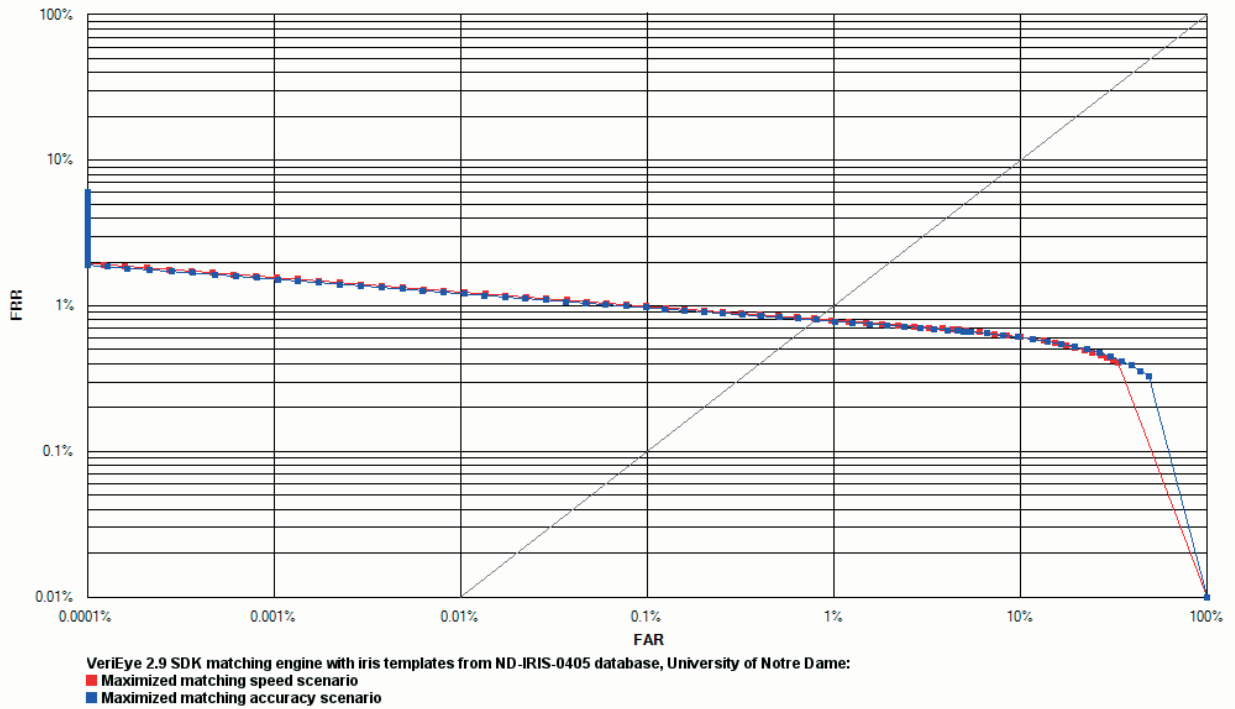
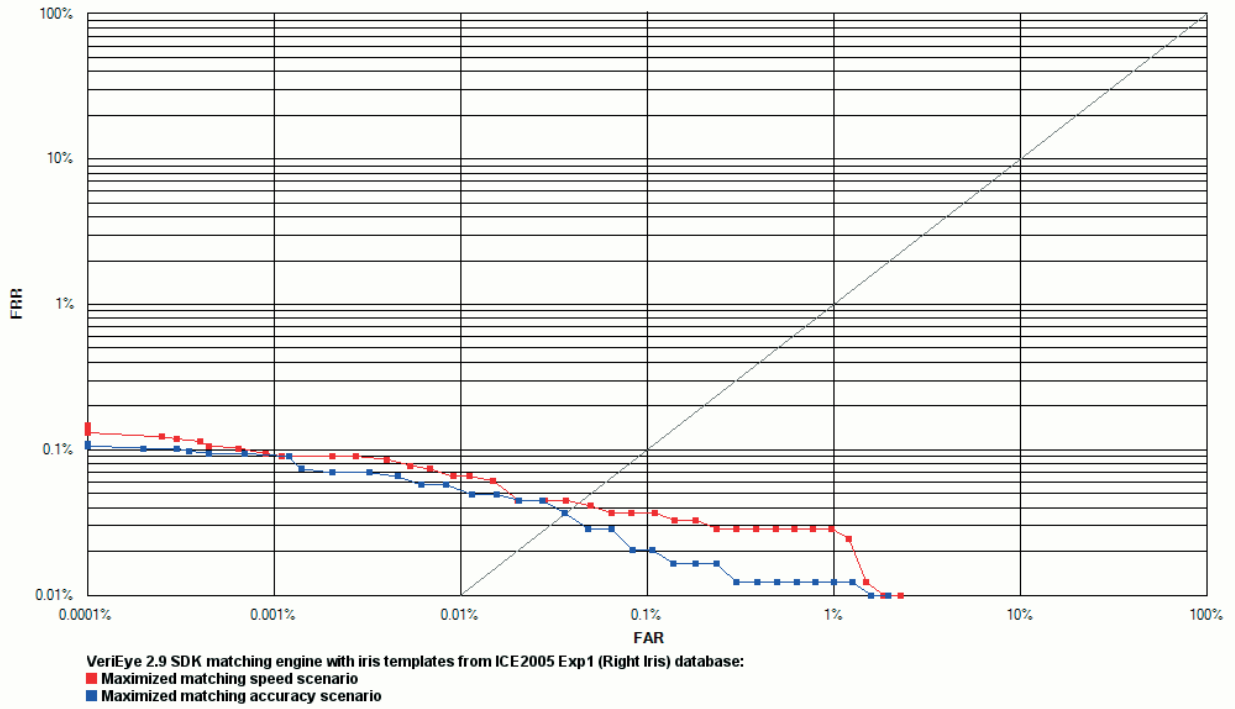
Two tests were performed with each database:

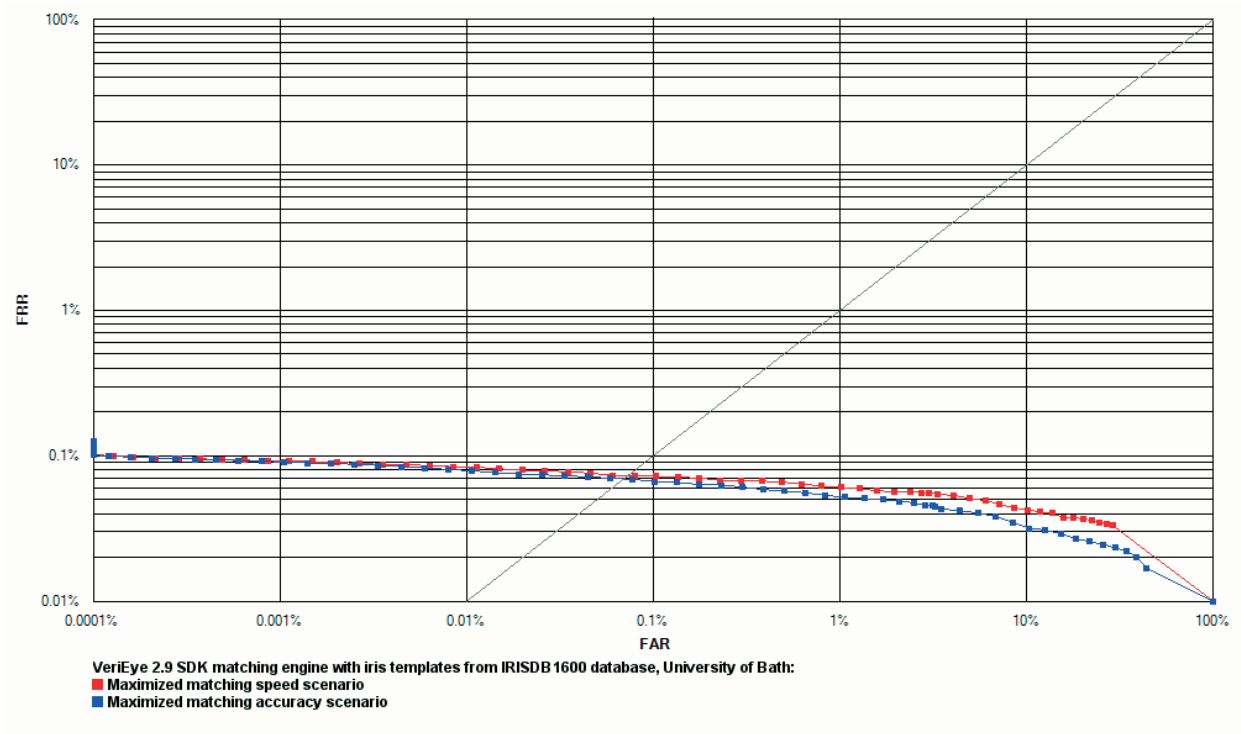
- **Test 1** maximized **matching accuracy**. VeriEye 2.9 algorithm reliability in this test is shown as **blue curves** on the ROC charts.
- **Test 2** maximized **matching speed**. VeriEye 2.9 algorithm reliability in this test is shown as **red curves** on the ROC charts.

The iris rotation tolerance was set to  $\pm 15^\circ$  in all tests.

VeriEye 2.9 algorithm reliability testing results, FRR at 0.001 % FAR		
	Test 1	Test 2
ICE2005 Exp1 database	0.0983 %	0.1187 %
ND-IRIS-0405 database	1.5550 %	1.6000 %
BATH IRISDB1600 database	0.0893 %	0.0928 %

Receiver operation characteristic (**ROC**) curves are usually used to demonstrate the recognition quality of an algorithm. ROC curves show the dependence of false rejection rate (**FRR**) on the false acceptance rate (**FAR**). The ROC charts are on the next page.





## VeriEye Demo, Trial SDK and Related Products

VeriEye algorithm demo application and VeriEye 30-day SDK Trial are available for downloading at [www.neurotechnology.com/download.html](http://www.neurotechnology.com/download.html).

These products are related to VeriEye SDK:

- **MegaMatcher SDK** – intended for development of AFIS or multi-biometric iris, fingerprint, face and voice identification products. See “MegaMatcher SDK” brochure for more information.
- **MegaMatcher On Card SDK** – a product for iris, fingerprint and face matching on smart cards. See “MegaMatcher On Card” brochure for more information.



## Licensing VeriEye SDK

The following licensing model is intended for **end-user** product developers. Integrators who want to develop and sell a VeriEye-based development tool (with API, programming possibilities, programming samples, etc.), must obtain permission from Neurotechnology and sign a special VAR agreement.

### Product Development

An integrator should obtain either a VeriEye 2.9 Standard SDK (EUR 339) or VeriEye 2.9 Extended SDK (EUR 859) to develop a product based on VeriEye technology. The SDK needs to be purchased just once and may be used by all the developers within the integrator's company.

VeriEye SDKs include a number of components; each particular component has specific functionality. A **license** for an individual VeriEye component is required for **each computer or device** that **run** the component.

VeriEye SDK components and licenses included with a specific SDK		
	VeriEye 2.9 Standard SDK	VeriEye 2.9 Extended SDK
• Iris Matcher	1 single computer license	1 single computer license
• Embedded Iris Matcher	1 single computer license	1 single computer license
• Iris Client <sup>(1)</sup>		3 single computer licenses and 1 concurrent license
• Embedded Iris Client		3 single computer licenses
• Iris Extractor	1 single computer license	1 single computer license
• Embedded Iris Extractor	1 single computer license	1 single computer license
• Matching Server		+

(1) Iris Client component includes Iris Extractor and Iris BSS components, which can be also obtained separately. The Iris Client concurrent license may be also used for running the Embedded Iris Client on multiple Android devices.

Components are copy-protected – a license is required for a component to run. License activation options are listed below.

Additional component licenses may be obtained by VeriEye 2.9 SDK customers as required by their development process.

### Product Deployment

To deploy a product developed with VeriEye 2.3 / 2.4 / 2.5 / 2.6 / 2.7 / 2.8 / 2.9 SDK, an integrator need to obtain only the additional licenses required for the particular VeriEye 2.9 components that will run on **each computer or device** belonging to their customers computer's. The available VeriEye components and license types for product deployment are the same as for product development.

Each VeriEye component running on a computer belonging to the integrator's customer requires a license. License activation options are listed below on this page.

Prices for VeriEye 2.9 SDK and additional VeriEye component licenses can be found in the next chapter.

Please refer to the License Agreement on the Neurotechnology web site for all licensing terms and conditions.



## Single computer license

A single computer license allows the installation and running of a VeriEye component installation on one CPU (a processor can have any number of cores). Neurotechnology provides a way to renew the license if the computer undergoes changes due to technical maintenance.

Each single computer license requires **activation** for a VeriEye component to run. The available activation options are listed below.

Additional single computer licenses for VeriEye components may be obtained at any time by VeriEye SDK customers.

## Concurrent network licenses

Concurrent licenses are available for Iris Client component, allowing the installation of this specific component on an unlimited number of computers. An application obtains a specific license for the capturing process and to perform template creation (extraction). On average it takes less than 10 seconds for iris capturing/enrolling. After this interval the license is released, making it available for another user. One Iris Client concurrent license can be shared among tens of users, making this license especially **useful for web-based** software.

The number of simultaneously running Iris Client component instances is limited by the number of concurrent licenses. Available license management options are listed below.

The concurrent license for Iris Client also allows to run the Embedded Iris Client on multiple Android devices.

Additional concurrent network licenses may be obtained at any time by VeriEye SDK customers.

## License activation options

Single computer and concurrent network licenses are supplied in three ways:

- **Serial numbers** are used to activate licenses for particular VeriEye components. The activation is done via the Internet or by email. After activation the network connection is not required for single computer license usage. Note: activation by serial number is **not suitable for virtual environments**.
- **Internet activation.** A special **license file** is stored on a computer or an Android device; the license file allows to run particular VeriEye components on that computer after **checking** the license over the Internet. **Internet connection** should be available for a short period of time at least **once in 7 days**. A single computer license can be **transferred** to another computer or device by moving the license file there and waiting until the previous activation expires.
- Licenses may be stored in a volume license manager **dongle**. License activation using volume license manager may be performed without connection to the Internet and is suitable for virtual environments.





## Volume license manager

Volume license manager is **used on site by integrators or end users** to manage licenses for VeriEye components. It consists of license management software and a dongle, used to store the purchased licenses. An integrator or an end-user may use the volume license manager in the following ways:

- **Activating single computer licenses** – An installation license for a VeriEye component will be activated for use on a particular computer. The number of available licenses in the license manager will be decreased by the number of activated licenses.
- **Managing single computer or concurrent licenses via a LAN or the Internet** – The license manager allows the management of installation licenses for VeriEye components across multiple computers or Android devices in a LAN or over the Internet. The number of managed licenses is limited by the number of licenses in the license manager. No license activation is required and the license quantity is not decreased. Once issued, the license is assigned to a specific computer or device on the network.
- **Using license manager as a dongle** – A volume license manager containing at least one license for a VeriEye component may be used as a dongle, allowing the VeriEye component to run on the particular computer where the dongle is attached.

Additional VeriEye component licenses for the license manager may be purchased at any time. Neurotechnology will generate an update code and send it to you. Simply enter the code into the license manager to add the purchased licenses.

## VeriEye 2.9 enterprise license

The VeriEye enterprise license allows an **unlimited use** of VeriEye components in end-user products for a specific territory, market segment or project. Specific restrictions would be included in the licensing agreement.

The enterprise license price depends on the application size and the number of potential users of the application within the designated territory, market segment or project.

For more information please contact us.



## Prices for VeriEye Products

- The prices are **effective March 2, 2015**. The prices may change in the future, so please **download and review the latest version** of the brochure before making an order.
- Quantity discounts do not accumulate over time.
- Prices do not include local import duties or taxes.
- Product shipping costs depend on delivery country.
- Customers with Solution Partner status are eligible for product discounts.

VeriEye SDK	
VeriEye 2.9 Standard SDK	€ 339.00
VeriEye 2.9 Standard SDK	€ 859.00

Iris Client component concurrent licenses	
Price per license	€ 650.00

Iris components for PCs (prices per single computer license)				
Quantity	Iris Extractor	Iris Client <sup>(1)</sup>	Iris Matcher	Iris BSS <sup>(1)</sup>
1 - 9	€ 30.00	€ 38.00	€ 38.00	€ 10.00
10 - 19	€ 22.00	€ 28.00	€ 28.00	€ 7.50
20 - 49	€ 19.00	€ 25.00	€ 25.00	€ 6.50
50 - 99	€ 17.00	€ 22.00	€ 22.00	€ 5.50
100 - 199	€ 15.00	€ 19.00	€ 19.00	€ 5.00
200 - 499	€ 13.00	€ 17.00	€ 17.00	€ 4.50
500 - 999	€ 12.00	€ 15.00	€ 15.00	€ 4.00
1000 - 1999	€ 11.00	€ 13.00	€ 13.00	€ 3.50
2000 - 3999	€ 10.00	€ 12.00	€ 12.00	€ 3.10
4000 - 7999	€ 9.00	€ 11.00	€ 11.00	€ 2.80
8000 and more	Please contact us for more information			

Embedded iris components for Android devices (prices per single computer license)			
Quantity	Embedded Iris Extractor	Embedded Iris Client <sup>(1)</sup>	Embedded Iris Matcher
1-9	€ 20.00	€ 25.00	€ 25.00
10-19	€ 15.00	€ 18.00	€ 18.00
20-49	€ 13.00	€ 16.00	€ 16.00
50-99	€ 11.00	€ 14.00	€ 14.00
100-199	€ 10.00	€ 12.50	€ 12.50
200-499	€ 9.00	€ 11.00	€ 11.00
500-999	€ 8.00	€ 10.00	€ 10.00
1000-1999	€ 7.00	€ 9.00	€ 9.00
2000-3999	€ 6.40	€ 8.00	€ 8.00
4000-7999	€ 5.80	€ 7.00	€ 7.00
8000 and more	Please contact us for more information		

License management	
Volume license manager	€ 16.00

(1) These components are not available for VeriEye Standard SDK customers.

VeriEye products can be ordered:

- online, at [www.neurotechnology.com/cgi-bin/order.cgi](http://www.neurotechnology.com/cgi-bin/order.cgi)
- via a local Neurotechnology distributor; the list of distributors is available at [www.neurotechnology.com/distributors.html](http://www.neurotechnology.com/distributors.html)