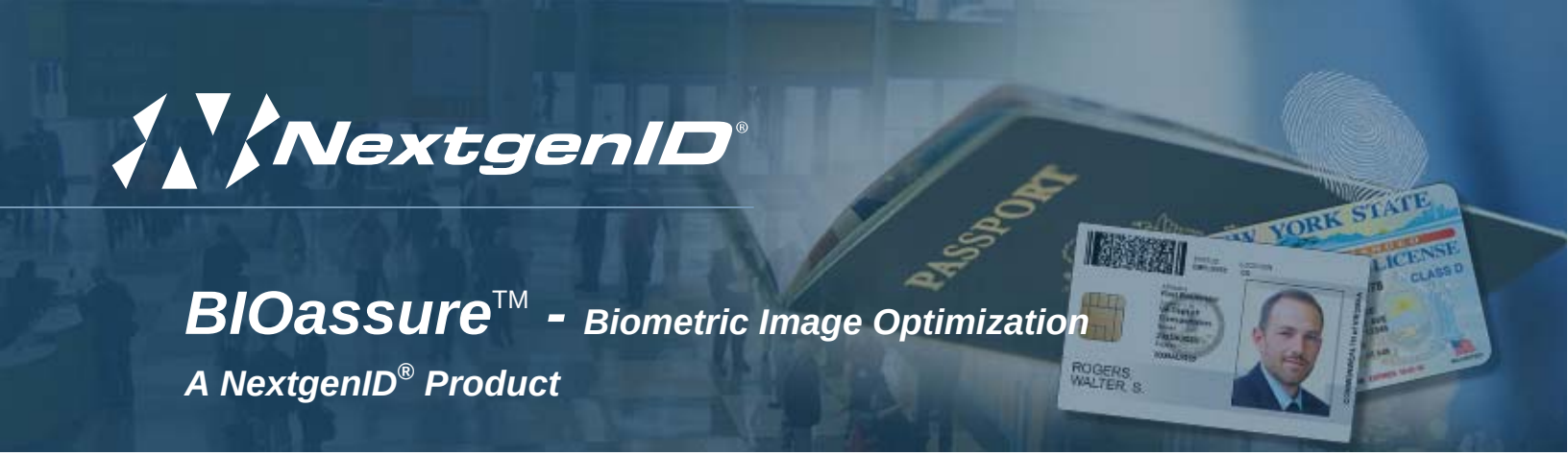


BIOassure™ - *Biometric Image Optimization*

A NextgenID® Product

ID*Capture

The NextgenID BIOassure software enables image quality assessment and normalization functionalities for applications in biometric enrolment or matching. Image quality is essential for biometric performance, and using BIOassurewill ensure the necessary quality and consistency to enable such applications. BIOassure image quality analysis is configurable to given standards such as the ICAO Standard (ISO/IEC 19794-5) for passport and ID card images. Additionally, BIOassure will process, or normalize an image any standard ICAO or custom image format. This can serve to effectively reduce costly image rejections where the original submitted image may not conform to the required standard.

BIOassure additionally includes tools for automated background replacement, such as would be used in creating images for laser engraving purposes. Automated tools are augmented by several manual enhancement options for background replacement, and also for characteristics such as brightness, contrast, sharpness, color balance, face size, and face position.

BIOassure Features

- Image Quality Analysis evaluates the following categories of image characteristics:
- Eye detection confidence (eyes obscured by glasses, glare, hair or clothing)
- Head rotation (3 dimensions)
- Resolution (distance between the eyes in pixels)
- Face Positioning (vertical and horizontal centering)
- Face Size (as a relative percentage of image size)
- Face brightness, sharpness, contrast, color balance
- Glare or hot spots
- Dynamic Range
- Shadows (eye, face)
- Background (brightness, consistency and shadows)
- Image Format (colour/mono, colour space, colour depth)
- Eyes (red eye, eyes closed)

BIOassure SDK is supplied in the form of a .dll or an ActiveX component for compatibility with a wide range of software development environments. In addition to the functional component, a graphical component provides a viewer and automatic display of the face and related landmarks.

10226 San Pedro, Suite 100 - San Antonio, TX 78216 USA - (210) 530-9991 www.nextgenid.com

Automated Functions include

- Automatic face finding from single and multi-face images
- Automatic eye landmark determination for each face
- Eye landmark confirmation and manual override
- Image resizing to specified number of pixels between the eyes
- Automatic image rotating for optimal biometric sampling
- Transformation of captured facial image to a specified canonical image format (full frontal, token or special custom image specifications)
- Automatic cropping to specified requirements
- Automatic background removal and tools for manual background editing if required

BIOassure Benefits

- Can be used to ensure image quality and consistency upon enrolment, thus increasing the performance of the face-matching solution
- Can be easily integrated with existing biometric and security solutions
- Provides developers total control of facial biometric image processing and handling
- Architecture is flexible enough to accommodate current and emerging international standards for global exchange of facial biometrics as specified in ICAO DOC9303, and industry best practices
- Creates images that are suitable for laser engraving as well as printing and encoding on rfid chips
- Reduces rejections of submitted photos and the associated costs.

Illustrations

Images are attached to illustrate some of the functions of BIOassure and BIOassure Image Analyzer.

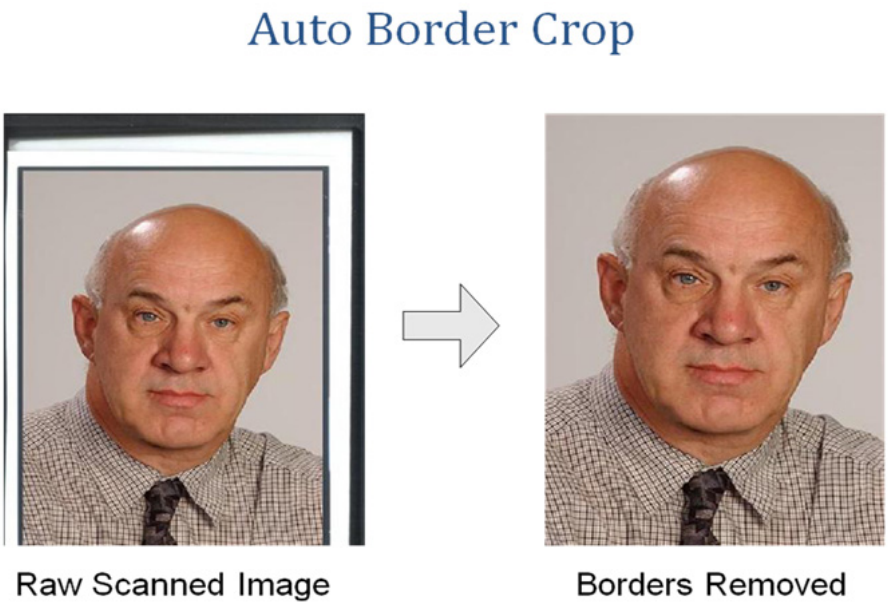


Figure 1: Face image is cropped from application eliminating borders and scanning artifacts

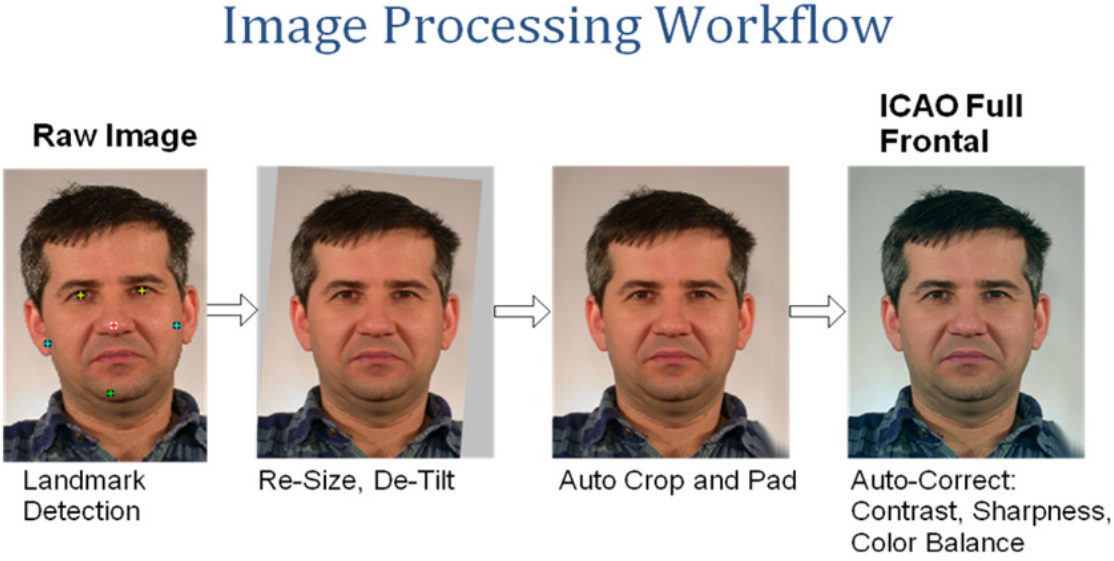
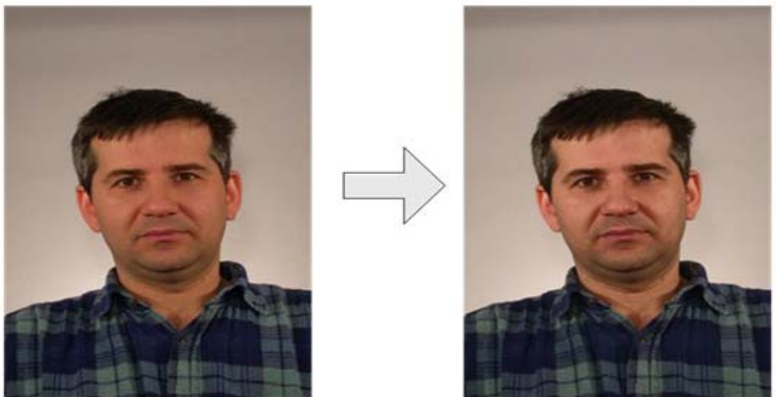


Figure 2: Cropped face image is automatically adjusted to best fit ICAO standards and best practices

The following figures illustrate the photo image adjustments that are available for use within BIOassure

Auto Sharpness Correction

Auto Contrast Correction



Auto Color-Balance Correction

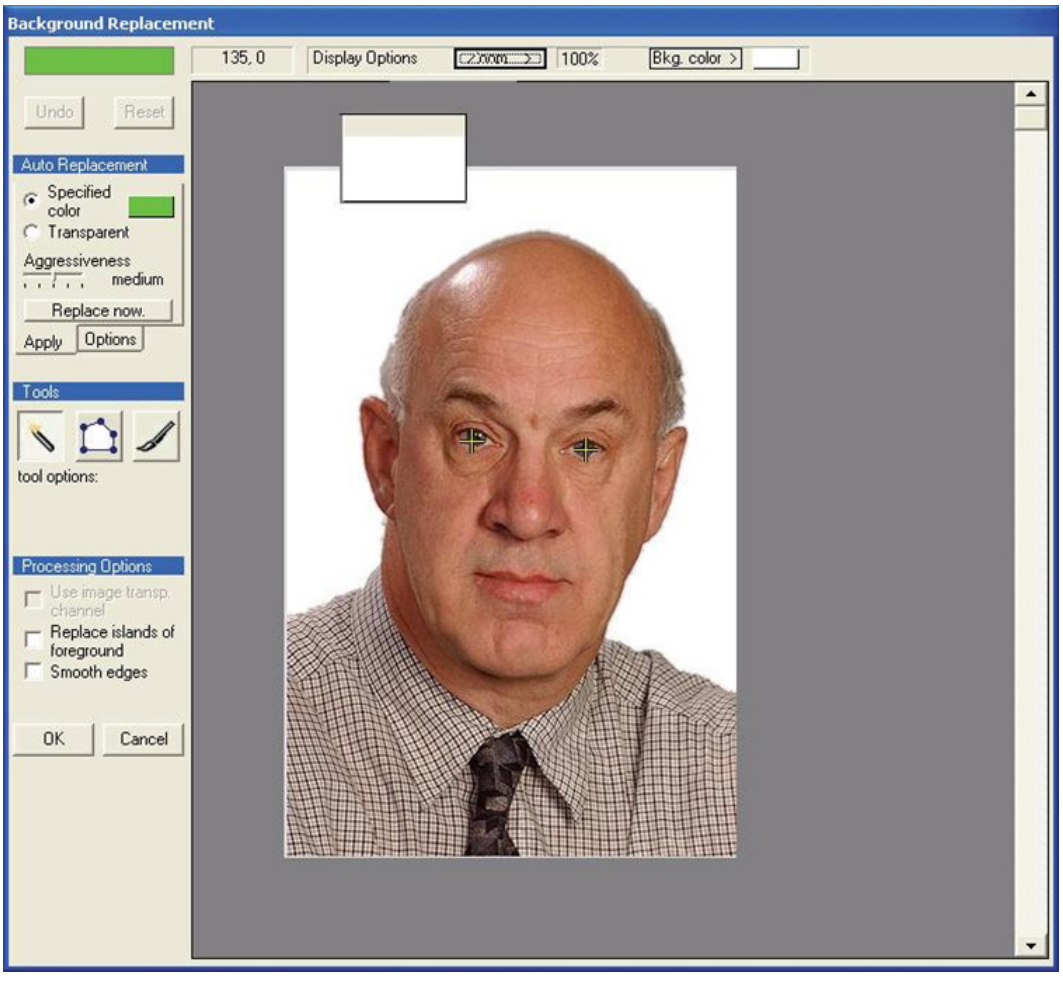
Auto Background Replacement

Convert to Grayscale

Background Replacement

A screen shot of the user interface for manual assisted background replacement is provided below. Facilities are provided for:

- Selecting background colour or transparent
- Adjusting the aggressiveness of the background replacement. This helps if the background is not consistent.
- Replacing islands of foreground. If clothing has same colour as background, then it might be accidentally removed and this allows the foreground to be easily replaced.
- Removing background by point and click, brushing or fencing
- Zoom and a drag and drop magnifier allow fine work to be done easily and accurately



VisPro Image Analyzer

BIOassure Image Analyzer is a sample application that is provided with BIOassure SDK to illustrate how the methods within BIOassure can be used. The screen shot below shows Image Analyzer with the original image on the left, the image quality analysis in the middle and the processed image on the right.

Contact NextgenID

Headquarters
10226 San Pedro, Suite 100
San Antonio, TX 78216 USA
Office +1 (210) 530-9991
Fax +1 (210) 530-9992

Washington DC
13454 Sunrise Valley Dr, Suite 430
Herndon, VA 20171
Office +1 (703) 429-8525