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SOFTWARE DEVELOPMENT KIT

SDK

Armatura FaceLite SDK

Overview

Armatura FaceLite SDK encapsulates Armatura near-Infrared face recognition algorithm and provides rich programming interfaces to the full cycle face recognition operations, including face detection, liveness detection, face template extraction and matching.

FaceLite SDK also wraps libusb function calls to support USB 2.0 compatible communication protocols with Armatura face modules. FaceLite SDK supports popular operating systems including Windows, Android and Linux (on request).

In summary, FaceLite SDK offers transparent, intuitive, and self-contained integration interfaces to application integrators/developers, flatting the learning curve on biometric recognition development, and simplifying the hardware communication implementation with software. The combination of infrared face modules and FaceLite SDK makes biometric features available to a wide range of business systems, such as access control devices, time attendance clocks, POS, ATM, lockbox and more.

FaceLite Algorithm Features

The quality of the facial image directly impacts the performance of face recognition. Visible light could cause under- or over-exposure and leave uneven darkness or brightness on face, making poor-performance face recognition.

Armatura infrared face modules employs near-infrared light (NIR) to evenly illuminate the face and take the facial image in grayscale representation. Different from visible light images, such grayscale image removes the uneven brightness and darkness from face, make it superior for face recognition.

FaceLite algorithm takes facial grayscale images as input, scans the image to detect key facial feature points which may not be visible from visible light images, analyzes the liveness likelihood to ensure a real person's face, generates template to represent facial features and performs enrollment and matching operations.

The infrared light-based face recognition algorithm provides more features:

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- ### Face Focusing Method to Enhance Image Quality

Amatura infrared face module utilizes FaceLite algorithm auto focusing method to optimize the exposure time on face, this approach significantly reduces the ambient light impact on the face. As a result, it ensures the consistent high-accuracy face identification for all indoor and most outdoor environments.

- ### High-Performance and High-Accuracy Face Recognition

FaceLite algorithm can detect different level (18,40 or 120) of key facial feature points and its locations in milliseconds, including eyes, lips, nose tips, contours and more. Such key feature points taken by infrared light are stable bio-characteristics, the algorithm can easily distinguish and identify them on the grayscale image, it guarantees FaceLite Algorithm to maintain face recognition highly performed and highly accurate.

- ### Multi-dimensional Face Feature Template

The FaceLite algorithm generates multiple registration templates (5 by default) from the face image captured in sequence, calculates multi-dimensional features from the templates then merge into one single enrollment template. Merging of multiple templates minimizes the side impact from hat, scarves, dark glasses or other attachments during the registration process, ensures high quality of face enrollment and high accuracy of face identification.

- ### Liveness Detection

Built-on near-infrared technologies, FaceLite algorithm can effectively detect a fake face from a digital photo, printed color photo, Black & White face image, or a recorded video of live face.

- ### Automatic Update on Template Library

FaceLite algorithm tracks face features and automatically updates the face template into the template library, such adaptive approach always keeps the enrollment template up to date and lower the rejection rate caused by change on the user's appearance and hairstyle.

- ### Algorithm Integrity

Combined with Armatura infrared face modules, FaceLite algorithm ensures the face image data integrity and makes face recognition unbreakable, authentic, and reliable.

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Algorithm and SDK Specifications

Algorithm	Armatura FaceLite Algorithm v12.0	
SDK Size	Android Jar Lib	<15MB
	Windows DLL lib	<130MB
Minimal Image Size	100W x 140H (pixel)	
Pose Range	Yaw ≤ 25°, Pitch ≤ 25°, Roll ≤ 25°	
Template Size	29KB	
Performance*	Face Detection Time	< 50ms
	Template Extraction Time	< 200ms
	Identification Time	< 100ms
Match Mode	1:1 for verification, 1:N for identification	
1:N Capacity	6,000 templates	
Accuracy**	TAR =98.6% when FAR = 0.001%	
Operation System	Windows	Windows XP, 7, 10 (x86 & x64)
	Android	Android 4.1 and above
	Linux	Provided on request
Damo Program	C/C++, C#, Java	

Note:

*The algorithm performance is assessed based on image resolution of 480 * 640, and Quad-Core Cortex-A9, 1.5GHz processor.

** The accuracy is assessed based on the proprietary infrared light face image data set.

** TAR: True Acceptance Rate, FAR: False Acceptance Rate.

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