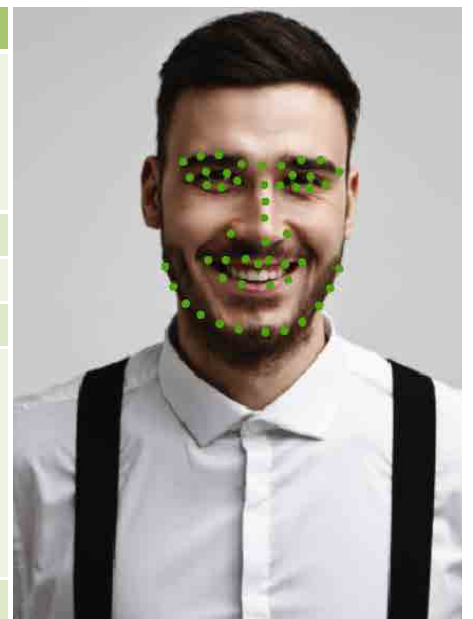


Visible Light Facial Recognition



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Product Introduction : What is Visible Light Facial Recognition

Enhanced Visible Light Facial Recognition is the latest technology of ZKTeco, aimed to overcome shortcomings of previous facial recognition and achieve an all-rounded upgrade on whatever performance and reliability by using Deep Learning. Facial Recognition has been considered as one of the rising biometric technologies and many are optimistic about its development in the future. However, the technological incapability of facial recognition has also been exposed along with the increasing usage in our daily life, mainly in the ability of anti-spoofing, threshold of processing power, environmental restriction on light source and pose of angle.

Therefore, this is precisely what the Enhanced Visible Light Facial Recognition developed for and the key to this breakthrough would be incorporating Deep Learning technology. Deep Learning is adapted to fill up those three technological incapacities as aforesaid and has been passing through a continuous training to keep enhancing its performance.

Performance on practical applications

The Enhanced Visible Light Facial Recognition is rather an all-rounded upgraded version on previous facial recognition technology, not only qualified for general applications, it is also competent for advanced recognition task under a dynamic environment. Especially for its cutting edge anti-spoofing function, any business with high level of security needs will only find it a more reliable technology over the rest.



Product Specifications



G4

- Proactive Facial Recognition
- New Height of Anti-Spoofing
- Speedy Recognition
- Wide Pose Angle Acceptance
- Touchless for Better Hygiene

ZKBioSecurity



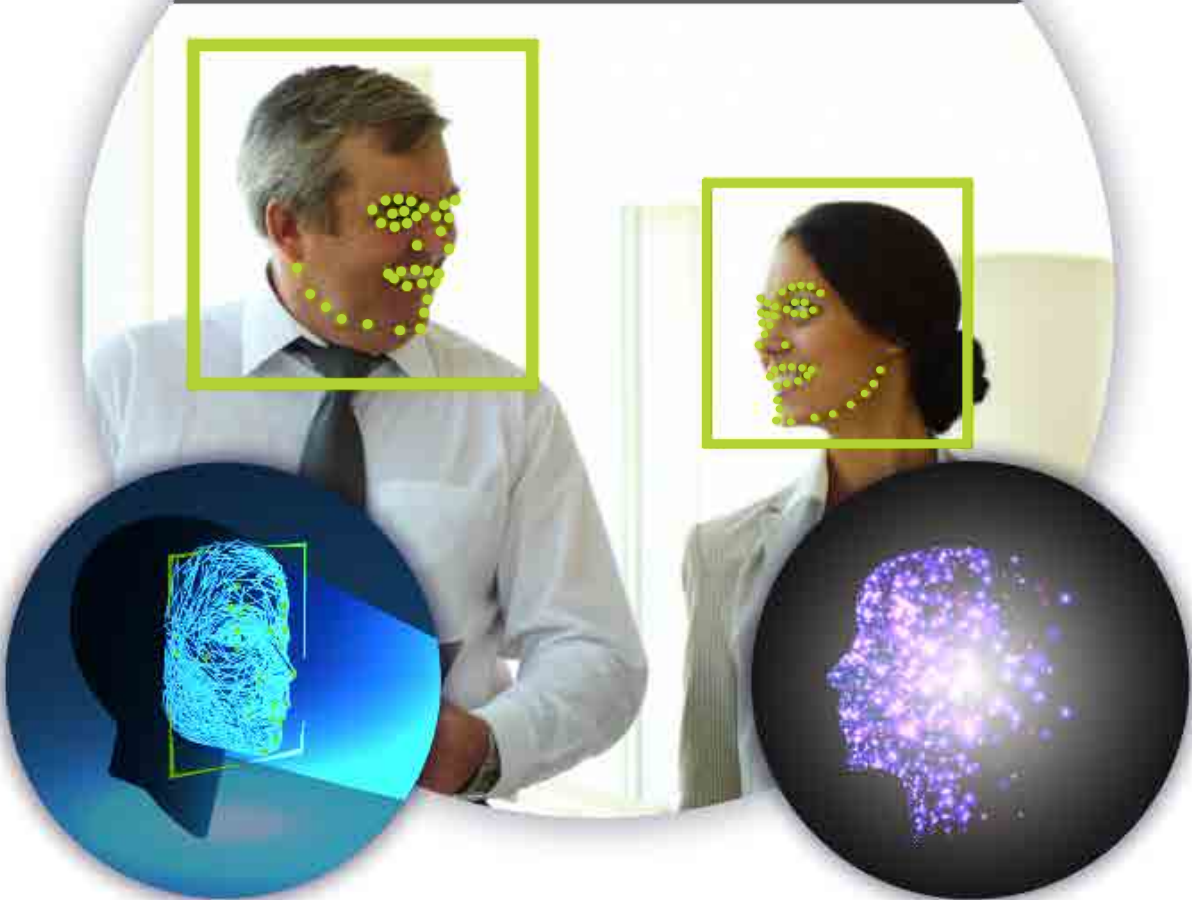
ZKBioSecurity Software

- All-In-One solution
- Multi-door Management Capacity
- Simple Structure and Smooth Workflow



The new evolution of technology
Visible Light Facial Recognition

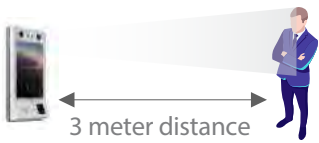
**VISIBLE LIGHT FACIAL
RECOGNITION**



**FACE RECOGNITION
SYSTEM**

**DEEP LEARNING
TECHNOLOGY**

Step through the enhanced Visible Light Facial Recognition



① Detection

System will firstly identify if there is a human face in the image or video and ignore anything else. During detection, Deep Learning with high accuracy and real-time detection ability has given play to its functions of detecting human faces in different size as well as being more adaptable when dealing with backlight.



② Pose Estimation (Deep Learning)

Estimation model is developed via Deep Learning for precisely identify the pose angle such as yaw, pitch and roll. Learning the precise pose angle can benefit subsequent moderation on angular distance.



③ Quality Review

After estimation of the pose angle of input faces, the image will undergo a quality review in 3 dimensions of brightness, clarity and pose angle to ensure quality of images falls into an acceptance range and screen out images which classified as unrecognizable for preventing any waste of processing power.



Alignment

④ Alignment and Feature Extraction

Face alignment refers to the positional adjustment of a person's eyes, nose and mouth to the indicated positions. This process requires 2D affine transformation including movement, zooming, opposition and rotation. The aligned face images are more efficient to be verified by verification algorithms.



Feature Extraction

Face alignment refers to the positional adjustment of a person's eyes, nose and mouth to the indicated positions. This process requires 2D affine transformation including movement, zooming, opposition and rotation. The aligned face images are more efficient to be verified by verification algorithms.



⑤ Recognition

Recognition is the final process which classifies the detected, aligned and normalized faces into known identities by crosschecking the extracted features on templates. Recognition is usually done for training purpose or identification task, different approaches or techniques will be applied either way:

Verification succeeded



Verification unsuccessful



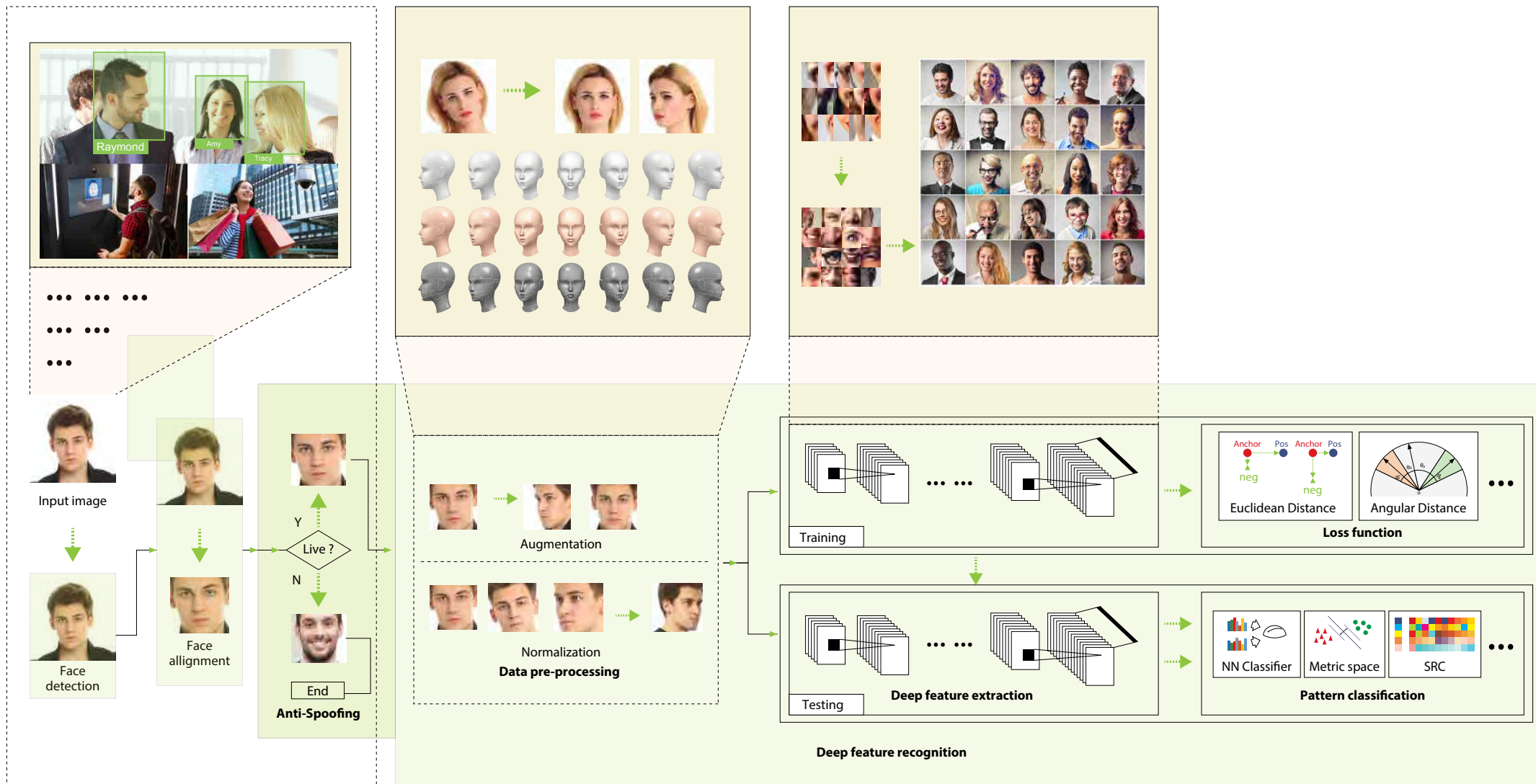
⑥ Unlocked and able to open the door



⑥ Door keep locking



Step through the enhanced Visible Light Facial Recognition





Application for Visible Light Facial Recognition

Visible Light Facial Recognition System is able to automatically recognize and track faces in videos. After installation, System is enabled to actively collect face images and perform matching and identification upon any human activity in its 3-meter distance. Upon successful verification, staffs are free to have entrance and exit without any queuing and waiting needed.

The Visible Light Facial Recognition System is widely suitable for various applications including offices, warehouses, clinics, manufacturing plants, catering premises and constructions sites etc. For staffs that have been tired of long queue, it no longer requires waiting long time and walking in front of conventional passive recognition systems for fingerprint or facial verification. Instead, with the great convenience and efficiency brought by the Visible Light Facial Recognition System, staffs only need to walk straight through and the System actively match faces and data.



Office buildings



Ware House



Clinic



Factories

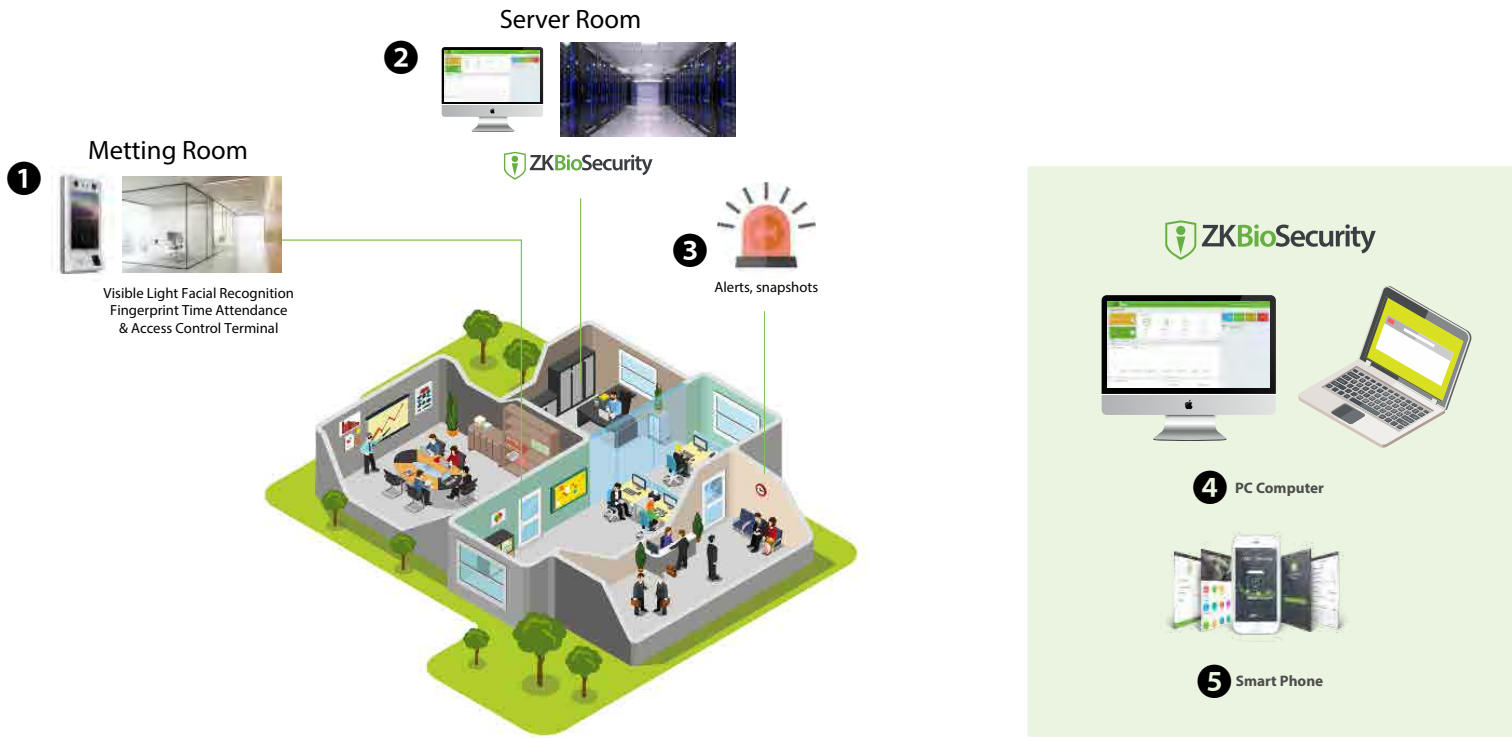


Restaurants

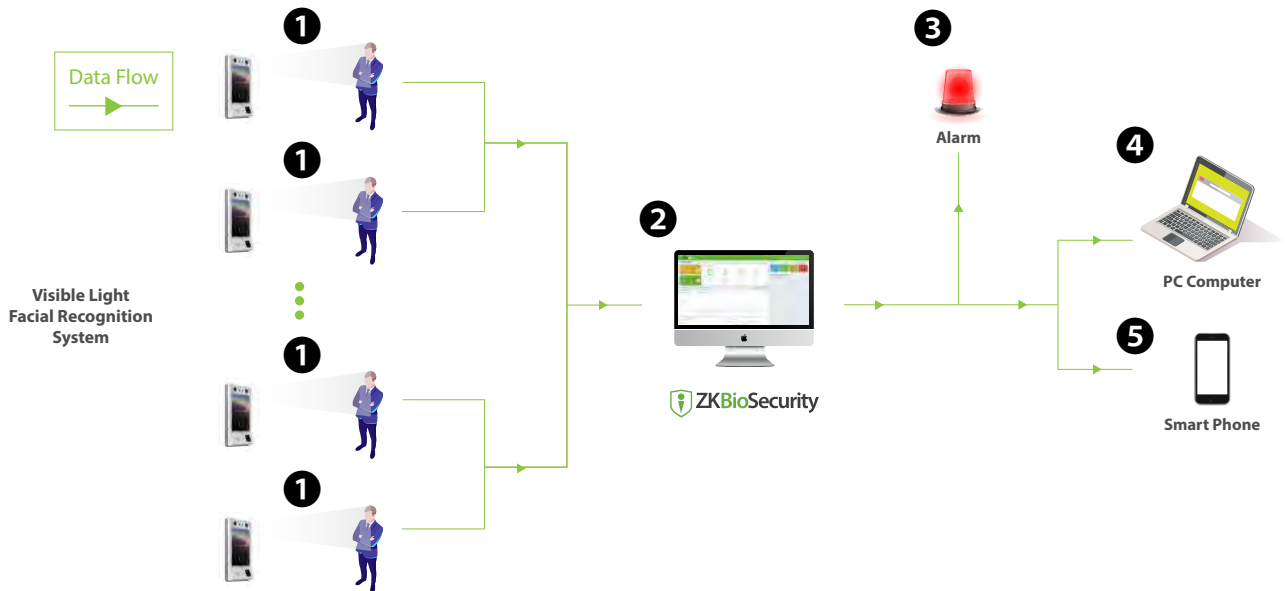


Construction

Solution Office building



System topology



	Key product	Installation loaction	Function
1	Visible Light Facial Recognition System	Office corridor, carpark, entrance area...etc	Real-time monitoring, real-time snapshot, video surveillance,...etc
2	ZKTecoSecurity Server	Server room...etc	Visible light facial recognition
3	Alarm	Security office, office corridor...etc	Smart alerts
4	PC Computer	Security office...etc	Effectively manage an export your company's time attendance data via Computer
5	Smart Phone	All locations	Web based mobile attendance system helps in managing employees attendance



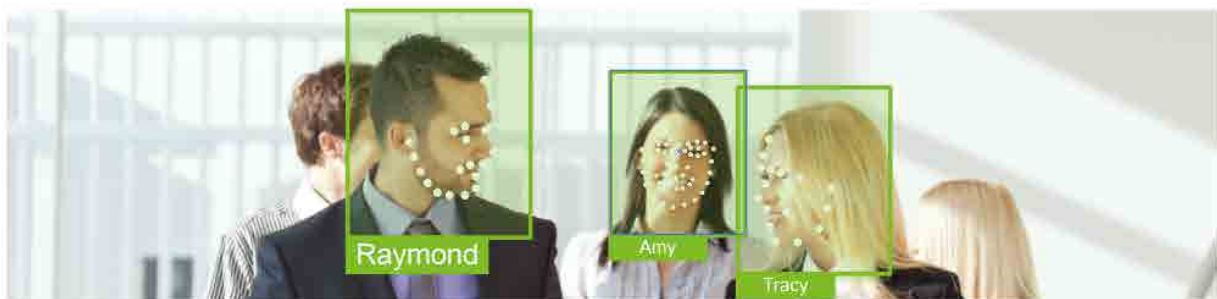
Strength 1 Proactive Facial Recognition

Visible Light Recognition is a proactive facial recognition device, users no longer need to stand steadily in front of camera. When users pass through the specific area, they are possibly recognized automatically.



Opening doors without standing in front of the camera

With the newest visible light recognition technology, if users would like to get access to the authorized area, they are no longer required to get close to the terminal and stop by for recognition, as the system is able to automatically recognize and track faces in video.



Auto-recognizes Everyone

This cutting-edge technology can recognize multiple persons in one single frame, and greatly enhanced the recognition distance to 3 meters (no need to que up)





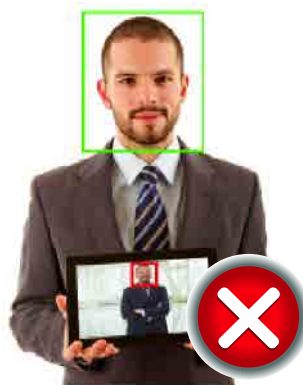
Strength 2 New Height of Anti-Spoofing

With the applied CNN deep learning algorithm, Anti-spoof function has been greatly enhanced and is able to prevent fake faces, photos and video attacks, which is benefited from the power of deep learning which is trained up to conduct liveness detection by learning differences as lighting, texture and resolution.



Anti Fake Video Attack

Deep Learning is introduced to against intruders using fake videos to access the specific area, it is trained to identify differences between living human face and human face played in a video in terms of texture and resolution, consequently video attack can also be defended.

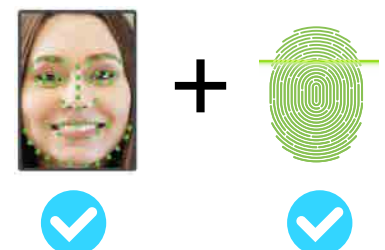


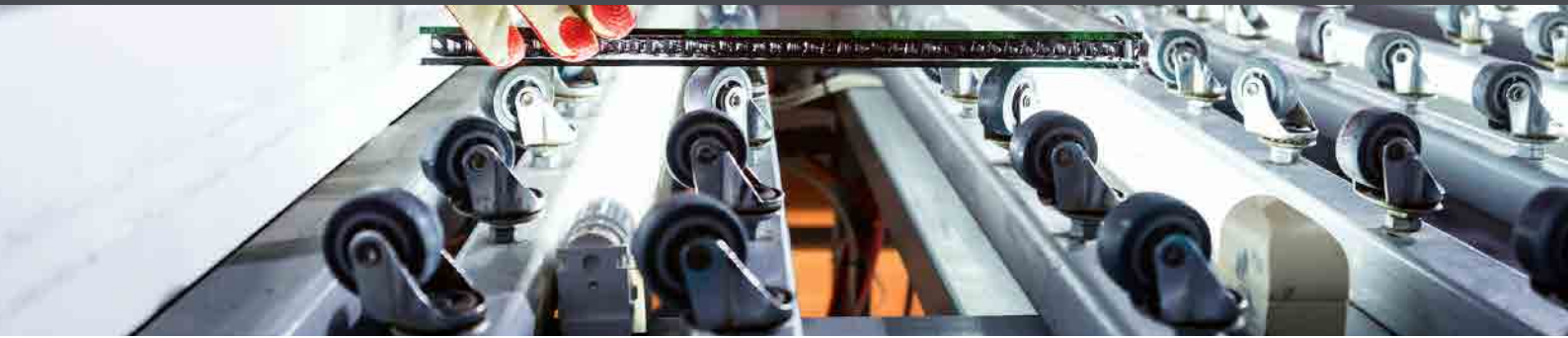
Anti-Fake Photo Attack

Anti-spoofing disallows intruders to cheat the system into granting entrance to a building to an unauthorized visitor by using the fake photo, this recognition can separate real persons and photos, thus disabling intruders to access the locked area of building.

Enhancing Anti-spoofing Standard with Multiple Biometrics

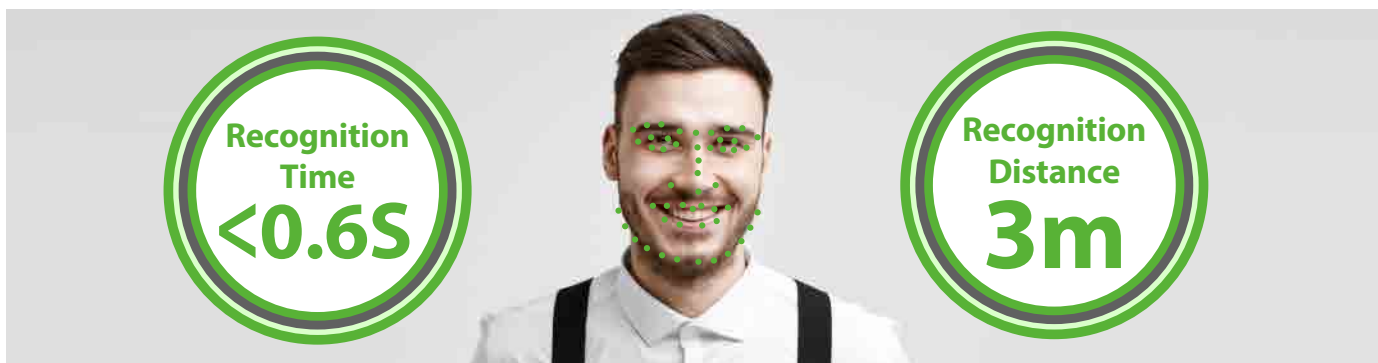
Visible Facial recognition System supports two-factor authentication of users to enhance security level. E.g. Users are only allowed to perform fingerprint / palm print verification progress to open doors upon successful authentication by the System, thus in full aspects improving safety level and satisfying complete security standard.





Strength 3 Speedy Recognition

The visible light facial recognition is way faster than the previous near Infrared facial recognition, and the recognition distance has been greatly extended up to 3 meters long, which significantly improves maximum traffic rate.



Ultra-fast real time Less than 0.6 Second

The most advanced face recognition algorithm enabling industry-leading quick face recognition with less than a second.

High speed processing time

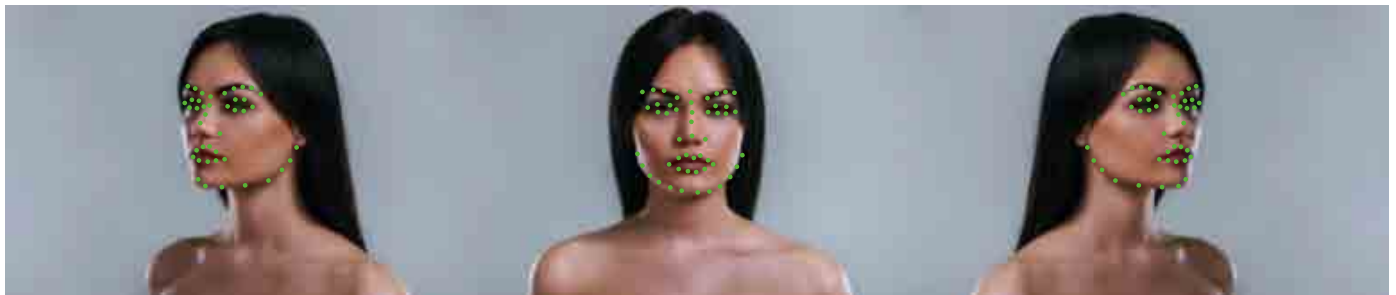
Due to the low processing size of the image, visible light facial recognition provides a 3 times faster processing time than the traditional IR facial recognition.





Strength 4 Wide Pose Angle Acceptance

As the CNN deep learning algorithm is applied, the terminals now have true cognition of faces, which enables larger pose angle acceptance by applying 3D rendering.

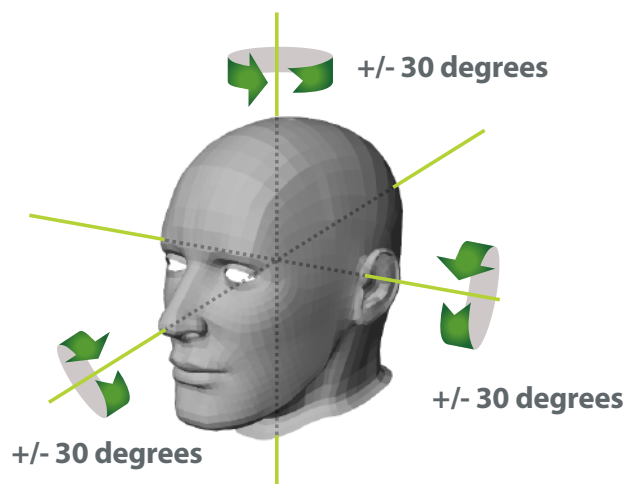
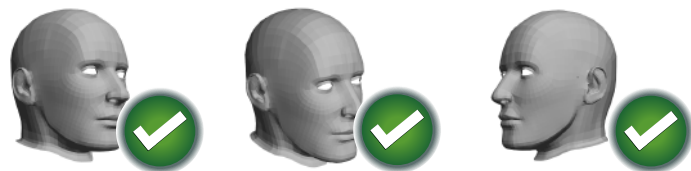


Wide pose angle acceptance

Deep learning technology enriched the pose angle of the recognition up to 30degree in all angles such as pitch, row and yaw.

Extra wide angle recognition (+/- 30 degrees)

While most of algorithms only support 15-degree angle facial recognition, ZKBioFace supports 30-degree angle facial recognition.



Make-up, glasses and different styling acceptance

Delighted by deep learning technology, the recognition technology now able to recognize human from the fundamental pixel level, which greatly enlarged the tolerance of make-up, glasses and styling.



Strength 5 Touchless for Better Hygiene

Visible light facial recognition is a touchless biometric solution, which prevents diseases spread out through dirt.



Touchless & Hygiene

In certain scenarios such as clinic, hospital, construction site, factory, etc, where have a relatively high hygiene level, a stable and reliable facial recognition technology will be needed for opening door, time attendance, opening gate. With the great convenience of this technology, staffs only need to walk straight thought and after the system matched the face and data, the door will be opened automatically.



Clinic



Hotel



Hospital



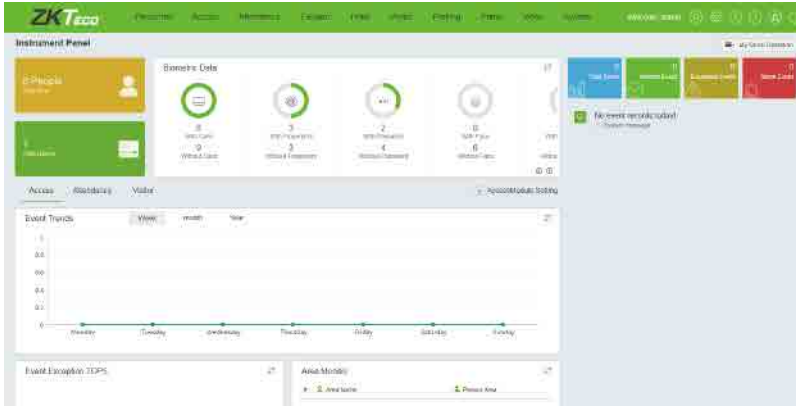
Business



Construction

Support ZKBioSecurity

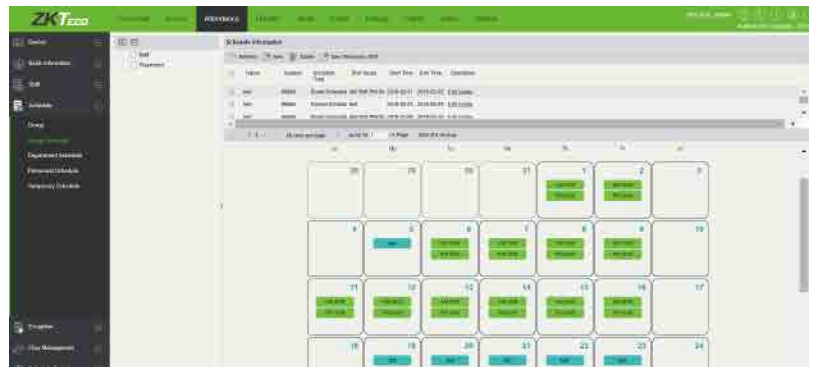
"All-in-One" Web-Based Biometric Security Management Platform



ZKBioSecurity is an "All in One" security platform and the visual light face recognition devices supports the web-based time & attendance module of the ZKBioSecurity. Administrators can manage the Time & Attendance module from anywhere they have access to the Internet. Moreover, this is an powerful time & Attendance system, which can handle most of the complicated time & attendance circumstance, such as, flexible shifts, multi-level OT, cross day shift and online leave application with multi-level approval.

Flexible Group Scheduling

ZKBioSecurity provides flexible group scheduling in the Time & Attendance module, providing users to group their employees, the entire company and individual departments with the same attendance rules. Users have the ability to set attendance parameters like check-in, check-out and overtime rules.



Multi-Location

Users can access the centralized system anywhere by their web browser to remotely manage thousands of standalone terminals and controllers under wide area network (WAN)

USA Office

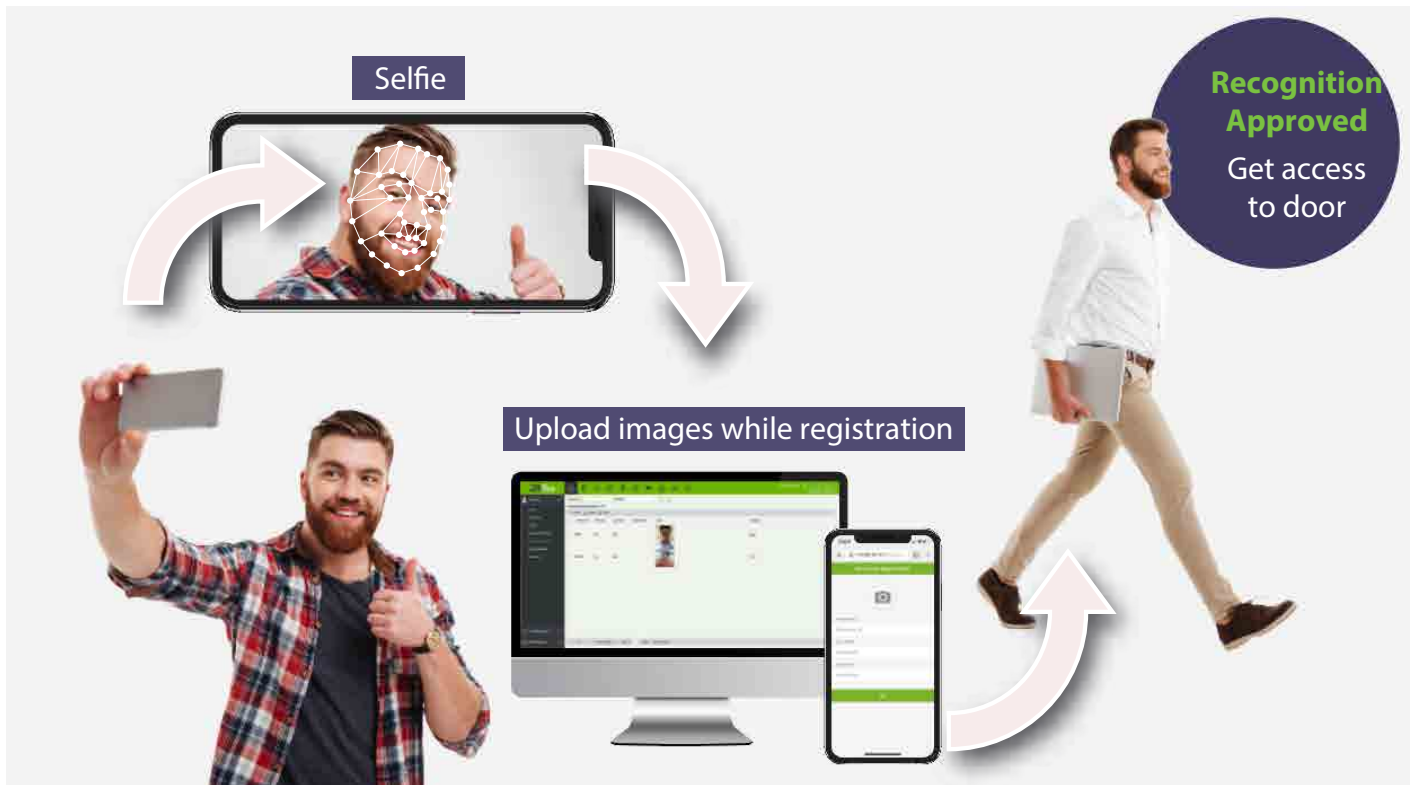
Australia Office

France Office

Indonesia Office

User-friendly mobile App selfie registration and alert pop-up

User-friendly mobile photo-capture face registration function, supports iOS/ Andriod versions. Management staffs only need to use mobile phones or tablet devices to capture self image and upload to ZKBioFace for registration. After registration the faces can be conveniently set as blacklisted or whitelisted.



Report

Attendance Module supports to generate reports for administrators, such as, Daily Report, Leave Summary, Monthly Detail, Monthly Statistical, Department Report, etc.

To maximize the working efficiency, the ZKBioSecurity supports the automatic report generating with custom formats & fields.



The Leader Of Security And Time Management Solution



Fingerprint Recognition



Face Recognition



Palm Recognition



Finger Vein Recognition



Iris Recognition



Card Recognition



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