SCYLLA

Face Recognition Guide

Introduction

This comprehensive guide provides essential instructions for selecting, installing, and configuring a face recognition camera with utmost precision. Proper camera installation is crucial to ensure optimal performance and prevent any potential complications that may impact recognition accuracy. To ensure a seamless installation process, we strongly advise thoroughly reviewing this manual prior to proceeding.

Camera Selection

When considering camera options, we highly recommend paying close attention to the following specifications:

	Requirements
Image Resolution	From 2 Megapixel (HD 1080p, 1920×1080 pixels, 16:9 aspect ratio)
Tilt Angles	Not more than 15⁰ vertically and horizontally recommended
Lens Aperture	At least F1.4 (with a depth of field control)
Matrix Size	Not less than 1/2.8" for FullHD camera, 1/1.8" for 2K camera
Shutter Speed	Min. 1/100s. (shutter speed of 1/30 or longer may cause blurring of moving objects)
Frame Rate	FPS at least 7 frames per second. The recommended value is 12
WDR	Disabled. WDR is working on 2 or 3 exposure frames. This may cause motion blur and distortion of the image

Camera Installation Requirements

As a rule, surveillance cameras are installed high on ceilings and the view is "top-down". The main reasons for choosing this installation method are:

- To provide an unobstructed view of each person at eye level

- Reducing the risk of unauthorized access to the cameras

- To avoid injuries caused by bumping into cameras

However, this type of camera placement is not optimal and has its disadvantages. So, it is always important to consider parameters such as distance, height, and angle of the camera.

To achieve the best results, limit the horizontal angle of deflection to less than 25° for optimal coverage.
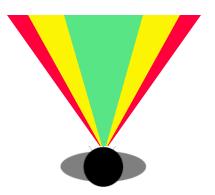
Install the camera at an elevated angle to mitigate the risk of partially obscured faces going undetected.

Recommended angles for the best facial recognition results:

Area Color	Tilt Angle	Recognition reliability
Red	50º+	Low
Yellow	15º – 45º	Average
Green	0º – 15º	High

Area Color	Horizontal Angle	Recognition reliability
Red	35º+	Low
Yellow	10º – 25º	Average
Green	0º – 10º	High

Recommended camera installation height at different ranges to the detection zone:

Monitoring Distance [m]	Installation Height of Camera [m]	Elevation angle α
4,00	2,57	15
5,00	2,84	15
6,00	3,11	15
7,00	3,38	15
8,00	3,64	15
9,00	3,91	15
10,00	4,18	15

Cameras with varifocal lenses are strongly recommended to maintain a proper pixel density of at least 250 pixels per meter.

Image Quality Requirement

When installing and configuring cameras for face recognition, it is crucial to prioritize image quality. The camera's ability to deliver high-quality images depends on several factors, including:

1. Sensor Sensitivity: The sensitivity of the camera's sensor impacts its ability to capture clear and detailed images.
2. Camera Resolution: Higher resolution cameras provide more precise and defined images, facilitating accurate face recognition.
3. Camera Shutter Speed: The camera's shutter speed affects the captured image clarity and sharpness, especially when dealing with moving subjects.

To evaluate the image quality effectively, follow these steps:

1. Capture a frame from the video camera and open it in a graphic editor software.
2. Draw a line across the face in the image.
3. Estimate the distance in pixels.
4. By assessing image quality through these steps, you can ensure that your camera can capture the necessary level of detail for reliable face recognition.

The minimum interocular distance (IOD) in the frame for face recognition is 15 pixels (250 pixel per meter). The minimum interocular distance (IOD) in the frame for face auto-enrollment is 25 pixels (500ppm).

If the IOD is less than 15 pixels, adjust the settings/placement of the camera for optimal image quality.

Figure 1: 25 pixel IOD

Figure 2: 35 pixel IOD

Camera Shutter Speed

Efficient facial recognition of individuals in motion is dependent on clear and non-blurry images. The clarity of an image is influenced by the shutter speed of the camera sensor, which helps maintain optimal image brightness in varying lighting conditions.

To establish an appropriate shutter speed for your camera, follow these steps:

1. Transition from Auto Shutter mode to Manual Shutter mode.
2. Adjust the Shutter setting for minimum of 1/100 (for example 1/100, 1/200, 1/250, etc.).

By switching to Manual Shutter mode and selecting a suitable speed within the recommended range, you can enhance the image clarity and facilitate accurate facial recognition, even when dealing with subjects on the move.

Image compression

To achieve the best facial recognition results, it is advisable to disable or minimize compression options, aiming to reduce noise. Compression settings such as zip streaming, VIQS, H.264+ etc. should be avoided as they can hinder the accuracy of facial recognition.

Nevertheless, it is acceptable to utilize H264 compression methods, provided that the compression ratio is reduced.

Camera Shutter Speed

Proper lighting plays a vital role in installing cameras for effective face recognition. To ensure optimal results, it is recommended to provide even lighting of at least 150 lux for faces within the detection area. Paying attention to the background is also crucial, as recognition outcomes are generally best achieved against well-lit and smooth walls or floors.

Furthermore, the camera's location should be considered in relation to the room's lighting, as it directly impacts face recognition quality. The following criteria can be identified:

1. Ceilings and Lighting Angle: To achieve high-quality facial recognition, it is preferable to have high ceilings with soft overhead lighting. This configuration ensures that the lighting angle remains consistent, even when the subject is in motion.

2. Low Ceilings and Halogen Spotlights: In contrast, low ceilings with halogen spotlights can negatively impact face recognition quality. This situation can be particularly challenging in parking lots with poor lighting. However, these issues can be mitigated by incorporating additional light sources as a solution.

3. Camera Placement near Doorways: Placing cameras near doorways can present challenges due to intense natural lighting. It is crucial to evaluate the camera's performance at various times of the day after installation. This assessment allows for a review of the camera's location and potential improvements to be made.

By considering these lighting criteria and optimizing the camera's placement accordingly, you can enhance the quality and accuracy of face recognition in different environments.

Camera Positioning Recommendations

To ensure accurate face recognition, proper camera positioning is essential. Consider the following guidelines:

1. Gate and Pedestrian Crossings: Install the camera at gates and in front of pedestrian crossings where people are compelled to slow down, as it takes some time (typically 0.2 to 1 second) to process video. This positioning reduces the risk of missing fast-passing individuals.

2. Corridors with Direct Flow: Cameras can be installed in corridors where people move directly towards the camera. It is sufficient for the face to be in the frame for 1-2 seconds, provided that the control zone has good-quality lighting.

3. Avoidance of Foreign Noise: Pay attention to potential sources of foreign noise that can hinder high-quality face recognition. Some examples include information racks or displays, supporting structures, landscape objects, passing traffic, and dense human traffic. Minimizing such distractions helps optimize the recognition process.

By positioning the camera strategically at gates, pedestrian crossings, corridors, and taking measures to reduce foreign noise, you can enhance the effectiveness of face recognition and ensure accurate identification of individuals in various scenarios.

Scylla makes the camera surveillance environment real-time **proactive** instead of **reactive**

For more information, please contact us

Scylla Technologies,Inc.
Address: 11801 Domain Blvd,Austin, TX 78758, United States Tel:+1 747 271-4717
Email support@scylla.ai