TURING

TURING AI

PEOPLE SEARCH USER GUIDE

2022

TURING VISION

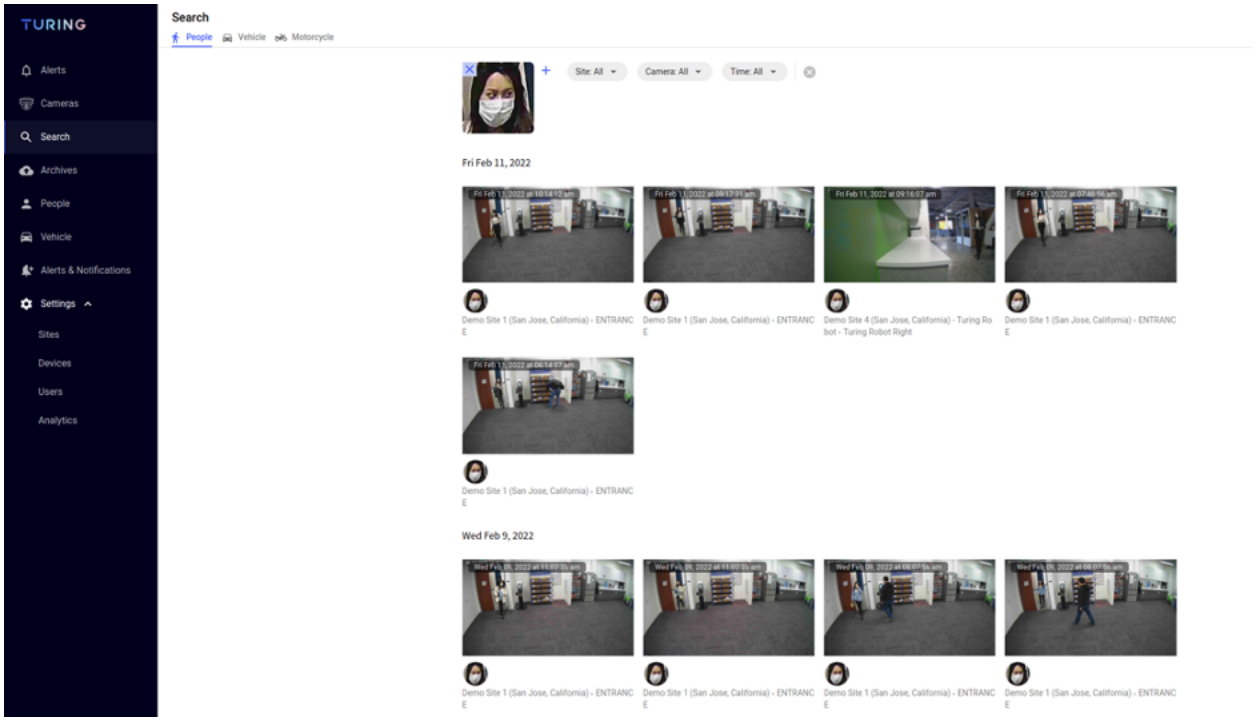
User Guide for People Search (Face Recognition)

Overview

As a fast-growing technology company, Turing provides industry-leading personnel detection solutions using device-side and cloud-side devices combined with computer vision technology. With real-time processing of visual video streams, face search, people history, and people alerts are provided to help you quickly identify and search for individuals in camera footage, saving you time.

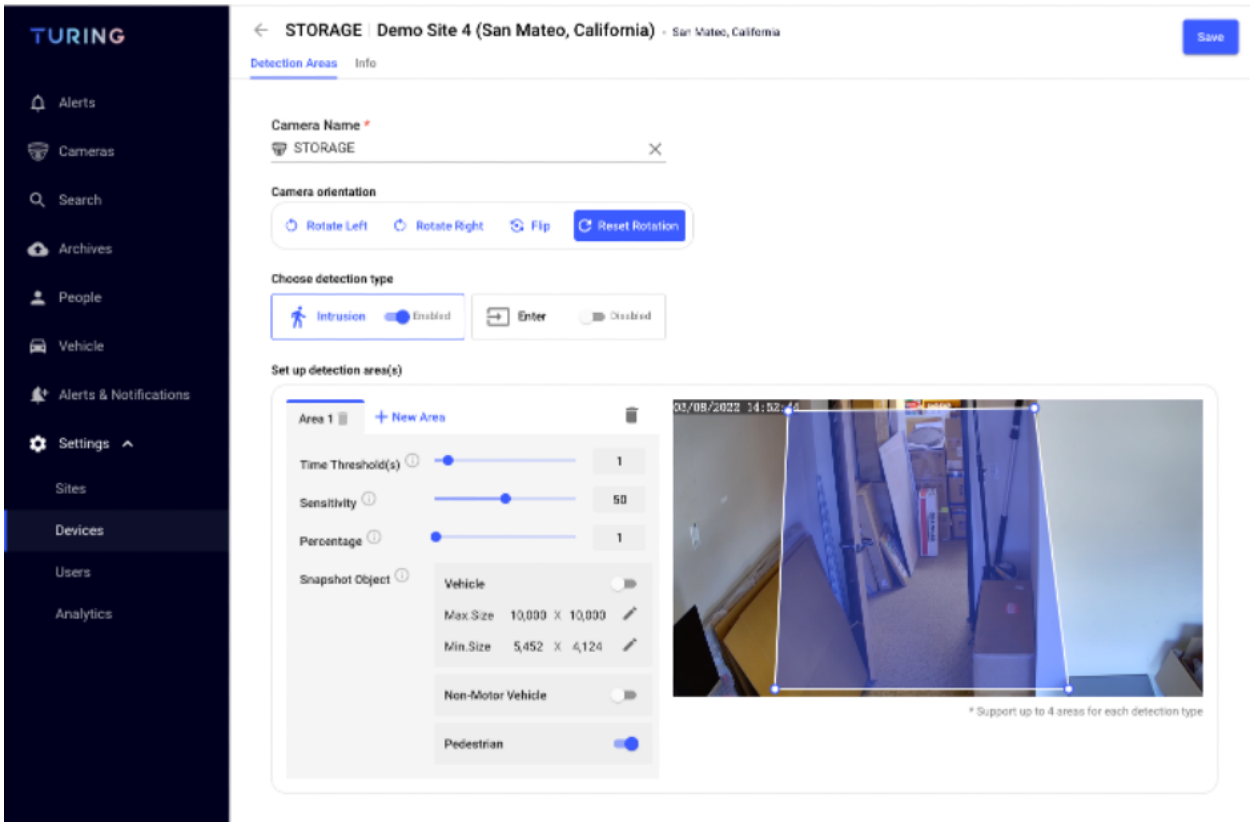
Turing utilizes hybrid cloud technology to keep all your data safe and secure within your command organization.

Turing provides a complete solution that requires no additional software and hardware. This guide will show you how to configure the camera settings and position the camera in order to optimize face recognition with the Turing Vision platform.

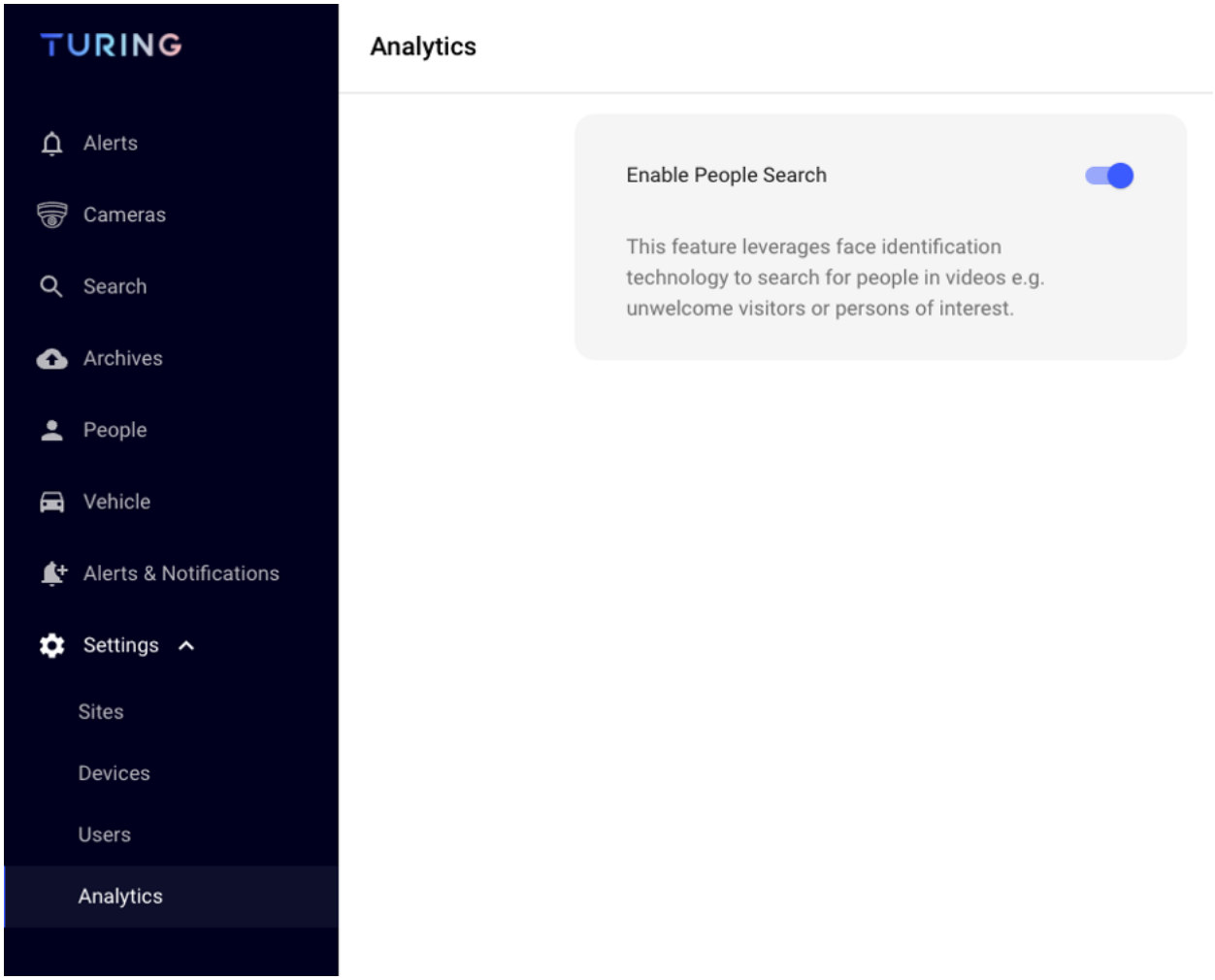


How to Setup Face Recognition

1. Install and position the camera. Refer to “Distance between the Face and Camera” section below to identify the ideal distance where the camera is mounted.
2. Connect the camera to Turing Smart NVR. Install Turing Smart Bridge to be connected to the same local network.
3. For Turing Smart Cameras:
    a. Go to Settings > Devices > select the camera > Detection Areas. Enable “Enter” detection type and select Enter detection type to configure detection areas.
    b. Create one or more detection areas by clicking “+ New Area”. Start drawing the detection area by clicking on the camera live view port on the right. Make sure the area encloses where a person’s face will be close to the camera and is well-lit.



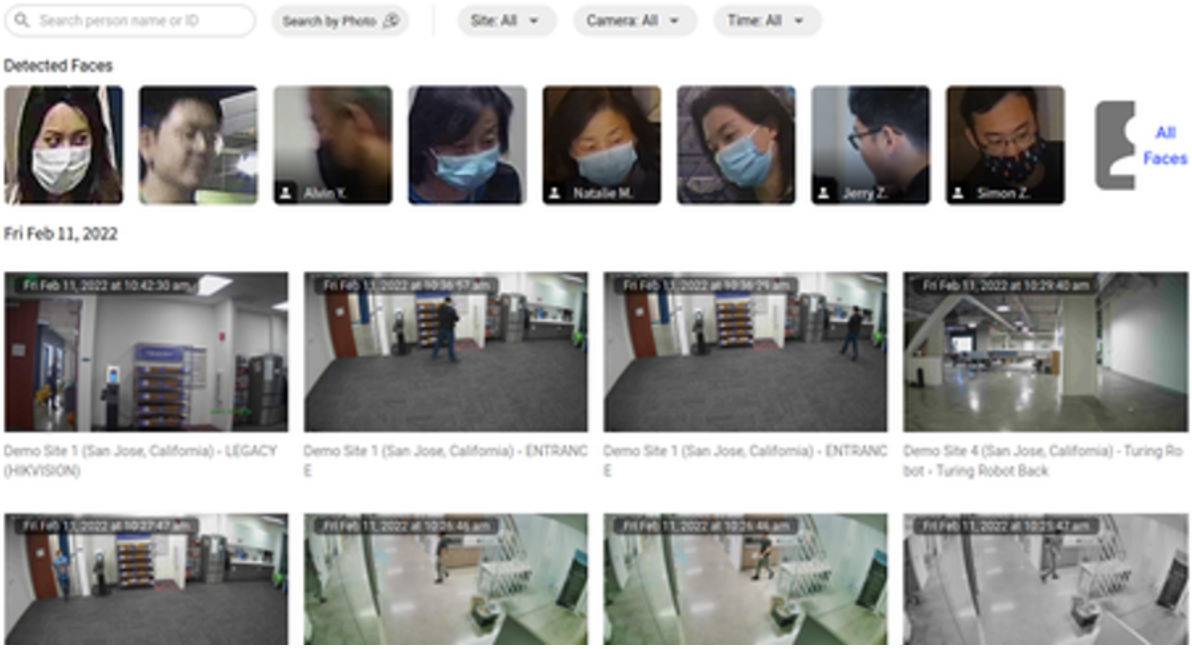
4. For third party ONVIF cameras, follow the configuration steps in User Manual > Third Party Hardware Manual. https://turing.ai/resources/turing-vision/user-manual
5. Go to Settings > Analytics, toggle Enable People Search on, and make sure you agree to the terms.


TURING
Alerts
Cameras
Search
Archives
People
Vehicle
Alerts & Notifications
Settings
Sites
Devices
Users
Analytics
Analytics
Enable People Search
This feature leverages face identification technology to search for people in videos e.g. unwelcome visitors or persons of interest.

How to Find a Person Across Multiple Cameras

Once the hardware setup and configuration are completed, whenever a recognizable face is captured by the camera, a user can see the recently detected faces in Turing Vision.

Recently Detected Faces

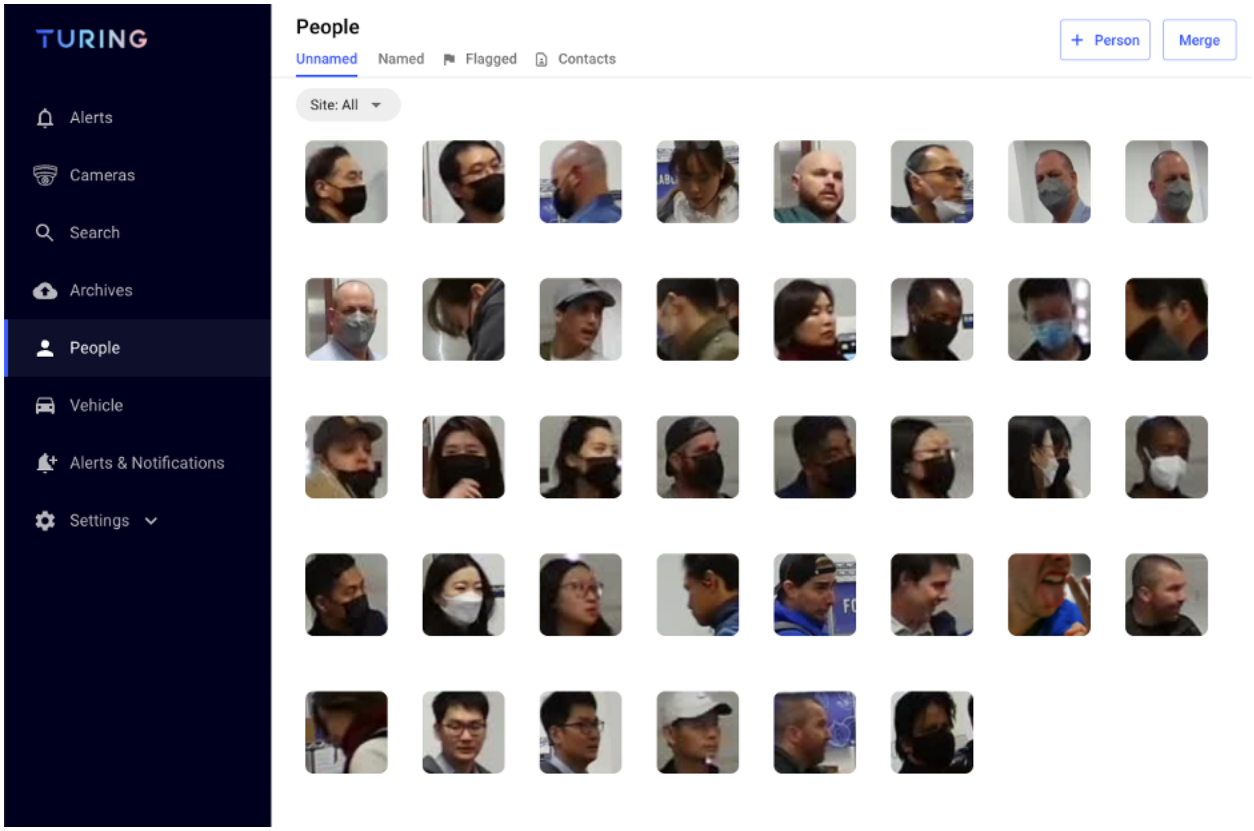


Look for all Events Related to The Same Person

Select a face to view all events with the same person captured on any camera in your account connected to the Turing Vision platform. Speed up investigations by searching across multiple cameras with the option to filter events by time range and/or by site.

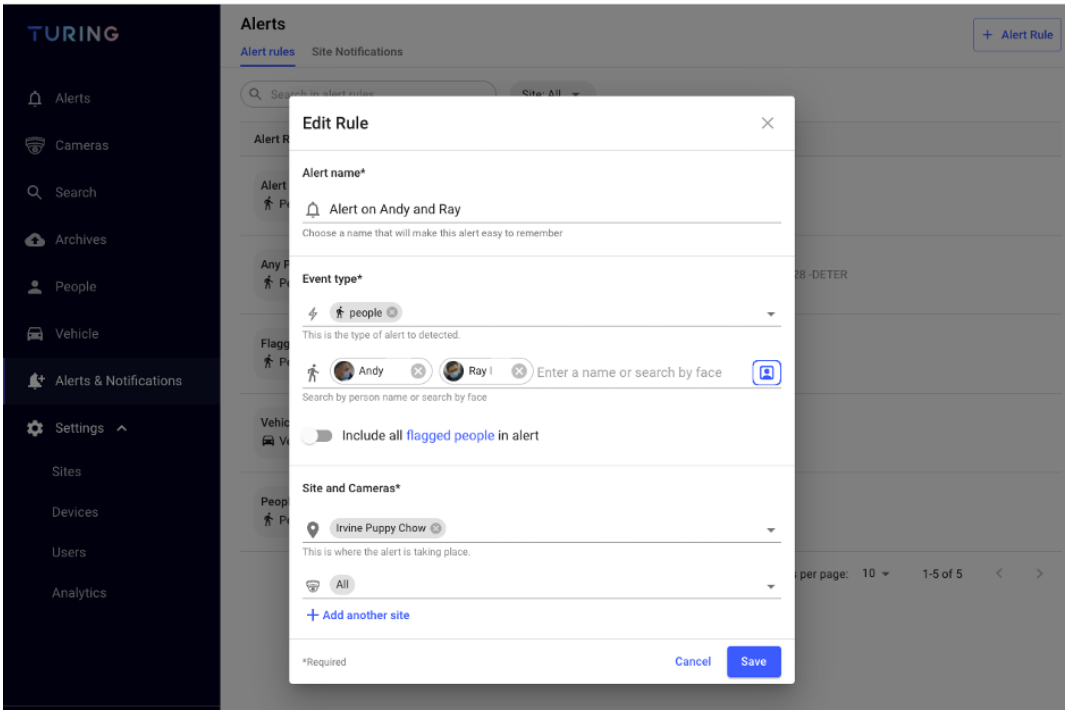
Face Recognition History

View all faces detected by cameras in the People tab. Label the person with name, add to flagged people list to receive alerts when the person is detected by any camera.

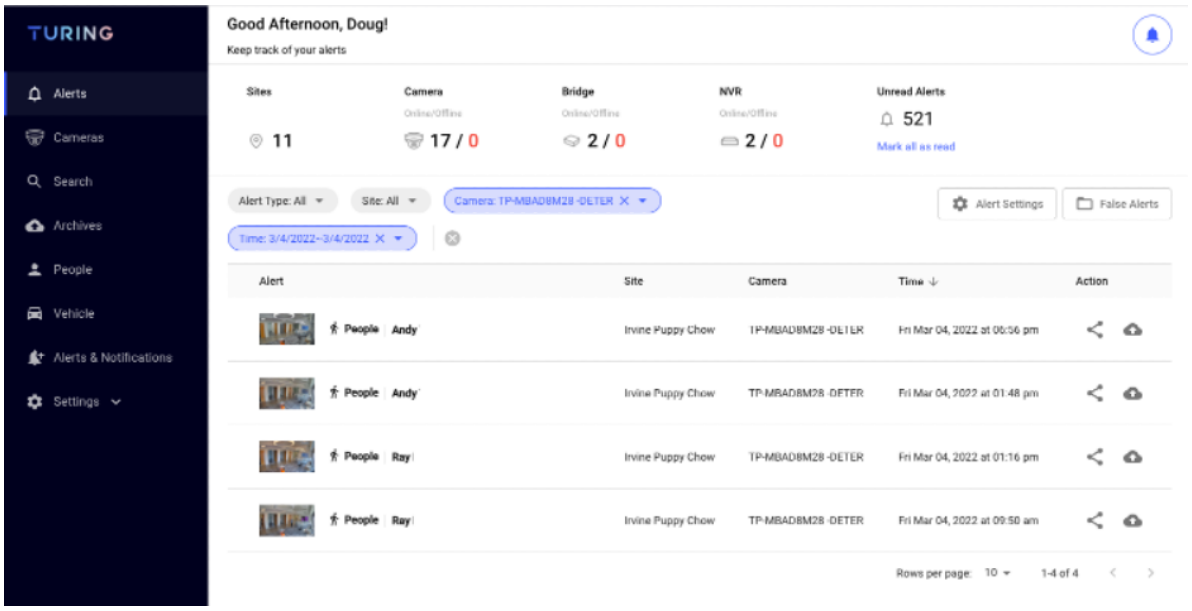


Alert for Flagged People

Proactively set alerts for when a person is detected on site who has a face that matches a pre-selected individual by setting up Alert Rule and selecting specific faces or names.



Receive alerts in email, text message, and/or mobile push notification, when anything matching the user's selected criteria happens such as a selected face is detected by camera. In this example, when Andy or Ray is detected by a camera, alerts are triggered.



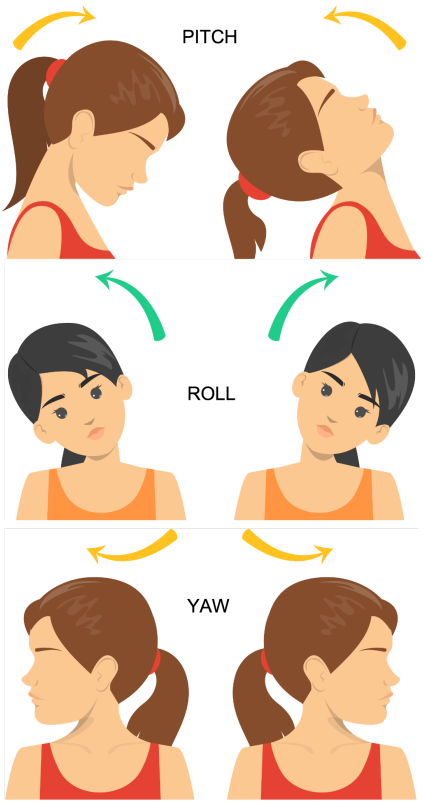
Optimizing Face Recognition on Turing Vision

Ensure your cameras are positioned according to the following guidelines to get the most consistent results with People Analytics features. The purpose of optimization is to obtain high-definition face images

Head Angle

For optimal performance with Face Search and Person of Interest alerts, cameras should capture faces head–on, facing the camera, and as close to the camera as possible.

The three dimensions of Yaw, Roll and Pitch are usually used to define the angle of the face. The following figure illustrates the corresponding directions of these three dimensions:



The recommended range of angles for each dimension to obtain the best effect is as follows:

Pitch < ±20°	**Roll < ±45°**	**Yaw < ±30°**

Distance Between the Face and Camera

People and face detection requires a minimum level of detail, expressed quantitatively as pixels per foot (PPF):

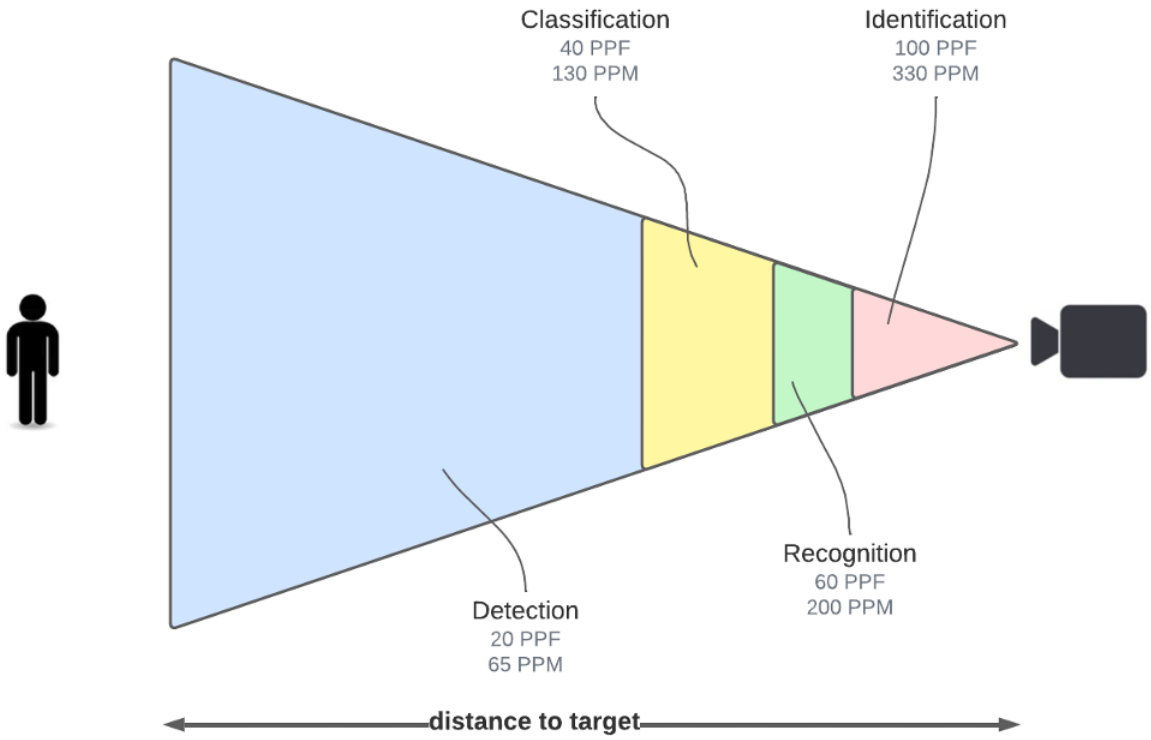
• PPF decreases with distance from the camera. The PPF at any given distance varies with the camera's field of view and the image resolution.

• A PPF of 100 or greater is recommended for face recognition features such as Face Search and Flagged People alerts.

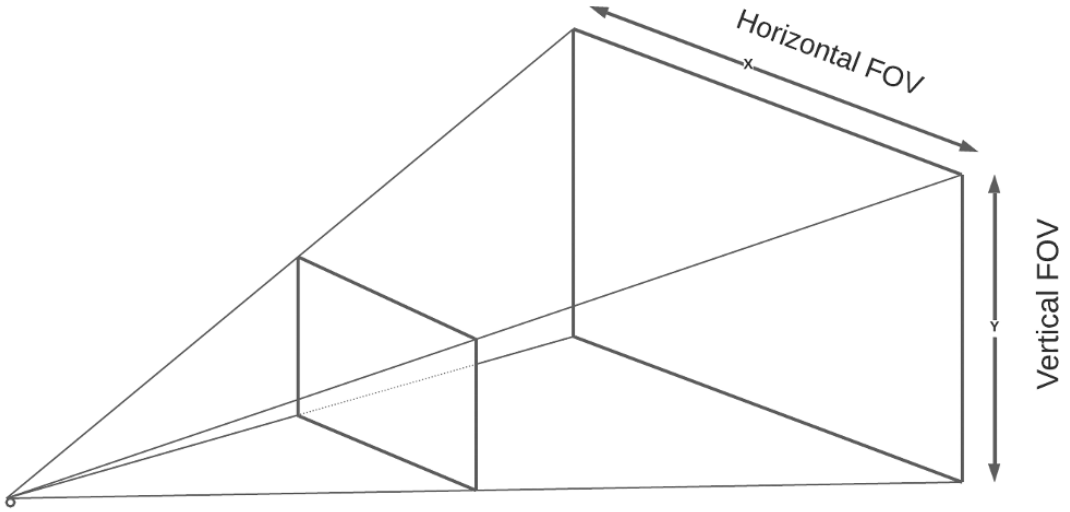
To calculate the PPF value at the distance you wish to detect people, divide the camera's horizontal pixel count (available in the camera's datasheet under Resolution) by the width in feet of the camera's horizontal field of view (HFoV) at that distance.

PPF = (Horizontal Pixels) / (HFoV Width)

The following figure will illustrate the specific impact of PPF on identification:



The diagram below explains what Horizontal Pixels are:



Example:

The size of this image is 1055×699, which is 1055 for Horizontal Pixels. There are two faces one after the other in the figure. The HFoV Width of the former face is 3 feet, and the HFoV Width of the latter face is 15 feet, so the corresponding PPFs are: 351 and 70 respectively. Since the PPF of the first face exceeds 100, the recognition of the first face will be ideal. Since the PPF of the second face is lower than 100, the second face may not be recognized.

Lighting

Bright and even lighting will provide the most reliable and accurate results. Face recognition is not recommended in low-light scenes nor in those with direct sunlight or high contrast.

Good Lighting

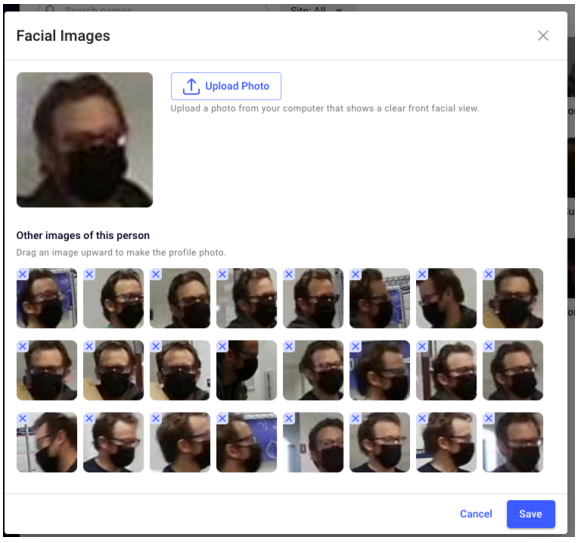
Poor Lighting

Tips for uploading facial images of the person for People Search and Face Profiles:

A user can upload several facial images to a person's profile in order to increase recognition accuracy in People Alert. Alternatively, a user can upload a facial image of a person to search in existing people events. Following the tips for the uploaded image will help increase the accuracy of People Alert and People Search results.

- Facial features: The face in the image should have both eyes open and visible without any facial covering.
- No cropping: Use images where the face is not obscured or tightly cropped. The image should contain the full head and shoulders of the person. The face should occupy a large proportion of the image.
- No blocking: Position the camera to prevent anything that block the view of people and their faces.
- Face resolution: Ensure that images are sufficiently large in terms of resolution. Minimum 80 x 80 pixels in image resolutions up to 1920 x 1080 pixels. Higher-resolution images require a larger minimum face size. Faces larger than the minimum size provide a more accurate set of facial comparison results.
- Contrasts: Use images that have sufficient contrast with the background. A high-contrast monochrome background works well.
- Blurry: Use images that are bright and sharp. Avoid using images that may be blurry due to subject and camera motion as much as possible.

To upload multiple face images for a person's profile, go to the People tab, find the person and click on it, choose "Add Or Edit Facial Images", then upload photos.



Camera Field of View

See the Head Angle chapter. The angle of view of the camera should be able to ensure that the angle of the face image in the lens is within the optimal angle.

Camera shutter speed (FPS)

Larger FPS will have a better effect. The minimum should not be lower than 10FPS.

Privacy & Compliance:

Turing AI's People Analytics solution is built with optimal safety and security. Any historical data your system collects is encrypted and securely stored within your organization.

Turing AI provides customers complete control over their Turing Vision Platform. Face Search and People Attribute Search takes administrative approval to be activated. Face Search is not available and may not be used in the States of Illinois, Texas, or Washington. By enabling Face Search, I agree not to use Face Search in Illinois, Texas or Washington. If I do use Face Search in Illinois, Texas or Washington, I agree to indemnify and hold harmless Turing for any claims or liability arising from or related to my use of Face Search in Illinois, Texas, or Washington.
I further acknowledge that the data generated by Face Search may be subject to certain Data Protection Laws and Biometric Privacy Laws and agree that I will comply with all applicable Data Protection Laws and Biometric Privacy Laws relating to the deployment and use of Face Search.

Data Protection Laws include, without limitation, (i) the California Consumer Privacy Act of 2018 (CCPA), as amended and replaced by the California Privacy Rights Act of 2020, (ii) the Virginia Consumer Data Protection Act (VCDPA), (iii) the Colorado Privacy Act (CPA), (iv) the Connecticut Data Privacy Act (CTDPA), (v) the Utah Consumer Privacy Act (UCPA), (vi) the Canada Personal Information and Electronic Documents Act (PIPEDA), (vii) the Alberta Personal Information Protection Act (Alberta PIPA), (viii) the British Columbia Personal Information Protection Act (BC PIPA), (ix) the Quebec Act Respecting the Protection of Personal Information in the Private Sector, (x) the Quebec Information Technology Act and (xi) such other comprehensive data protection laws that may be enacted and during my use of the services and would apply to my use of the services. Biometric Privacy Laws include, without limitation, (i) the Illinois Biometric Information Privacy Act (BIPA), (ii) Washington statute RCW 19.375, (iii) the Texas Capture or Use of Biometric Identifiers (CUBI), (iv) New York City Admin. Code § 22-1201 and (v) such other biometric privacy laws that may be enacted during my use of the services and would apply to my use of the services.

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