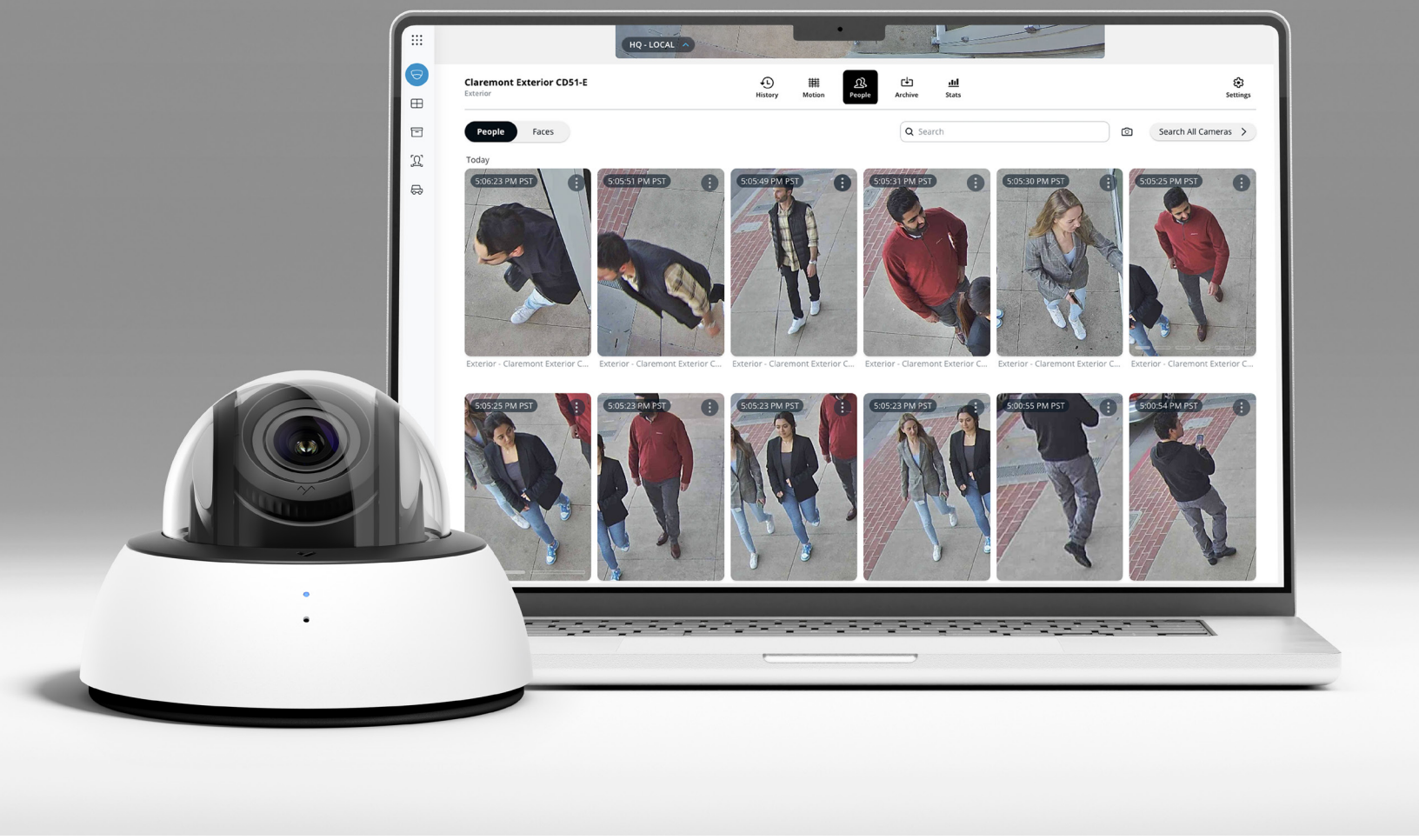


Verkada

User Guide for People Analytics

Overview

Verkada's people analytics solution is designed to make it easier to find meaningful events and save time during critical investigations by enabling users to identify and search for individuals in your camera footage.

Powered by Verkada's industry leading edge-based processing and computer vision technology, Verkada's people analytics solution includes face search, person attributes, person history, person of interest notifications, occupancy trends, and queue trends.

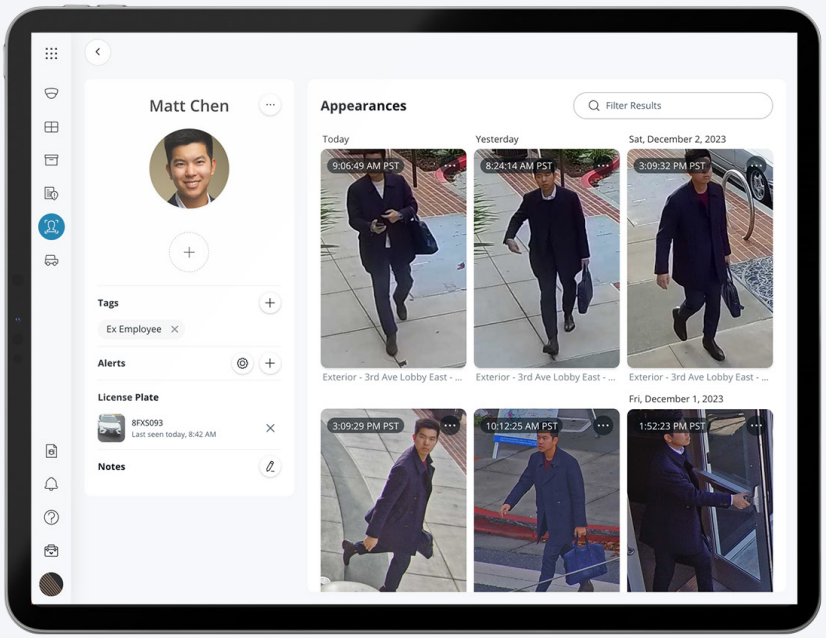
People analytics delivers high quality results with minimal bandwidth impact. All video, images and data are encrypted at-rest and in-transit and stay within your Command organization. To use Verkada's people analytics features, no additional software or hardware is needed. All Verkada camera models support people analytics, except for the CD22, CD22-E, and CM22 models.

Responsible use

People analytics leverages computer vision and facial recognition technologies that are powerful tools which must be used responsibly. These technologies have limitations as they rely on the ability to interpret visual inputs. In addition, factors like distance from the camera, image resolution, camera installation and placement, lighting and facial coverings like masks or hoods will affect performance.

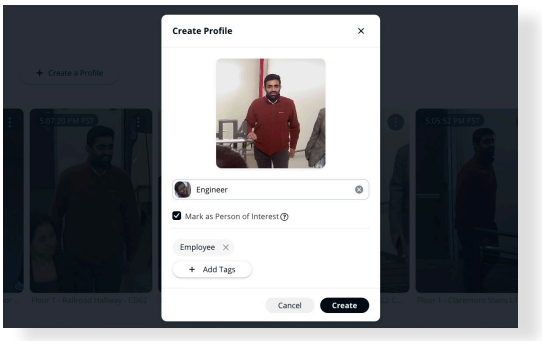
As has been widely reported, the accuracy of facial recognition technology may vary across diverse groups of people. At Verkada, we intentionally do not train our people analytics models to identify sensitive characteristics such as race, ethnicity, age, or other demographic information.

We also set administrative guardrails around the use of people analytics it is disabled by default and after opting in, only users authorized by an organization admin may enable or view analytics on a given device.



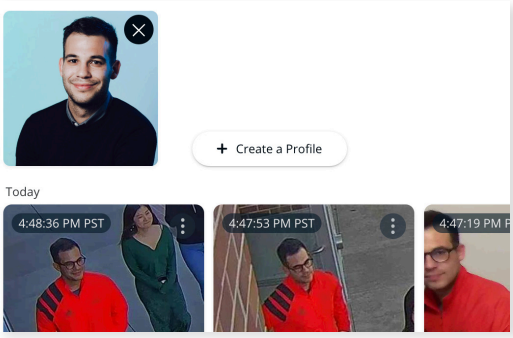
Key features

What can you do with people analytics? Once your camera is positioned correctly, explore all the use cases possible with this powerful toolkit.



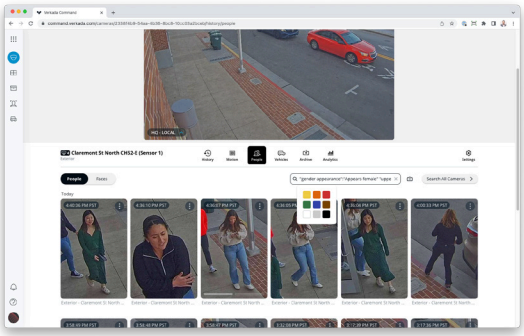
Person of interest alerts

Set up proactive alerts for when a specific person of interest is seen on a camera.



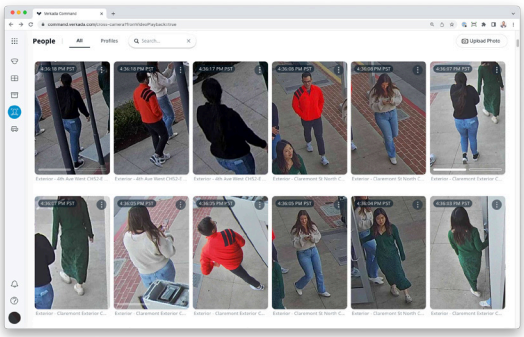
Face search

Select a previously detected face or upload a photo to search for sightings of a specific person.



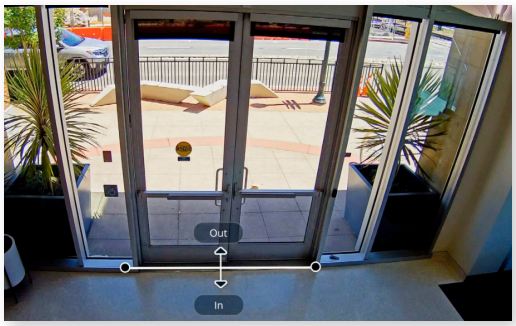
Person attributes

Quickly search for people that match selected attributes, including clothing color, gender appearance and more.



Person history

View all people that have been captured by your Verkada cameras to speed up investigations.



Occupancy trends

Track the number of people or vehicles entering or exiting a space and estimate net occupancy.

Queue trends

Track the number of people or vehicles in a designated region and quantify wait times.

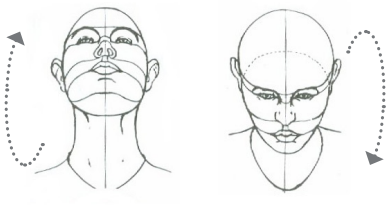
Optimizing Analytics Performance

Ensure your cameras are positioned according to the following guidelines to get the most consistent results with people analytics features.

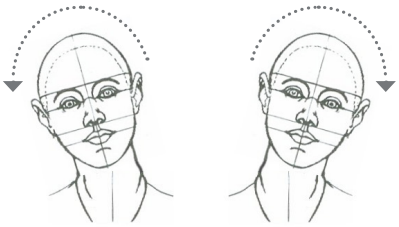
Head angle

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.

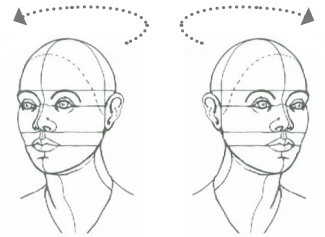
The angle of captured faces must be within the following range of values:



Pitch < ±20°



Roll < ±45°



Yaw < ±30°

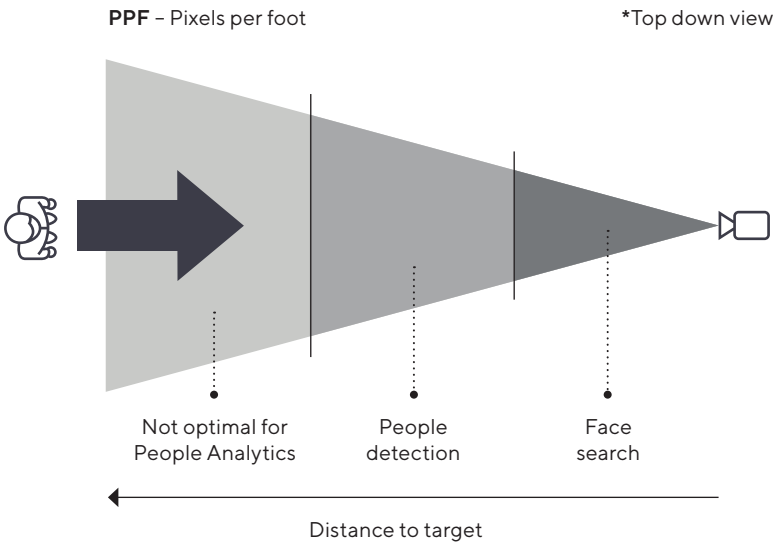
Good face angle

Poor face angle

Distance to camera

Person detection and facial recognition require 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.

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 "Tech Specs" → "Sensor Resolution") by the width in feet of the camera's horizontal field of view (HFoV) at that distance.



$$\frac{\text{Horizontal Pixels}}{\text{HFoV Width}} = \textbf{PPF}$$

example:

$$\frac{3840\text{ p}}{12\text{ ft}} = 320\ \textbf{PPF}$$

This image was taken from a CD62 with a resolution of 3840 x 2160 and the width of the horizontal field of view at the target distance is 12 feet. Using the PPF formula we find that we have a PPF value of 320 at the doorway, which is sufficient for all People Analytics features.

The maximum target distances we recommend for our camera models are listed below. These distances are recommendations only and can vary based on conditions of a particular camera deployment. Note that the PPF required to detect people and recognize faces depends on the camera model. Our latest generation camera models run on more powerful hardware and are therefore able to run larger, more powerful computer vision models. This allows them to detect people and recognize faces with fewer pixels per foot.

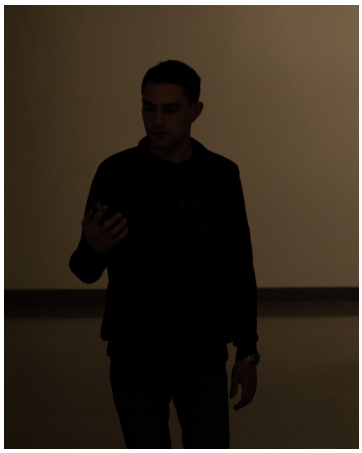
		Person detection (Person history, person attributes)			Facial recognition (Face search, person of interest)		
Camera Series	**Model Number**	**0% zoom**	**100% zoom**	**PPF**	**0% zoom**	**100% zoom**	**PPF**
Dome							
	CD32/E	110.6ft / 33.7m		11	16.9ft / 5.1m		75
	CD42/E	110.6ft / 33.7m		15	22.1ft / 6.7m		75
	CD43/E	100.0ft / 30.4m		15	20.0ft / 6.1m		75
	CD52/E	100.0ft / 30.4m	269.1ft / 82.0m	15	20.0ft / 6.1m	53.8ft / 16.4m	75
	CD53/E	90.0ft / 27.4m	275.0ft / 83.8m	15	18.0ft / 5.4m	55.0ft / 16.7m	75
	CD62/E	125.0ft / 38.1m	350.0ft / 106.7m	13	30.0ft / 9.1m	98.2ft / 29.9m	54
	CD63/E	135.0ft / 41.1 m	300.0ft / 91.4m	13	32.5ft / 9.9m	140.0ft / 42.7m	54
	CD31/E	11.3ft / 3.4m		75	5.7ft / 1.7m		150
	CD41/E	15.8ft / 4.8m		75	7.9ft / 2.4m		150
	CD51/E	19.9ft / 6.0m	50.0ft / 15.3m	75	10.0ft / 3.0m	26.8ft / 8.2m	150
	CD61/E	21.5ft / 6.5m	75.0ft / 22.9m	75	10.7ft / 3.3m	35.2ft / 10.7m	150
	D40	16.0ft / 4.9m		75	8.0ft / 2.4m		150
Mini							
	CM42/S	108.7ft / 33.1m		15	21.7ft / 6.6m		75
	CM41/E/S	22.1ft / 6.7m		75	11.1 ft / 3.4m		150
	CM61	31.6ft / 9.6m		75	15.8ft / 4.8m		150
Bullet							
	CB52-E	82.1ft / 25.0m	253.0ft / 77.1m	15	16.4ft / 5.0m	50.6ft / 15.4m	75
	CB52-TE	267.8ft / 81.6m	637.5ft / 194.3m	15	53.6ft / 16.3m	127.5ft / 38.9m	75
	CB62-E	111.3ft / 33.9m	395.0ft / 120.4m	13	26.8ft / 8.2m	95.1ft / 29.0m	54
	CB62-TE	395.0ft / 120.4m	988.2ft / 301.2m	13	95.1ft / 29.0m	237.9ft / 72.5m	54
	CB51-E	20.6ft / 6.3m	50.0ft / 15.3m	75	10.3ft / 3.1m	26.8ft / 8.2m	150
	CB51-TE	50.6ft / 15.4m	125.0ft / 38.1m	75	25.3ft / 7.7m	63.8ft / 19.4m	150
	CB61-E	23.5ft / 7.2m	75.0ft / 22.9m	75	11.7ft / 3.6m	33.3ft / 10.2m	150
	CB61-TE	66.7ft / 20.3m	175.0ft / 53.3m	75	33.3ft / 10.2m	85.6ft / 26.1m	150

		Person detection (Person history, person attributes)			Facial recognition (Face search, person of interest)		
Camera Series	**Model Number**	**0% zoom**	**100% zoom**	**PPF**	**0% zoom**	**100% zoom**	**PPF**
Fisheye							
	CF83-E (pano)	45.0ft / 13.7m		40	22.5ft / 6.9m		80
	CF83-E (4-way)	20.0ft / 6.1m		75	10.0ft / 3.1m		150
	CF83-E (ePTZ)			75			150
	CF81-E (pano)	40.0ft / 12.2m		40	20.0ft / 6.1m		80
	CF81-E (4-way)	18.0ft / 5.5m		75	9.0ft / 2.74m		150
	CF81-E (ePTZ)			75			150
Multisensor							
	CH52-E	103.1ft / 31.4m	284.2ft / 86.6m	15	20.6ft / 6.3m	56.8ft / 17.3m	75
	CH53-E	83.4ft / 25.4m	250.9ft / 76.5m	15	16.7ft / 5.1m	50.2ft / 15.3m	75
	CH63-E	115.9ft / 35.3m	407.5ft / 124.2m	13	27.9ft / 8.5m	98.1ft / 29.9m	54
	CY53-E	82.0ft / 25.0m	250.9ft / 76.5m	15	16.4ft / 5.0m	50.2ft / 15.3m	75
	CY63-E	109.7ft / 33.4m	386.4ft / 117.8m	13	26.4ft/8.1m	93.0ft/28.3m	54
PTZ							
	CP52-E	173.0ft / 52.7m	4800.0ft / 1463.0m	15	35.0ft / 10.7m	980.0ft / 298.7m	75
	CP63-E	210.0ft / 64.0m	5200.0ft / 1585.0m	15	42.0ft / 12.8m	1040.0ft / 317.0m	75
Remote							
	CR63-E	119.6ft / 36.5m	339.7ft / 103.5m	13	28.8ft / 8.8m	81.8ft / 24.9m	54
Command Connector							
	All			75			150

Lighting

Lighting can impact people analytics performance. Bright and even lighting will provide the most reliable and accurate results. Performance may suffer in low-light scenes as well as those with direct sunlight or high contrast. People analytics generally performs best with a minimum light level of 250 lux, which can be measured with a standard luxmeter.

Good lighting



Poor lighting

Compliance and Availability

Verkada is committed to ensuring its hardware and features comply with applicable regulations.
The following security camera features are not available in the jurisdictions listed below.

Jurisdiction	Face detection	Gender appearance	Person of interest notifications
Illinois	X	X	X
Portland	X	X	X