VCA: DL People Tracker Technical Note
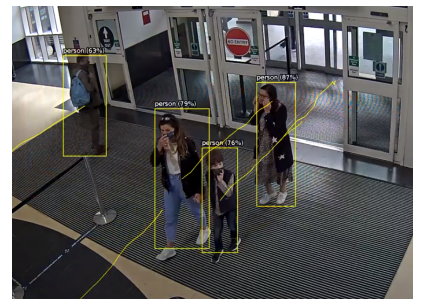
DL People Tracker

Introduction

This technical note details the best practices for using the DL people tracker along with some answers to common questions about when to use it and some considerations.

Applications

The DL people tracker is designed to detect and track people in a scene. It uses POSE estimation to identify the skeletal outline of a person and tracks them through a scene.
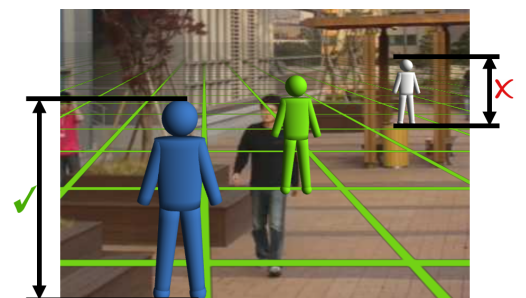
- Retail
    - Accurate footfall counting
    - Dwell times
    - Queue monitoring

Limitations

The DL people tracker has been trained to work effectively when people occupy more than 35% of the scene's vertical height. In many environments, ***the distance is defined by the lens and focal point of the camera***. The DL people tracker will not provide accurate tracking of objects where the form of a person is not identifiable.

- Nighttime views, dark scenes
- Fisheye cameras
- External views where objects are at a distance
- Situations where speed estimation is required
- External crowd monitoring

General Guidelines

The following guidelines should be used to provide optimal tracking and classification.

Camera Position and Angle

- Minimumal camera height of 2.8 meters from the ground plane.
- Cameras should be mounted on a stable surface to reduce the effects of vibration or other environmental factors.
- The camera view angle (tilt) should be within 30° from the horizontal.
- For high tracking accuracy, position the camera so objects are present for at least 2 seconds.

Obstructions

Camera scenes should be clear of foliage and other environmental factors that can reduce object detection and tracking.

- Avoid location that include foliage and large objects that can interfere with tracking.
- Be aware of surfaces that can reflect light (both white and infrared) to the camera lens

Light conditions

- Camera positions should avoid direct sunlight and other bright light sources direct to the lens.
- Avoid locating cameras that experience drastic light changes.
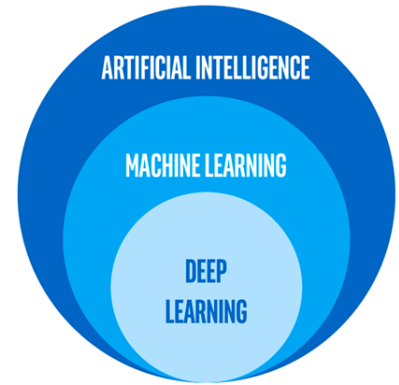- Avoid locations where the camera lens exposed to indirect light sources

Example situations are: Direct sunlight, Headlights, reflective surfaces and white light illumatinators. These can result in poor object detection and tracking and reduce the effectiveness of video analytics.

- Minimum recommended Lux on target is 10. Some cameras provide a reading of the value, third-party tools are available to provide a lux reading.
- Bad weather environments will impact video analytics and can reduce accruacy.

Frequently Asked Questions

Does the DL people tracker improve during operation?

The DL people tracker detects and classifies people using a pre-trained model. This is created using large sets of reference data, it does not learn while in use.

Is calibration still required?

Because the DL people tracker detects and classifies objects that are in the scene, no calibration is currently required. As such, there are no calibration settings available when the DL people tracker is selected.
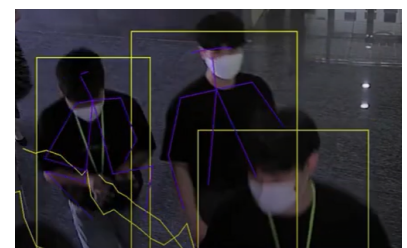
Will it detect any other objects?

The DL people tracker will only track people that are moving through the scene, it will ignore other objects. It is designed to identify the skeletal make-up of a person, using POSE estimation, and track them through the scene.
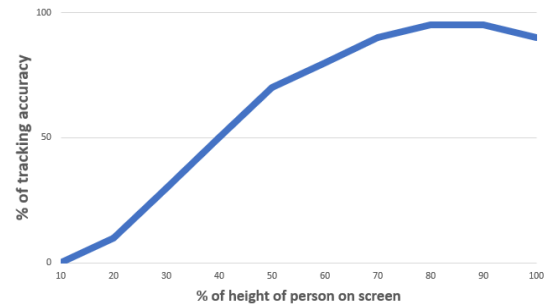

How do I define the camera view?

The DL people tracker is designed to be used in a controlled environment where people will occupy more than 35% vertical height of the scene. It uses the key skeletal points of a person to track and is able to identify and track objects with only a view from the shoulder upwards.

What distance will the DL people tracker detect?

Detection range will vary based on a camera's field of view, which is defined by the camera lens and focal point. The DL people trackers accuracy increases when objects occupy 35% or more of the vertical height.

What image settings should I use on the camera?

The image quality is an essential component to achieving accurate detection and tracking. The optimal resolution is 640x480 or D1 (720x480). Defining a lower resolution will reduce detection and tracking accuracy while defining a larger resolution, such as 1920x1080 may provide a small increase in detection and tracking but will significantly increase the resource usage and reduce the system's channel capacity.

The optimal frame rate is 15 fps, providing a lower framerate reduces the detection and tracking accuracy while increasing the framerate will only result in an increase in resource usage without providing an increase in detection and tracking.

The image quality and bitrate are important to ensure a good quality image is provided for video analytics. Where possible, the image quality and bitrate should be set to a high or max setting with bitrate defined near or at the maximum available limit. This ensures that a good image can be presented for the tracker to detect and track accurately.

Setup

The DL people tracker is active on the channel as soon as it is selected. On first use, the tracker optimizes to the available GPU(s). Depending on the GPU, this process can take up to 15 minutes to complete. During this initialisation process, a message is displayed on the channel preview page.

The tracker assesses every frame being delivered regardless of actively, this means that the GPU loading will be constant.

General

- Check that the prerequisites are installed and working correctly. The DL people tracker requires a Nvidia graphics card and CUDA libraries.

Note: More information on the exact requirements can be found in our support portal, in the manual and through the hardware requirements document. (https://vcatechnology.com/downloads/)

- The DL people tracker is controlled through licensing. Ensure the correct license has been activated on the system.
- Licenses are assigned to channels. Ensure the correct license is assigned to the channel.
- Ensure you have selected the correct tracker for your application.
- Ensure a good quality Image is being delivered to the analytic engine.