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Administrator's Guide for
People and Vehicle Detection

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Based on
Synology Surveillance Station 8.2.9

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Introduction

With its powerful AI Image Analysis, Synology Deep Video Analytics (DVA) can instantly calculate large amounts of object attributes, filter out environmental interference, and deliver accurate detection results. Backed with Smart Tag technology and a comprehensive management interface, it allows users to take control of events with ease and efficiency.

Among the supported algorithms, People and Vehicle detection specializes in detecting people or vehicles that have entered a specific area. To accommodate different scenarios and security levels, you can determine what types of objects (people, vehicles, or both) to track and customize your own trigger times.

For you to achieve optimal precision, this guide aims to introduce the key factors of setting up People and Vehicle detection tasks. For best results please follow the listed points as closely as possible.

System Requirements

• Surveillance Station version 8.2.9 or later.

• Synology's Deep Learning NVR. (Synology Deep Video Analytics—also known as DVA— installed by default).

Note: No additional licenses required for People and Vehicle detection.

Camera Quick Installation

Step 1

Select Appropriate Camera

Stream Quality 1920x1080@20 FPS or above

Sunshield (Optional) Added to outdoor cameras to avoid direct sunlight on the lens

Step 2

Check Installation Environment
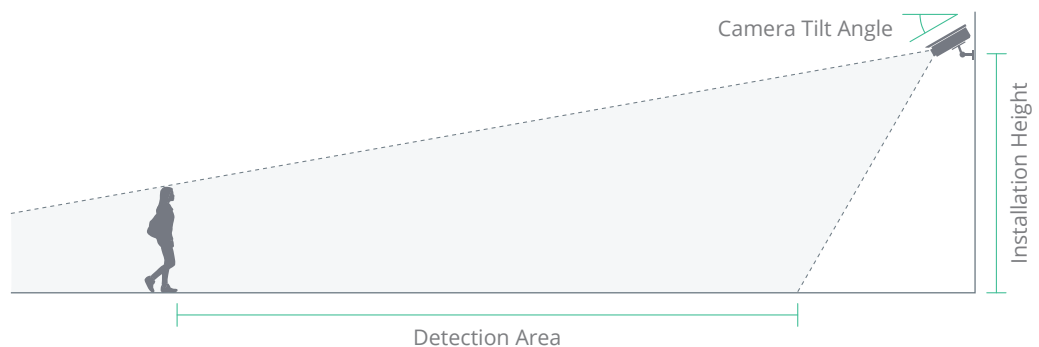
Minimum Illumination 300 lux

Step 3

Mounting Height and Angle

Installation Height 2.5 ~ 4 meters

Camera Tilt Angle Less than 30 degrees

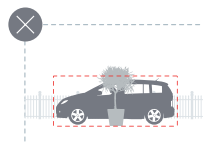**Detection Area** The recommended length ranges from 10 meters to 15 meters

*Please check Triggering Mechanism section for more details.

Camera Tilt Angle

Installation Height
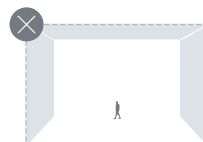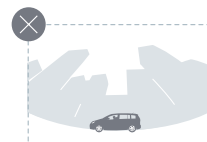
Detection Area

Do's and Don'ts

Directly face the object

The object is blocked

The object is too far

Do not use panoramic cameras

Improve Detection Accuracy

It is still possible that objects will not be detected or will be wrongly recognized even with thorough planning of the camera placement and environment. The following situations can affect detection and tracking by the AI:

• Weather sometimes affects the clarity of outdoor cameras. Rain and snow, changes of shadows, or differences between day and night can have an impact on detection and recognition.

• Objects with similar appearances to real objects, such as cardboard cut-outs or mirror reflections, might be mistaken by the AI for the real thing.

• Unstable network connection might lead to incomplete or corrupt images. Wired connections are highly recommended.

• Dust, insects, or other stains can block the lens. Keep the lenses clean so that a clear image can be taken.

• Cameras anchored to unstable surfaces. A shaky camera can lead to blurry images, which may impede detection and recognition.

• Reflective surfaces above, below or in front (e.g., mirrors, shiny floors and ceilings).

• Light shining directly into the camera's lens.

Configure Software Settings

Once your cameras are mounted successfully, you can configure software settings for the DVA to suit your requirements. This chapter covers the essential settings for the People and Vehicle detection algorithm.

Select a Stream Profile

For optimal detection accuracy, select a resolution of at least 1920x1080@20FPS.
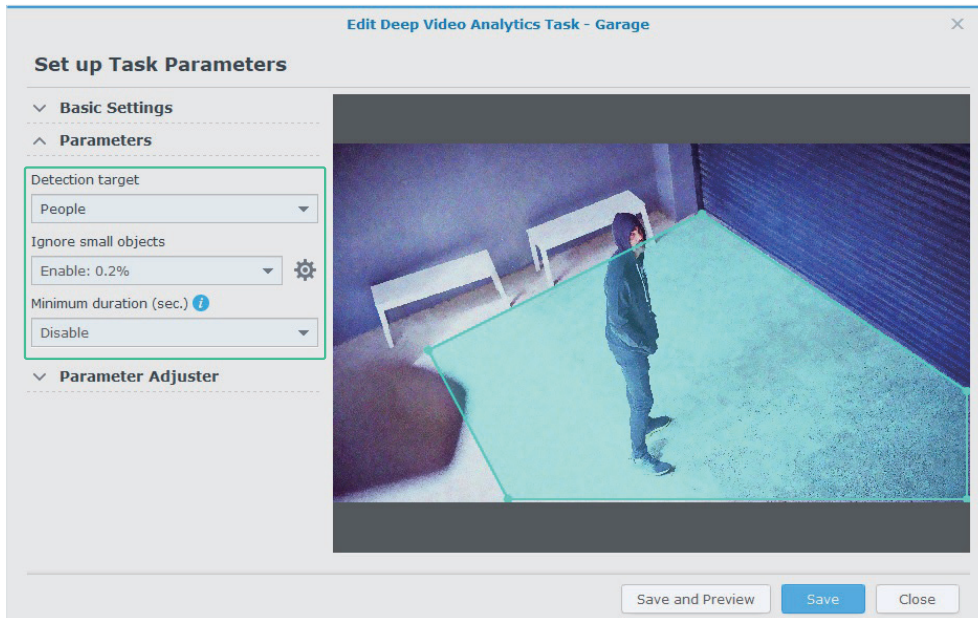
Define the Detection Zone

DVA allows usage of two types of zones: Inclusive and Exclusive. An Inclusive zone means that detection will occur within the defined zone. An Exclusive zone means that detection will occur outside the defined zone. Both are highly compatible with various scenarios, allowing you to cover the areas that truly matter.

Simply drag the nodes to adjust the position of the detection zone. You can left-click on the zone border to add nodes or right-click on the nodes to delete them. The detection zone should not be too thin or small; it should at least be two times the size of the smallest object you want to detect. Up to three zones on one screen can be configured. If there are not enough overlapping areas between objects and detection zones, the detection will fail. Please check Triggering Mechanism section for more details.
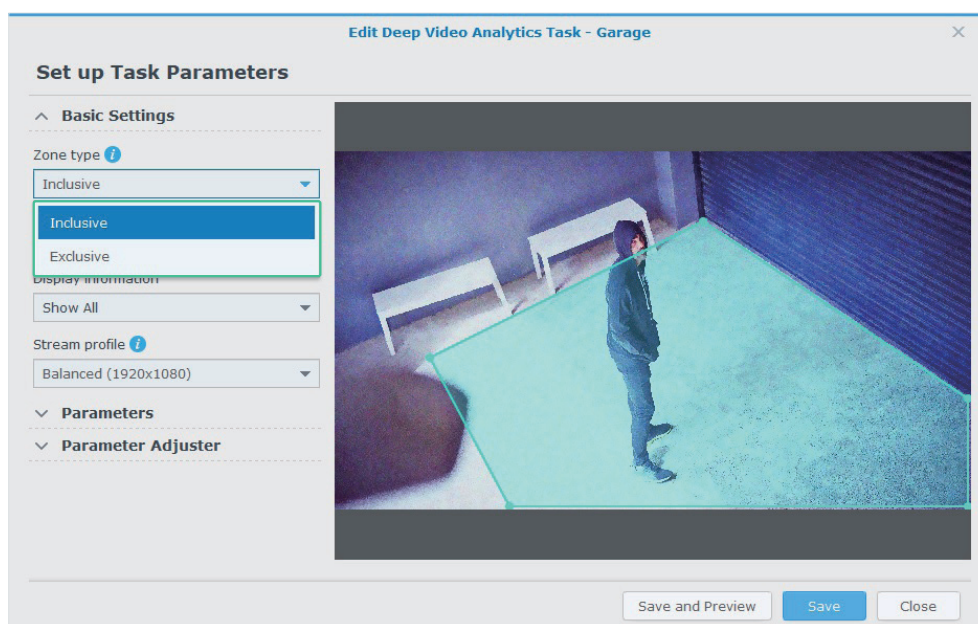
Triggering Mechanism

People and Vehicle detection works by tracking the overlapping areas between objects and detection zones. If Minimum Duration setting is enabled, when an object enters a zone and the overlapping area exceeds the threshold, the object will be recognized as lingering; if the object continues to linger for over the set time duration, an event will be triggered.


People and Vehicle detection supports specified detection for people, vehicles, or both.

People: Events will be triggered when 10% of the height from the bottom center of a person's bounding box enters the detection zone and stays longer than the pre-configured time (if the Minimum Duration setting is enabled).

The trigger point is not in the detection area
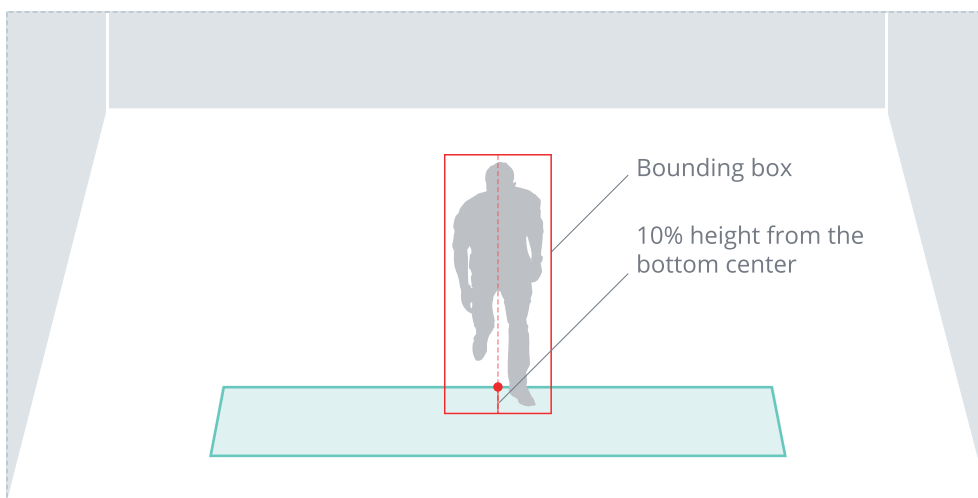
Vehicle: Events will be triggered when 10% of a vehicle enters the detection zone and stays longer than the pre-configured time (if the Minimum Duration setting is enabled). Currently, People & Vehicle Detection detects the following vehicle types: Car, pick-up, van, truck, bus, etc. However, it is still possible that vehicles with a unique appearance are not detected or wrongly recognized.

10%

Overlapped area is less than 10% of the vehicle
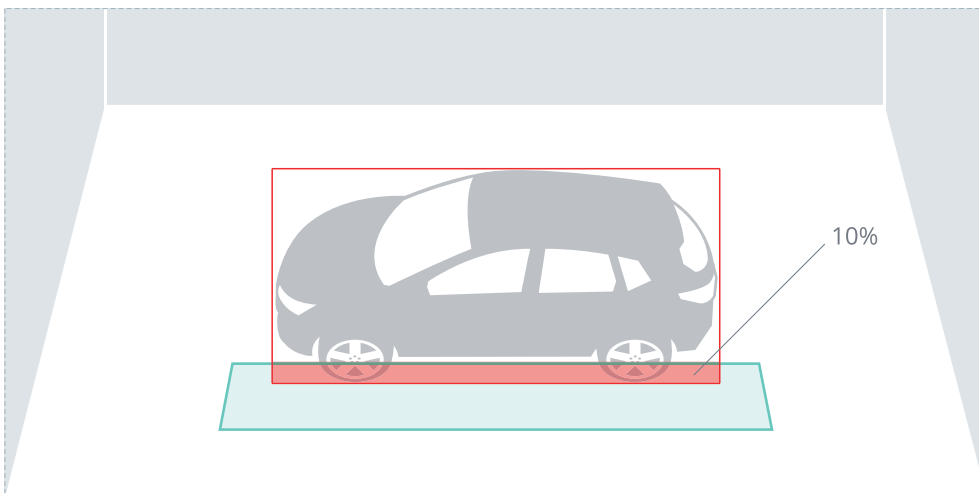
Ignore Small Objects

It is important to fine-tune the minimum object size to filter out false positives from small objects. In the Parameters page, click the Edit button and adjust the blue object frame to define the minimum object size. (The percentage refers to the size of the object in relation to the camera image size.) Moving objects that are smaller than the defined object size will be filtered out.

Using the image below as an example, the minimum object size has been set to 0.2%. Objects smaller than this size, lingering or not, will be ignored by the system.
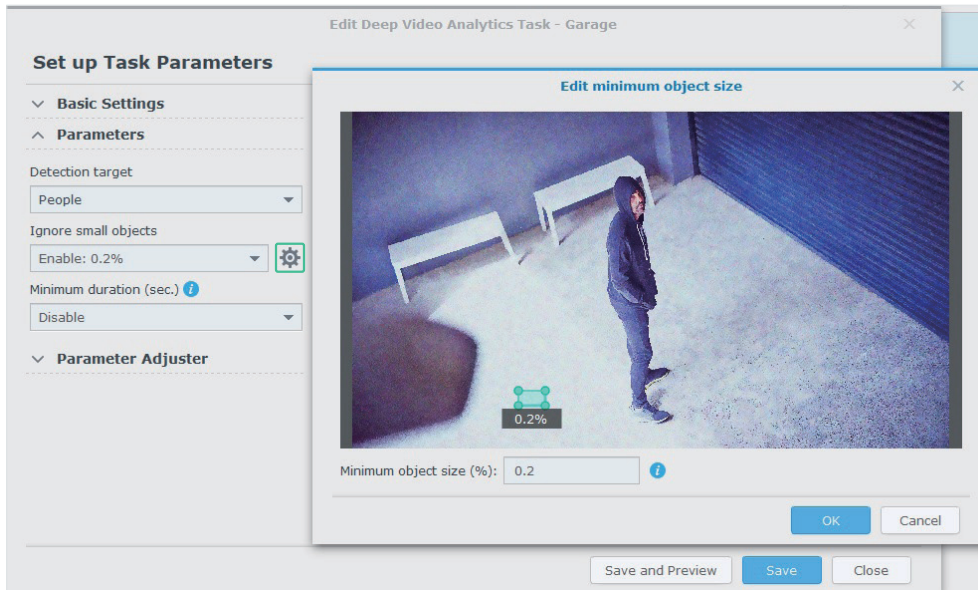
Utilize Advance Features

Besides detailed configuration options, DVA also offers labeling features for easy file management and a Parameter Adjuster that helps fine-tune parameters.

Integrate with Motion Detection

People and Vehicle detection can be integrated with Surveillance Station's motion detection so that cameras' recording, notifications, action rules, and other settings can also be triggered when a People and Vehicle event is detected.

Label and Comment

Labels and descriptions can be added to DVA detection results. For example you can add the "People" label to mark all videos in which people are detected.
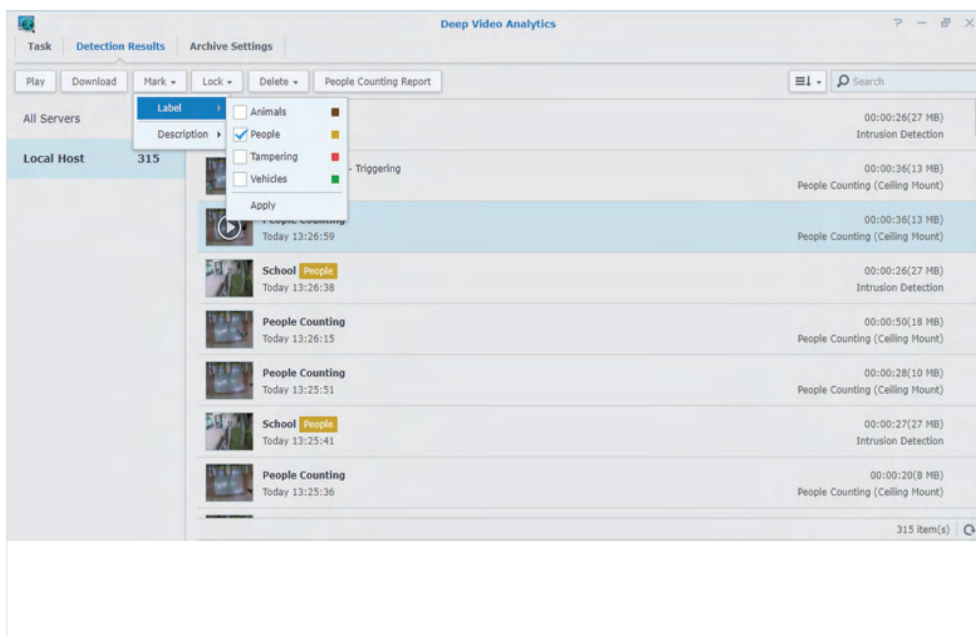
Optimize Parameter Settings

The Parameter Adjuster allows you to use previous camera recordings or DVA detection results to fine-tune task parameters. This helps fit your actual usage scenarios.

Select a clip from the Video Source panel and drag the nodes to adjust the detection zones according to your needs using the clip as a guide. Basic settings and parameters in the left panel can be edited as well.
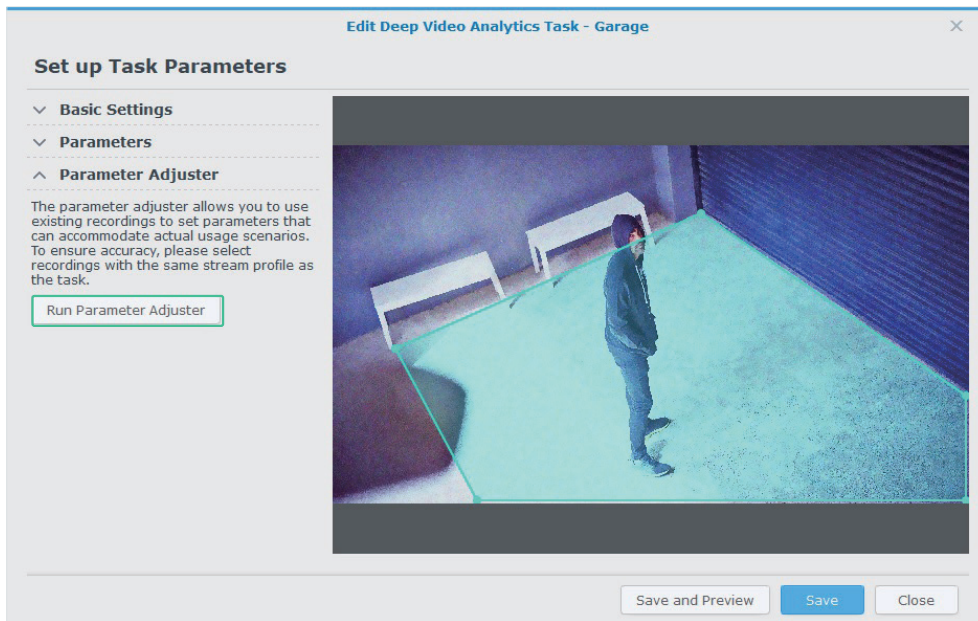
Using the image below as an example, if you want to detect people lingering in the area covered by the camera in question, the zone can be adjusted to cover the person that was detected as seen in the image as well as their surrounding area.

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