

User Guide

Valerus SmartAnalytics



XX306-10-00

Valerus **SmartSearch**

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1 About this Guide

Use this guide to get acquainted with the features and capabilities of Valerus SmartSearch and to operate them.

1.1 About Valerus SmartSearch

Vicon offers Valerus SmartSearch bundled with its future-proofed, real-time video analytics software product Valerus SmartAnalytics, providing a complete suite of solutions for intelligent video management.

Valerus SmartSearch is a software application that enables users to search for and quickly locate specific recorded video content to be used, for example, as forensic video evidence.

The application continuously analyzes video feeds from cameras, generates metadata tags, and saves them in a database. When users submit a query, the Valerus SmartSearch query engine accepts the query, searches and analyzes the saved metadata, and delivers search results to match the query.

Highlights:

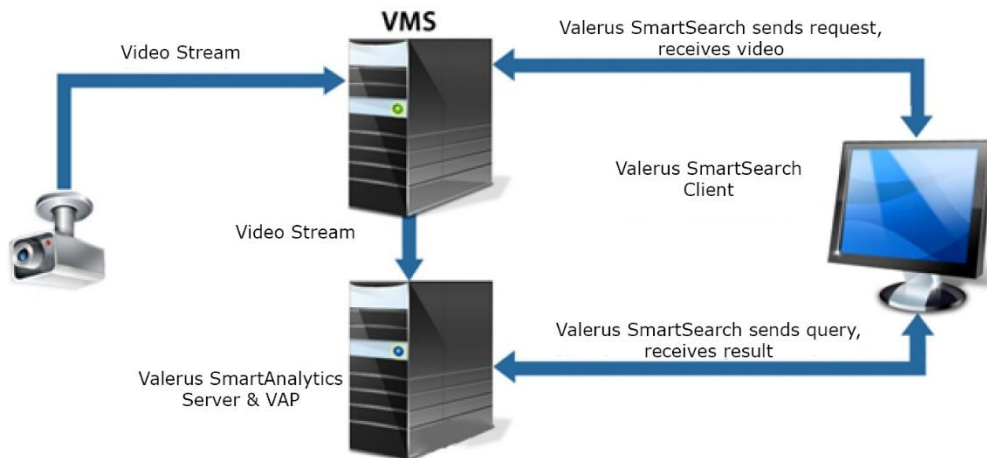
- Finds behaviors of persons, vehicles and objects (moving, stopped, crossing line, occupancy, etc.)
- Capable of performing a search based on filters: time, object type/sub-type, dwell time, color, height, etc.
- Searches a day's video recording in seconds to almost instantaneously find requested targets
- Supports *an unlimited number* of network surveillance cameras
- Capable of finding objects similar to a target already located, across all camera recordings
- Produces statistics reports (of people counting, etc.)
- Shows paths of moving objects and shows locations of non-moving objects across a surveillance period
- Delivers results immediately after deployment irrespective of the number of cameras because users aren't required to define analytics rules

1.2 Searching Recordings from any Camera

Valerus SmartSearch can search recordings and locate video content from any edge device that is managed by a Valerus VMS (Video Management System) that is analytics enabled by a VAP.

1.2.1 Searching Recordings from Cameras Managed by a VAP

Figure 1-1: Searching Recordings from Cameras Managed by a VAP

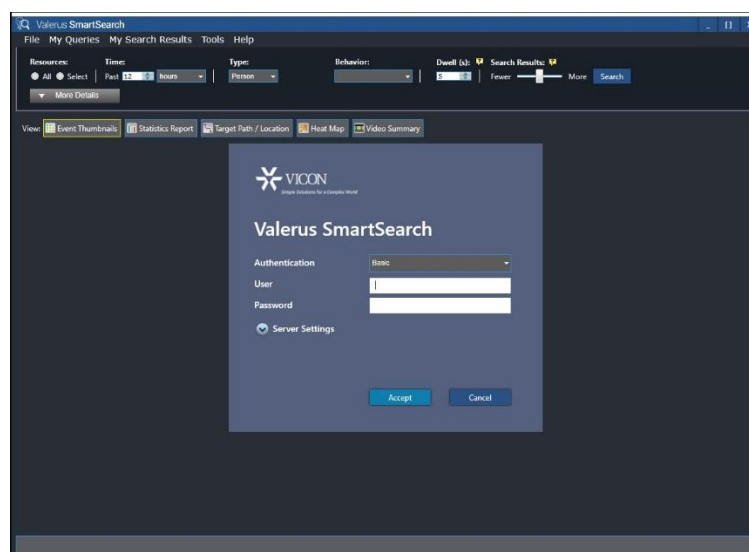


2 Getting Started

To get started, follow these procedures:

1. Install **Valerus SmartAnalytics** (all components, including Server). See **Valerus SmartAnalytics Installation & Administration Guide**.
2. Install Valerus SmartAnalytics client on the same PCs used as the viewing clients.
3. Configure the system. Remember only channels set analytics that have the search option configured and licensed will show in the ValerusSearch app.
4. When clicking the Analytics Search icon in Valerus, the SmartSearch software will launch and log in will display; you may also run it directly by logging in by double-clicking the Valerus SmartSearch icon that is automatically placed on your desktop after installation; the **Valerus SmartSearch Login** screen opens (see Figure 2-1).

Figure 2-1: Valerus SmartSearch Login

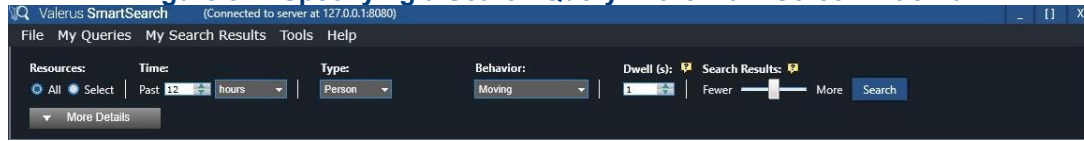


5. Enter user name and password (default is **Admin/Master**) and click **Accept**; accessibility to the application's main screen is enabled.

3 Specifying a Search Query

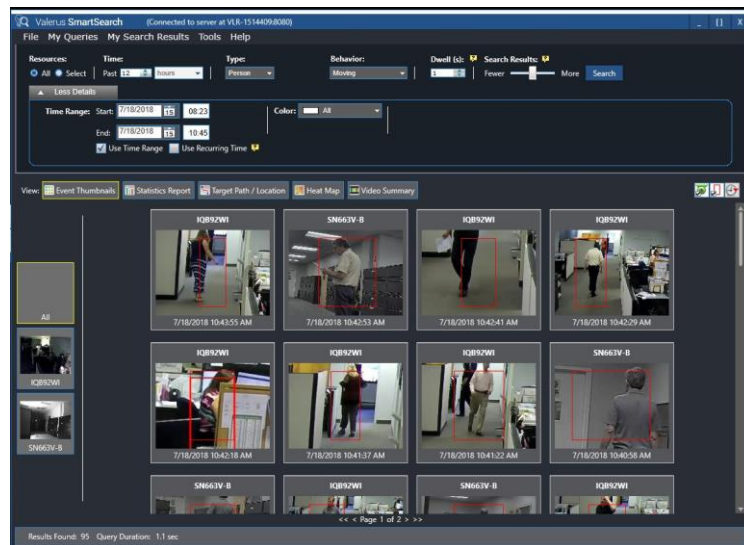
Specify a search query in the main screen title bar:

Figure 3-1: Specifying a Search Query in the Main Screen Title Bar



Parameter	Description
Resources	Check All to search all resources or check Select to search one or more
Time	Specify the time period (the past <i>n</i> minutes/hours/days/weeks/months) within which to perform the search
Type	Specify the target <i>Type</i> to search for: Person , Vehicle or Object . You can specify a <i>subcategory</i> (e.g., Adult vs. Child). <i>Type</i> and <i>subcategory</i> impact the object <i>characteristics</i> that the query searches for (e.g., height, size).
Behavior	Define a behavior to search for. Choose either: (Person) Moving , Crossing Line , Occupancy , Crowding (Vehicle) Moving , Stopped , Crossing Line (Object) Added/Removed
Dwell	Define the length of time which the person, vehicle or object behaves according to the Behavior defined above.
Search Results	Use this adjuster to control the tolerance of the query attributes. Range = Fewer - More Generates more or fewer search results.
Search	Click the button; the search is performed. Progress is indicated by a bar: <div> <p>The figure shows a 'Query Progress' bar with a blue progress indicator and a 'Stop' button.</p> </div> Users can choose to stop the search process.

Figure 3-2: Results after Performing a Search Query



3.1 Performing a Search on Selected Resources

- **To perform a search on a selected resource(s):**
 1. Click **Select** in the main screen title bar; the **Resource Selection** screen opens displaying site/s and resources.
 2. In the tree under **Resource Selection**, check the check box(es) adjacent to the specific resource(s) on which to perform a search and click **Close**; you're returned to the main screen where you can click **Search** to perform the search. The results are displayed in thumbnails. If there are results on multiple resources, a thumbnails index appears to the left of the screen; click thumbnail **All** to view results on all resources (default) or click a thumbnail to view results for that resource alone.

In the **Resource Selection** screen, **All** (enabled) resources are displayed by default. To display a specific resource only, check that resource's check box and then for parameter **Display Resources**, check **Selected Only**; only that resource whose check box you checked is displayed.

3.2 Displaying Thumbnail Results

This section deals with displaying the thumbnail results of a search, enabling users to quickly and easily verify that the target that they were searching for was located.

Users can manage the default behaviors of these thumbnails in the **Tools – Valerus SmartSearch Options** dialog under tab **Thumbnails**.

3.2.1 Zoom Thumbnails

Thumbnail results of a search can be displayed either *zoomed* or *non-zoomed* on found targets. *Zoomed* helps users to precisely identify the target that they were searching for. *Non-zoomed* helps users to better understand the position of the target within the field of view.

Users can manage this functionality by clicking the **Zoom thumbnails enabled/disabled** icon in the uppermost right corner of the results display pane (see Figure 3-3 and Figure 3-4).

Users can manage the default behavior in the **Valerus SmartSearch Options** dialog under tab **Thumbnails**.

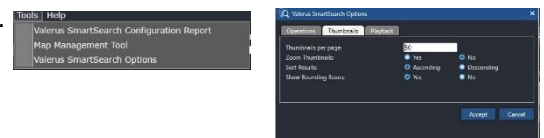


Figure 3-3: Zoom Thumbnails Enabled

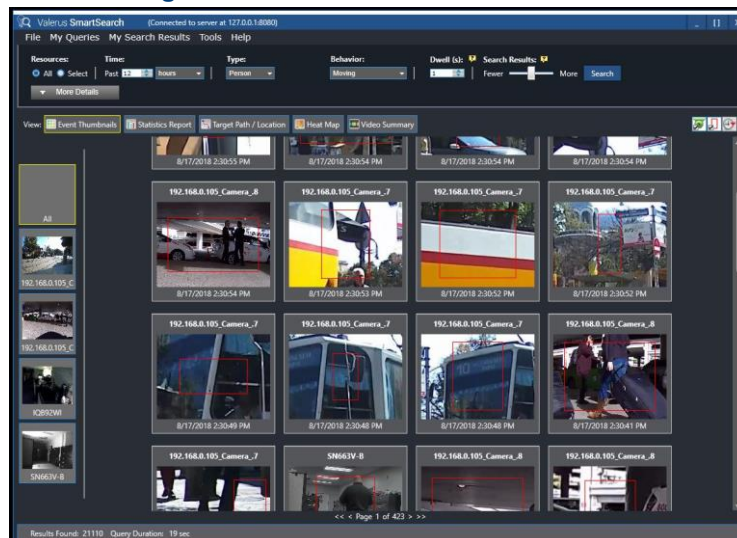
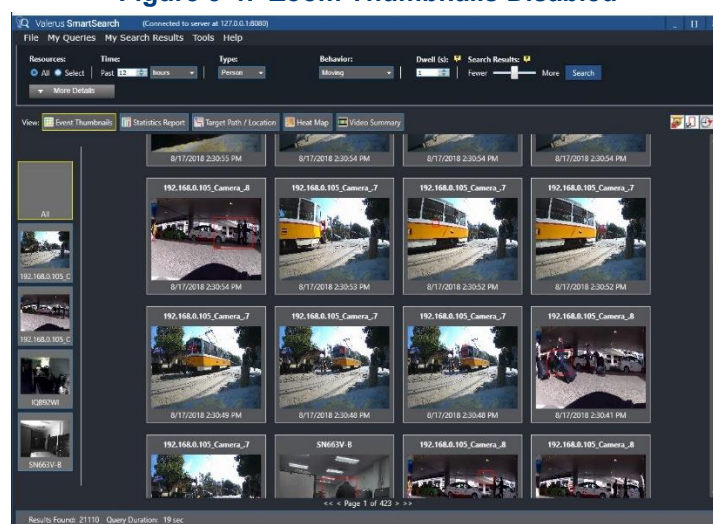




Figure 3-4: Zoom Thumbnails Disabled



3.2.2 Sorting Results Chronologically/Reverse Chronological Order

After a search for a target is performed, the thumbnail results can be displayed in either:



- *chronological order (ascending)* , i.e., targets found *earlier* in the recording are displayed *before* targets found *later*
- OR-
- *reverse chronological order (descending)* , i.e., the thumbnail results of targets found *later* in the recording are displayed *before* those found *earlier*

This functionality helps users to quickly locate thumbnail results obtained at the point of time in history that the target was known to be present in the camera's field of view – if the time is known. This can effectively reduce the time it takes to determine if the sought target was found, especially if the search was performed on a recording covering an extended period of time and multiple results were obtained.

The order can be toggled by clicking icon **Sort from earliest to latest (ascending)/Sort from latest to earliest (descending)** located in the uppermost right corner of the results display pane.

Users can manage the default behavior in the **Valerus SmartSearch Options** dialog under tab **Thumbnails**.

3.2.3 Displaying/Hiding Bounding Boxes

Thumbnail results of a search can show boxes bounding found targets  or with bounding boxes hidden . This functionality differentiates the found target from other possibilities present in the field of view, facilitating quick target identification. It can be especially effective, for example, in distinguishing a target in a large crowd.

Users can opt to hide bounding boxes if, for example, only one target is present in the field of view but it is distanced from the camera and is indistinct as a result; in this case, hiding the bounding boxes can enhance target clarity and expedite identification.

Bounding boxes around targets can be shown/hidden from view by clicking icon **Show/Hide bounding box** located in the uppermost right corner of the results display pane.

Users can manage the default behavior in the **Valerus SmartSearch Options** dialog under tab **Thumbnails**.

3.3 Playing Back Results

Every thumbnail result produced after performing a search can be played back as a video clip to help users verify target identification. Playback is important because if a found target can be successfully identified, the clip can be used as irrefutable hard evidence.


➤ **To play back a result:**

1. Double-click the result thumbnail; the thumbnail expands into a window playing back the clip (see [Figure 3-2](#)).
2. **Pause/Play** the playback (optional).
3. Use the **slider** to play back from any point in the video.

➤ **To revert back to the thumbnail:**

Double-click the playback window; it contracts back into a thumbnail -OR- Double-click another thumbnail; the previous playback window contracts and the double-clicked event thumbnail expands into a playback window.

3.3.1 Virtual PTZ

Users can play back a search result in the playback window *so that the playback approximates a Pan/Tilt/Zoom camera, zooming in and locking onto* the found target as it moves in the field of view .


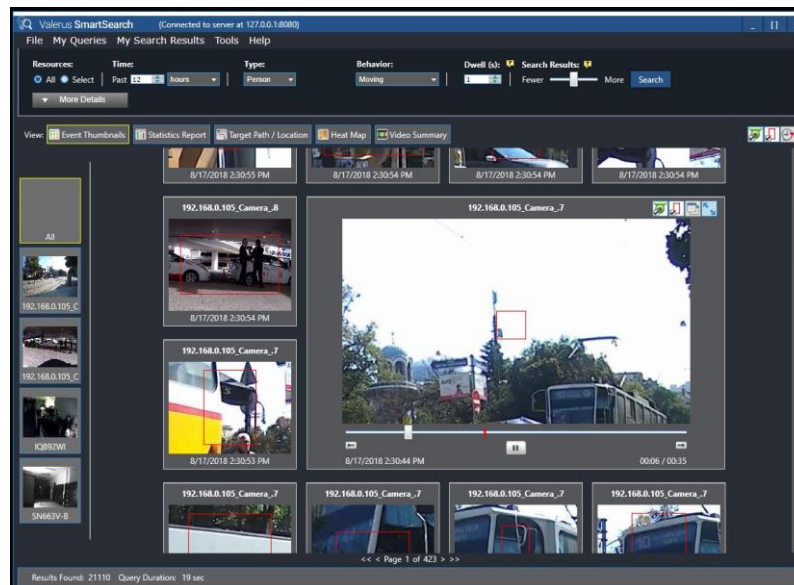
Virtual PTZ can help users to instantly and correctly identify the target that they're searching for. *Regular* playback  can help users to better understand the position of the target within the field of view.



Figure 3-5: Virtual PTZ Playback



The functionality is enabled/disabled by clicking icon **Enable/Disable virtual PTZ** located in the uppermost right corner of the playback window.

Users can manage the default behavior in the **Options** dialog under tab **Playback**.

3.3.2 Bounding Boxes

Results can be played back either *showing* a box bounding the found target , or *hiding* it .


Showing a bounding box distinguishes the found target from other possibilities present in the field of view, helping users see it better (a target in a crowd, for example).


Users can *hide* the bounding box if, for example, only one target is present in the field of view but it is distanced from the camera and as a result is indistinct; hiding the bounding box can enhance the found target's clarity and facilitate identification.

Bounding boxes can be shown/hidden from view by clicking icon **Show/Hide bounding box** located in the uppermost right corner of the playback window.

3.3.3 Controlling Playback Window Size

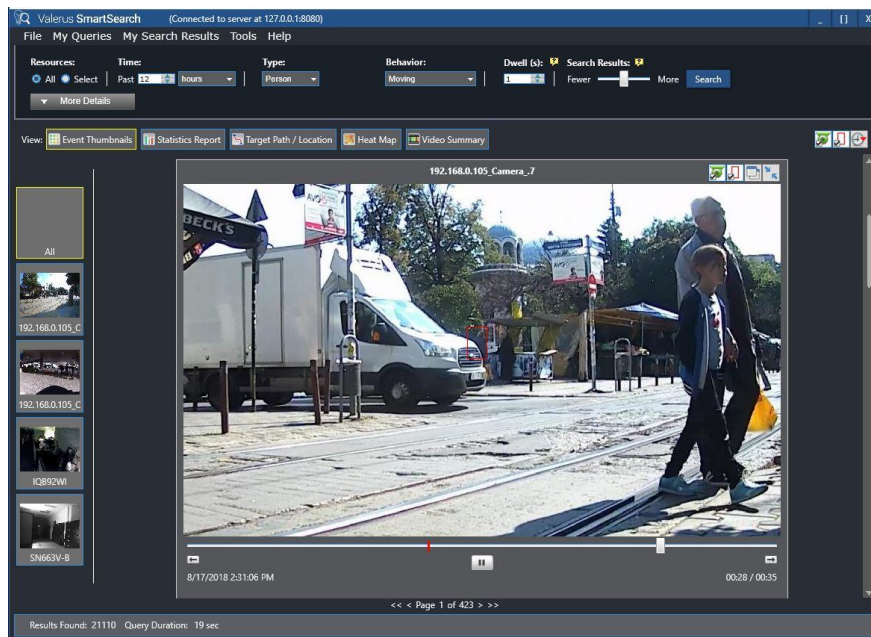
This functionality enables the regular small playback window to be played back in a *larger* playback window, facilitating easier target identification. **Large Playback** is only available if the video's native size is significantly larger.

The functionality can be activated by clicking the **Small Playback** icon  in the right uppermost corner of the playback window; the **Large Playback** window opens.

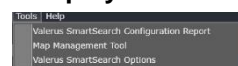
The window can be restored to its previous size by clicking the **Large Playback** icon  in the right uppermost corner of the playback window; the **Small Playback** window is reverted to.

Double-clicking on either a **Small** or **Large Playback** window restores it to a thumbnail.

Figure 3-6: Large Playback Window



Users can manage the *default* size of the playback window (either **Small Playback** or **Large Playback**) that results start playing back in, in the **Tools – Valerus SmartSearch Options** dialog under tab **Playback**, option **Video playback size**.



3.3.4 Pop Out

This functionality enables a **Controlling Playback** window to expand to play back in *full screen resolution*, facilitating easier target identification (see Figure 3-7).

The functionality is available only if the *native* size of the full screen resolution playback is significantly larger than **Large Playback**; if it isn't, only **Large Playback** will be available.


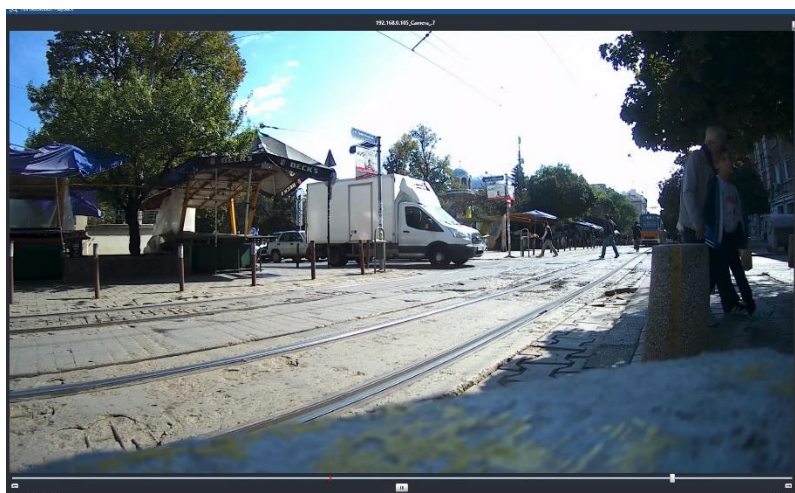
Pop Out functionality is enabled by clicking icon **Pop out**  in the right uppermost corner of a **Large Playback** window; the popped-out playback window occupies the entire screen.



Figure 3-7: Pop Out



3.3.5 Playback Starting Mode

Users can manage the default mode in which playbacks will start (either **Pause** or **Play**) in the **Valerus SmartSearch Options** dialog under tab **Playback**, option **Video playback starting mode**.

3.3.6 Extending or Shortening Playback Time

Users can extend the playback by one minute or shorten it by one minute, by clicking  on the right side of the progress bar (to extend) or  on the left side (to shorten). This feature can deepen the forensics context for users, providing a wider background behind the actual search result.

4 Specifying an Advanced Search Query

- To perform an advanced search query:
 - Click button **More Details** in the main screen title bar; additional search parameters drop down:

Figure 4-1: Performing an Advanced Search Query

The screenshot displays the advanced search query configuration interface. It includes a 'Time Range' section with 'Start' and 'End' date and time pickers. A 'Color' dropdown is set to 'Yellow', with a secondary dropdown for 'All'. 'Min Size' and 'Max Size' are set in square feet. At the bottom, there are checkboxes for 'Use Time Range' and 'Use Recurring Time', and radio buttons for 'Include' and 'Exclude'.

Parameter	Description
Use Time Range	Check the check box and specify the exact Start date and time and End date and time to search in.
Use Recurring Time	Check the check box to enable searching in recurring time intervals. Example: If you specified Start/End date as Feb. 1/Feb. 5 and Start/End time as 2 pm - 3 pm, the search will be performed on each 2-3 pm time slot on each day between Feb. 1 and Feb. 5.
Color	<p>If you leave the parameter at its default (All), the search is performed irrespective of color. Click the drop-down arrow to select a color to search for.</p> <p>After choosing a color, another color drop-down is enabled. Either leave it at the default (All) or choose another color, in which case two colors will be searched for. After choosing a color or two colors, radio button Include (default) and radio button Exclude are displayed.</p> <p>Include = a search is performed only for the specified color(s); a result is delivered only if <i>both</i> colors are found.</p> <p>Exclude = a search is performed for all colors except for the specified color(s); a result is delivered only if <i>neither</i> of the two specified colors are found.</p>
Min/Max Height/Size	<p>Automatically defined by Valerus SmartSearch. Users can modify the default.</p> <p>Min/Max Height relates to persons</p> <p>Min/Max Size relates to vehicles and objects</p>

5 Statistics Reporting

Valerus SmartSearch enables you to count behaviors and to instantaneously display the count in a statistics report. This capability can provide valuable enterprise and traffic management intelligence. Note that for this option to work, the resource must be configured and licensed to support Business Intelligence (BI).

5.1 Generating a Statistics Report

Generate a statistics report to display the count of a requested behavior **By Time** or **By Resources**.

You can also generate a statistics report to display the count of persons or vehicles crossing a line (after drawing a crossing line in the FOV; see [Defining a Crossing Line in the FOV](#)).

➤ **To generate a statistics report:**

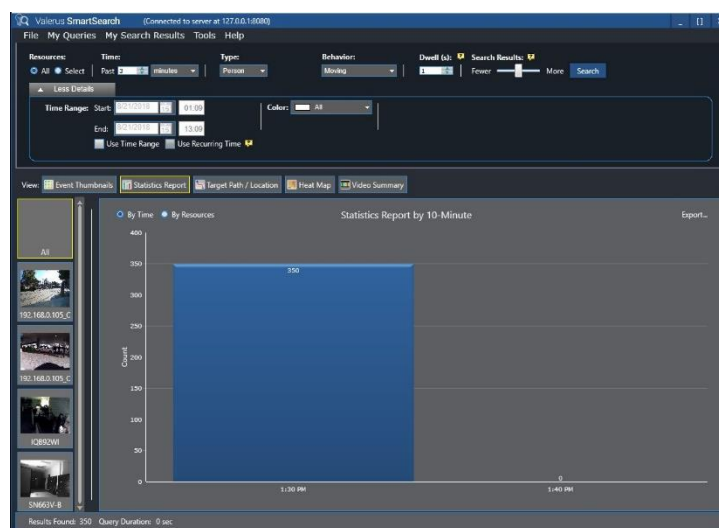
1. In the main screen title bar, specify the query details.
2. Check the button **Statistics Report**:

Figure 5-1: View: Statistics Report



Figure 5-2 shows an example of a **Statistics Report**.

Figure 5-2: Statistics Report



3. Display the results **By Time** (hour/day, etc.) or **By Resources**.
4. (Optionally) click **Export** to export the report to either **PDF** or **Excel** (exporting to Excel requires that Excel is installed on the machine).
5. When a report is generated, Valerus SmartSearch automatically chooses the **Timeline basis** optimized for the time period you're searching in. Use the **Timeline basis** menu control to modify the default layout and present the data differently (e.g., in **Weeks** instead of the default **Months**).

6 Excluding Part of the FOV from a Search

6.1 Defining a Detection Area

Users can define a detection area in the camera's field-of-view so that searching will be performed only within it and not in the region outside it.

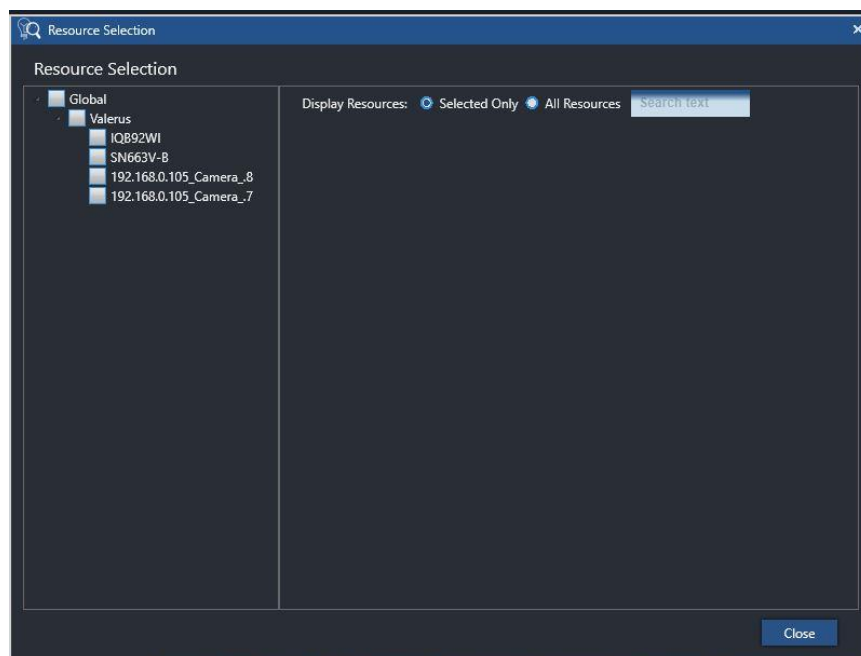
If, for example, you want to search for a **Person Moving** in a sterile zone but the FOV also covers a crowded sidewalk adjacent to the zone, you can define a detection area to include only the sterile zone and to exclude the sidewalk. This will eliminate unwanted detection on the crowded sidewalk.

You can define a detection area for the rules **Person Moving**, **Person Occupancy**, **Crowding**, **Moving Vehicle**, **Stopped Vehicle** and **Object Added/Removed**.

➤ **To define a detection area:**

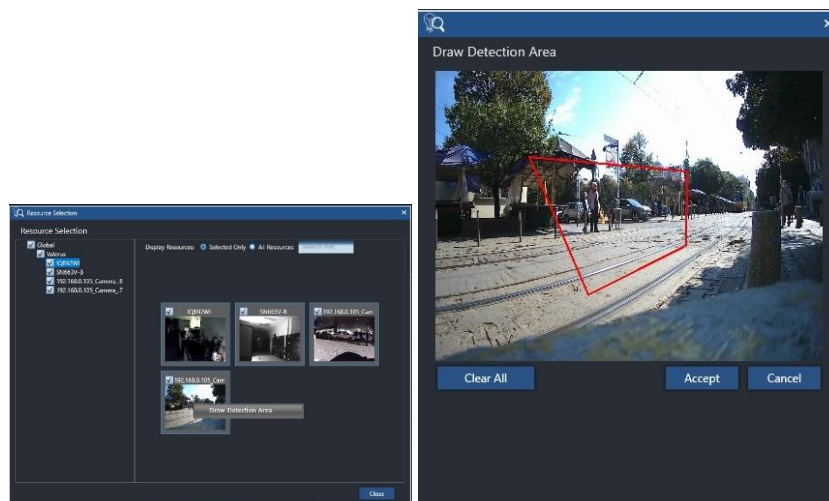
1. In the Valerus SmartSearch main screen title bar, under Resources, click **Select**; the **Resource Selection** screen opens.

Figure 6-1: Resource Selection



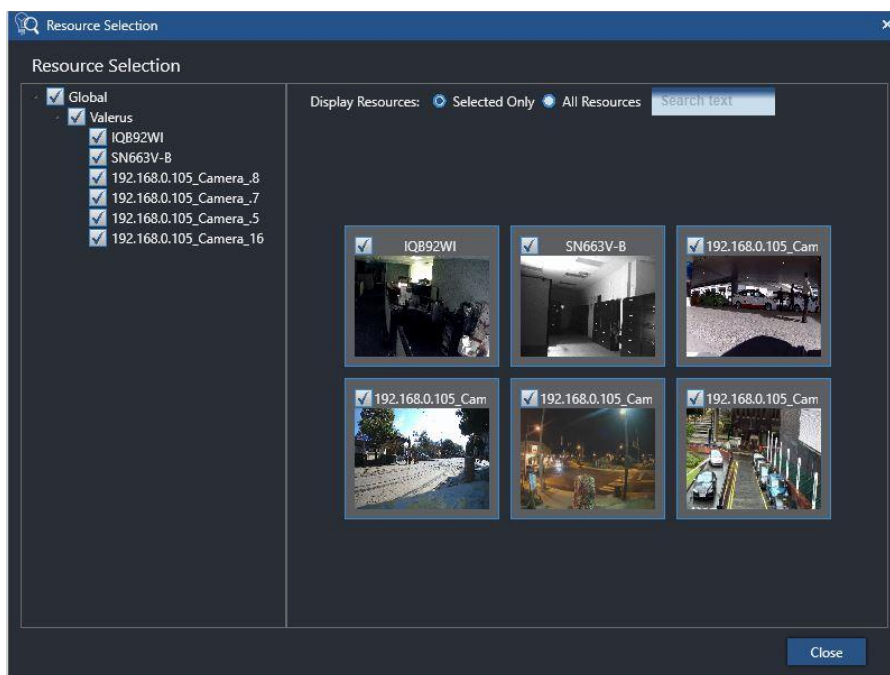
2. Right-click the thumbnail on which you want to draw an FOV detection area, and select **Draw Detection Area**.
3. In the FOV that pops up, click on points in it to draw a polygonal detection area.

Figure 6-2: Draw Detection Area



4. After drawing the detection area, click **Accept**; the detection area is displayed on the resource thumbnail:

Figure 6-3: Detection Area Displayed on the Resource Thumbnail



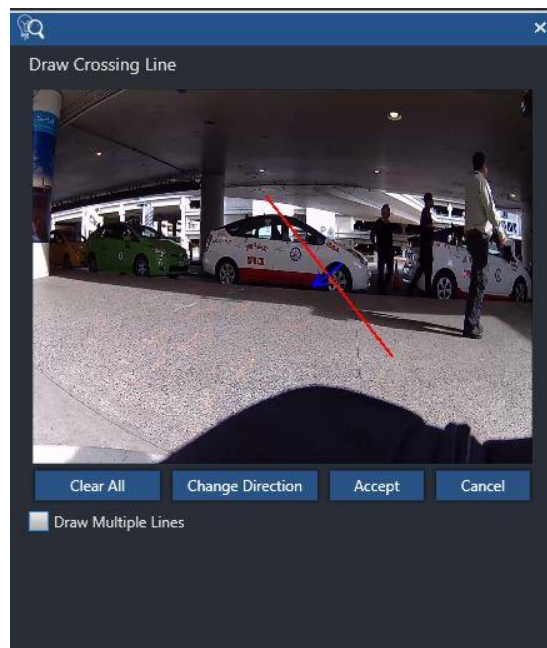
5. Perform a search on the camera. Only the detection area will be searched in; the region outside it will be excluded from the search.

7 Defining a Crossing Line in the FOV

➤ **To define a crossing line:**

1. In the main screen title bar, define the rule **Type** and **Behavior**: **Person Crossing Line** or **Vehicle Crossing Line**.
2. Click **Select** under **Resources**: the **Resource Selection** screen opens (see [Figure 6-2](#)).
3. Right-click on a resource and select **Draw Crossing Line**; the **Draw Crossing Line** screen opens (see [Figure 7-1](#)).
4. Define the line: click the start point and the end point.
5. Click button **Change Direction** to toggle direction.

Figure 7-1: Draw Crossing Line



8 Showing a Target's Movement Path/Location

You can specify that a search result for:

1. Motion-based behaviors (Person Moving, Person Crossing Line, etc.) will show the **path** tracing the target's progress in the FOV. This can be useful, for example, when investigating the scene of a crime for clues.
2. Non-motion based behaviors (Stopped Vehicle, Object Added/Removed) shows the **location(s)** of all objects found.

➤ **To show the path of a moving target or the location of a non-moving target:**

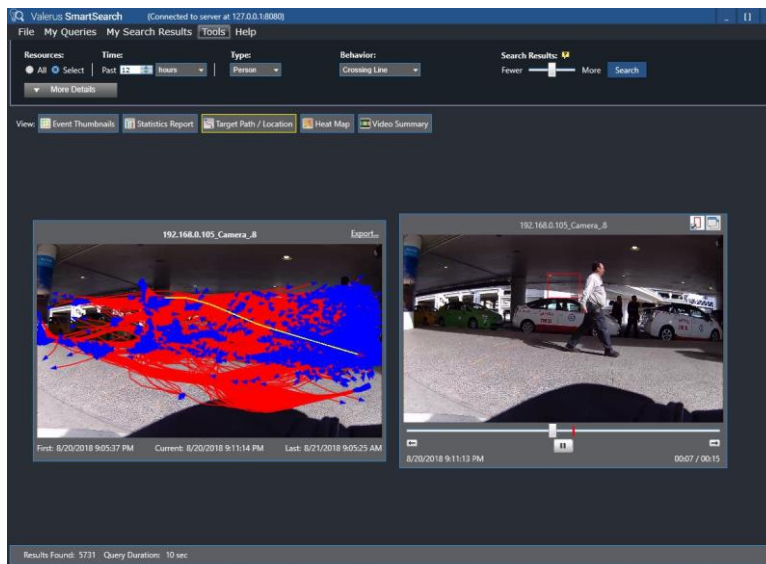
1. In the main screen title bar, define the **Type** and **Behavior** of the target you're seeking.
2. Click **Search**; the search is performed and the result thumbnails are displayed.
3. Adjacent to **View**, check radio button **Target Path/Location** (see [Figure 8-1](#)); the result thumbnails show movement paths (see [Figure 8-2](#)) or non-moving objects' locations.

Figure 8-1: View: Target Path/Location



- Alternatively, right-click a search result thumbnail or multiple selected search result thumbnails, and from the popup menu, choose option **View Target Path/Location**.

Figure 8-2: Target Path



All paths/locations are drawn on a single enlarged thumbnail.

From here you can:

- Click a path/location boundary box to highlight it in a different color.
- Double-click a path/location boundary box to play back the video.

Note

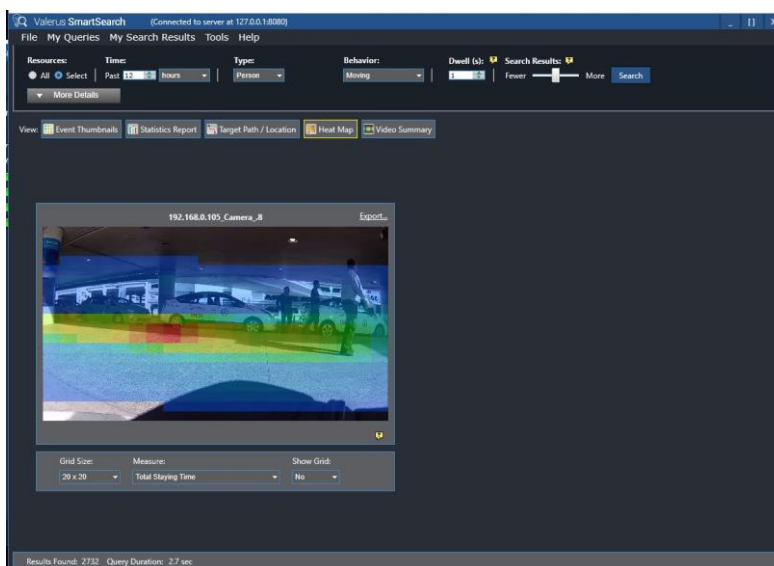
- If multiple search results from resources are obtained, a small thumbnails index of those resources is displayed on the left of the screen. Select a thumbnail; all results obtained from that resource are displayed.

9 Heat Map

Valerus SmartSearch's **Heat Map** feature *visualizes* the video intelligence that is found after performing a search, providing you with *immediate* visibility and insight into the search results. Note that for this option to work, the resource must be configured and licensed to support Business Intelligence (BI).

For example, a **Heat Map** view of results obtained from a search for persons moving in an area shows which locations in the field of view are “hottest” in terms of this particular target's/target behavior's frequency of occurrence.

Figure 9-1: Heat Map



➤ **To show a heat map view of search results:**

1. In the main screen title bar, define the **Type** and **Behavior** of the target you're seeking.
2. Check radio button **Heat Map** adjacent to **View** (see Figure 9-2);

Figure 9-2: View: Heat Map



3. Click **Search**; the search is performed and the result thumbnails are displayed, each showing a heat map of the locations of the found target/target behavior.
4. [Optionally] adjust **Grid Size** (5x5, 10x10 or 20x20).
[Optionally] filter on the basis of dwell time (targets exceeding dwell time or all targets found irrespective of dwell time).
[Optionally] show or hide grid.
5. [Optionally] Double-click a cell in the grid to view a video summary for all targets that contributed to that Heat Map cell.

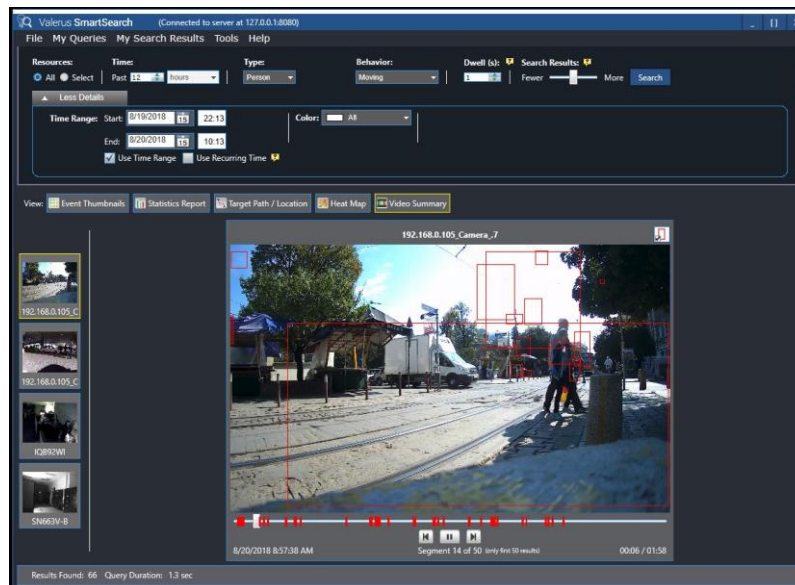
10 Video Summary

Video Summary collates all search results obtained per camera and displays them in a single playback slot. Each result is segmented from the next result so there's no "dead" time when playing back. To choose this view, check the radio button **Video Summary** and click **Search**:

Figure 10-1: View: Video Summary



Figure 10-2: Video Summary

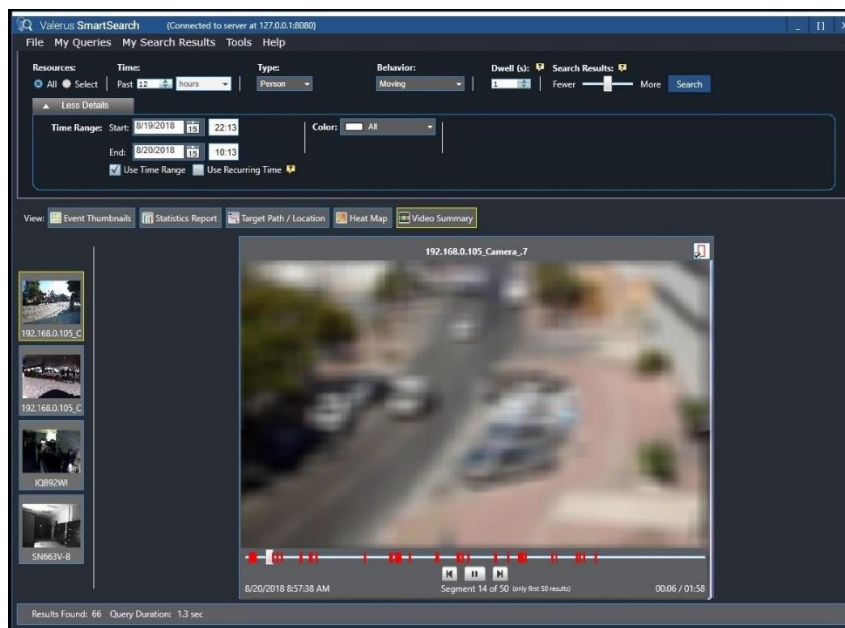


1. You can choose this view type *before* searching.
2. You can *revert* to this view type *after* searching and viewing the results in one of the other view types.
3. You can select a number of search results from the **Event Thumbnail** view and then choose **Video Summary** to view these specific results (via the right-click menu).
4. By default, the playback runs by itself (the segments in the slot run one after the other).

➤ **To jump to the time position required, you can:**

- Use the **>>Next** and/or **<<Back** buttons -OR-
- Click the progress bar on the required position.

The number of red bars along the progress bar corresponds to the number of original search results. When the playback moves from one video segment to the next, a fade out/in indicates the transition to the new time position.

Figure 10-3: Video Summary – Fade Out/In Transition from Segment to Segment

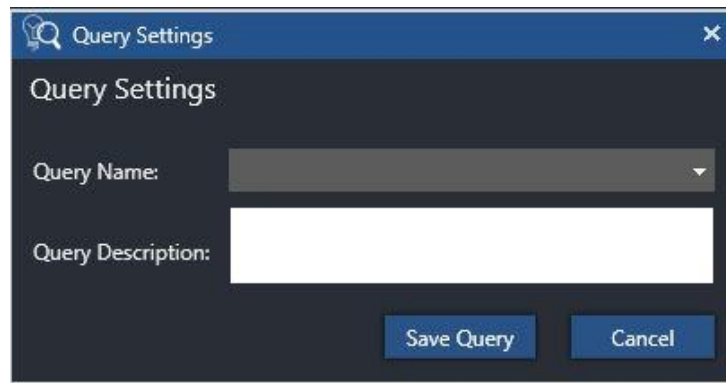
If there's overlap between two or more segments, the segments are merged so you don't have to view the same scenes twice. In such cases, you'll view multiple objects being tracked (each corresponding to a different search result).

11 Searching for Similar Targets

➤ **To search for similar targets:**

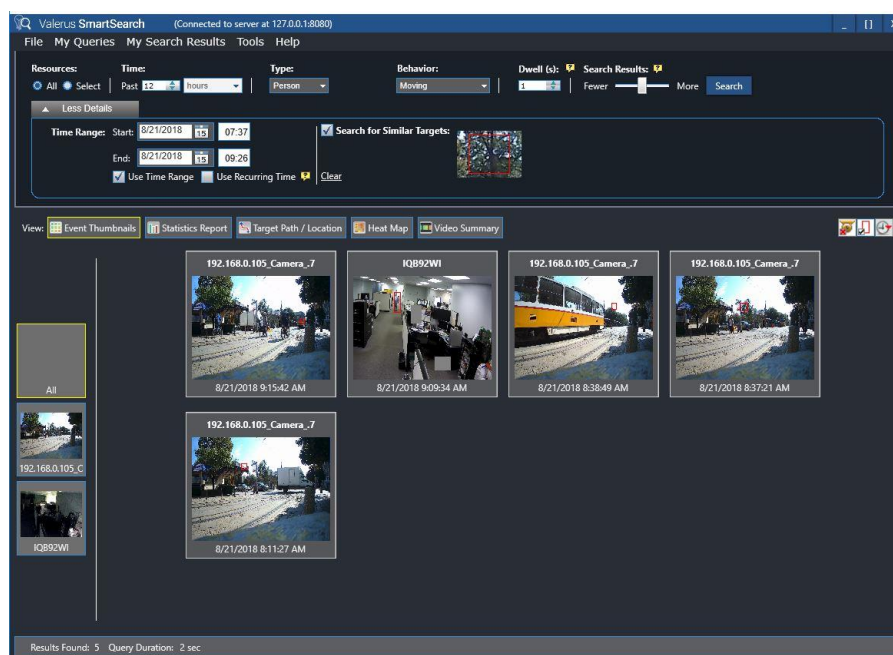
1. After performing a search and obtaining results, right-click a result thumbnail and select **Search for Similar Targets**; the **Query Settings** screen opens:

Figure 11-1: Searching for Similar Targets



2. You can adjust the search **Time** around this specific event (or leave as it was in the previous search). You can limit the search to this specific resource, or expand it to other resources.
3. Click **Search**; a search for similar targets is conducted, based on the object detected in the initial search and the remaining query parameters. The query GUI will show that a search for similar targets is being conducted:

Figure 11-2: Result after Searching for a Similar Target



4. Unselect the radio button **Search for Similar Targets** to eliminate a search for similar targets but retain the previous object characteristics. This enables you to search again for that target later. If you are no longer interested in searching for similar targets, click **Clear**; the standard mode of operation is reverted to.

12 Saving Search Results & Queries

12.1 Saving a Search Result

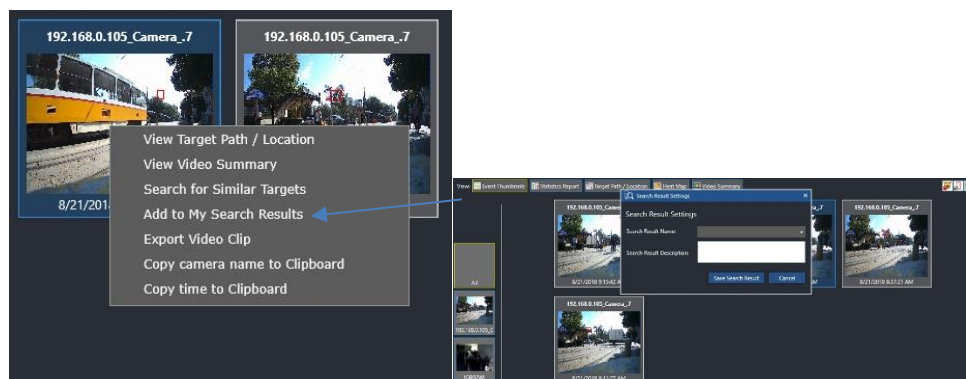
Valerus SmartSearch enables you to save a search result as a snapshot of the event in *jpg* format, including the result's identifying information (camera ID, time).

This can be useful when conducting an investigation and you need to collate all the video evidence you have in a centralized location. Let's say you've found a number of events from different cameras showing a person moving, a person crossing a line, a person wearing blue overalls, a person loitering, etc.). You can save each snapshot in a single location to enable quick access, organize the evidence for effective presentation, and facilitate the investigation.

➤ **To save search results:**

1. Select one or more search results
2. Right-click on a search result thumbnail and select **Add to My Search Results**; alternatively, select a search result thumbnail (or a number of search results thumbnail), open the menu **My Search Results** in the main screen and select **Add to My Search Results**.

Figure 12-1: Add to My Search Results



3. You're prompted to provide a name for the saved result(s).
4. You can invoke this process multiple times and continue adding search results under an existing name or under a new name.

12.2 Saving a Query

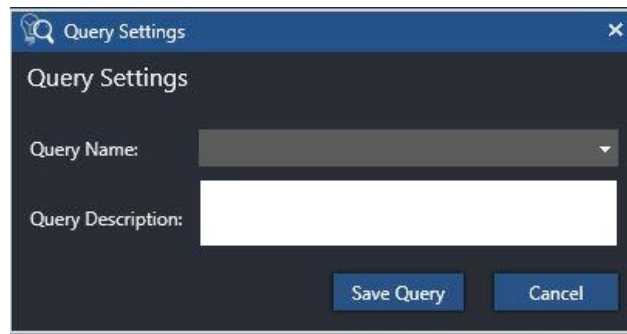
You can save a search query so that you'll later be able to reuse it. Saving a query can be used, for example, when counting. If you defined a query to find how many vehicles crossed a line during time period x, you can run the same query at a later date.

Or, if you searched for crowding and you foresee future opportunities to search for crowding, you can save the query for use at a later date.

➤ **To save a query:**

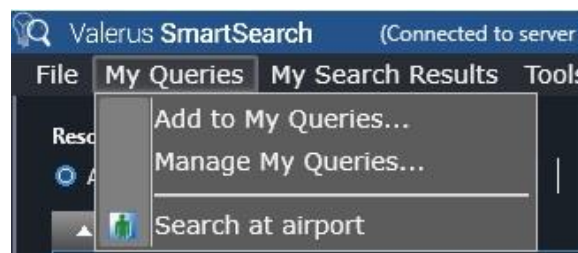
1. Open menu **My Queries** and choose option **Add to My Queries**; the **Query Settings** screen opens.

Figure 12-2: Query Settings



2. In field **Query Name**, define a user-friendly name for the query. If you previously defined and saved a query, you can click on the arrow and select it from a drop-down menu. In this case, the new query overrides the query that was saved before.
3. Provide a **Query Description** to optimize usability and click **Save Query**.
4. To later invoke the saved query, reopen the menu **My Queries** and select the saved query corresponding to the name you saved it under (see example '**Look for suspects**' below):

Figure 12-3: Query Saved in My Queries



5. You can modify a saved query and save it again under the same name (i.e., override it) or you can save it under a new name.

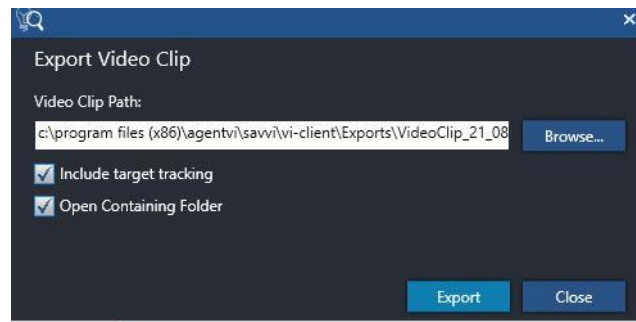
13 Exporting a Video Clip

This feature enables you to send an *avi* clip of the event to a remote addressee who doesn't have Valerus Smart Analytics software installed on their PC who can then play the standalone clip of the event in a media player.

➤ **To export a video clip:**

1. Right-click on a result thumbnail and from the popup menu (see [Figure 12-1](#)), choose **Export Video Clip**; the **Export Video Clip** dialog opens (see [Figure 13-1](#)).

Figure 13-1: Export Video Clip

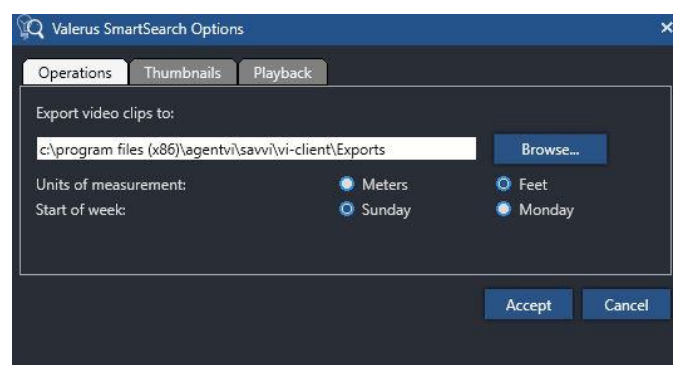


2. Browse to the location to which the clip is to be exported.
3. Leave **Include target tracking** checked in order to preserve the target tracking in the export.
4. Leave **Open Containing Folder** checked in order to open the folder immediately following the export.
5. Click **Export**; the clip is exported (requires DIVx).

14 Customizing the Default Behaviors of Valerus SmartSearch Operations & Functionalities

The behaviors of Valerus SmartSearch operations and functionalities (search result thumbnails and playback windows) can be configured to meet user requirements in the **Valerus SmartSearch Options** dialog in the **Tools** menu. This convenience allows users to enhance individual user experience and improve usability.

Figure 14-1: Configuring the Default Behaviors of Valerus SmartSearch Functionalities



Operations	
Parameter	Description
Units of measurements	Configure Meters or Feet according to requirements
Start of week	Sunday or Monday , according to user preference
Notify on resource configuration issues	Configure Yes to be prompted with a Valerus SmartSearch Configuration Report when running a search on resources on which there are configuration issues.
Search resources with SmartSearch state disabled	Configure Yes for searches to be applied on resources that are currently Valerus SmartSearch state disabled . Relevant if you want to run a search on resources that previously had Valerus SmartSearch state enabled and metadata was captured for them. Configure No for resources that are Valerus SmartSearch state disabled to not be displayed when selecting resources to search on and for these resources to not be included in a search when searching All resources .
Thumbnails	
Thumbnails per page	Configure the maximum number of results you require to be displayed per page
Zoom Thumbnails	Configure Yes for search results to be displayed <i>by default zoomed-in</i> . Configure No for search results to be displayed <i>by default not zoomed-in</i> . See Displaying Thumbnail Results .
Sort Results	Search results can be Sorted from earliest to latest (ascending) or Sorted from latest to earliest (descending) . Ascending = targets found earlier in the recording are displayed before targets found later. Descending = targets found later in the recording are displayed before targets found earlier. See Sorting Results Chronologically/Reverse Chronological Order
Show Bounding Boxes	Configure Yes for search results to be displayed <i>with boxes bounding the found targets</i> . Configure No for search results to be displayed <i>without boxes bounding the found targets</i> . See Displaying/Hiding Bounding Boxes .
Playback	
Virtual PTZ	Configure Yes for search results to be played back so that the playback <i>by default approximates the action of a PTZ camera</i> . Configure No for the playback <i>by default to approximate the view from a fixed camera</i> . See Virtual PTZ .
Video playback starting mode	Configure Play or Pause . If Play is configured, the result begins playing back immediately after clicking the thumbnail. If Pause is configured, the result is presented in a paused state after clicking the thumbnail.
Video playback size	Configure Small for the <i>default playback window</i> that opens when playing back a search result, to be a Small Playback window. Configure Large for the <i>default playback window</i> that opens when playing back a search result to be a Large Playback window. See Controlling Playback .

15 Appendix: Use Cases

15.1 Introduction

15.1.1 Forensic Video Analysis vs. Real-Time Video Analysis

Forensic analysis can be critically useful to customers needing to find video evidence of a behavior of a person or of an object that real-time video analysis isn't capable of detecting, from tens of hours of video recordings recorded from multiple cameras.

Real-time analytics rules cannot differentiate, for example, between a shopper removing a product from a shelf in order to evaluate it and a thief removing it in order to take it out the store without paying. Together with eyewitness accounts, Valerus SmartSearch is capable of quickly finding recorded video evidence of the theft and the thief.

Airports

On January 3, 2010, authorities shut down Newark Airport after a man was seen walking from an unsecured, public hall into a sterile area. More than 5.5 hours after the incident was first reported at 5.20 p.m., news channels were still reporting on the search for the man. A spokeswoman said that video footage from terminal cameras was still being reviewed to determine whether the man underwent screening, exited and then returned to the secure area, or alternatively, never underwent screening. Either way, the damage was done - a major aerial transportation hub was shut down, multiple flights were delayed, and several thousand passengers had to be re-screened.

How can Valerus SmartSearch prevent a debacle like this from happening?

A quick and simple query scans the recorded video and identifies the suspect instantly, allowing the security team to quickly apprehend him. Such instantaneous search saves the valuable time required to undertake a manual search through the video in order to trace the suspect's steps through the terminal. Valerus SmartSearch presents the target's entire motion path, any objects he might have left in the terminal, and even any interaction he may have had with screened passengers.

Figure 15-1: Search Results using Valerus SmartSearch of a Person Walking through an Exit Lane



Valerus SmartSearch can prevent millions of dollars of losses for airports and airlines, not to mention the inconvenience caused to passengers and to scheduling of other flights which were connecting with flights from the disrupted airport. The cost associated with installing Valerus SmartSearch is infinitesimal compared to the disturbance and losses which can be caused by a terror attack, major accident, or even a simple act such as a person walking through an exit, in the wrong direction. While the effortless implementation of video analytics could have resolved this breach within seconds, 24 hours after the incident, airport security staff was still reviewing the recorded video to identify the trail of the suspect, who by then, was long gone.

Retail

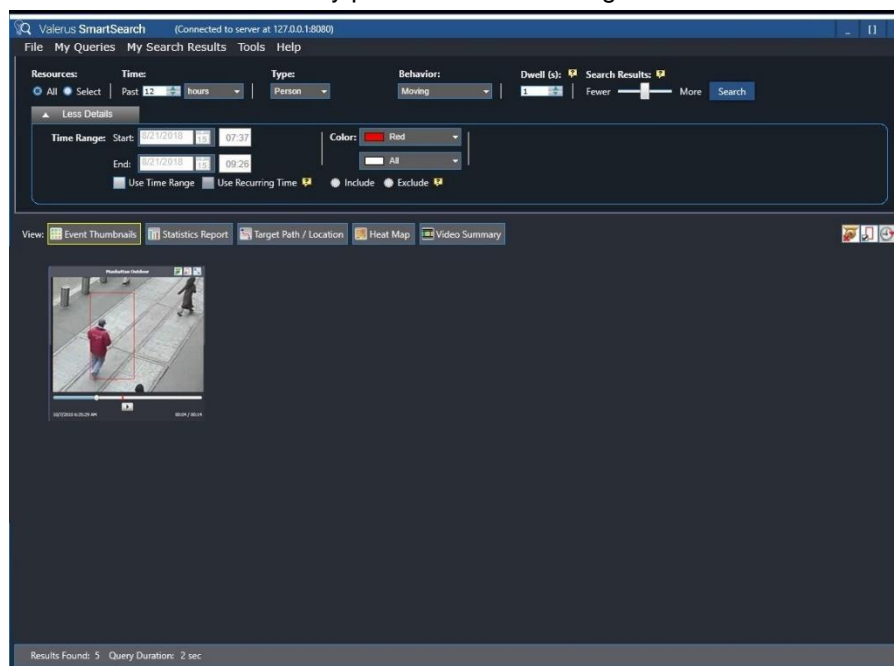
A department store employee recalls that soon after starting her lunchbreak, a man entered the cosmetics department and aroused her suspicions. The man left without buying anything. Shortly afterwards, staff discovered that expensive perfumes were gone missing. The employee tells police that she remembers the man was wearing a red jacket.

15.1.1.2.1 Sidewalk Cameras

Video surveillance operators open Valerus SmartSearch and define a search query *on the 16 video cameras covering the sidewalks outside the store*, to determine the direction in which the suspect headed. They define these search criteria:

1. Time range: 1 p.m. to 2 p.m.
2. Type: Person, Adult
3. Behavior: Moving
4. Color: Red

Valerus SmartSearch instantly produces the following result:



15.1.1.2.2 Indoor Cameras

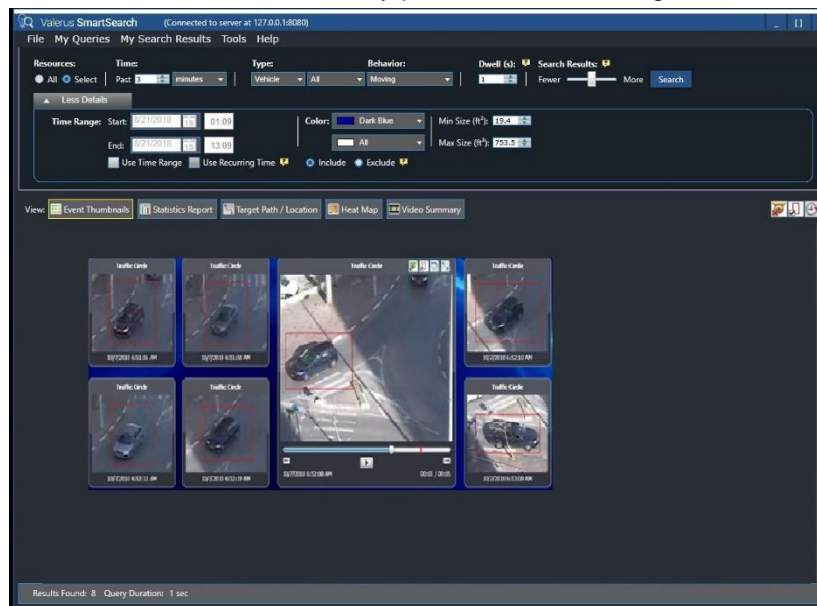
A search is then performed on recordings from *all video cameras in the store* using the same search criteria. All results showing the suspect's face are saved as snapshot images in a single location (using menu option **Add to My Search Results**) to be used for identification. Clips judged to be useful to the investigation are exported using option **Export Video Clip**. Clips are saved as *avi* files playable on any machine with a media player.

15.1.1.2.3 Traffic Intersection Cameras

Police are told that the man was seen getting out of a blue station wagon type car. Video surveillance operators define a search query in Valerus SmartSearch for a moving blue vehicle on cameras at traffic intersections in the vicinity. They define these search criteria:

1. Time range: 1 p.m. to 2 p.m.
2. Type: Vehicle, All
3. Behavior: Moving
4. Color: Blue

Valerus SmartSearch instantaneously produces the following result:



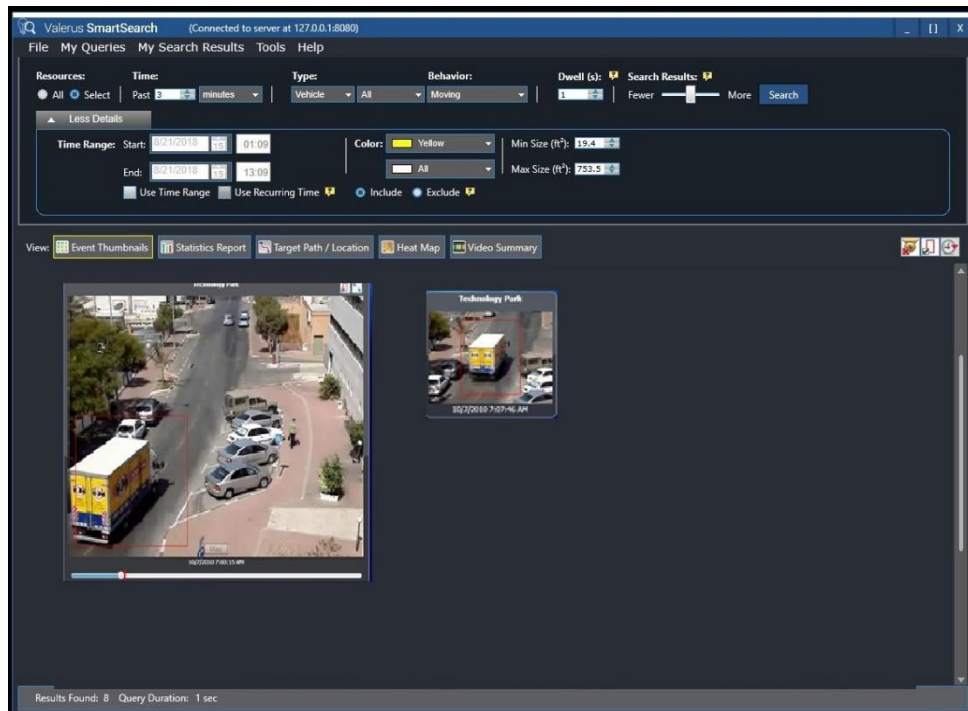
Patrols are alerted to be on the lookout for a blue station wagon type car matching the video recording of the vehicle that transported the suspect to the scene of the crime.

Transportation

A tollway authority receives notification from the police to search video recordings for evidence of a large yellow truck that might have passed on the highway on its way out of the state the morning before. Thousands of vehicles pass under the highway's surveillance cameras every day. Operators define the following search criteria in Valerus SmartSearch:

1. Time range: 7 a.m. to 12 p.m.
2. Type: Vehicle, Large
3. Behavior: Moving
4. Color: Yellow

Valerus SmartSearch instantaneously produces a result similar to the following:



Video evidence such as this can save authorities time and effort. Even if Valerus SmartSearch had produced 5 search results, the saving in terms of effort and time is significant.

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