

Track Explorer – Manual

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Software version : 1.0

The Track Explorer is an analysis tool designated for time-lapse analysis of the ITS output data. Based on the information about the subject's position at a time it is able to reconstruct the path, play it in real time and calculate various properties such as the 2D histogram, total path or subject's presence in a target of arbitrary shape.

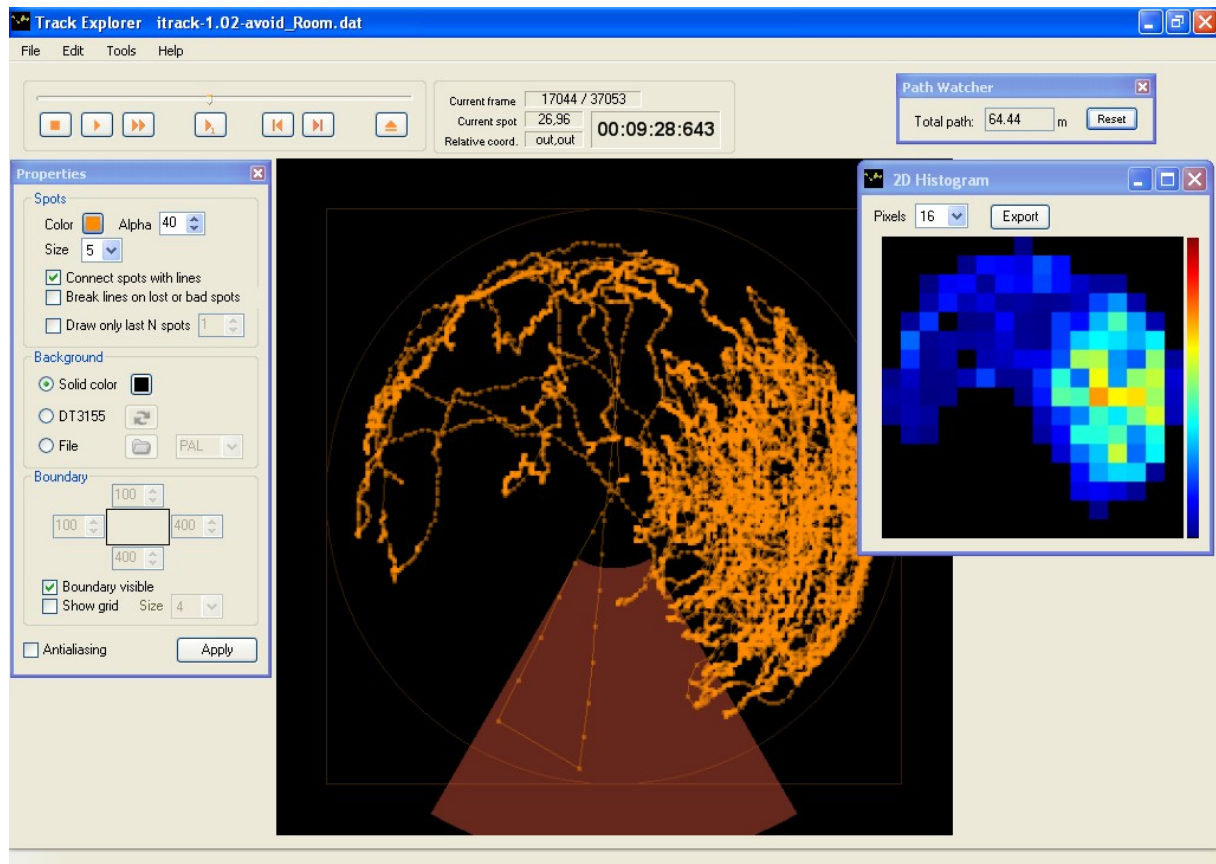


Figure : Track Explorer main screen

1 Main Window

Track Explorer is basically controlled as a standard VCR. You open an ITS data file (.dat) either by the menu function **File – Open Data File** or by pressing the Open file button at the navigation bar.

After the dat file is selected, it gets loaded into the application and some basic information is shown on a screen.

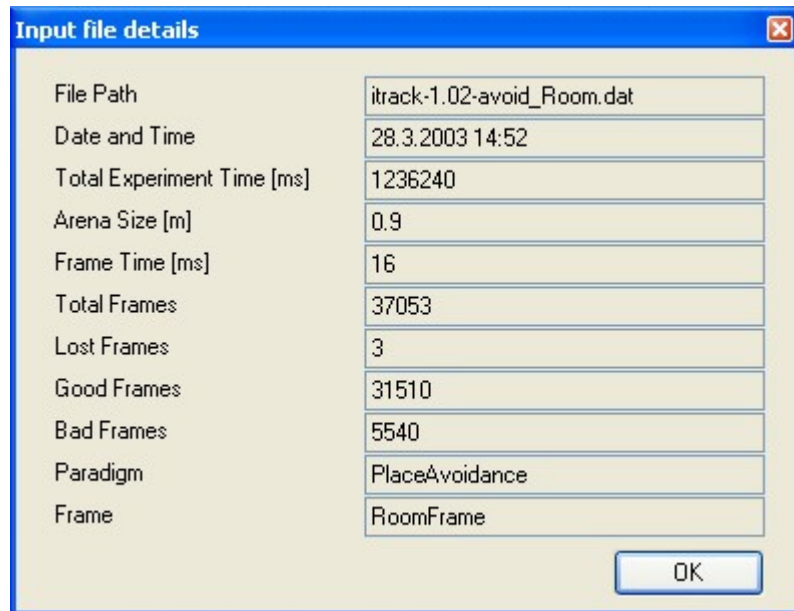


Figure: File information

This informs you about the properties, which were set before the data were acquired (i.e. the Arena Size) but also about the quality of the data, i.e. the number of lost frames (Lost Frames), number of frames with a subject detected (Good Frames) or a number of frames without the subject detected (Bad Frames).

You may recall the File information window at any time by **File – File information**.

For the navigation through the file you use the Navigation bar.

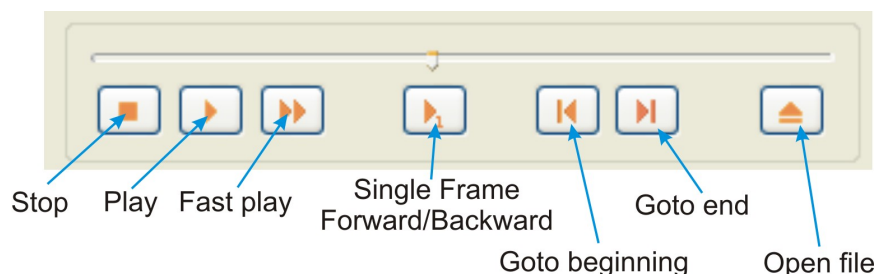


Figure: Track Explorer navigation bar

You may also drag the scroll bar above the controls for easy navigation across whole the file.

Notice, that when you move through the file, information in the status window changes.

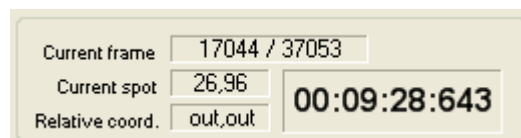


Figure: Status bar

Current frame shows the actual frame position in a file. **Current spot** shows the actual spot location in relative coordinates. **Relative coordinates** shows your mouse position converted into the relative coordinates. This might be useful i.e. when the precise polygon targets are drawn.

Note: you may export the actual track into a file by right clicking the graphics area and choosing **Save Image**.

2 Properties

2.1 General properties

General application properties are available under **Edit – Properties**.

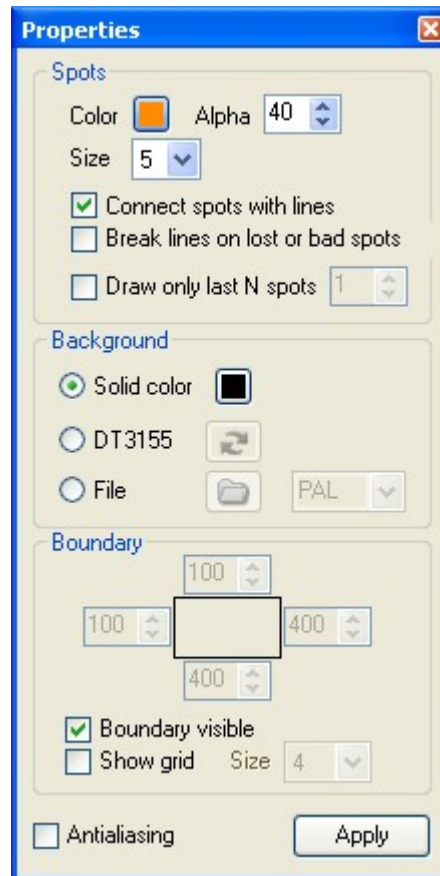


Figure : Drawig properties

Spots box sets how the reconstructed path is drawn. Following properties are available:

- **Color** – sets the color of the reconstructed spots and path.
- **Alpha** – sets the alpha (transparency) of the spots and path. When there is a lot of data to draw over the screen, it may be usefull to set the lower alpha, so another track drawn across the existing one would add an intensity to the previous so you are still able to distinguish the path orientation.
- **Size** – sets size of the drawn spots.
- **Connect spots with lines** – when checked, all drawn spots are connected with a line.
- **Break line on lost or bad spots** – when checked, line connecting the spots is broken when there is no information about the subject position for the particular video frame.
- **Draw only last N spots** – enables to draw only last N spots.

Background box sets the background properties.

- **Solid color** let's you set the solid background for the main window.
- **DT3155** let's you grab actual image from the PC's DT3155 framegrabber.
- **File** let's you load a background from an image stored in a file.

Note: For both DT3155 and File you need to choose appropriate video format (NTSC or PAL)

Boundary box allows you to match the relative positional data to the absolute pixel coordinates of an image from the framegrabber or a file. You may use the same numbers as you used in the ITS for specifying the region of interest.

- **Boundary visible** hides the boundary when unchecked.
- **Show grid** enables drawing of a square grid over the analysis window. Size property sets the number of pixels in each grid cell.

2.2 Target properties

To be able to run place specific analysis of the, you have to setup the targets. You access the window by **Edit – Targets**.

There are three basic target shapes, which you might choose in **Target Properties** box – Arc, Circle or Polygon. Every shape has its specific parameters. Arc and circle properteis are set using available boxes, polygon is drawn in a main window using a mouse. To add the active target to the setup, press the **Add** button. To remove target from the set of targets, press the **Remove** button. To update target's properties, press the **Update** button.

Each target may have a specific **Color** and **Alpha** to be easily distinguished from the others when drawn on the main screen.

The 'Targets' dialog box is shown with the 'Target properties' tab selected. It contains a dropdown menu set to 'Arc', and four numeric input fields for 'Minimum Radius' (25.00), 'Maximum Radius' (127.00), 'Place Angle' (270.00), and 'Angle Width' (60.00). There are also color and alpha settings (Color: red square, Alpha: 40). Buttons for 'Add', 'Remove', and 'Update' are on the right. Below these is a table with columns 'Type', 'Params', and 'Color'. The table contains one row for an 'Arc' target with parameters '25,127,270,60' and color '40,255,99,71'. At the bottom, the 'General' tab is partially visible, showing checkboxes for 'Remember targets from previous session' (unchecked), 'Load targets from input files' (checked), and 'Draw targets' (checked), along with another color and alpha setting. An 'Apply' button is at the bottom right.

Type	Params	Color
Arc	25,127,270,60	40,255,99,71

Figure : Target properties

The General box sets some of the general properties of the targets:

- **Remember targets from previous session** – when checked, application stores all the targets you set and uses them when the application is restored next time.
- **Load targets from input files** – because ITS files store also the information about the targets used during the experiment, application may load these targets if the box is checked. You may choose specific color.
- **Draw targets** – unchecking this box disables drawing of targets in the main window.

3 Tools

Tools are basically application plugins which integrate specific function. All tools can be found under the **Tools** menu in the main application window.

3.1 Target Presence Watcher

Target presence watcher is designed to log the subject's presence in a particular target. You are free to setup as many watchers you want, i.e. each for a single target you create.

Each watcher has a box at the top, which specifies the actual target with its properties listed. You also may edit the Entrance and Exit latencies to avoid counting very short target entering or escaping as a new event.

Entrance latency is basically a time constant, which is counted, when the subject first appears inside the target. When the subject escapes the target before the latency expires, the event is not logged. If it remains inside the target after the latency expires, event is being logged (with a time of the first target entrance).

Exit latency is a similar time constant, but it is active, when the subject leaves the target, i.e. it is being counted when the subject first leaves the target. If the subject returns inside the target before the latency expires, event (subject presence inside the target) is not finished and the presence time continues counting. When the subject stays outside the target after the latency expires, the first time when subject left the target is logged as the exit time.

Setting the entrance and exit latency to 0 disables them.

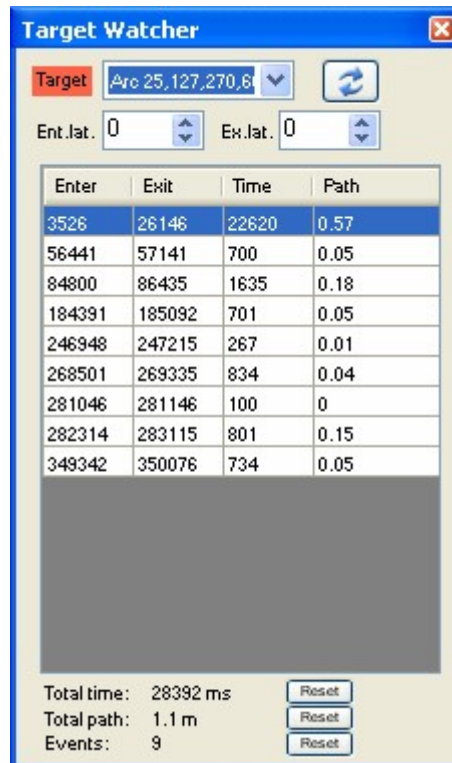


Figure: Target presence watcher

As you may see on the figure above, all events are logged in a table, including the entering time, exit time, time spent in a target and a path crossed inside the target.

In addition to this, some global parameters are counted which include all the events related to a specific target – total time, total path and number of events. All counters may be reseted as needed.

3.2 Path Watcher

Path Watcher is a simple path integrator, which integrates the path crossed by the subject.

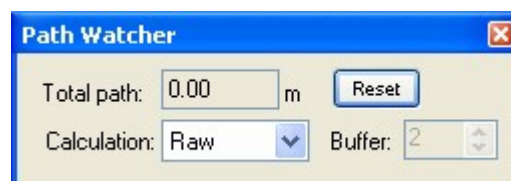


Figure: Path Watcher

There are three modes for path calculation:

- **Raw** – in raw mode, every position is used for the path calculation
- **Skip** – in skip mode, a number of positions set by a **Buffer** property is skipped so the path is calculated only from some positions
- **Average** – in average mode, all locations are used for the path calculations, but they are averaged based on the **Buffer** property.

3.3 2D Histogram

2D Histogram is a tool designed for monitoring a spacial distribution of the subject's location inside the arena.

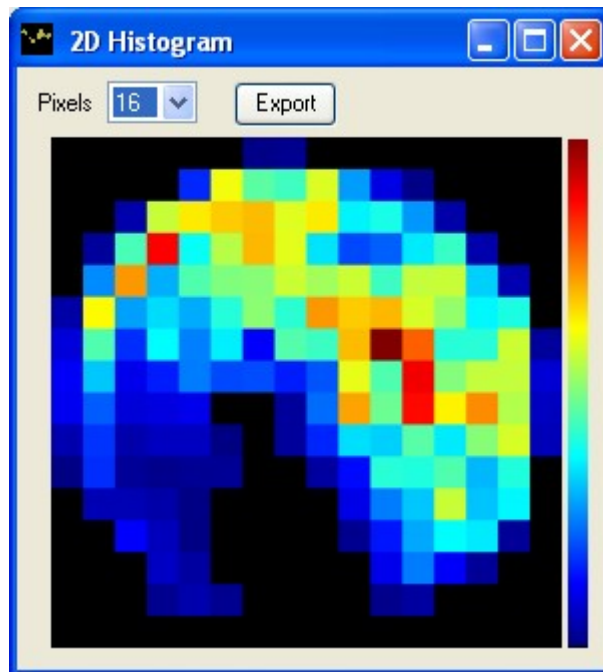


Figure: 2D Histogram

You may change the resolution of the histogram by changing the **Pixel** property.

If you need the exact values of the subject presence inside a specific pixel, you may click the **Export** button and save the values in a tab-delimited file.

Note: you may also save the histogram as an image into a file by right-clicking the graphics area and choosing **Save Image**.