

DEEPSIGHT TOOLKIT USER MANUAL

v6.2.1

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1. INTRODUCTION

Welcome to the DeepSight Toolkit user guide! This manual contains a brief introduction to the product specifications and all the information that you need to get started with your Toolkit. It will guide you through the steps to properly install the software and make full use of all the functionalities provided.

1.1 ABOUT THE DEEPSIGHT TOOLKIT

DeepSight Toolkit empowers you with accurate, real-time insights into your audience as they interact with your brand in real-world environments. It enables you to discover their behavior patterns, interests, and demographic profiles. With this actionable data at your fingertips, you are free to focus on the things you love: engaging your customers, optimizing your business, and making data-driven decisions.

Key Features:

- ✓ Easy & quick setup
- ✓ Affordable pricing
- ✓ CMS Integration
- ✓ Real-time results
- ✓ Offline analysis
- ✓ Anonymous analysis
- ✓ Cross-Platform
- ✓ Processed Locally
- ✓ Push mechanism
- ✓ Compatible with most cameras

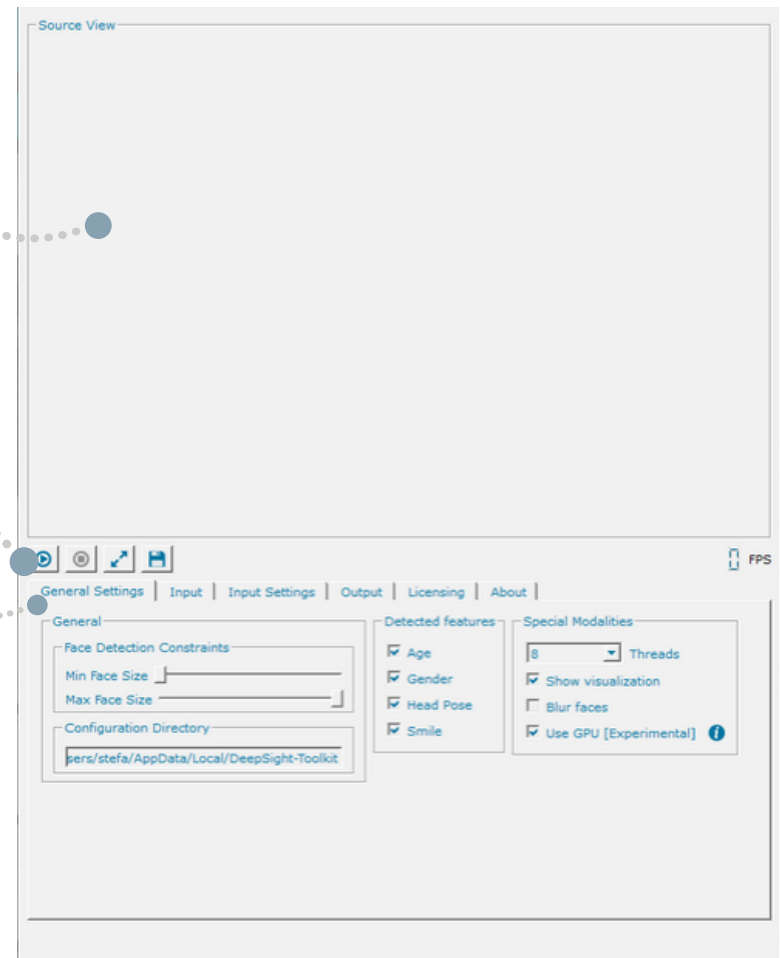
1.2. CONFIGURATION SETUP

The software configuration setup will help you make changes to the application settings in order to adjust it to your scenario or computational requirements.

The Toolkit is presented in two sections:

- **The top half** shows the **'Source View'**
- **In the middle**, you can find the **'Play'**, **'Stop'**, **'Pop out'**, and **'Save Settings'** buttons and on the right you can see the number of analyzed frames per second (FPS).
- **The bottom half** shows the **'Settings'**, **'Input'**, **'Output'**, **'Licensing'** and **'About'** tabs.

Click on the **'Play'** button to turn on the camera and start the analysis. The analyzed metrics will be shown on the right side of the detected face.



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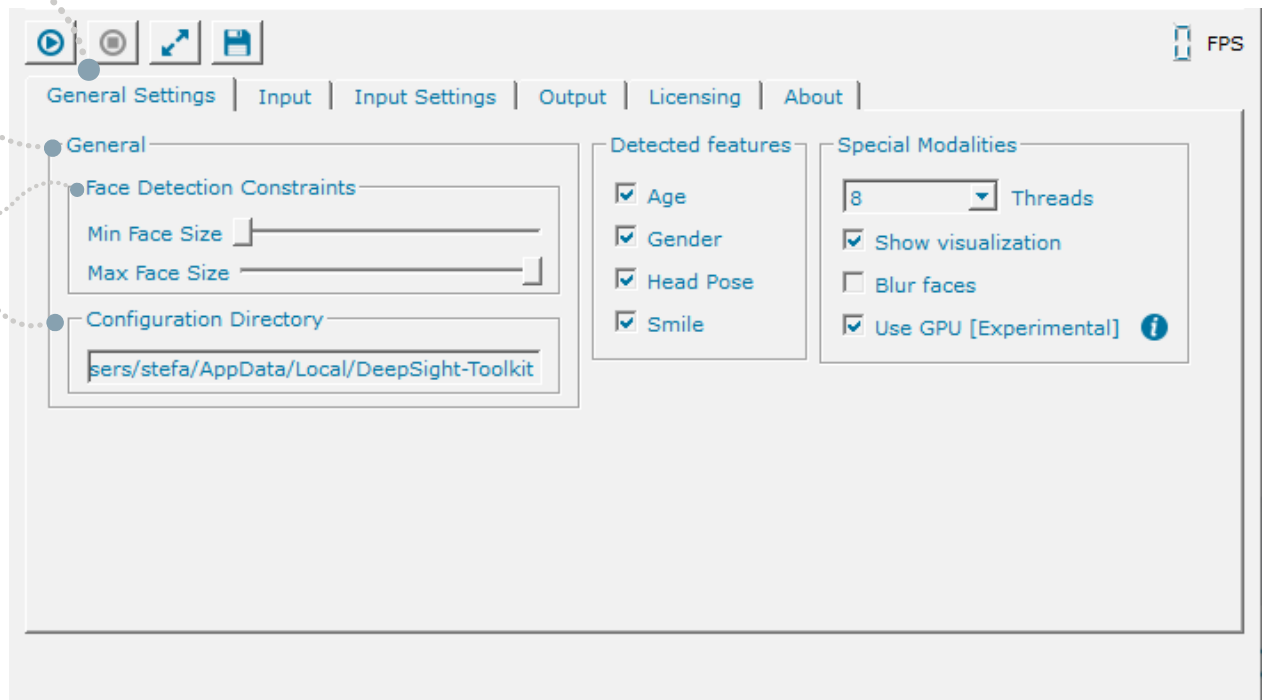
GENERAL SETTINGS

2.1 SETTINGS

Under the '**General Settings**' tab, you can adjust the settings based on your ideal scenario.

In the '**General**' box you can find two main components:

- Face Detection Constraints
- Configuration Directory
 - > path where the configuration file is saved



The '**Face Detection Constraints**' section lets you decide the minimum or maximum face size to be detected.

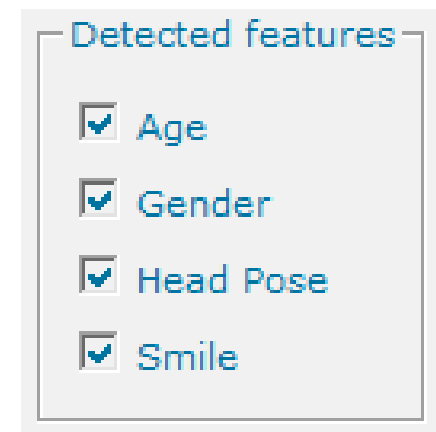


This is an **important** feature to improve performance. For instance you can increase the minimum face size and avoid the detection of small background faces that are not relevant for your analysis. The same goes for maximum face size which helps you to filter out faces that might be too close to the camera.

On the **right side** of the '**General settings**' tab you can find two sections:

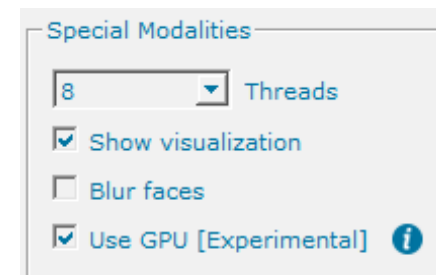
Detected Features:

You can select the facial features that you want to measure during the analysis.



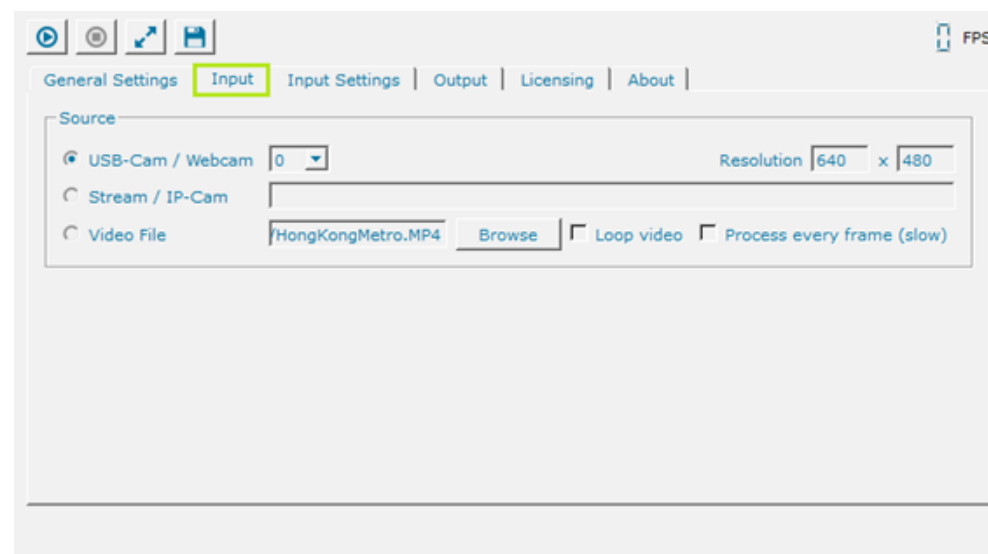
Special Modalities:

- *'Threads'* allows you to select the number of CPU threads that you want each instance of the Toolkit to use. By default the Threads are set to Max. If you want to use more than 1 Toolkit on the same machine it is recommended to split the number of available threads in two;
- *'Show visualization'* toggles the graphic interface displayed on top of the video stream;
- *'Blur faces'* replaces the graphic interface with a blur overlay, hiding the identity of the analyzed faces;
- *'Use GPU'* is a new feature that boosts performance on devices with integrated GPU units (e.g. Intel NUC);

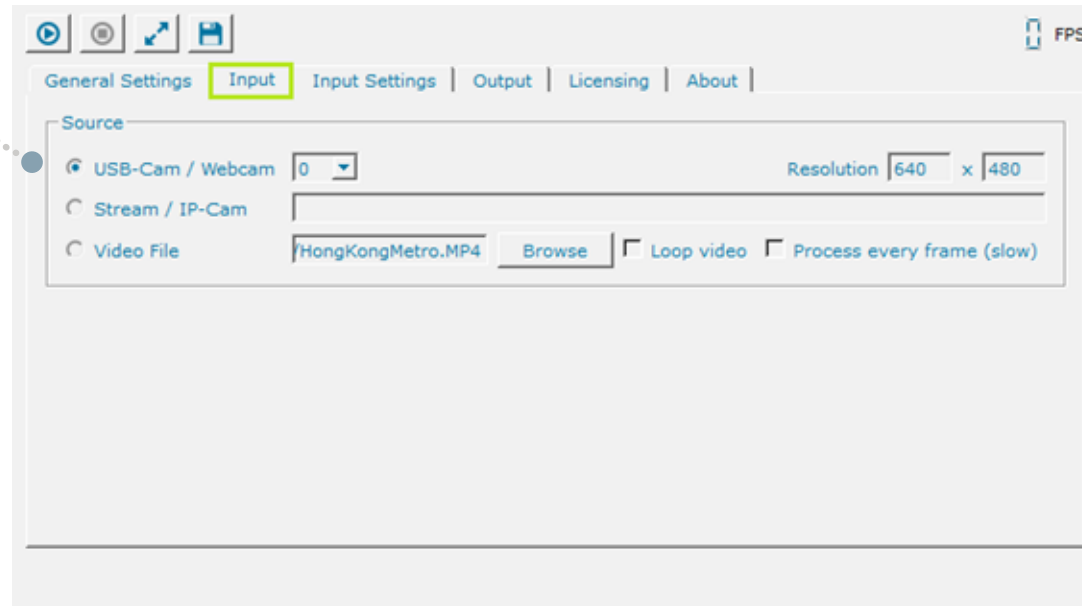


2.2 INPUT

Once you have adjusted the settings based on your ideal scenario, you are ready to jump to the next tab: **'Input'**.



In the '**Source**' box, you can select different types of input:



- **USB-Cam / Webcam:** here you can select the camera you want to use. A stronger processor (e.g. i7 or i9) can handle multiple cameras (max. 2-3 video streams).

Please remember that for **every extra camera** you need to run an **extra DeepSight Toolkit** instance. To do so, please make a copy of the installation folder, add it to another location and rename it. Learn more about how to run multiple instances [here](#).

Once you've added a camera, on the right side you can change its **resolution**.

- **Stream / IP – Cam:** this function allows you to analyze a video stream by just copying a link into it. Learn more about how to setup an IP camera [here](#).
- **Video file:** click on the '**Browse**' button to upload a video from your PC. Then select '**Loop video**' if you want to process the video in a loop.

When analyzing a video, you can choose to run analysis at the speed of the video or you can choose to process every frame of the video. Running the analysis on every video frame will be considerably slower.

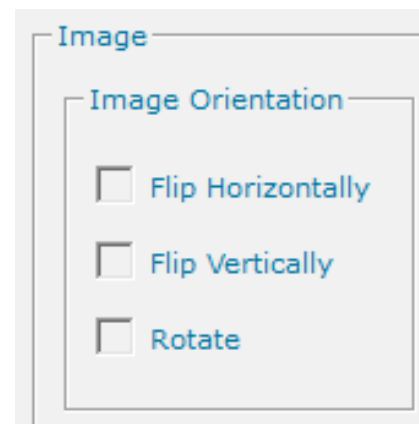
If you choose to analyze at the speed of the video, new frames will be dropped into the CSV until the processing of the input frame is finished. You will notice non-consecutive frame numbers in the CSV file.

2.3 INPUT SETTINGS

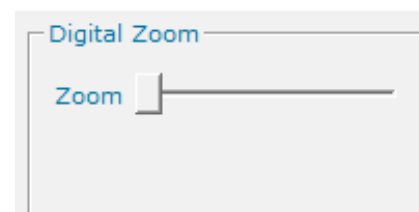
In the **'Image'** box, you can adjust the image settings according to your requirements:



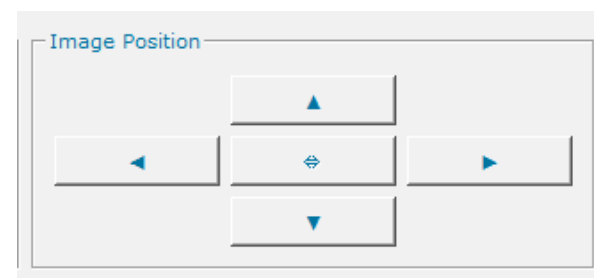
- **Image orientation:** check the fields to flip your image horizontally, vertically, or simply rotate it.



- **Zoom:** increase the zoom by sliding the bars towards the right side.



- **Image position:** use this setting when you want to tweak the zoom mode.

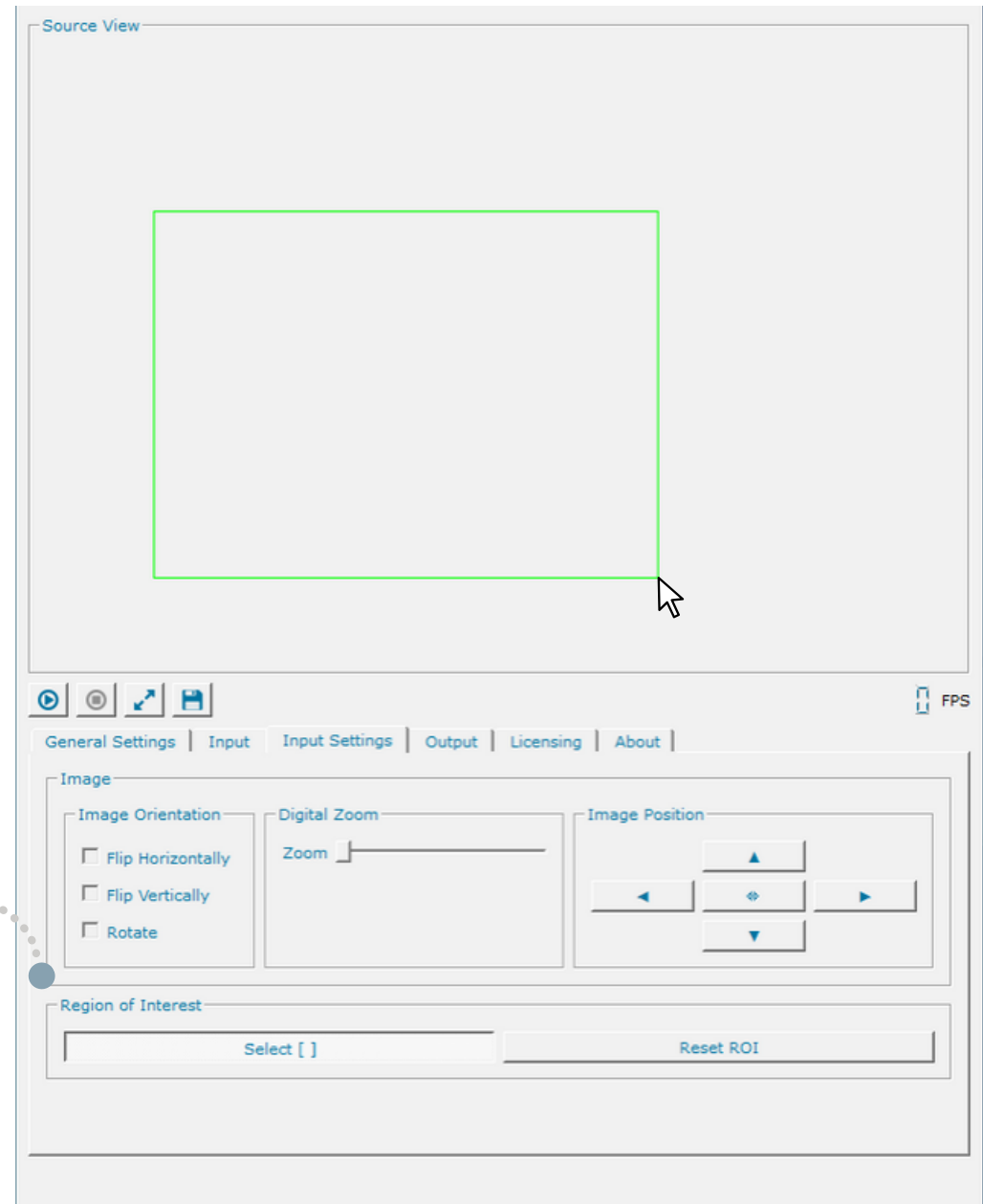


- **Region of Interest:**

The 'Region of Interest' option lets you analyze only a selected part of the Source View.

This is a great way of avoiding overcounting, detections in areas that are not of interest to you, and saves CPU resources as a result of the smaller analyzed area.

Use this function for analysis in Retail environments, for instance, with entrance or exit counting.



Once you have chosen the input that best fits your requirements, don't forget to **'Save settings'**.



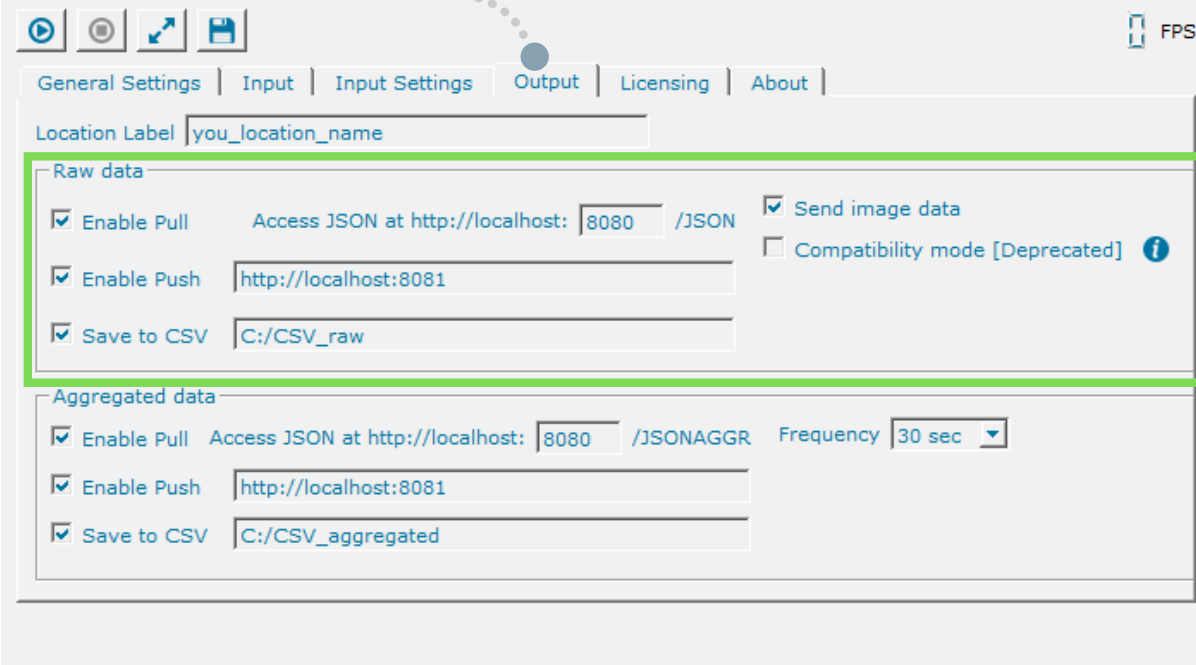
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DATA OUTPUT

2.4 OUTPUT

You are now ready to go to '**Output**' Tab and explore the multiple ways to connect and integrate with the Toolkit.



The screenshot shows the 'Output' tab of the Sightcorp Toolkit configuration interface. The 'Raw data' section is highlighted with a green border. It contains the following settings:

- Enable Pull: Access JSON at http://localhost: /JSON
- Enable Push:
- Save to CSV:
- Send image data
- Compatibility mode [Deprecated] 

The 'Aggregated data' section is visible below the 'Raw data' section and contains the following settings:

- Enable Pull: Access JSON at http://localhost: /JSONAGGR Frequency
- Enable Push:
- Save to CSV:

Raw data: top half of the output tab, lets you control the path and ports for raw data output.

- **Enable Pull:** with this function you can request the JSON response through a GET request on localhost for your external application. Learn more about using the pull mechanism [here](#).

- **Enable Push:** The push mechanism allows for messages to be sent from the Toolkit to external applications (eg. CMS systems) instead of requiring the external application to actively ask the Toolkit for changing status (pulling). If the push feature is enabled, the Toolkit will send a HTTP POST request with **raw data** to the endpoint defined by the user every second. Learn more about using the push mechanism [here](#).

EXAMPLE USE CASE:

Digital signage: Connect your CMS to the Toolkit to trigger custom and relevant ad content to the right people at the right time. The Toolkit will give you a real-time stream of raw data in JSON format. Make sure the number of the JSON port corresponds to the number in the external application in order to establish the link. Learn more about integration via JSON **here**.

Learn more about examples of targeted advertisements by using our [Narrowcasting demo](#).

- **Compatibility mode:** use this option to **retain the CrowdSight CSV format** in case you have built a data analysis application around the previous Toolkit. This feature only applies to the raw CSV and JSON outputs since CrowdSight did not have any built in data aggregation.

- **Save data to CSV:** use this option to **write all real-time data into a CSV file stored on your local device**. By default the .csv files will be saved in your configuration directory. To change the path where the .csv files are stored please click on the field next to 'Save data to CSV' to browse a different folder.

New CSV files will be generated and stored in the target folder daily. The aggregated CSV file shows data in a user friendly format which can be used right away, while the raw data CSV can be used for further data analysis.

Read more about CSV output [here](#).

Aggregated data: bottom half of the output tab, lets you control the path and ports of the aggregated Toolkit output.

The screenshot shows the 'Output' tab of the Sightcorp Toolkit settings. The 'Location Label' is set to 'you_location_name'. The 'Raw data' section has the following settings:

- Enable Pull: Access JSON at http://localhost: 8080 /JSON
- Enable Push: http://localhost:8081
- Save to CSV: C:/CSV_raw
- Send image data
- Compatibility mode [Deprecated]

The 'Aggregated data' section (highlighted with a green border) has the following settings:

- Enable Pull: Access JSON at http://localhost: 8080 /JSONAGGR Frequency 30 sec
- Enable Push: http://localhost:8081
- Save to CSV: C:/CSV_aggregated

- **Enable Pull:** with this function you can connect the Toolkit with your Content Management system, reporting dashboard, or another business intelligence platform. A new aggregated JSON output will become available every 30 seconds, 1 minute, 5 minutes, or 10 minutes depending on the **Frequency** that you choose from the drop down box.

- **Enable Push:** The aggregated push mechanism allows for messages to be sent from the Toolkit to external applications (eg. CMS systems) instead of requiring the external application to actively ask the Toolkit for changing status (pulling).

If the push feature is enabled, the Toolkit will send an HTTP POST request with aggregated data to the endpoint defined by the user every 30 seconds, 1 minute, 5 minutes, or 10 minutes, depending on the **Frequency** selected from the drop down box.

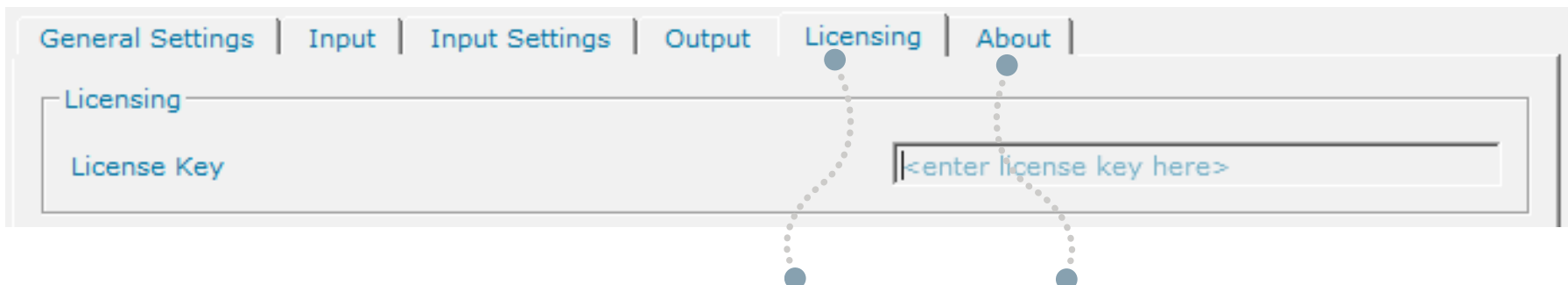
Learn more about using the push mechanism [here](#).

- **Frequency:** the Toolkit now lets you select the frequency at which you want data to be aggregated. The available values are 30 seconds, 1 minute, 5 minutes, and 10 minutes. Depending on which you select, the aggregated data will be stored in your machine's RAM and outputted after the selected time period has elapsed. Stopping the Toolkit or closing it will cause the current data to be pushed / exported, regardless of the aggregation frequency.

- **Save data to CSV:** use this option to **write aggregated data into a CSV file stored on your local device**. By default the .csv files will be saved in your configuration directory. To change the path where the .csv files are stored please click on the field next to 'Save data to CSV' to browse a different folder. New CSV files will be generated and stored in the target folder daily. The aggregated CSV file shows data in a user friendly format which can be used right away.

READ MORE
about
aggregated
CSV output

WATCH A VIDEO
about CSV
output



The final sections of the setup are the '**Licensing**' Tab and the '**About**' tabs where you can check your license key, and can see other Toolkit specifications such as the version.

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TIPS & TRICKS

Sightcorp technology is very flexible which means it can be used in different scenarios and run on different types of hardware. Based on our own experiences, we have compiled a list of best practices and practical scenarios. You can refer to these recommendations to improve your configuration setup and the quality and accuracy of the data you capture.

3.1 BEST PRACTICES

The first step in every real-life setup is placing the camera. In order to get the best accuracy from the Toolkit, you need to make sure you are feeding it quality video input. The following section will help you with determining the distance and resolution of your camera.

In the Toolkit General Settings, you can manipulate the **Input Settings** and the **Video Resolution**. Changing these values can give you optimal face detection distance for your given scenario.

[CLICK HERE
for face detection
distance](#)

(NOTE: when **changing the resolution**, you need to **STOP** the Toolkit, **SAVE** the settings and then click **PLAY**)

HARDWARE RECOMMENDATIONS

3.2 HARDWARE RECOMMENDATIONS

Although our DeepSight Toolkit is hardware and camera agnostic, this section gives a few recommendations for devices that you can use in different scenarios. In case none of these machines match your requirements, you are free to choose your own device according to the following general specifications:

Minimum:

- Intel® Atom E3950 (up to 2.00 GHz)
- AAEON UP² board
- RAM: 4 GB minimum
- Storage at least 2 GB free space

Preferred:

- Intel® Core i3-8109U (up to 3.60 GHz)
- NUC 8th generation
- RAM: 8 GB
- Storage at least 2 GB free space

Recommended Intel NUCs:

Intel NUC 8 NUC8i3BEH

Intel NUC 8 NUC8i5BEH2

Intel NUC 8 NUC8i7BEHGA

[CLICK HERE
for hardware
benchmarks](#)

(NOTE: hardware type significantly influences the software performance therefore choose your devices carefully)

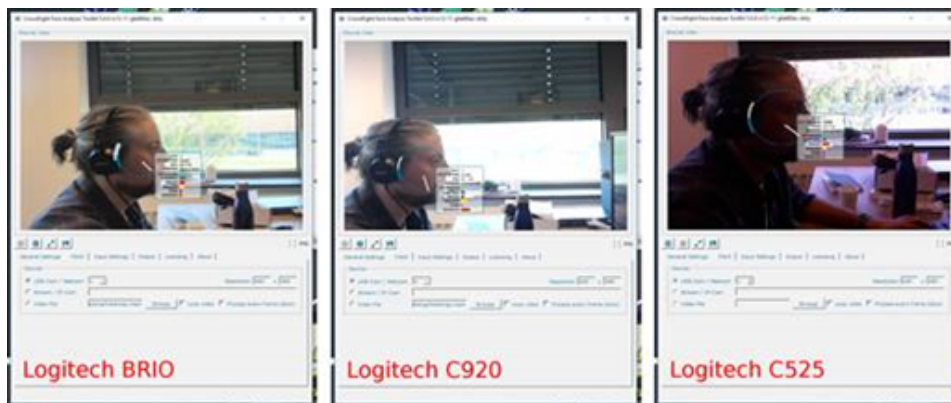
CAMERA RECOMMENDATIONS

3.3 CAMERA RECOMMENDATIONS

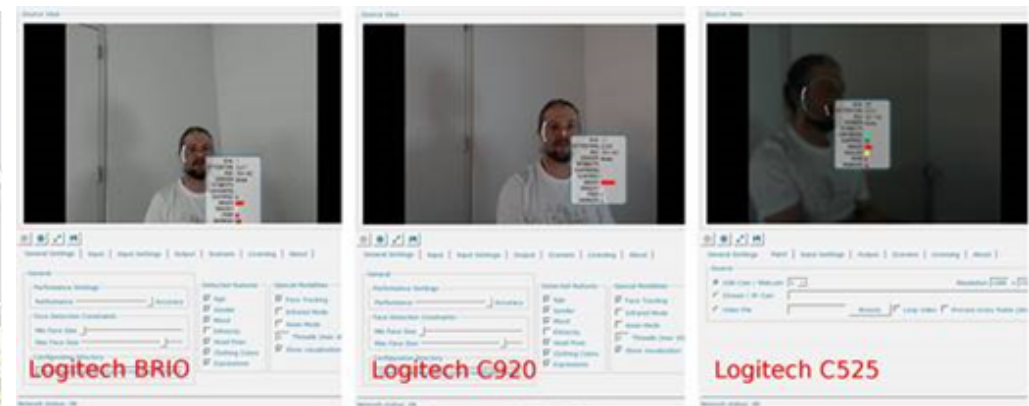
The camera that you choose can make a huge difference on result accuracy depending on the environment that you want to observe. Areas with a **strongly lit background** (overexposure), or areas with **low lighting** (underexposure) are common speedbumps in the Toolkit set up process.

To help you choose the ideal camera in these scenarios we have tested a few popular options from Logitech - The **Logitech BRIO**, **Logitech C920**, and **Logitech C525** cameras, with the **BRIO** producing the best results as seen in the following images:

Strong back-light



Poor lighting



There are many different camera types on the market that work with the Toolkit, but to make your decision easier, below is a list with a few preferred models per industry that we and our clients use frequently:

Digital Signage:

[Logitech HD Pro Webcam C920](#)

[Logitech webcam BRIO 4K Ultra-HD](#)

[UP HD camera](#)

DOOH:

[AXIS F Series cameras](#)

Retail:

[AXIS FA Series cameras](#)

[Hikvision Pro Series cameras](#)

**CLICK HERE
for camera
benchmarks**

4. ADDITIONAL FEATURE DOCUMENTATION

Please refer to the following links for a more detailed explanation of different Toolkit features:

[CSV DUMPER](#)

[AUTO-START GUIDE](#)

[PUSH MECHANISM](#)

[TOOLKIT VISUALIZER GUIDE](#)

[HTTP INTERFACE](#)

[DISABLE UPDATES](#)

Good job!
You have successfully
tested the Toolkit

Now you are ready for the POC phase
Please contact our sales team for next steps

