DeepSight Toolkit JSON Guide

v6.6.0

TABLE OF CONTENT

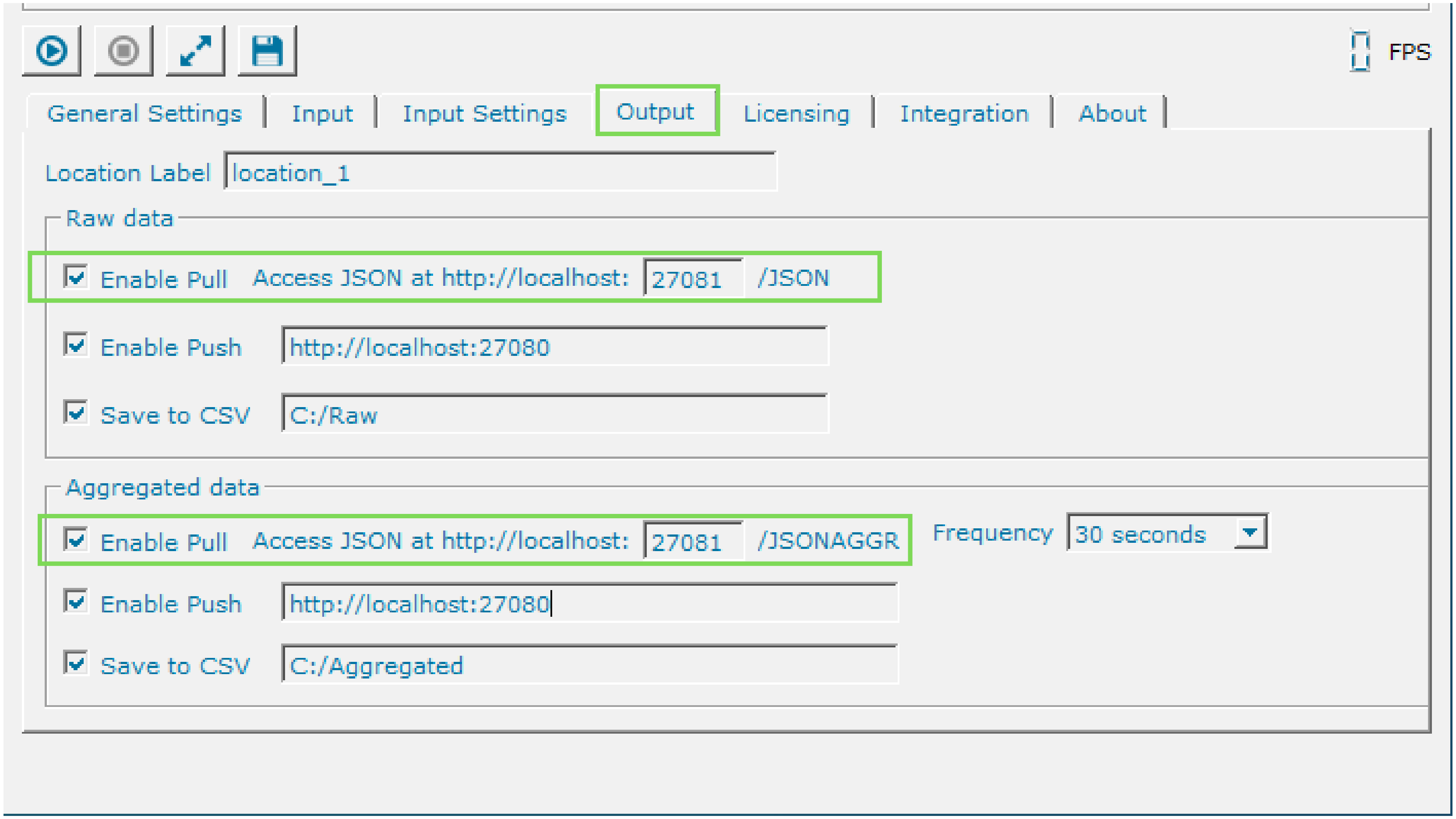
1. Using the PULL MECHANISM

The HTTP interface can be used to connect any Business Intelligence platform or CMS to the Toolkit. Go to ‘**Output**’ Tab and click on the fields: ‘**Enable Pull**’. You have the option to either get **raw** or **aggregated** data.

The JSON response can be accessed through a GET request on localhost for your external application. You can use this function for instance for Digital Signage or narrowcasting applications which trigger custom and relevant ad content to the right people at the right time.

For the raw data JSON output you can access: **http://localhost:27080/JSON**
For the aggregated JSON output you can access: **http://localhost:27080/JSONAGGR**

On the next page you can find a screenshot highlighting the Output tab along with the boxes that need to be checked for the HTTP interface to function.



Location Label location_1

Raw data

☑ Enable Pull Access JSON at http://localhost: 27081 /JSON

☑ Enable Push http://localhost:27080

☑ Save to CSV C:/Raw

Aggregated data

☑ Enable Pull Access JSON at http://localhost: 27081 /JSONAGGR Frequency 30 seconds

☑ Enable Push http://localhost:27080

☑ Save to CSV C:/Aggregated

Toolkit Output tab

1.1 JSON raw example output

```
{
    "source":<camera name>,
    "timestamp":<unix timestamp in seconds>
    "framenr":<frame number in sequence starting from 0>
    "state": <reported even if no detections, 1 if Toolkit is on>
    "people":[
        {
            "id":<person ID>,
            "age":<age estimation>,
            "age_deviation":<age confidence standard deviation>,
            "gender":<gender estimation (-100 = male, 100 = female),
            "smile": <quantity of smile (0 = neutral, 100 = 100% smiling)
            "face_mask":<certainty of mask detection>,
            "world_position":{ <world position relative to the camera in centimeters>
                "x": <x world coordinate in centimeters>,
                "y": <y world coordinate in centimeters>,
                "z": <z world coordinate in centimeters>
                },
            "position":{ <BB top left corner position relative to the frame top left corner in pixels>
                "x": <x coordinates in pixels>,
                "y": <y coordinates in pixels>,
                "w": <bounding box width in pixels>,
                "h": <bounding box height in pixels>
                },
            "rotation"{ <person headpose estimation in degrees>
                "yaw": <yaw angle in degrees>,
                "pitch": <pitch angle in degrees>,,
                "roll": <roll angle in degrees>
                },
            "detection_confidence": <certainty of a given detection>,
            "distance_from_camera": <distance from camera in meters>,
            "viewing": <(0 = not looking, 1 = looking)>,
            "dwelling": <(0 = not dwelling, 1 = dwelling)>,
            "gaze":{ <where a person's head is pointing on the camera plane in centimeters relative to the camera>
                "x": <x position in centimeters>,
                "y": <y position in centimeters>,
                },
        "detection_time": <detection timestamp in UTC in ms>,
        "detection_duration": <total duration of a person being detected in ms>,
        "total_attention_duration": <total duration of a person looking at stimulus in ms>,
        "current_attention_duration": <current uninterrupted duration of a person looking at stimulus in ms>,
        "total_dwell_duration": <total duration of a person dwelling (+/- 45 deg) near stimulus in ms>,
        "current_dwell_duration": <current uninterrupted duration of a person dwelling near stimulus in ms>
        }
    ]
}
```

```
{
    "source":"location_1",
    "timestamp":1617185410,
    "framenr":295,
    "state": 1,
    "people":[
        {
            "id":2,
            "age":30,
            "age_deviation":3.6120627,
            "gender":-99,
            "smile":1,
            "face_mask":0,
            "world_position":{
                "x":1,
                "y":-2,
                "z":48
                },
            "position":{
                "x":244,
                "y":149,
                "w":182,
                "h":233
                },
            "rotation"{
                "yaw":22,
                "pitch":17,
                "roll":4
                },
            "detection_confidence":0.975,
            "distance_from_camera":0.49,
            "viewing":1,
            "dwelling":1,"gaze":{
                "x":-20,
                "y":15
                },
        "detection_time":1617185410072,
        "detection_duration":8847,
        "total_attention_duration":8847,
        "current_attention_duration":8847,
        "total_dwell_duration":8847,
        "current_dwell_duration":8847
        }
    ]
}
```

1.2 JSON aggregated example output

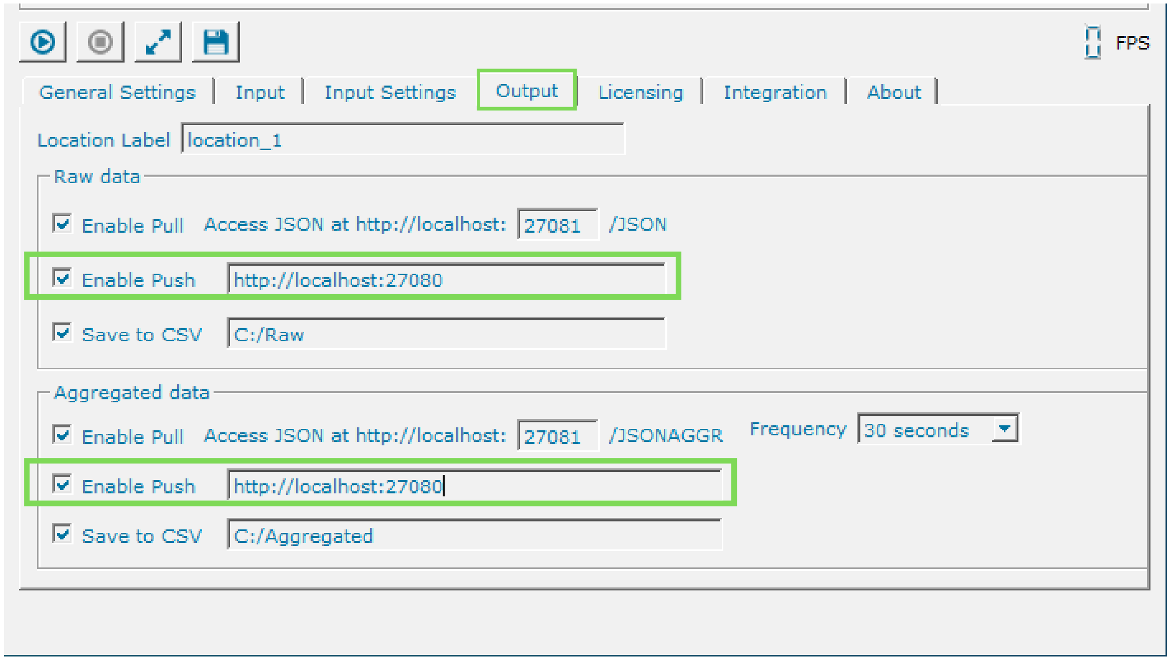
```
{
    "submission_time": <date_time of submission in YYYY/MM/DD hh:mm:ss>,
    "detection_count": <number of detected people>,
    "source": <location_label>,
    "aggregator_freq": <frequency at which data is reported in ms>,
    "state": <reported even if no detections, 1 if Toolkit is on>,
    "aggregated_data": [{
        "id": <person ID>,
        "timestamp": <date_time of detection in YYYY/MM/DD hh:mm:ss>,
        "age": <age_estimation in years>,
        "gender": <gender estimation (m = male, f = female, u = unknown)>,
        "impressions": <count of impressions>,
        "views": <count of views>,
        "attention_sessions": <count of attention sessions>,
        "average_attention_time": <average attention time per session in ms>,
        "attention_time": <total attention time in ms>,
        "dwell_sessions": <count of dwell sessions>,
        "average_dwell_time": <average dwelling time per session in ms>,
        "dwell_time": <total dwelling time in ms>,
        "total_detection_time": <total detection time in ms>,
        "smile_viewing": <maximum smile while viewing>,
        "smile_maximum": <maximum smile overall>,
        "face_mask": <mask detector estimation (1 = wearing mask, 0 = not wearing mask)>
    }]
}
```

```
{
    "submission_time": "2021-03-31 12:43:16+02:00",
    "detection_count": 1,
    "source": "location_1",
    "aggregator_freq": 30000,
    "state": 1,
    "aggregated_data": [{
        "id":7,
        "timestamp":"2021-03-31 12:42:53+02:00",
        "age":28,
        "gender":"m",
        "impressions":1,
        "views":1,
        "attention_sessions":1,
        "average_attention_time":7.618,
        "attention_time":7.618,
        "dwell_sessions":1,
        "average_dwell_time":7.618,
        "dwell_time":7.618,
        "total_detection_time":7.618,
        "smile_viewing":38,
        "smile_maximum":38,
        "face_mask":0
    }]
}
```

2. Using the PUSH Mechanism

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). Therefore the Toolkit can push data into any external application or API.

If the push feature is enabled, the Toolkit will send an **HTTP/HTTPS POST** request to the endpoint defined by the user every second. The endpoint needs to be a **valid HTTP/HTTPS server** able to receive POST requests. The body of the POST request is a JSON object containing a summary of the last second of analysis. You can add the target URL directly in the Toolkit interface.



Location Label location_1

Raw data

☑ Enable Pull Access JSON at http://localhost: 27081 /JSON

☑ Enable Push http://localhost:27080

☑ Save to CSV C:/Raw

Aggregated data

☑ Enable Pull Access JSON at http://localhost: 27081 /JSONAGGR Frequency 30 seconds

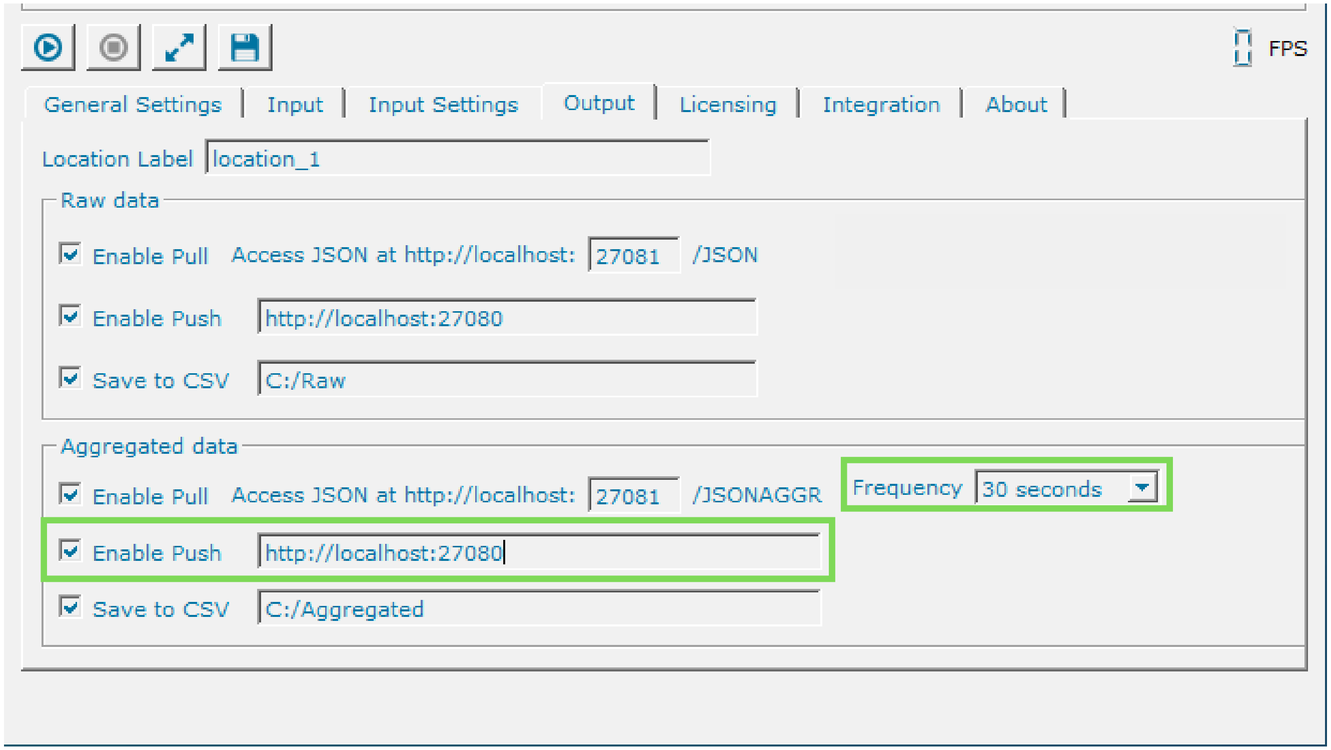
☑ Enable Push http://localhost:27080

☑ Save to CSV C:/Aggregated

Toolkit Output tab

The aggregated JSON output will be sent to your server's location every 30 seconds, 1 minute, 5 minutes, or 10 minutes, depending on the **Frequency** that you select from the drop down box on the right hand side of the *Output* tab. This will contain data aggregated per ID for any detections that occurred during the aggregation period.

The Toolkit will aggregate data for each ID 5 seconds after the last detection occurs, in case the person returns into the frame.



Location Label: location_1

Raw data

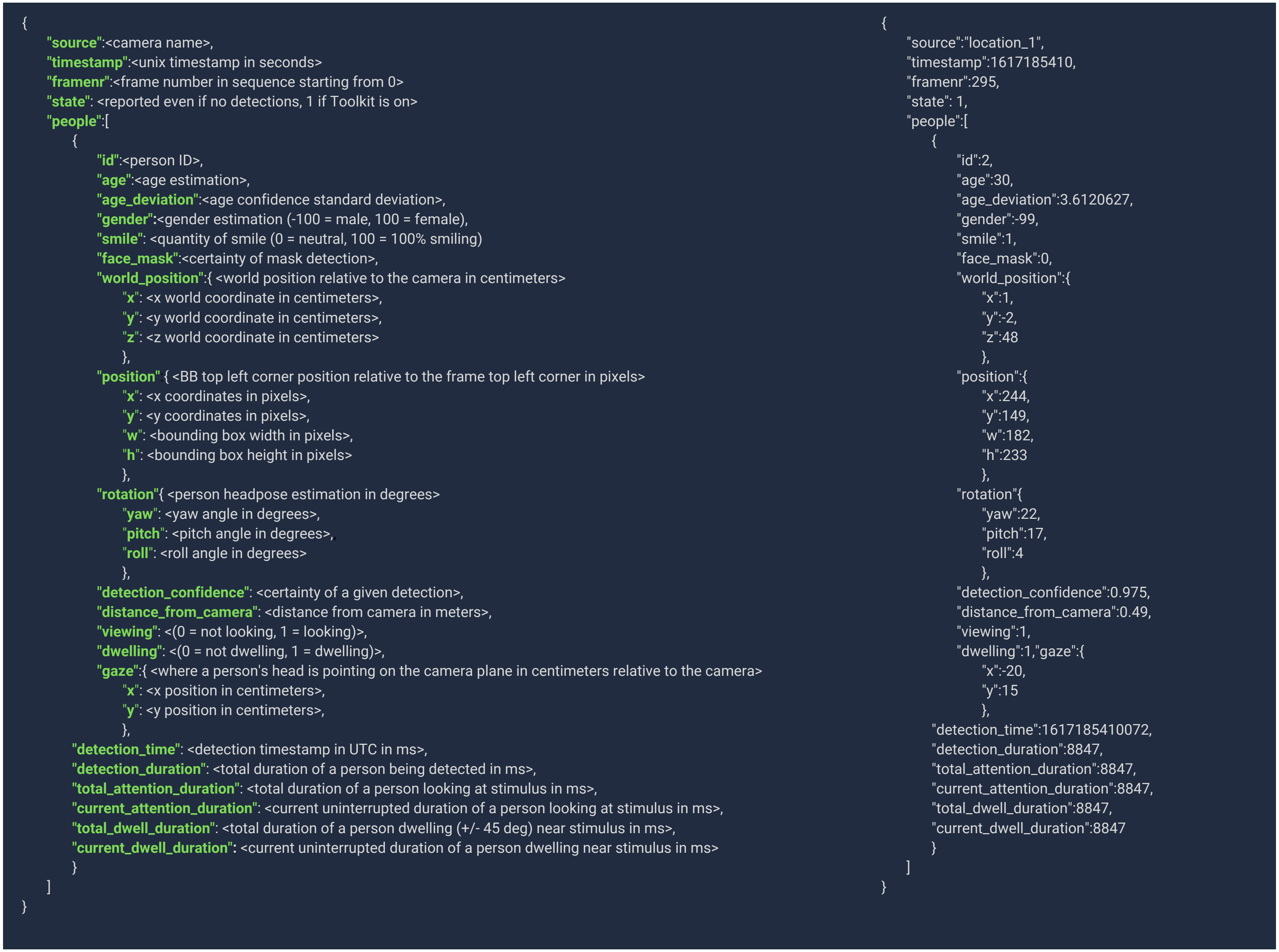
- ☑ Enable Pull — Access JSON at http://localhost: 27081 /JSON
- ☑ Enable Push — http://localhost:27080
- ☑ Save to CSV — C:/Raw

Aggregated data

- ☑ Enable Pull — Access JSON at http://localhost: 27081 /JSONAGGR — Frequency: 30 seconds
- ☑ Enable Push — http://localhost:27080
- ☑ Save to CSV — C:/Aggregated

Toolkit Output tab

2.1 JSON raw example output



```
{
    "source":<camera name>,
    "timestamp":<unix timestamp in seconds>
    "framenr":<frame number in sequence starting from 0>
    "state": <reported even if no detections, 1 if Toolkit is on>
    "people":[
        {
            "id":<person ID>,
            "age":<age estimation>,
            "age_deviation":<age confidence standard deviation>,
            "gender":<gender estimation (-100 = male, 100 = female),
            "smile": <quantity of smile (0 = neutral, 100 = 100% smiling)
            "face_mask":<certainty of mask detection>,
            "world_position":{ <world position relative to the camera in centimeters>
                "x": <x world coordinate in centimeters>,
                "y": <y world coordinate in centimeters>,
                "z": <z world coordinate in centimeters>
                },
            "position":{ <BB top left corner position relative to the frame top left corner in pixels>
                "x": <x coordinates in pixels>,
                "y": <y coordinates in pixels>,
                "w": <bounding box width in pixels>,
                "h": <bounding box height in pixels>
                },
            "rotation"{ <person headpose estimation in degrees>
                "yaw": <yaw angle in degrees>,
                "pitch": <pitch angle in degrees>,
                "roll": <roll angle in degrees>
                },
            "detection_confidence": <certainty of a given detection>,
            "distance_from_camera": <distance from camera in meters>,
            "viewing": <(0 = not looking, 1 = looking)>,
            "dwelling": <(0 = not dwelling, 1 = dwelling)>,
            "gaze":{ <where a person's head is pointing on the camera plane in centimeters relative to the camera>
                "x": <x position in centimeters>,
                "y": <y position in centimeters>,
                },
        "detection_time": <detection timestamp in UTC in ms>,
        "detection_duration": <total duration of a person being detected in ms>,
        "total_attention_duration": <total duration of a person looking at stimulus in ms>,
        "current_attention_duration": <current uninterrupted duration of a person looking at stimulus in ms>,
        "total_dwell_duration": <total duration of a person dwelling (+/- 45 deg) near stimulus in ms>,
        "current_dwell_duration": <current uninterrupted duration of a person dwelling near stimulus in ms>
        }
    ]
}
```

```
{
    "source":"location_1",
    "timestamp":1617185410,
    "framenr":295,
    "state": 1,
    "people":[
        {
            "id":2,
            "age":30,
            "age_deviation":3.6120627,
            "gender":-99,
            "smile":1,
            "face_mask":0,
            "world_position":{
                "x":1,
                "y":-2,
                "z":48
                },
            "position":{
                "x":244,
                "y":149,
                "w":182,
                "h":233
                },
            "rotation"{
                "yaw":22,
                "pitch":17,
                "roll":4
                },
            "detection_confidence":0.975,
            "distance_from_camera":0.49,
            "viewing":1,
            "dwelling":1,"gaze":{
                "x":-20,
                "y":15
                },
        "detection_time":1617185410072,
        "detection_duration":8847,
        "total_attention_duration":8847,
        "current_attention_duration":8847,
        "total_dwell_duration":8847,
        "current_dwell_duration":8847
        }
    ]
}
```

2.2 JSON aggregated example output

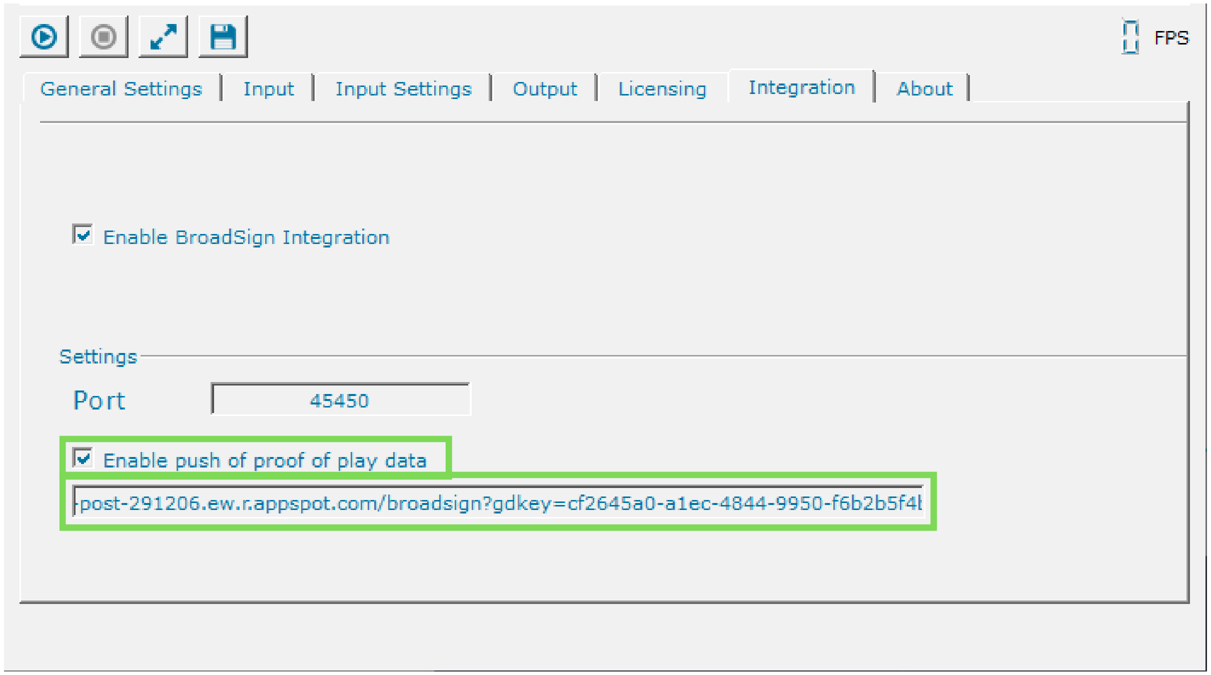
```
{
    "submission_time": <date_time of submission in YYYY/MM/DD hh:mm:ss>,
    "detection_count": <number of detected people>,
    "source": <location_label>,
    "aggregator_freq": <frequency at which data is reported in ms>,
    "state": <reported even if no detections, 1 if Toolkit is on>,
    "aggregated_data": [{
        "id": <person ID>,
        "timestamp": <date_time of detection in YYYY/MM/DD hh:mm:ss>,
        "age": <age_estimation in years>,
        "gender": <gender estimation (m = male, f = female, u = unknown)>,
        "impressions": <count of impressions>,
        "views": <count of views>,
        "attention_sessions": <count of attention sessions>,
        "average_attention_time": <average attention time per session in ms>,
        "attention_time": <total attention time in ms>,
        "dwell_sessions": <count of dwell sessions>,
        "average_dwell_time": <average dwelling time per session in ms>,
        "dwell_time": <total dwelling time in ms>,
        "total_detection_time": <total detection time in ms>,
        "smile_viewing": <maximum smile while viewing>,
        "smile_maximum": <maximum smile overall>,
        "face_mask": <mask detector estimation (1 = wearing mask, 0 = not wearing mask)>
    }]
}
```

```
{
    "submission_time": "2021-03-31 12:43:16+02:00",
    "detection_count": 1,
    "source": "location_1",
    "aggregator_freq": 30000,
    "state": 1,
    "aggregated_data": [{
        "id":7,
        "timestamp":"2021-03-31 12:42:53+02:00",
        "age":28,
        "gender":"m",
        "impressions":1,
        "views":1,
        "attention_sessions":1,
        "average_attention_time":7.618,
        "attention_time":7.618,
        "dwell_sessions":1,
        "average_dwell_time":7.618,
        "dwell_time":7.618,
        "total_detection_time":7.618,
        "smile_viewing":38,
        "smile_maximum":38,
        "face_mask":0
    }]
}
```

3. Using the Broadsign POP PUSH MECHANISM

The Broadsign POP Push mechanism allows you to push ready-aggregated audience per content data to your preferred endpoint for data visualization. Unlike the standard Toolkit output, this push message also contains proof-of-play and content/campaign meta data.

If the Broadsign POP push feature is enabled, the Toolkit will send an **HTTPS POST** request to the endpoint defined by the user every time an ad play ends. The endpoint needs to be a **valid HTTPS server** able to receive POST requests. The body of the POST request is a JSON object containing a summary of the last ad session of analysis. You can add the target URL directly in the Toolkit interface.



☑ Enable BroadSign Integration

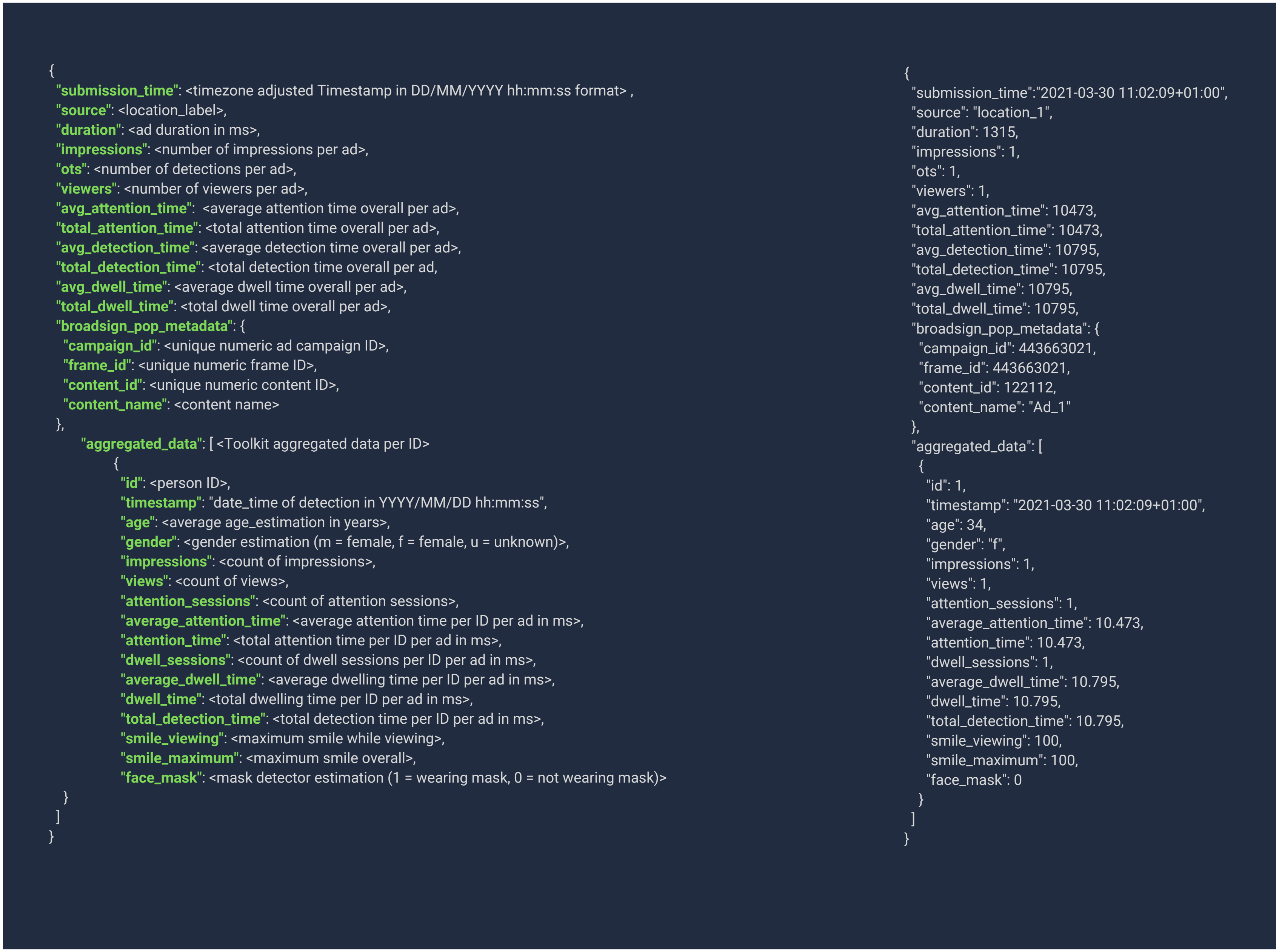
Settings

Port 45450

☑ Enable push of proof of play data

-post-291206.ew.r.appspot.com/broadsign?gdkey=cf2645a0-a1ec-4844-9950-f6b2b5f4l

3.1 JSON Broadsign POP output example



```
{
 "submission_time": <timezone adjusted Timestamp in DD/MM/YYYY hh:mm:ss format> ,
 "source": <location_label>,
 "duration": <ad duration in ms>,
 "impressions": <number of impressions per ad>,
 "ots": <number of detections per ad>,
 "viewers": <number of viewers per ad>,
 "avg_attention_time":  <average attention time overall per ad>,
 "total_attention_time": <total attention time overall per ad>,
 "avg_detection_time": <average detection time overall per ad>,
 "total_detection_time": <total detection time overall per ad,
 "avg_dwell_time": <average dwell time overall per ad>,
 "total_dwell_time": <total dwell time overall per ad>,
 "broadsign_pop_metadata": {
  "campaign_id": <unique numeric ad campaign ID>,
  "frame_id": <unique numeric frame ID>,
  "content_id": <unique numeric content ID>,
  "content_name": <content name>
 },
     "aggregated_data": [ <Toolkit aggregated data per ID>
            {
             "id": <person ID>,
             "timestamp": "date_time of detection in YYYY/MM/DD hh:mm:ss",
             "age": <average age_estimation in years>,
             "gender": <gender estimation (m = female, f = female, u = unknown)>,
             "impressions": <count of impressions>,
             "views": <count of views>,
             "attention_sessions": <count of attention sessions>,
             "average_attention_time": <average attention time per ID per ad in ms>,
             "attention_time": <total attention time per ID per ad in ms>,
             "dwell_sessions": <count of dwell sessions per ID per ad in ms>,
             "average_dwell_time": <average dwelling time per ID per ad in ms>,
             "dwell_time": <total dwelling time per ID per ad in ms>,
             "total_detection_time": <total detection time per ID per ad in ms>,
             "smile_viewing": <maximum smile while viewing>,
             "smile_maximum": <maximum smile overall>,
             "face_mask": <mask detector estimation (1 = wearing mask, 0 = not wearing mask)>
  }
 ]
}
```

```
{
 "submission_time":"2021-03-30 11:02:09+01:00",
 "source": "location_1",
 "duration": 1315,
 "impressions": 1,
 "ots": 1,
 "viewers": 1,
 "avg_attention_time": 10473,
 "total_attention_time": 10473,
 "avg_detection_time": 10795,
 "total_detection_time": 10795,
 "avg_dwell_time": 10795,
 "total_dwell_time": 10795,
 "broadsign_pop_metadata": {
  "campaign_id": 443663021,
  "frame_id": 443663021,
  "content_id": 122112,
  "content_name": "Ad_1"
 },
 "aggregated_data": [
  {
   "id": 1,
   "timestamp": "2021-03-30 11:02:09+01:00",
   "age": 34,
   "gender": "f",
   "impressions": 1,
   "views": 1,
   "attention_sessions": 1,
   "average_attention_time": 10.473,
   "attention_time": 10.473,
   "dwell_sessions": 1,
   "average_dwell_time": 10.795,
   "dwell_time": 10.795,
   "total_detection_time": 10.795,
   "smile_viewing": 100,
   "smile_maximum": 100,
   "face_mask": 0
  }
 ]
}
```