

Pro Lab integration into SennsMetrics

User guide

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Introduction

This is a short guide about the procedure to jointly analyse a study in Tobii Pro Lab and SennsMetrics, thus allowing to obtain biometrics from the IOIs, AOIs and snapshots declared in Tobii Pro Lab.

First, the IOIs, AOIs, and snapshots of interest must be declared in Tobii Pro Lab and then exported. After that, this data can be imported into SennsMetrics. In this document, we describe the rules that must be followed in order to successfully load Pro Lab data into SennsMetrics and give some advises for making a good use of the solution.

Notice that this guide was written based on Tobii Pro Lab 1.207 and SennsMetrics 2.20. If using another version, some elements may differ.

Advises when working on Tobii Pro Lab

The main procedure for the solution, would start by analysing the data in Tobii Pro Lab. But before that, there are a few things to have in mind during the process. First, here is a simple summary of the elements from Tobii Pro Lab that are imported into SennsMetrics:

1. Fixations calculated by the selected algorithm.
2. Areas and Intervals of interest and its metrics
3. Snapshots with its gaze points and intervals

This way, if we export the data from Pro Lab without any further analysis, the only imported element will be the fixations. And the more elements added in Pro Lab, the more useful will be the combination.

Event automatic creation

The main element to have in mind is the difference between areas and intervals of interest in both applications.

In Pro Lab, AOIs and IOIs are created independently for each recording and, when exporting metrics, these are given for each possible pair IOI-AOI. Something similar happens when importing.

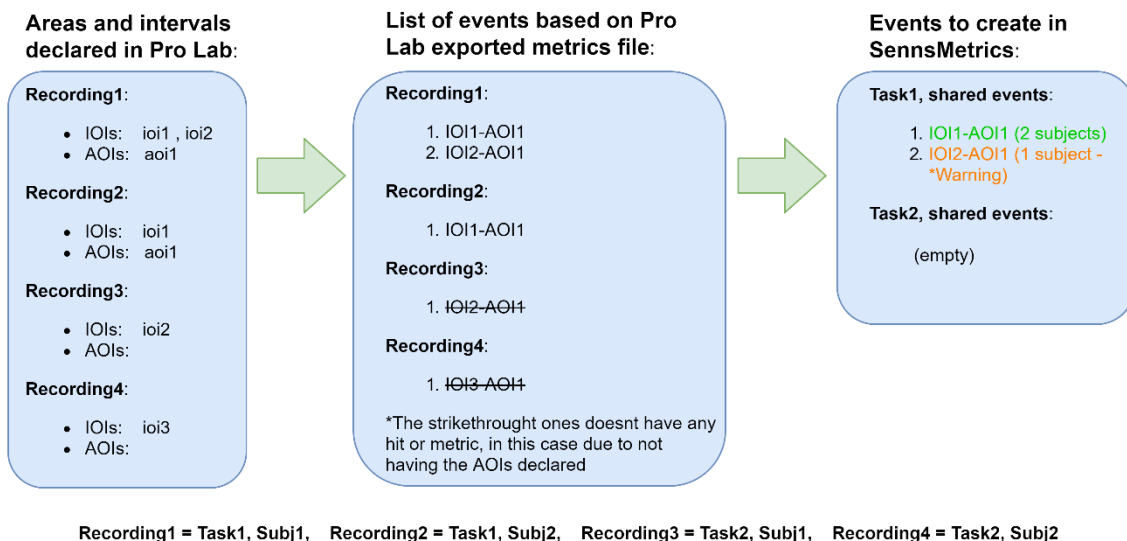
SennsMetrics is based in a structure named as “event” (not similar to the concept of “event” in Pro Lab). These events are composed of one IOI, and optionally, one AOI. Thus, one event has a set of metrics associated: biometrics, and metrics related to the eye-tracker data (number of visits, number of fixations, etc.).

In addition to that, the SennsMetrics events can belong to a specific participant, however they are usually shared among participants (named as 'shared events'). This design allows to represent group level information based on segmentation variables and groups of participants. An example would be the descriptive statistics for the biometrics, or the dynamics plots and heatmaps. Note that SennsMetrics can export the data of each event to a excel file both at individual and group level.

The events that are going to be created from Pro Lab belong are 'shared events'. This allows to automatically obtain group level results. In addition, if a participant did not declare at least one interval, SennsMetrics will mark the participant as incomplete so that the analyzer can check the participant and correct the initial definition in Pro Lab if needed.

For the purpose of creating the same IOI-AOI pair in different Pro Lab recordings, the AOIs with the same name are considered the same, even if they are in different recordings. With this design concept, the data from the metrics file is managed as following:

1. A list consisting of each possible IOI-AOI pairs is created, each one related to a participant and task (recording in Pro Lab).
2. The ones from the list that have not any hit or metric are discarded.
3. Those that have the same IOI-AOI pair and refers to the same task (different participants) are combined.



Extra rules for avoiding known problems

There are a few more considerations when working in Pro Lab:

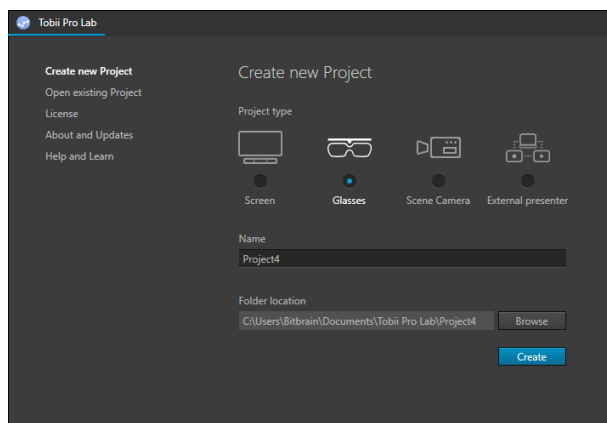
- Pro Lab option to rename snapshots can produce some troublesome changes in “.plog” files. Do not rename the snapshot or the imported image files once imported.
- Do not rename the recording either.
- Snapshots must be imported in “.jpg” format. Other formats are not allowed yet.

Importing data from Tobii Pro Glasses to Tobii Pro Lab

When importing Tobii Pro Glasses data into Tobii Pro Lab, the recordings are stored in the Glasses internal SD card and have to be retrieved manually by inserting it in the computer.

The workflow for analyzing the data in Tobii Pro Lab is the following:

1. Recording data with SennsLab and Tobii Pro Glasses.
2. Import SD card recordings into SennsLab.
3. Upload data to SennsCloud.
4. Copy recordings from SD card Tobii Pro Glasses to your computer.
5. Open Tobii Pro Lab.
6. Create a project with glasses as Project type.



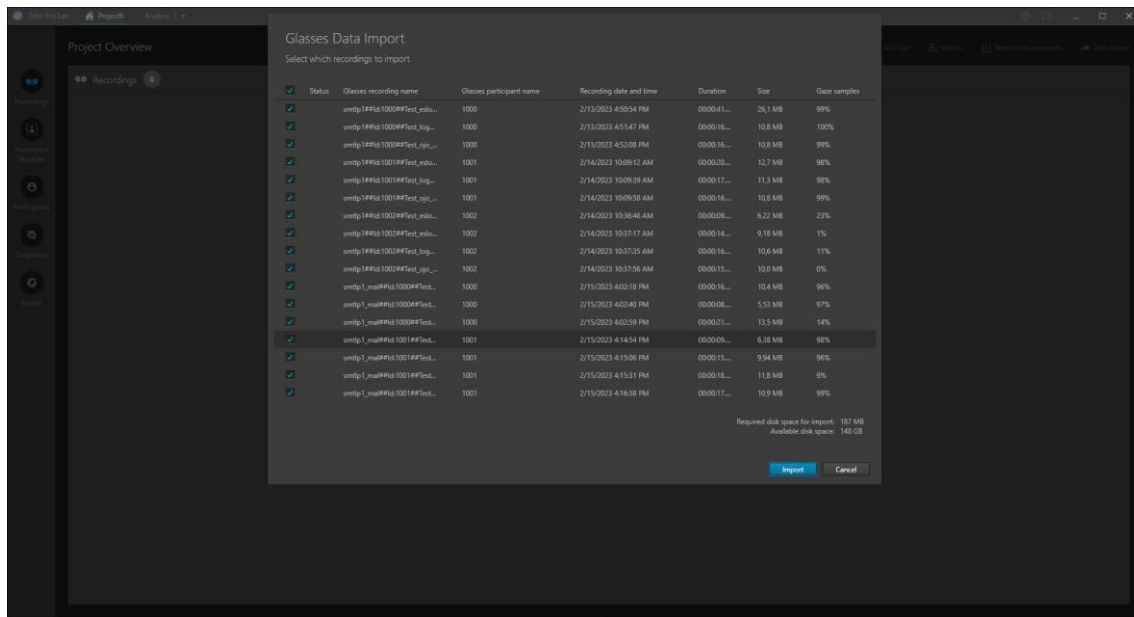
7. Import recordings from your computer into Tobii Pro Lab.

The name of the recording will be:

<Study name>##<Participant id>##<task name>##<Tobii recording id>

- Study name: Name of the study defined in SennsLab.
- Participant id: Participants ID defined in SennsLab.

- `task_name`: Name of the task defined in SennsLab study.



8. Analyzing data in Tobii Pro Lab.

Exporting from Pro Lab

In order to import Pro Lab data into SennsMetrics, a set of data must be exported to the same folder that later will be imported (subfolders are not supported). This folder must contain files from three different sources:

1) Tobii Pro Lab “Data Export” (obligatory): this option is needed to export the gaze points and fixations using the “Tobii Pro Lab Output (.plof)”.

Set the “timestamp precision” to microseconds and use the desired gaze filter.

In the “Data selection” option, all recordings must be selected, and TOIs, Snapshots and AOIs selection is up to the user, but we recommend not modifying this selection and leave all selected (default)¹.

Finally, the mandatory fields per file to export are the following (if any of them is missing, SennsMetrics will display an error message and the data will not be imported):

1. **Recording:** ProjectName, ParticipantName, RecordingName, RecordingDateUtc, RecordingStartTimeUtc.

¹ A manual selection of this ones can produce many problems and inconsistencies between this and the other exported files, which will produce unexpected results when importing.

2. **Event:** Event, Eye movement, Mapped Eye movement, Recording media, AOI hit.
3. **Data:** Gaze point 2D, Validity of eye data, Mapped gaze point.
4. **Media:** Media information.

2) **Tobii Pro Lab "Metrics" (optional):** this option is needed to export the metrics using the "Interval-based TSV file". This option is not mandatory but recommended. Without it, the only new information the import will add are the gaze points and fixations visualized in SennsMetrics when you open a recording view.

Here we have again the option "Data selection" and again, we recommend leaving all selected (default).

The mandatory fields are:

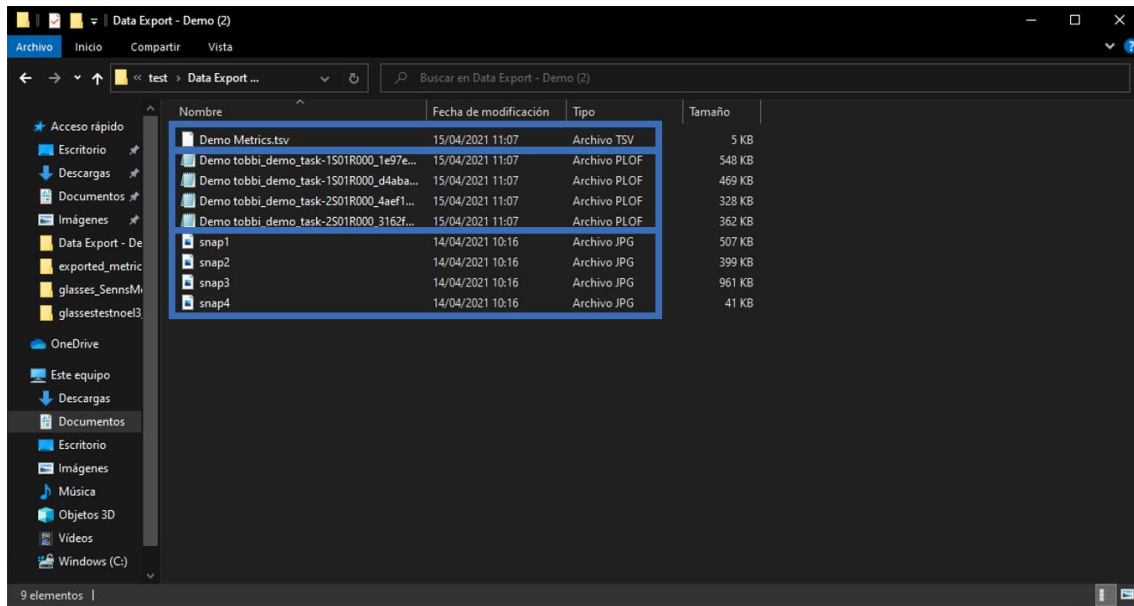
1. **General:** Media.
2. **Interval metrics:** Duration of interval, Start of interval.
3. **AOI fixation metrics:** Number of fixations, Time to first fixation.
4. **AOI visit metrics:** Total duration of Visit, Number of Visits.

3) **Image file for each snapshot (obligatory):** the folder need to contain the image files of each snapshot referenced in the ".plog" files and this step must be done manually: these files must be copied from its location to the folder with the exported data.

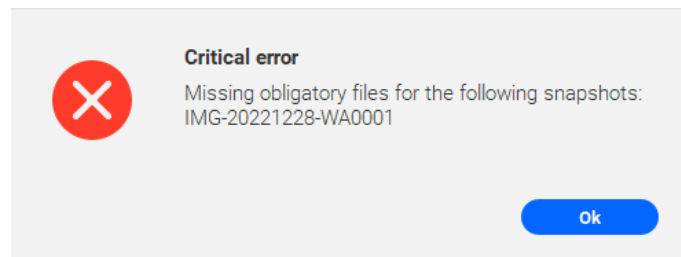
The format of the snapshot must be ".jpg"

The image files cannot be renamed after being imported in Pro Lab and snapshot renaming option from Pro Lab should not be used either.

The filenames of all these files must be the same as the moment they were exported. The following figure shows an example of a valid folder.

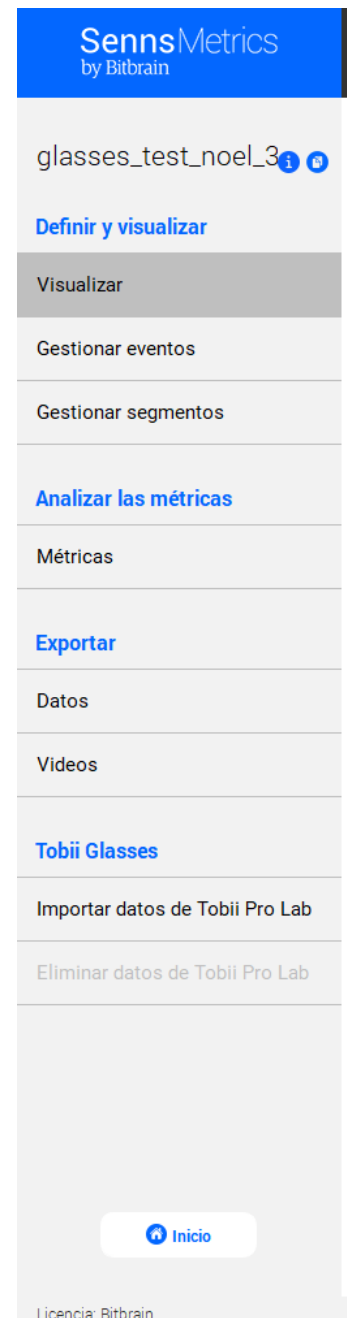


If the name of the snapshot changes during this procedure, once the data got imported to SennsMetrics, an error pop up like this will come out:



Importing into SennsMetrics

In SennsMetrics, when opening a study with glasses data, two new buttons are shown (the ones in the image in the right in the section called Tobii Glasses). One for loading data from Pro Lab and another for deleting it and go back to use the original data from SennsMetrics.



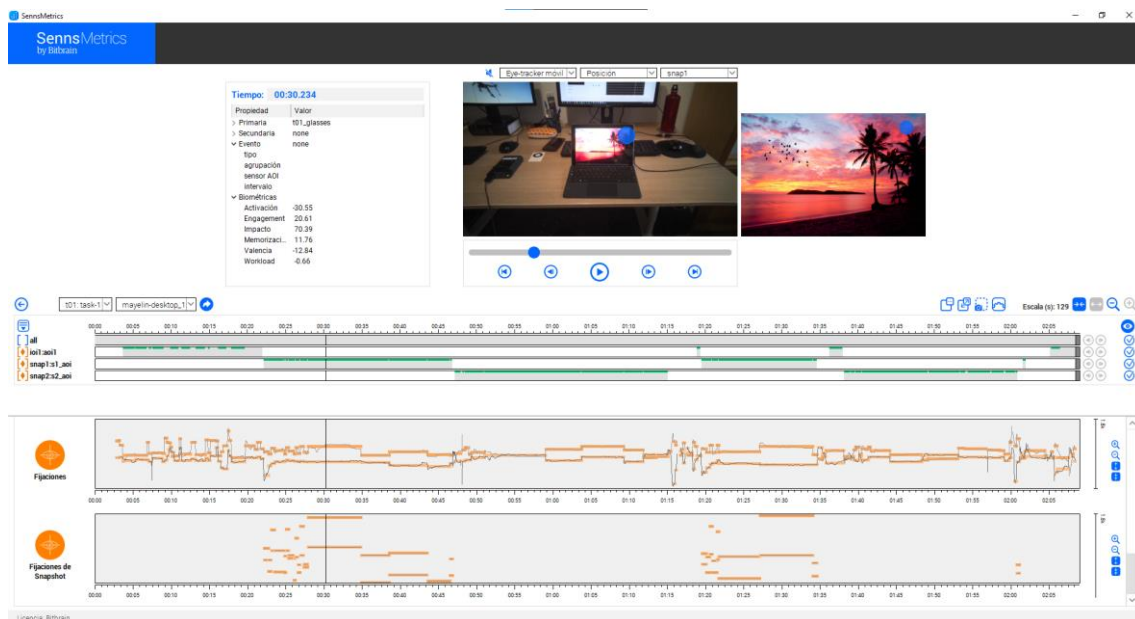
Results

Finally, here we would like to give a summary of the functionalities in SennsMetrics that are most useful when importing Pro Lab data.

Pro Lab Fixations and snapshots visualized with biometrics.

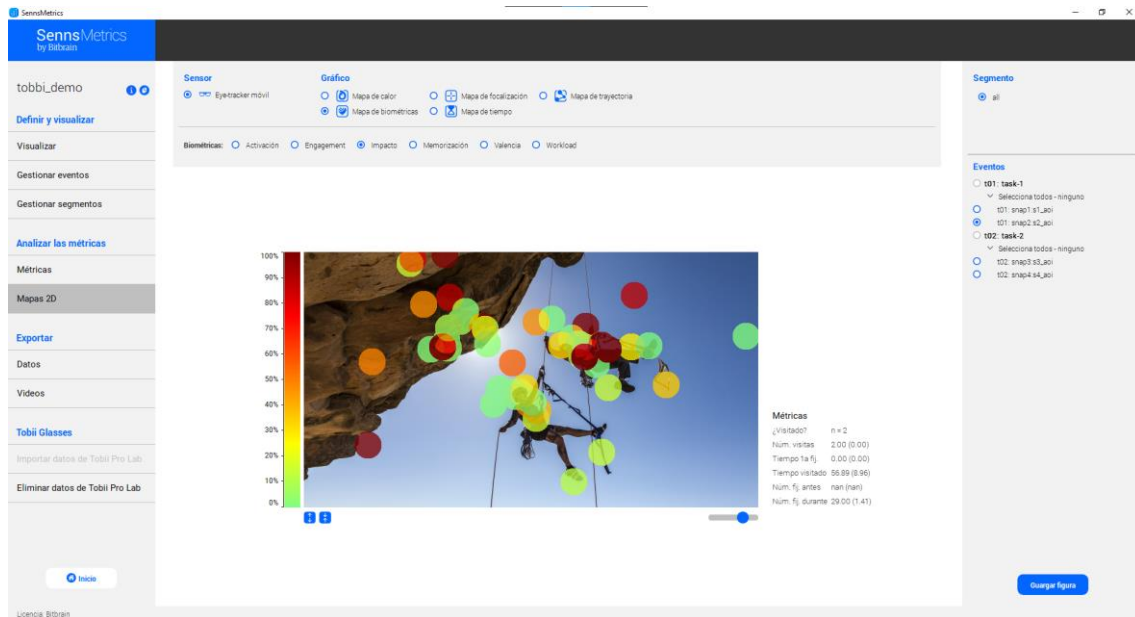
After importing Pro Lab data, in the study view, we can see the following Pro Lab related information from top to bottom:

- The snapshot is shown right to the video and has its own fixations synchronized with the video. The fixations can be displayed over the video.
- In the events shown here, we can have a better look at the concept of the IOI-AOI pair. In the event section, we can see the intervals in grey, and the hits are highlighted in green (the region cannot be visualized over the video).
- The gaze data and fixations plot can be visualized under the biometrics and synchronized with them.



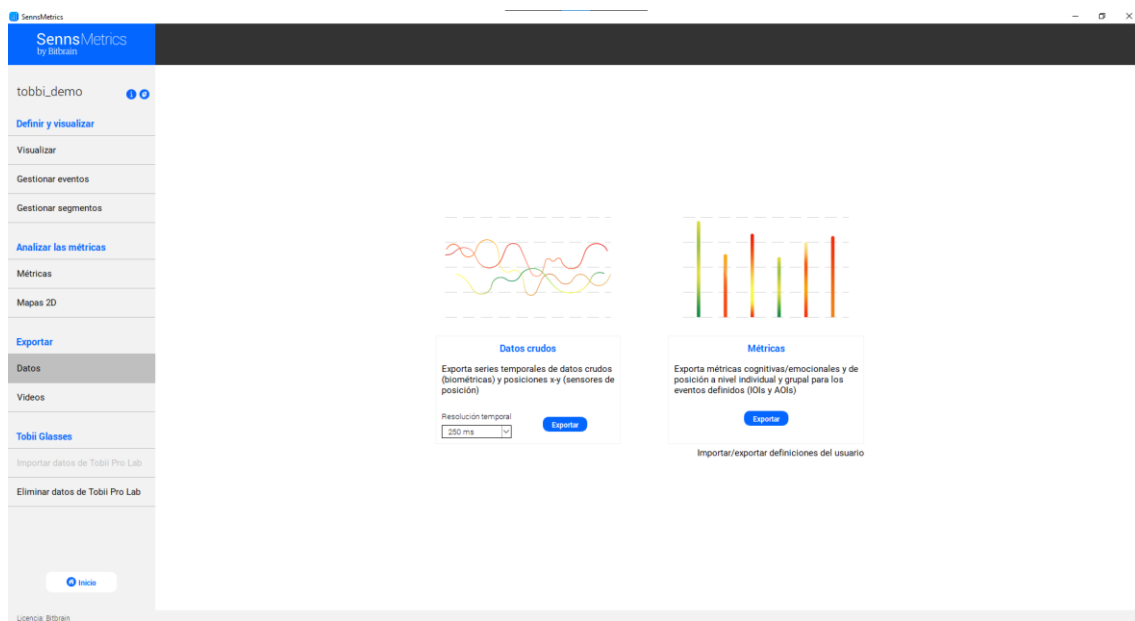
Heatmaps and biometric maps over snapshots

When importing snapshots, there are some especial events created for them that can be used for visualizing 2D maps over the snapshot, including biometric maps, which are the most important ones in this integration.



SennsMetrics data export

The raw data and biometrics (individual or group level) can be exported to excel files.



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