Tobii Pro VR Analytics

Product Description

tobii pro

1. Introduction

1.1 Overview

This document describes the features and functionality of Tobii Pro VR Analytics. It is an analysis software tool that integrates into new or existing Unity environments. This software enables the collection and playback of eye tracking data using new or existing Unity environments. It provides analysis on a range of human behaviors, including automated visualizations and analytics for interaction, navigation, and eye tracking data. Playback and analytics are available for both individual and combined, multi-participant sessions. The automated statistics ensure the rapid availability of results after recordings are complete.

This document applies to Pro VR Analytics. This software is continuously being developed and refined. Please visit www.tobiipro.com for the most recent specifications for the software and for the latest version of this document.

1.2 Compatible VR headset

Tobii Pro VR Analytics has been designed to work with genuine eye-movement data, which requires a VR headset with integrated eye tracking from Tobii to access the gaze-based capabilities.

Tobii Pro VR Analytics supports the following VR headset:

- Tobii Pro VR Integration – Based on the HTC Vive HMD (more information can be found on www.tobiipro.com)

1.3 License models

Pro VR Analytics has two different license models: a perpetual-based license model and a subscription-based license model.

- The subscription license is available for one-year contracts and gives you access to the latest software versions as soon as they become available if you keep your agreement up to date.
- The perpetual license gives you access to the software and you receive one year of free upgrades. After the first year, an additional upgrade contract is required to keep your software updated.

When acquiring a license for Pro VR Analytics, you are provided a Unity package that is imported into an existing or new Unity project. With a license as many Unity environments as desired can be created, and each of the created environments has a license to record with a specific VR headset. To record with several VR headsets, you will need multiple licenses (one for each recording VR headset). There is no limitation on how many recordings can be done in one environment or on how many computers that can run the replay and analysis features.

1.4 Example use cases

Tobii Pro VR Analytics can be used for a broad range of applications, such as:

- Market research
- Wayfinding
- Training and performance optimization in various industries
- Education
- Medical research and testing
- Automotive development
- Design and architecture
- UX and interface design

2. Functionality

The current capabilities of Tobii Pro VR Analytics are:

2.1 Record

- Calibrate participants (5-point calibration)
- Record eye movements (120Hz with Pro VR Integration)
- Live view of gaze cursor during recording on external screen
- Toggleable live view of gaze cursor during recording inside HMD
- Ability to enter participant name and gender

2.2 Replay and visualizations

- Replay of single participant recordings
- Replay of multiple participant recordings
- First-person camera view of replay
- Scene camera view of replay (if camera objects are available in the Unity project)
- Picture in Picture (PIP) dual-replay view
- Avatar representation of participant's head position and orientation on playback
- Avatar color-coded to identify recording/user
- Avatar color-coded to represent gender of participant
- Heat map visualization of fixations rendered on the object surfaces in the Unity environment
- Opacity map visualization of fixations rendered on the object surfaces in the Unity environment
- Gaze ray visualization in replay
- Path map (breadcrumbs visualized on the Unity environment floor)

2.3 Metrics

Eye tracking metrics for all objects in the environment – available in total after recording is complete or in real time as replay is progressing:

- Fixations (count)
- Fixations (total duration)
- Fixations (average duration)
- Time to First Fixation

When interaction is enabled, interaction measures and statistics for all objects in the environment are available in total after recording is complete or in real time as replay is progressing:

- Interactions (count)
- Interaction Time (total duration)
- Time to First Interaction
- Fixation to Interaction

All metrics are available in the Unity application or as a CSV export for offline processing in Excel etc.

3. Unity compatibility & performance

3.1 Unity scene compatibility

For Tobii Pro VR Analytics to work properly, the Unity environment must be compatible with the Tobii Pro VR Analytics integration. Use the list below to check if your Unity environment can be used with Tobii Pro VR Analytics.

- Tobii Pro VR Analytics does not support mesh deformation. For objects with mesh deformation (i.e. objects that change shape), heatmaps will be incorrectly drawn. Metrics will be correct if the collider changes shape just like the object itself.
- Tobii Pro VR Analytics does not support recording and replaying non-static objects. Metrics and Heatmap data will be collected for these objects, though, their movement will not be recorded or replayed. If you follow two simple rules during replay, environments with objects that move (i.e. make translations) behave correctly: 1. Replay one recording at a time. 2. Do not pause or change speed during replay.
- Tobii Pro VR Analytics does not support replaying multiple participants when participants have interacted with objects in the scene. Multiple participant replay will not show the interactions, but data is still counted for the objects. To view the interactions in the scene, you need to load and replay one recording at a time.
- Tobii Pro VR Analytics does not support replaying multiple participants in a scene where the objects in the scene can be put at new places. To view interactions in such scenes where objects can be placed at new positions by the participants, you need to replay one recording at a time.
- The Tobii Pro VR Analytics feature of showing path arrows on the floor does not work for vertical movements. For instance, if the participant walks up the stairs, the path arrows will not be shown on the steps of the stairs but on the ground level.

3.2 Performance requirements

To carry out an effective study in VR, the environment should be immersive, which implies that it needs to run smoothly in VR. We recommend that the environment should be running in at least 90 frames per second after integrating with Tobii Pro VR Analytics. Below, some tips for optimizing your scene our outlined:

- Optimize the scene so that it can run at a high frame rate, for instance 110 fps, before integrating with Tobii Pro VR Analytics. How large the performance impact from Tobii Pro VR Analytics is depends on the complexity of the scene.
- Real-time lighting is costly in terms of performance. Use it only when absolutely necessary. Many times, baking the light gives a good enough result.
- Use primitive shape colliders as much as possible and avoid mesh colliders, since they are performance heavy. On the other hand, for some objects in the scene, it might be necessary that the eye tracking rays hit a surface that follow the shape of the object precisely as described in section 4, point 2.

4. System requirements

Recording sessions with Tobii Pro VR Analytics are done with the Tobii Pro VR Integration, a Tobii eye tracking retrofitted HTC Vive. To secure a smooth and immersive experience in VR, consistent performance and proper recording of sessions it is crucial to meet the computer systems requirements for the HTC Vive.

Component	Recommended PC requirements for HTC Vive
Processor	Intel Core i5-4590/AMD FX 8350 equivalent or better
GPU	NVIDIA GeForce GTX 1060, AMD Radeon RX 480 equivalent or better
Memory	4 GB RAM or more
Video output	HDMI 1.4, DisplayPort 1.2 or newer
USB port	1x USB 2.0 or newer
Operating system	Windows 7 SP1, Windows 8.1 or later, Windows 10

You can also use the HTC Vive VR Performance Test to test if your computer is VR-ready.

To run replay and analysis with Pro VR Analytics a computer with lower specifications could still work, but it will be highly dependent on the environment.

Depending on its size and complexity, each VR environment can require a different level of computer performance. Complex lighting/shading and photorealistic environments are more resource-intensive, while smaller, simpler environments can be run for analysis purposes on a computer with lower specifications.