



Multimedia Authoring and Management using your Eyes and Mind

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D4.4 - Final implementation of MAMEM's middleware and interaction SDK

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Abstract: The goal of D4.4 is to deliver the documentation of the software implementing the final version of MAMEM's middleware and interaction SDK. The software is delivered along with this document in the form of an installation package and handles most of the work required for the integration of all the system subcomponents. The document presents an overview of the system, advances in the development of the platform, step by step installation instructions, system testing results and detailed instructions on how to modify or extend the functionalities of the system.

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Executive Summary

The purpose of this document is to deliver the documentation of the final version of MAMEM’s middleware and interaction SDK. This is the final deliverable for WP4 whose work can be summarized as the analysis of the platform’s technical requirements (D4.1), the plan for integration for the different components of the system (D4.2), the initial implementation of the MAMEM platform (D4.3) and the final implementation (current document). This work package is largely interconnected with the work of the other 2 technical work packages (WP2 & WP3) and incorporates some of their results. Moreover, work reported from D5.3 is also related with this deliverable with respect to the data logging and monitoring of the participants during the Phase II trials. This deliverable is also accompanied with the installation package for the MAMEM platform as well as the technical and verification tests of the updated software.

Abbreviations and Acronyms

API	Application Programming Interface
EEG	ElectroEncephaloGram
GSR	Galvanic Skin Response
PD	Persuasive Design
XDF	Extensible Data Format
DLL	Dynamic Link Library
LSL	LabStreamingLayer
GTW	GazeTheWeb
SDK	Software Development Kit
ErrP	Error related Potentials
SMR	Sensorimotor Rhythm

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1 Introduction

This document includes the documentation for the final implementation of MAMEM’s middleware and interaction SDK, from now on referred to as “**MAMEM platform**”. The main goal of this deliverable was to provide a version of the platform that will include all the updated algorithms and components and ensure the smooth execution of the Phase II trials. The main difference between the Phase I and Phase II trials was that the participants will have to use the system by themselves without any technical person from the consortium present. For this reason, we had to introduce improvements on the system architecture in order to be easily distributed and installed as well as ensure high quality of usability and reliability.

Section 2 will present a brief overview of the new version of the MAMEM platform. The changes that were introduced into the architecture of the system are presented on Section 2.1. Sections 2.2-2.6 presents the most important subcomponents of the system and how they were integrated into the system and Section 2.7 describes how the system is packaged and distributed.

Section 3 initially lists the requirements of the system and provides step-by-step instructions for the installation. Information follows about how the system is updated and a few demos of multi-modal interaction.

Section 4 provides information about how the system was validated and tested and Section 5 troubleshooting information.

Lastly, the results of our testing process are presented on the Appendix.

2 Overview of the MAMEM platform

2.1 Architecture

In order to facilitate the smooth execution of the Phase II trials, we had to introduce major redesigns into the MAMEM platform. Based on the old version of the MAMEM platform, it was nearly impossible for a non-technical person to setup and run the system due to a significant number of individual plugins that had to run separately. To tackle this problem, we have grouped all those different plugins into a single library, namely **SensorLib** which makes all those plugins transparent to the end user and automates a lot of processes that were previously handled by a technical associate. This was also a big step towards a production version which together with the installer allows for easy installation of the system and execution without advanced technical knowledge.

More specifically, SensorLib handles the connection with the supported sensor devices mentioned on Section 2.2 the synchronization of each data stream with LabStreamingLayer, the data recording and the Interaction SDK which refers to the typing error correction of the visual keyboard. The sensor data, together with key-typing events are recorded on the local filesystem along with other metadata that are used for identifying the user and the time they were recorded.

As seen on Figure 1, the new architecture consists of the GazeTheWeb browser including the SensorLib as a dynamic link library (DLL), whereas all the functionalities of SensorLib are hidden from the end user who is only asked to interface with GazeTheWeb. SensorLib handles the data recording in xdf files to the local filesystem which includes data recorded from the EEG, eye-tracker and Shimmer sensors as well as events that are generated during typing via the GazeTheWeb keyboard. Moreover, GazeTheWeb communicates with a cloud-based server built upon Google's Firebase framework for storing data such as browsing events (clicks, going back/forward, refresh page, etc.), user authentication, scores that were achieved on the training application/tutorial and web usage statistics and categorization such as e.g. time spent on social network or a multimedia consumption. These data are then used to generate several social activity scores and are presented back to the user in the form of the persuasive design dashboard.

Each individual component will be described more extensively on the following subsections.

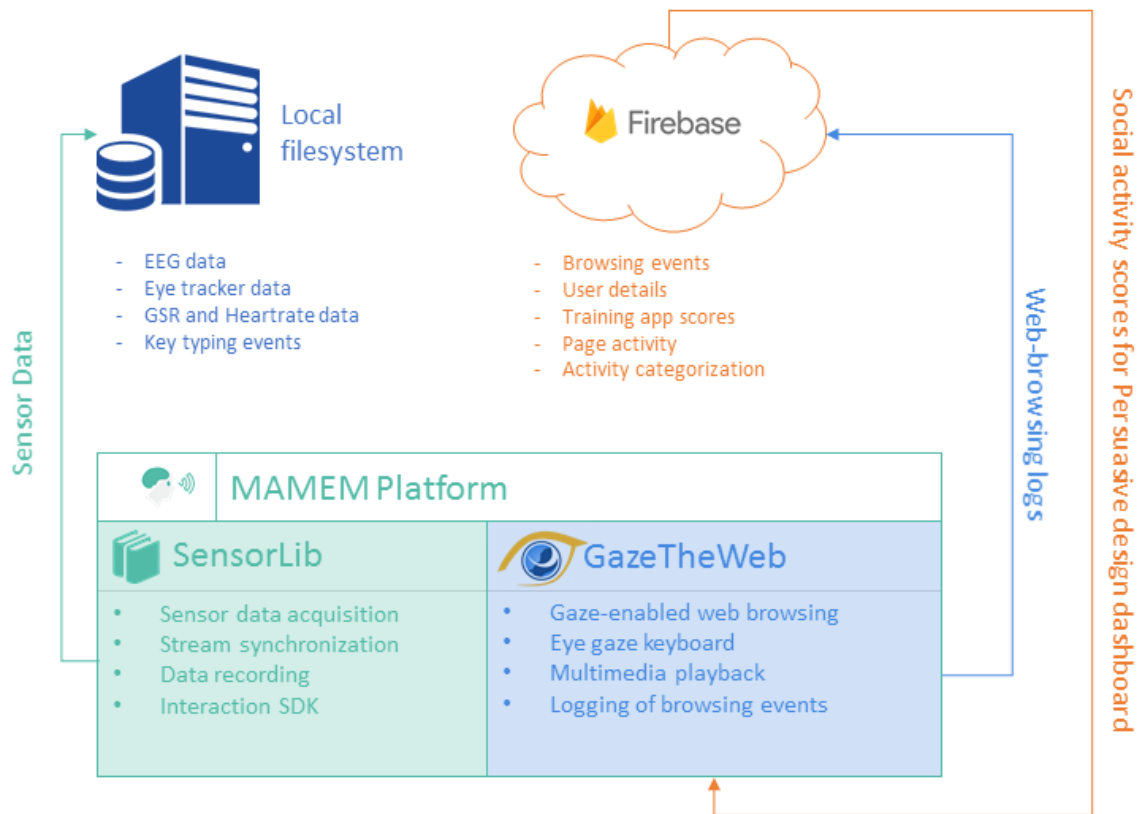


Figure 1. New MAMEM architecture

2.2 Supported sensor devices

Due to the redesign of the platform and the introduction of SensorLib, the list of sensors that are currently supported by the system has changed. Support for some of the sensors has been discontinued on the new version, namely Emotiv EPOC+ due to changes of their license policy related to acquisition of raw EEG data. Also, we replaced the heavyweight equipment (i.e. SMI iViewRED eye-tracker and BE Plus LTM EEG device), with their corresponding lightweight devices (respectively, VI myGaze eye-tracker and Enobio headset), since the latter ones were selected for the Phase II trials. Nevertheless, the extendibility of the platform has been kept on the same high level, allowing new sensors to be integrated rather easily if such a need should arise.

This list of the supported sensors is now formed as follows;

- **Visual Interaction myGaze eye-tracker** that was used for the “lightweight” configuration during the Phase I trials.
- **Enobio EEG headset**, that was selected as the replacement of EPOC+ device for the Phase II trials
- **Shimmer3 GSR+**, the wireless wearable device for monitoring GSR and optical heart rate.

2.3 EEG Processing Toolbox

The EEG Processing Toolbox for Matlab stands outside the overall architecture (i.e. not included in the installer) of the MAMEM platform as a toolkit that mostly targets scientific experimentation for testing algorithms. The main reason for this is licensing issues for distributing Matlab programs as well as because it is hard to use for users with no technical experience and no coding abilities. This, however does not mean that the toolbox can only function as an independent software, since it can easily be used for developing mini-applications for the rest of the system. This is possible due to the flexibility that LabStreamingLayer provides, which allows for the communication between different platforms. Two examples of this inter-platform communication have been made with the help of toolbox, MM-Tetris for playing the well-known game with EEG and eye-tracking signals and typing error correction using ErrP EEG signals (see D3.3). The latter example has also been transferred and integrated with the core part of the system (Section 2.5).

Both applications rely on the toolbox for providing the necessary signal processing algorithms and train classifiers for signal classification. Through experimentation, the appropriate configuration can be selected which delivers the best classification score. After the necessary offline steps have been completed, the methods for running the algorithms online and applying them on GTW can be found inside LSLWrapper class (e.g. runTetrisSMR). More information on both applications can be found on Deliverable D3.3, Section 3.

2.4 GazeTheWeb

GazeTheWeb integrated two levels of data logging due to the requirements of the Phase II trials: Offline (i) and Online (ii).

- (i) Offline logging is implemented through the SensorLib (See Section 2.5), which records sensor data from the eye-tracker, EEG and GSR sensors into locally stored files. In addition, GazeTheWeb adds labels as to clarify about the interaction context. These logs are especially useful for post-experiment research about Error-potential detection for improving gaze-based typing.
- (ii) Online logging is achieved with the Google Firebase Cloud infrastructure and the REST API. GazeTheWeb connects to this interface through CURL and sends data about page activity and browser usage for each individual user. E.g., which pages have been visited, how long have they been inspected and what action have been performed on them. This serves two purposes: First, the data is used to adapt the persuasive design and to motivate participants. Second, the data will be used in post-experiment analysis to evaluate the impact of the system and the progress of the individual users.

The above is independent from the social logging performed additionally for social networks like Facebook or Twitter (See D5.3 for more details).

2.5 SensorLib

SensorLib was developed with the purpose of integrating several parts of the platform into a single library such as the data acquisition plugins, LabStreamingLayer (LSL) connectors and data recording. Previously, the execution of different standalone applications was required for connecting each sensor with LSL while also the data recording was handled manually via

a different application. Thus, the development of this library minimises the effort required for performing the aforementioned tasks while also automating some of them e.g. detecting automatically which sensor is connected to the system and acting accordingly.

More specifically, the tasks that are handled by the library are:

- (a) Automatic connection¹, i.e. acquisition of data and streaming to LSL, of the following sensors; i) VI MyGaze eye-tracker ii) Enobio EEG system, iii) Shimmer GSR+ sensor.
- (b) Interface for starting or stopping the recording of data to the local filesystem.
- (c) Reporting of the connection status and informing the user to act in case of any errors.

The library merges a large percentage of all the previously developed code into a dynamic link library (DLL) that is integrated within GazeTheWeb browser. This includes the following components

- MyGazeSDK for connection and data capture from the VI MyGaze eye-tracker.
- ShimmerSDK for connection and data capture from the Shimmer device.
- LabStreamingLayer for generating LSL inlets, outlets, stream synchronization and data formatting.
- LabRecorder for recording the LSL streams into. xdf files.

GazeTheWeb browser was accordingly modified to include the interfaces supported by the library with respect to allowing the user to pause/start the data recording on his own will. This functionality is available on the main screen of the GazeTheWeb browser by a toggle button as seen in the left screenshot of Figure 2. Moreover, the connection status can also be seen in the right screenshot of Figure 2.

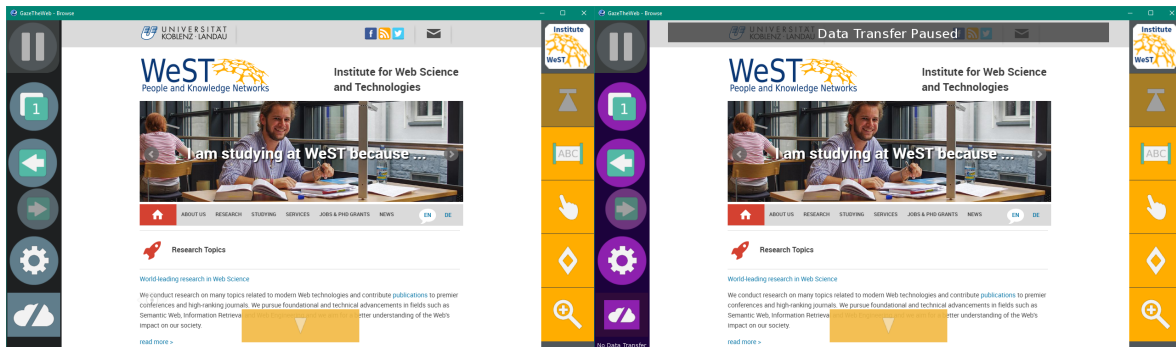


Figure 2. Data transfer can be deactivated by hitting the lowest button in the left panel.

SensorLib handles the synchronization of events and data recorded from labstreaminglayer with events stored in the Firebase cloud server. This was possible by adding the following *event_synchronization* xml element on every file recorded by SensorLib. This calculates the offset between the two clocks (Firebase clock + labstreaminglayer clock) which enables the transition of the labstreaminglayer timestamps to a common time scale by adding the *streamoffset* value to the labstreaminglayer provided timestamps.

¹ Full automatic connection with the Enobio EEG headset is not possible due to software limitations of the headset. More information can be found on Section 3.3 .

```
<event_synchronization>
  <unixtimestampms>1515424593170</unixtimestampms>
  <lslock>1660759.66628425</lslock>
  <streamoffset>1515422932410.33</streamoffset>
</event_synchronization>
```

SensorLib is also able to process any sensor data in real-time and can be extended to provide additional applications. An example of this application is the **online detection of typing errors** using EEG ErrP signals in conjunction with eye-tracking data. This has been included in SensorLib as an add-on functionality which is turned off by default but can be enabled via the GazeTheWeb interface provided that an Enobio device is connected to the system. This functionality detects automatically whether a key is pressed on GazeTheWeb keyboard and processes the EEG and eye-tracking signals of the next 0.7 seconds to decide whether the key that was pressed was according to the intention of the user or not. If not, the system automatically removes the last character from the input field. This functionality was initially developed based on many experiments on the EEG processing toolbox (Section 2.3), but was later translated into native code (C++) with the help of third party signal processing libraries (Armadillo [1], SIGPACK [2]) and included in SensorLib. More information about this functionality can be found on Section 3.5.2 of this document as well as on D3.3 for more technical details.

2.6 User Monitoring Database

The MAMEM platform collects various kinds of information related to the user activity with the purpose of informing him/her about how well he is using the system as well as encouraging him/her to use the platform more. For this reason, several different components are linked to each other such as GazeTheWeb, a dashboard styled web application, the training application of GazeTheWeb, the Social Tracker and the Firebase cloud server. These components are described extensively on D5.3.

This sub-architecture within the general architecture of the MAMEM platform works by collecting various data related to the behaviour of the user when using the system which are in turn processed and used to provide feedback to the user. This can be seen Figure 3.

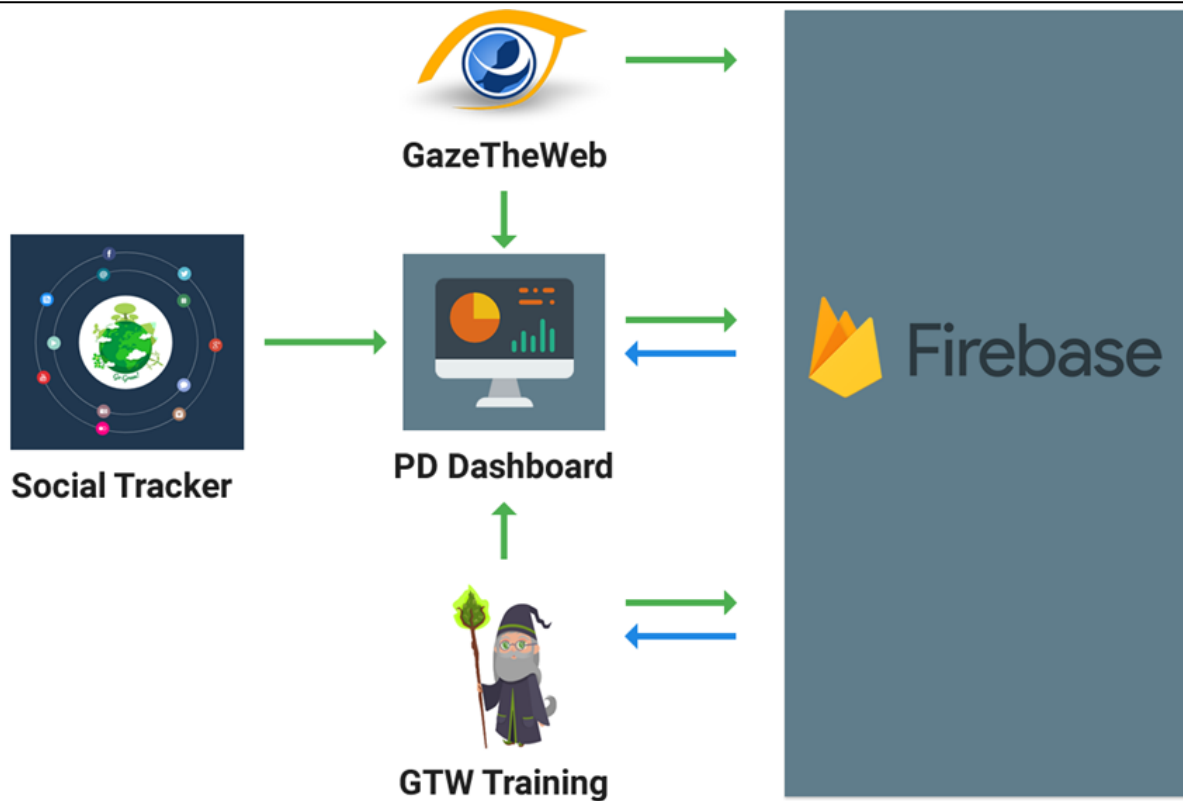


Figure 3. Data monitoring sub-architecture

GazeTheWeb tracks user activity related to the browser interface (button clicks, launch/termination of the application, adding new tabs etc.) and web activity (URL visits, time spent on a webpage, categorization of webpages). These data are used to generate several scores and are presented on the PD dashboard as feedback to the user. Data also from the Social Tracker (number of public posts on social networks) and the training application of GazeTheWeb are also tracked.

2.7 Deployment package of MAMEM platform

MAMEM Platform has been packaged into a single easy to use installer which allows for easy deployment and installation without requiring any technical skills. The installer was developed with the free tool “Inno Setup”¹ using a scripting language based on PASCAL. The installer compresses the whole MAMEM platform files into a single .exe file that pops up an installation wizard when executed. It allows for the specification of several parameters related to account credentials, eye-tracker configuration and GazeTheWeb configuration which are required during the setup of the system. It also handles automatically the correct paths for the installation, it generates shortcuts and registers the application to execute automatically on system startup to allow the operation of the system without any use of the traditional mouse interfaces.

¹ <http://www.jrsoftware.org/isinfo.php>

3 Installing the MAMEM platform

3.1 System requirements

The MAMEM system is composed of several components, each with different requirements. In the following, we provide details for a set of the system requirements and recommended PC configurations that cover all different components composing the MAMEM system. Although not recommended, the MAMEM system can be installed and run on any PC of the user’s choice. However, users must be aware that the quality of the recording cannot be guaranteed on devices which do not fulfil specific requirements. In this section, we provide guidelines and hardware requirements for using the MAMEM system on a PC. Nevertheless, we cannot guarantee that a particular Laptop or Desktop PC running Microsoft Windows 7™ or 8™ will be sufficient. It is possible that other hardware components or software on a particular PC may interfere with the proper functioning of the MAMEM software. The following instructions are to be considered as guidelines only about how to set up a PC. All information about the system requirements and recommended configuration is provided in the following table.

Requirements	
Operating system	Windows 7™, Windows 8™, Windows 8.1™, Windows 10™
CPU Architecture	64-bit
Disk Space	2GB free space is required to install the MAMEM platform and all necessary components. Additional disk space is required for data recording and analysis.
CPU	Quad-Core Intel Core i5 or i7 of 3rd and 4th generation (Core 3xxx and 4xxx series).
USB	Native USB 3.0 or USB 3.0 Add-On Card with support for SuperSpeed USB 3.0 capability. It is possible that PCs do not support USB 3.0 or the USB chipset on the PC may not be compatible with the Eye Tracker. A USB 3.0 Add-On card may add SuperSpeed USB 3.0 capability to the PC.
Bluetooth	Bluetooth is required for connecting the Shimmer device with the system (GSR and Optical heart rate measurements).
GPU	OpenGL 3.3 support is required
Recommended PC Configuration	
User Account Rights:	Administrator rights are required
Standby Mode	Disable the Standby Mode
Screen Saver	Disable the screen saver
Power Options	Disable any function that will power-down the PC after a period of inactivity

Display	Set to never turn off
Sleep	Set to never put the computer to sleep
Power Plan	Set to High Performance
Closing the Lid:	Set to “Do nothing”
Windows Updates	During the recording sessions, the update should be set to “Never check for updates”
USB Devices	Do not use any other USB devices on the same USB controller as the myGaze eye tracker during the recording.
Other Software / Applications	Do not use additional applications that consume CPU or USB resources on the PC, since they might have an impact on the eye tracker performance
Firewall and Networking	Add an exception to the firewall when asked for the following applications <ul style="list-style-type: none"> • GazeTheWeb
Write Access:	Ensure the operator has “Write” access to the repository directory. Do not try to write to a folder for which you do not have “Write” access

Table 1. System requirements for the MAMEM platform

3.2 Structure of the installation package

MAMEM platform is packaged within an install wizard which provides an easy step by step installation process. Due to licensing limitations however, two additional software applications are required to be installed for supporting the Enobio EEG sensor and myGaze eye-tracker. Both applications are provided along with the respective devices when they are purchased. Specifically, “NIC” application is required to be installed for setting up the EEG device such as channel localization, sampling rate, filtering, etc. This application is provided on a USB stick along with the EEG device while also it can be downloaded for free from the official website¹. The other software that needs to be installed is named MyGaze and contains all the necessary libraries for the VI MyGaze eye-tracking device and is distributed after purchasing the license for the eye-tracker.

3.3 System setup

This section will mention all the necessary steps for installing and configuring the system.

Data logging

Prior to the installation and for enabling the data-logging on the Firebase cloud server, a user account needs to be created via the corresponding website². Several demographic

¹ <http://www.neuroelectrics.com/products/software/nic/#download>

² <http://augreal.mklab.it/mamem/gtw-home/register.html>

information items are required for registration such as gender, age, name as well as the participant group (Parkinson’s, Neuromuscular Disease, High Tetraplegia), language and participant ID.

MyGaze eye-tracker

To setup the eye-tracker, first MyGaze application should be installed using the provided installation wizard in the default installation path. Then the eye-tracker should be mounted on the monitor using the instructions provided on D4.2 Section 3.1. Then a few measurements are required to be calculated and written down (to be used later during MAMEM platform installation). A small ruler is needed to measure the distances as mentioned below.

- **Eye-tracker Depth:** the distance of the frontal area of the eye-tracker relative to the screen in millimetres. This value should be around 23mm for a normal laptop screen.
- **Eye-tracker Height:** the distance of the lowest point of the screen from the highest point of the eye-tracker in millimetres. The value should be negative if the eye-tracker is positioned on the below the screen which is strongly recommended. On the rare cases that the eye-tracker should be positioned above the screen (in case of obstacles), make sure to note the positive value. It is recommended as well to position the eye-tracker as close to the screen as possible so small values around 5mm are typical for this case.
- **Eye-tracker Angle:** The default value of 20 degrees should apply to the most cases here.
- **Screen width:** The width of the screen in millimetres.
- **Screen height:** The height of the screen in millimetres.

Enobio EEG (optional)

For using the Enobio EEG headset the NIC software application must be installed which can be downloaded for free via the official website¹. Installation should be done via the provided installation wizard and on the default path. After installing, turn on the Enobio device and pair it with your computer using the appropriate method based on your Operating System. Then launch the NIC application and select “USE BT DEVICES” when prompted.



Figure 4. Connecting with the Enobio headset

If the connection is successful a screen such as the one shown on Figure 5 should appear. Ensure that the settings are the same here as the ones on the provided screenshot and click “USE THIS DEVICE”. On the next screen, if not already done previously, a new protocol must

¹ <http://www.neuroelectrics.com/products/software/nic/#download>

be created which is required for specifying the correct order of the electrodes. This typically changes based on the usage of the EEG cap, but for the needs of the Phase II trials the specific order that is shown on Table 2 should be used. After creating the protocol, ensure that the settings are the same as shown on Figure 6 and then run it.

1	CP1	2	CP2
3	C1	4	C2
5	C3	6	C4
7	FC1	8	FC2

Table 2. Electrode configuration for the Enobio headset.

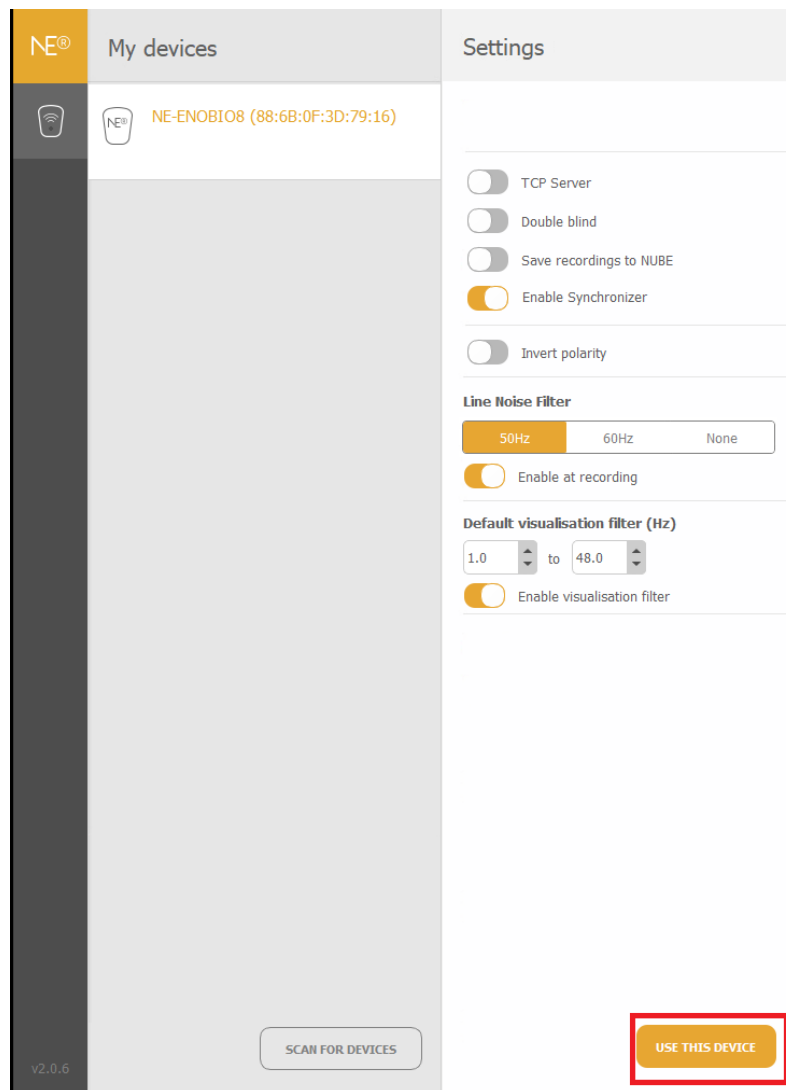


Figure 5. Enobio Headset settings 1/2

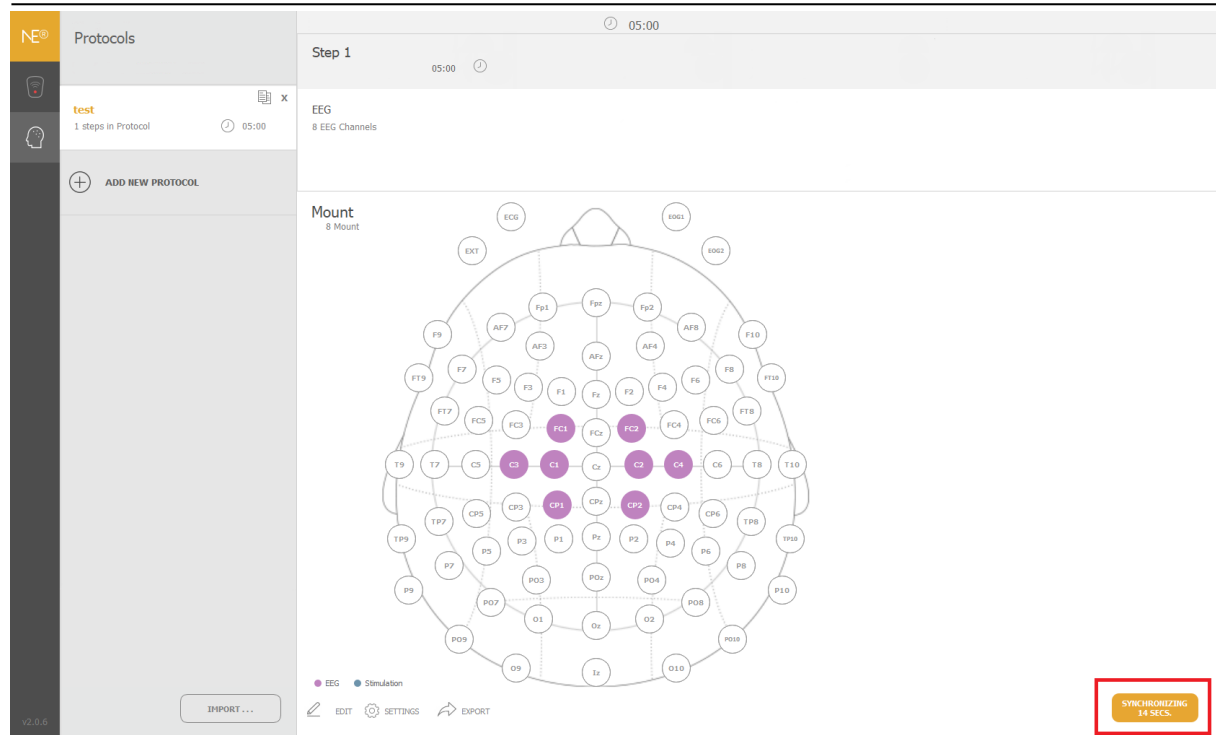


Figure 6. Enobio Headset settings 2/2

MAMEM platform

The MAMEM platform can be easily installed by using the installation wizard. A few parameters must be set however such as the firebase credentials for data logging, preferred keyboard layout language and eye-tracker geometry parameters that have been mentioned above. See the following screenshots for more details. On the dialog presented by Figure 7, the firebase credentials for data logging that were created in previous step “Data Logging” should be specified. On Figure 8, the preferred keyboard layout language should be specified and on the last two screenshots (Figure 9, Figure 10), parameters regarding the eye-tracker installation should be specified as mentioned on previous subsection (MyGaze eye-tracker).

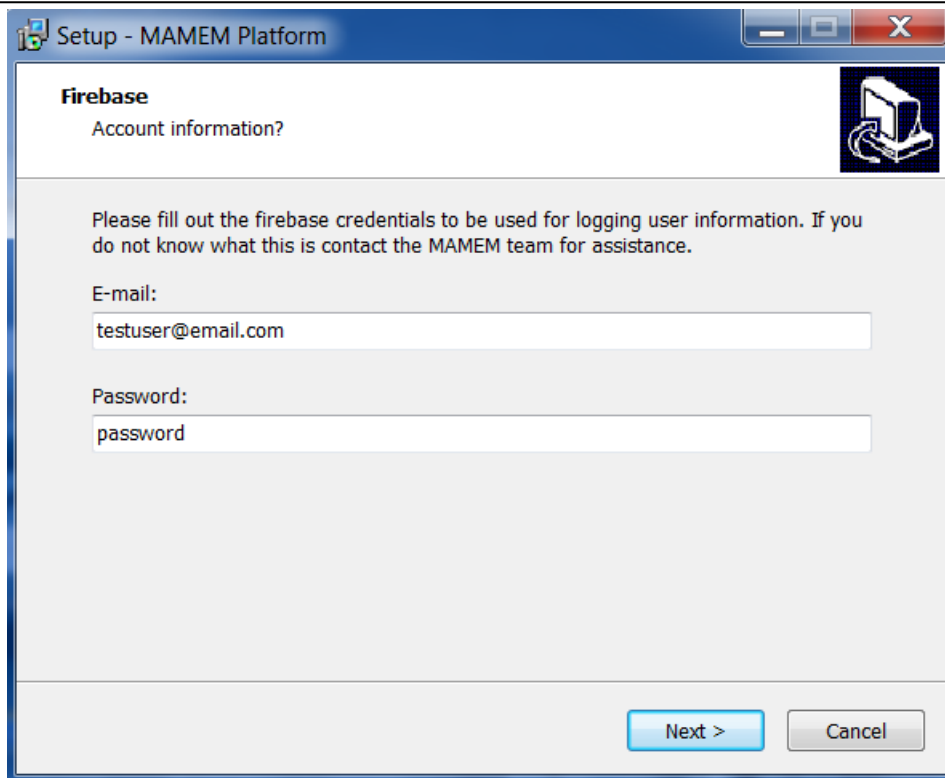


Figure 7. Providing the Firebase login credentials. Use the e-mail and password that was used when registering online. See *Data logging* above for more information.

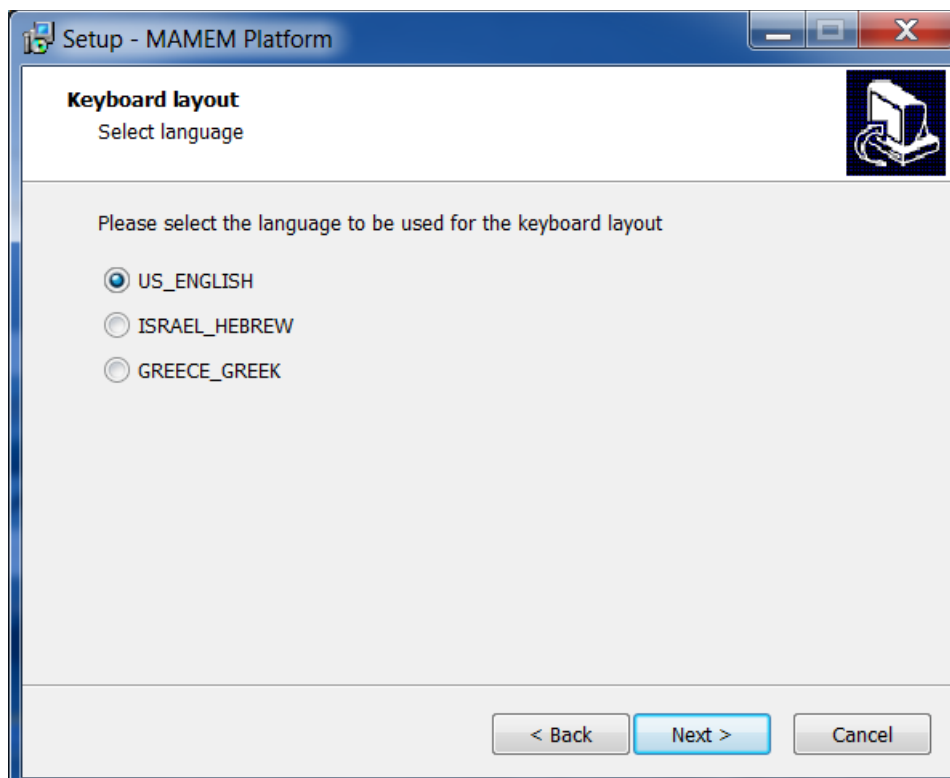


Figure 8. Choose the preferred language for the keyboard layout. This can be changed later on while typing.

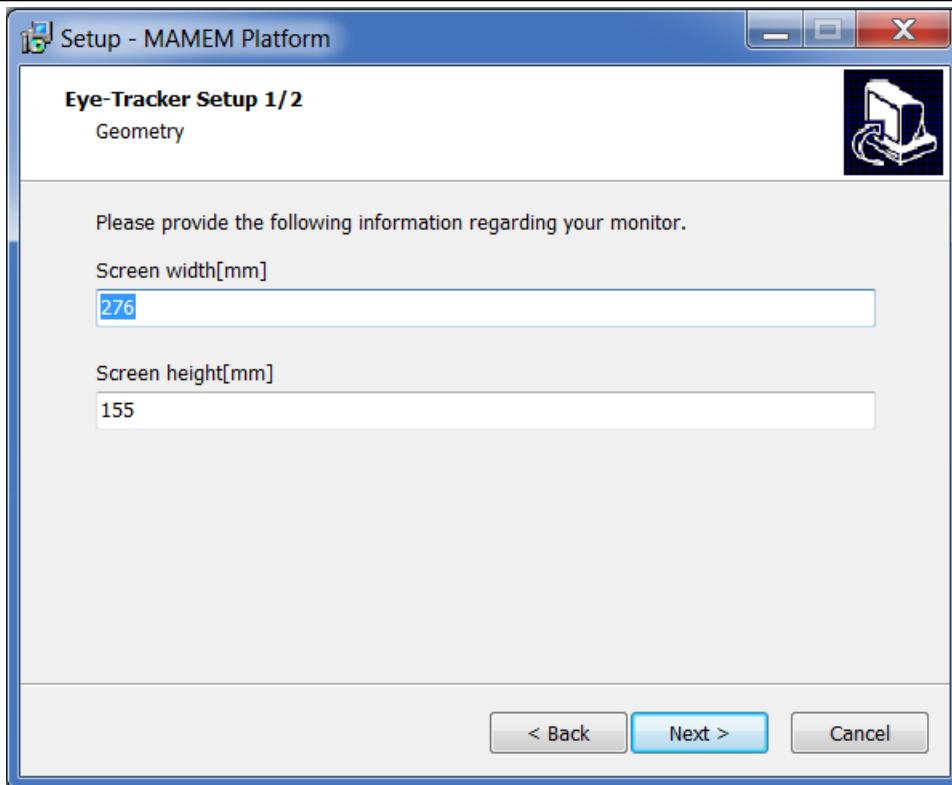


Figure 9. Provide the dimensions of the screen that the eye-tracker has been mounted on. See above for more information on setting up the eye-tracker.

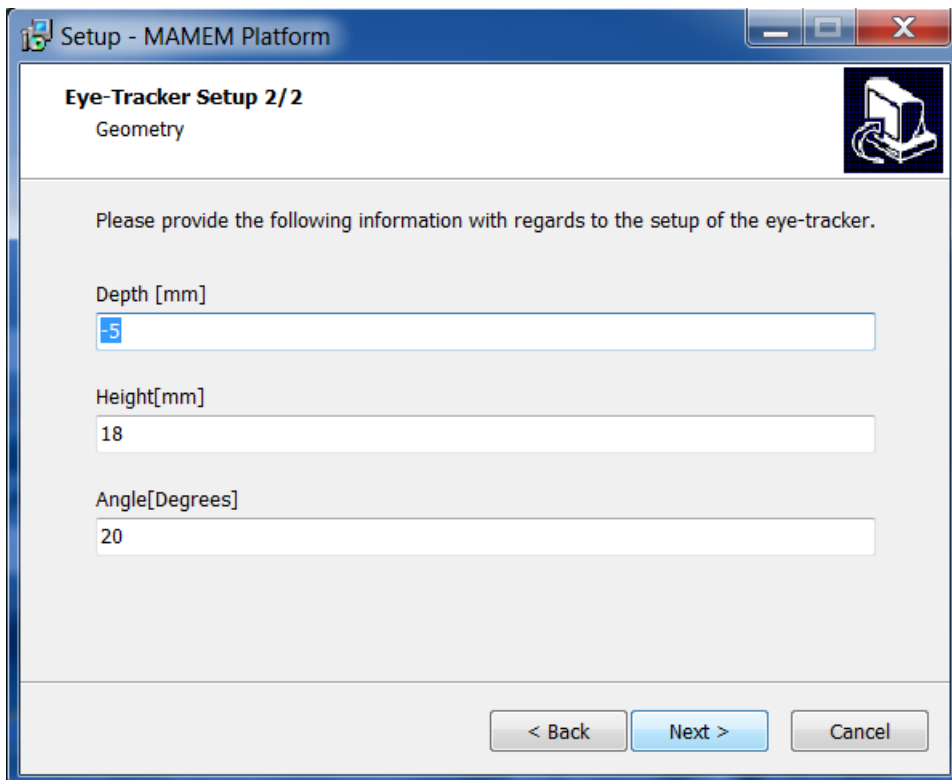


Figure 10. Provide other geometry parameters concerning the position of the eye-tracker relative to the screen. See above for more information on setting up the eye-tracker

If not already installed on the system, the installation wizard will also install the necessary Visual C (VC) redistributables for running the system. After the installation finishes, the necessary shortcuts should be generated on the desktop and start menu. Make sure that the installation path is set to default under the system's AppData folder, otherwise the system may not run properly (due to reduced permissions on writing files inside Program Files or other directories). MAMEM platform is also set up to run after each system start-up, for the convenience of the users that are not able to operate the mouse and keyboard.

3.4 System updater

The MAMEM platform automatically checks for updates after each start-up of the system. The current version number of the MAMEM platform build can be seen on the bottom left of the GazeTheWeb interface. The updater checks automatically if the current version number matches the version hosted on a server online, and overwrites the current installation in case there is a newer version. The updater is a small C++ program that is always executed before GazeTheWeb in the MAMEM installation. It reads the current version of GazeTheWeb from a text file and sends this information to a CGI-Python Script on a server at University of Koblenz-Landau. The script returns whether no update is required or an updated version of GazeTheWeb is available, including an URL where to download the recent version. In such case, a compressed GazeTheWeb version including all content is downloaded to the user's computer, is uncompressed and the previous GazeTheWeb installation is replaced. This does not affect the user data, which is stored in a personal folder.

At the moment of writing this document the current version is 0.7, but a number of updates are expected to be released prior the launch of the Phase II trials. Fixes will also be provided to the Phase II participants remotely as well during the execution of the trials, if necessary.

3.5 Example demos for multimodal interaction

Two examples of using multimodal interaction using the MAMEM system are described on the following 2 sections.

3.5.1 MM-Tetris

MM-Tetris is the multi-modal reinvention of the popular Tetris game, modified to be controlled with the users' eye-movements, mental commands and bio-measurements. MMTetris is intended for use by motor-impaired people that are not able to operate computing devices through the regular controllers (i.e. mouse and keyboard). In the proposed version of the game, the use of eye-movements and mental commands work in a complimentary fashion, by facilitating two different controls, the horizontal movement of the tiles through the coordinates of the gaze and the tile rotation through SMR signals detection respectively. Additionally, bio-measurements provide the stress levels of the player, which in turn determine the speed of the tile's drop. In this way, the three modalities smoothly collaborate to facilitate playing a game like Tetris as it can be seen on Figure 11. The game can be accessed online¹ but requires the Matlab EEG-processing-toolbox in order to run (Section 2.3), as well as a calibration stage during which EEG signals are captured.

¹ <http://augreal.mklab.it/tetris/>

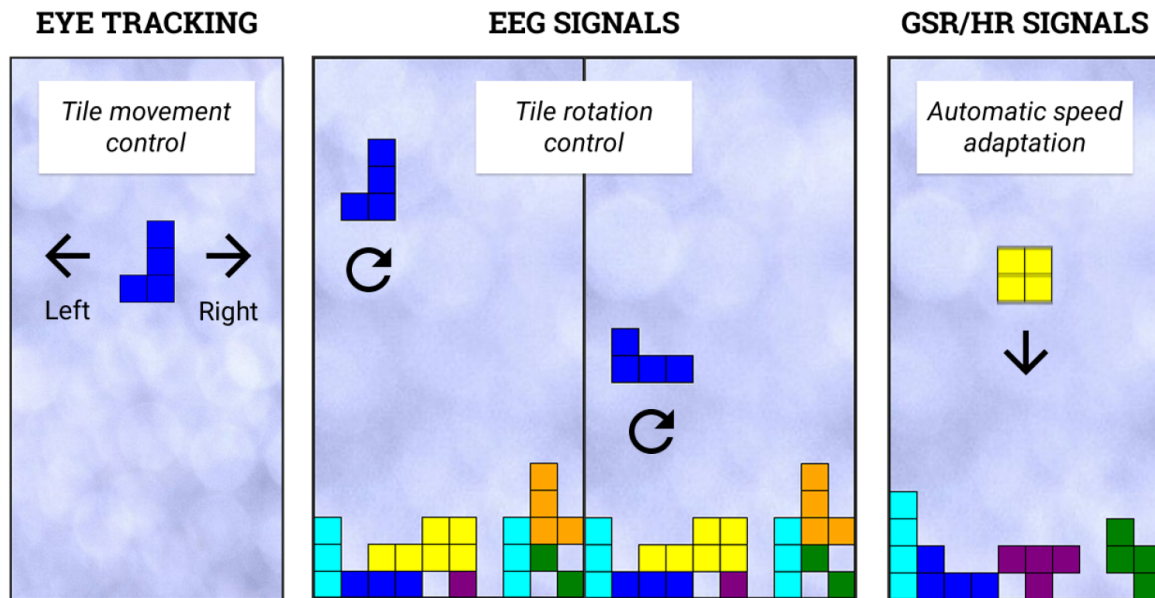


Figure 11. Utilizing three different signal sources for playing tetris

3.5.2 Typing Error Correction

The error correction during typing mechanism is another example of multi-modal interaction which utilizes signals from the eye-tracker and the EEG device in order to automatically detect errors during keyboard typing. As it is shown on Figure 12, when a character is typed the system detects whether the users intended to select the specific character based on their EEG responses and eye-movement patterns. To use this feature, an offline calibration is needed in order to generate the necessary classifier models. Then, it can be enabled by selecting the toggle button inside GazeTheWeb. SensorLib detects whether an EEG device is connected to the system or not and decides whether to use signals only from the eye-tracker or from both devices. The error correction can work by using only the eye-tracker but the classification accuracy can be further enhanced by using both sources.

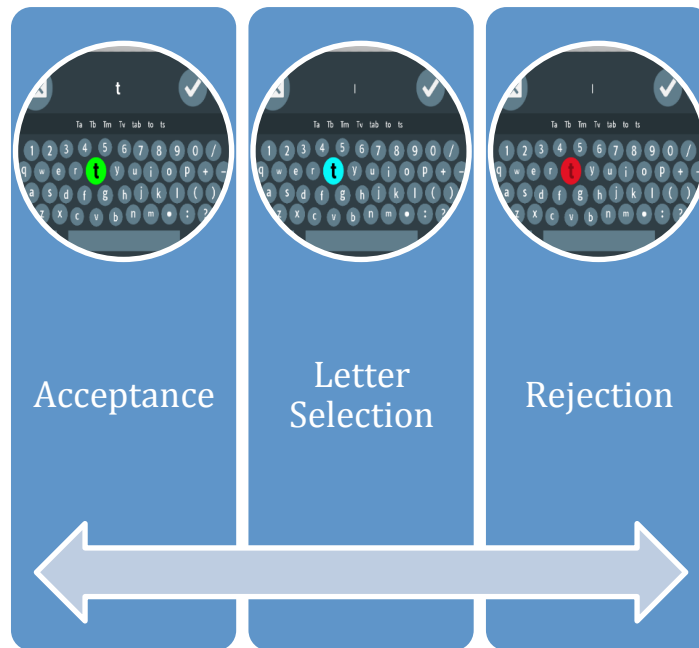


Figure 12. Correcting of typing errors

3.6 Source code

Every component of the system is open source and their code is available on the project's GitHub¹ page. The main repositories related to the current version of the MAMEM platform are

- **Persuasive-design-dashboard:** This project is the web application that is loaded on GazeTheWeb and parses the data logs of a user so as to inform how well he/she is performing.
- **GazeTheWeb:** This repository includes the web browser that allows accessing the web using eyes. It also includes the code for the software updater, a gaze-friendly Twitter client (Tweet) and a gaze-friendly YouTube client (Watch).
- **SensorLib:** Here lies the code for the dll library that handles sensor data acquisition and capturing as well as a subproject for testing the library.
- **Prototype-interfaces-training:** This includes the code for the web application that is used for GazeTheWeb training.
- **EEG-processing-toolbox:** This is the repository of the Matlab toolbox which contains algorithms for EEG, Eye-tracking and GSR signal analysis as well as the code for running on-line applications using LabStreamingLayer.
- **Javascript-tetris:** This includes the code for the online Tetris game which can be played by the MAMEM platform using EEG, Eye-tracking and GSR signals (Section 3.5.2).

¹ <https://github.com/MAMEM/>

4 Technical validation and verification tests

The technical validation and verification of the MAMEM platform is described on this section. It consists of two stages, (a) testing of each subcomponent individually and (b) testing the integrated system in different environments e.g. PCs from different cohorts.

The initial stage is described in Section 4.1 and refers to the analysis of the test requirements for each subcomponent of the system. These requirements were validated by the technical person who was responsible for the development of each component, since a certain level of technical expertise was required for the proper execution of the test plan. The parts that are most critical to the integration were merged into one single test plan for validating the integrated system. This test plan is described in Section 4.2 and was executed by multiple testers, different computers and environments like for instance the CERTH's laboratory in Greece and the SHEBA hospital in Tel Aviv. This was to identify bugs that could only arise when using a different system (e.g. using an OS in Hebrew language), or for instance a slow internet connection.

The test plan included step by step instructions as well as the expected result of each action, and the tester was asked to report a PASS or a FAIL whether the expected action occurred. A section for general remarks was also added in the end of the test plan in order to allow the tester to provide further explanation on the failed actions, if any, or to report additional problems that were encountered and were not foreseen by the test plan.

The next subsections contain the empty checklists that were provided to the testers while the testing results are reported in Appendix A. The results have only led to the discovery of minor issues that for the most part, were resolved. For the issues that couldn't be resolved, we have included guidelines on Section 6 on how to prevent them.

4.1 Testing of MAMEM subcomponents

4.1.1 GazeTheWeb

GazeTheWeb Test Plan			
Tester Name:			
Organization:			
Computer Specifications:			
Date:			
Step	Description	Expected Result	Test Result
Start Up	GazeTheWeb is added to the Windows autostart when installed through the MAMEM installer.	Calibration Screen is shown.	
Calibrate (Calibration Screen)	Check whether your eyes are shown in lower preview on the left. If you can see your eyes, select Calibrate on the right side.	MyGaze calibration process is executed. Fixate the dot to calibrate the eye-tracker.	
Close (Calibration screen)	After calibration, check the quality in the upper left panel of the calibration screen. If it looks ok, select Close.	GazeTheWeb front interface is shown and user can start with browsing.	
Pause	On the upper left is a global pause button, which pauses all input.	No interface interaction when pause is selected.	
Tab Overview	Select Tab Overview button in the left panel.	Tab Overview opens.	
Edit URL (Tab Overview)	Select Edit URL.	URL editing screen opens.	
Mark Bookmark (Tab Overview)	Select Mark Bookmark.	The current page is marked as bookmark and the star symbol on the button is coloured in yellow.	
Remove Tab (Tab Overview)	Select Remove Tab.	Removes the current tab.	
Reload Tab (Tab Overview)	Select Reload Tab.	Reloads the current tab.	

Bookmarks (URL input)	Select Bookmarks.	Bookmarks screen opens.	
Select Tab (Tab Overview)	Select Tab.	It is switched to another open tab.	
Add Tab (Tab Overview)	Select Add Tab.	Another tab is opened.	
History (Tab Overview)	Select History.	History screen is opened.	
Back	Select Back.	Previous page is loaded, if available.	
Forward	Select Forward.	Next page is loaded, if user went back before.	
Award	Select Award.	Opens dashboard page.	
To Top	Select To Top.	Page is scrolled to the top.	
Click Emulation	Select Click Emulation.	Click emulation is performed on the Web page.	
Zoom	Select Zoom.	Zoom on Web page is increased.	
Auto Scrolling	Select Auto Scrolling.	Scrolling sensors are hidden and the fixated page region is moved towards the center of the Web view.	
Text Selection	Select Text Selection.	Procedure for text selection is initiated and selected text is copied to internal clipboard.	
Settings	Select Settings.	Settings screen is opened.	
Data Transfer	Select Data Transfer.	Deactivates all logging through GazeTheWeb, both offline and online. If deactivated, the left panel is coloured in purple. Does not affect social logging.	
Scroll up	Focus Scroll up.	Scrolls the page up.	
Scroll down	Focus Scroll down.	Scrolls the page down.	
Closing Eyes for 30 seconds	User closes the eyes for 30 seconds or moves away from device.	A certain sound is played and the Calibration Screen from the start-up is shown again. Recalibration can be performed.	
T-Button on Web page	Select T-Button upon text input field on Web page.	Keyboard screen opens, and text input field can be filled.	
SelectField-Button on Web page	Select SelectField-Button upon select field on Web page.	Options screen opens, and it can be selected among the	

		available options.	
Play-Button on Web page	Select Play-Button upon video on Web page.	Video mode is entered.	
Globe (Keyboard)	Select Globe.	Language can be chosen.	
Paste (Keyboard)	Select Paste.	Text from internal clipboard can be inserted.	
Ok (Keyboard)	Select Ok.	Puts text into text input field.	
Submit (Keyboard)	Select Submit.	Puts text into text input field and submits it.	
Extra Keys (Keyboard)	Select Extra Keys.	Shows secondary keys with additionally letters.	
Play (Video Mode)	Select Play.	Plays video.	
Pause (Video Mode)	Select Pause.	Pauses video and shows forward / back controls on top of video.	
Volume Up (Video Mode)	Select Volume Up.	Increases the sound volume.	
Volume Down (Video Mode)	Select Volume Down.	Decreases the sound volume.	
Mute (Video Mode)	Select Mute.	Mutes the sound of the video.	
Exit (Video Mode)	Select Exit.	Closes Video Mode.	
10s back (Paused Video Mode)	Select 10s back.	Rewinds video 10 seconds.	
30s forward (Paused Video Mode)	Select 30s forward.	Forwards video 30 seconds.	
General Comments/Remarks:			

4.1.2 SensorLib

SensorLib Test Plan			
Tester Name:			
Organization:			
Computer Specifications:			
Date:			
Step	Description	Expected Result	Test Result
Eye-tracker data connection and recording	Start GazeTheWeb. Start SensorLib client. Wait 30 seconds and then terminate client	MyGaze stream should appear on the console as connected. A file with suffix myGazeLSL should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	
GazeTheWeb events connection and recording	Start GazeTheWeb. Start SensorLib client. Open the keyboard by selecting the search input field on the homepage. Type a few characters. Terminate all applications.	GazeTheWebOutput stream should appear on the console as connected. A file with suffix GazeTheWebOutput should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	
Enobio connection and recording	Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then start the protocol. Start SensorLib client. Wait 30 seconds and then terminate client	Enobio stream should appear on the console as connected. A file with suffix Enobio should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	
Shimmer connection and recording	Pair Shimmer with bluetooth. Start SensorLib client. Wait 30 seconds and then terminate client.	Shimmer stream should appear on the console as connected. A file with suffix Shimmer should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	
All sensors connection and recording	Start GazeTheWeb. Turn on Enobio headset. Start NIC application. Press use	All sensors should be listed as connected to the console. A file for each stream should be	

	Bluetooth device and then start the protocol. Pair Shimmer with bluetooth. Wait 30 seconds and then terminate client	generated under C:\sensordata (4 files total). Check if all the files can be opened with Sigviewer or Matlab	
Eye-tracker delayed connection	Start SensorLib client. Start GazeTheWeb after 10 seconds. Wait 30 seconds and then terminate client	MyGaze stream should appear on the console as connected. A file with suffix myGazeLSL should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	
GazeTheWeb events delayed connection	Start SensorLib client. Start GazeTheWeb after 10 seconds. Open the keyboard by selecting the search input field on the homepage. Type a few characters. Terminate all applications.	GazeTheWebOutput stream should appear on the console as connected. A file with suffix GazeTheWebOutput should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	
Enobio delayed connection	Start SensorLib client. Wait 10 seconds. Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then start the protocol. Wait 30 seconds and then terminate client	Enobio stream should appear on the console as connected. A file with suffix Enobio should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	
Shimmer delayed connection	Start SensorLib client. Wait 10 seconds. Pair Shimmer with bluetooth. Wait 30 seconds and then terminate client	Shimmer stream should appear on the console as connected. A file with suffix Shimmer should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	
All sensors delayed connection	Start SensorLib client. Wait 10 seconds. Start GazeTheWeb. Open the keyboard by selecting the search input field on the homepage. Type a few characters. Turn on Enobio headset. Start NIC application. Press use Bluetooth device and	All sensors should be listed as connected to the console. A file for each stream should be generated under C:\sensordata (4 files total). Check if all the files can be opened with Sigviewer or Matlab	

	then start the protocol. Pair Shimmer with bluetooth. Wait 30 seconds and then terminate client.		
Eye-tracker unexpected disconnect-reconnect 1/2	Start SensorLib client. Start GazeTheWeb. Wait 30 seconds and remove the eye-tracker from the USB port. Wait 30 seconds and reconnect eye-tracker to the USB port. Wait 30 seconds and terminate all applications	2 files should be generated under C:\sensordata with suffix myGazeLSL. Check if they can be opened with Sigviewer or Matlab. Check if the duration of both files is larger than 20 seconds.	
Eye-tracker unexpected disconnect-reconnect 2/2	Start SensorLib client. Start GazeTheWeb. Wait 30 seconds and terminate GazeTheWeb. Wait 30 seconds and re-open GazeTheWeb. Wait 30 seconds and terminate all applications.	2 files should be generated under C:\sensordata with suffix myGazeLSL. Check if they can be opened with Sigviewer or Matlab. Check if the duration of both files is larger than 20 seconds.	
GazeTheWeb events unexpected disconnect-reconnect	Start SensorLib client. Start GazeTheWeb. Open the keyboard by selecting the search input field on the homepage. Type a few characters. Exit GazeTheWeb. Wait 30 seconds and re-open GazeTheWeb. Open the keyboard by selecting the search input field on the homepage. Type a few characters. Terminate all applications.	2 files should be generated under C:\sensordata with suffix GazeTheWebOutput. Check if they can be opened with Sigviewer or Matlab. Check if the key events are properly logged.	
Enobio unexpected disconnect-reconnect 1/2	Start SensorLib client. Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then start the protocol. Wait 30 seconds and then exit NIC application. Wait 30 seconds and then re-open NIC application. Press use Bluetooth device and then	2 files should be generated under C:\sensordata with suffix Enobio. Check if they can be opened with Sigviewer or Matlab. Check if the duration of both files is larger than 20 seconds.	

	start the protocol. Terminate all applications after 30 seconds		
Enobio unexpected disconnect-reconnect 2/2	Start SensorLib client. Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then start the protocol. Wait 30 seconds and then turn off the EEG headset. Wait 30 seconds and then turn on the EEG headset. Wait 30 seconds and terminate all applications	2 files should be generated under C:\sensordata with suffix Enobio. Check if they can be opened with Sigviewer or Matlab. Check if the duration of both files is larger than 20 seconds.	
Shimmer unexpected disconnect-reconnect	Start SensorLib client. Wait 10 seconds. Pair Shimmer with Bluetooth. Wait 30 seconds and then turn off Shimmer. Wait 30 seconds and then turn on Shimmer. Repair Shimmer with Bluetooth. Wait 30 seconds and terminate all applications	2 files should be generated under C:\sensordata with suffix Shimmer. Check if they can be opened with Sigviewer or Matlab.	
Eye-tracker start-pause-restart	Start SensorLib client. Start GazeTheWeb. Wait 30 seconds. Pause recording. Wait 30 seconds. Start recording. Wait 30 seconds. Terminate all applications	2 files should be generated under C:\sensordata with suffix myGazeLSL. Check if they can be opened with Sigviewer or Matlab	
GazeTheWeb events start-pause-restart	Start SensorLib client. Start GazeTheWeb and type a few characters on the homepage input text field. Wait 30 seconds. Pause recording. Wait 30 seconds. Start recording and type a few characters on the homepage input text field. Wait 30 seconds. Terminate all applications	2 files should be generated under C:\sensordata with suffix GazeTheWebOutput. Check if they can be opened with Sigviewer or Matlab	
Enobio start-pause-restart	Start SensorLib client. Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then	2 files should be generated under C:\sensordata with suffix Enobio. Check if they can be opened with Sigviewer or	

	start the protocol. Wait 30 seconds and then pause recording. Wait 30 seconds and then restart recording. Wait 30 seconds and terminate all applications	Matlab	
Shimmer start-pause-restart	Start SensorLib client. Pair shimmer with Bluetooth. Wait 30 seconds and pause recording. Wait 30 seconds and then restart recording. Wait 30 seconds and then terminate all applications.	2 files should be generated under C:\sensordata with suffix Shimmer. Check if they can be opened with Sigviewer or Matlab	
All sensors start-pause-restart	Start SensorLib client. Start GazeTheWeb. Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then start the protocol. Pair shimmer with Bluetooth. Type a few characters in the homepage input field. Wait 30 seconds and then pause recording. Wait 30 seconds and then restart recording. Type a few characters in the homepage input field. Wait 30 seconds and terminate all applications	2 files for each stream should be generated under C:\sensordata. Check if they can be opened with Sigviewer or Matlab	
General Comments/Remarks:			

4.1.3 Persuasive Design dashboard

Persuasive Design Dashboard Test Plan			
Tester Name:			
Organization:			
Computer Specifications:			
Date:			
Step	Description	Expected Result	Test Result
Register	Go to http://augreal.mklab.itigr/mamem/gtw-home/register.html and fill in the information to register. Keep your E-mail and Password somewhere.	You will be redirected to a screen that features your registered E-mail and password	
Install GTW	Run the MAMEM platform installer and add the E-mail and Password when asked.	Installation successful	
Become a Facebook app Tester	Send an e-mail to tpapazoglou@iti.gr and ask him for facebook app permission. After you have been granted go to: https://developers.facebook.com/apps/340229343095066/dashboard/ Click on Roles, and add yourself as a tester clicking on Add Tester button		
Open GTW in Dashboard page	Double click on GTW	GTW opens the Dashboard page	
Click on login with facebook	Click on login with facebook	After a few seconds, the Dashboard will be loaded.	
Click on login without facebook	Click on login without facebook	After a few seconds, the Dashboard will be loaded.	
Test Help button	Click on the HELP button	A window should launch with information about getting help	

Test profile screen functionality	Click on the PROFILE button.	It will redirect you to a profile editor. Change your information if needed and click on save changes, or hit cancel to return to previous screen.	
Test training connectivity from dashboard	Click on the TRAINING button	It will redirect you to the training software page. Check if your nickname appears in the top right corner	
Finish a level on the training software	Finish a level on the training software. For example, the first from basic.	When the level finishes you should get back to overview. Then load the Dashboard again.	
Check Training summary	See that a circle in the Training summary is now colored and the percentage should not be 0%.		
Check details	See the information on the details panel. Check if there are any errors, or NaN values somewhere.	The score should have nominal values from the third day of using the dashboard.	
Check that task popup works	Click on a task button (e.g.: E-mail)	A popup should appear, with a list of webpage(s)	
Check graph	Click on the GRAPHS tab button. And then switch between basic categories and all categories. Check for errors or NaN values.	The graph should have nominal values from the second day of using the dashboard.	
GENERAL – language	Was the dashboard translated to your language based on your initial option in the registration/profile?		
General Comments/Remarks:			

4.2 Integration testing

Integrated System Test Plan			
Tester Name:			
Organization:			
Computer Specifications:			
Date:			
Step	Description	Expected Result	Test Result
Register	Go to http://augreal.mklab.it.gr/mamem/gtw-home/register.html and fill in the information to register. Keep your E-mail and Password somewhere.	You will be redirected to a screen that features your registered E-mail and password	
Installation	Run the MAMEM platform installer and add the E-mail and Password when asked. Use the default settings for the rest.	MAMEM platform should be installed under Users/[User]/AppData/Roaming/MAMEM platform/	
Run/update GTW	Run the MAMEM platform (shortcut lies inside start menu).	On first run GazeTheWeb should update from 0.7 version to 0.8. Ensure that version is indeed 0.8 as shown on the bottom right of the screen.	
Test autostart	Terminate all applications and restart the computer	GazeTheWeb should run automatically on system startup	
Calibration	Check whether your eyes are shown in lower preview on the left. If you can see your eyes, select Calibrate on the right side.	MyGaze calibration process is executed. Fixate the dot to calibrate the eye-tracker.	
Close (Calibration screen)	After calibration, check the quality in the upper left panel of the calibration screen. If it looks ok, select Close.	GazeTheWeb front interface is shown and user can start with browsing.	
Pause	On the upper left is a	No interface interaction when	

	global pause button, which pauses all input.	pause is selected.	
Add a new tab	Select Tab Overview button in the left panel.	Tab Overview opens.	
Add Tab (Tab Overview)	Select Add Tab.	Another tab is opened.	
Edit URL (Tab Overview)	Select Edit URL.	URL editing screen opens.	
Keyboard	Type www.google.com using the on-screen keyboard	Google webpage should load	
Data transfer	Select the pause data transfer button.	Data transfer paused message should appear.	
Data check	Check whether a sensordata folder is generated under C:\. Then check if data files are generated.	At least 2 files should be generated for the eye-tracker and events (if no other device is connected to the system). Try to open them using Sigviewer or Matlab	
Data transfer 2	Go back to GTW and pause resume data transfer multiple times	Generation of files for each resume is not guaranteed, but make sure that GTW does not crash	
Data transfer 3	Go back to GTW and pause resume data transfer multiple times but wait 10 seconds between each pause & resume	A number of files equal to the number of resumes should be generated (at least for the eye-tracker and events stream)	
Data transfer 4	Close GTW while data transfer is on	Check if the files are not corrupted and GTW does not crash.	
Data transfer 5	Close GTW while data transfer is off	Check if the files are not corrupted and GTW does not crash.	
Data transfer 6	Remove the eye-tracker while transfer is on. Then close GTW	Check if the eye-tracker data file is not corrupt. Check if GTW crashes in the process	
Data transfer 7	Remove the eye-tracker while transfer is on. Re-connect the eye-tracker after 1 minute	There should be either 1 eye-tracker data file of the whole duration filled with zeros or 2 separate files. No crashes should occur	
Become a Facebook app Tester	Send an e-mail to tpapazoglou@iti.gr and ask him for facebook app permission. After you have been granted go to:		

	https://developers.facebook.com/apps/340229343095066/dashboard/ Click on Roles, and add yourself as a tester clicking on Add Tester button		
Open GTW in Dashboard page	Double click on GTW	GTW opens the Dashboard page	
Click on login with facebook	Click on login with facebook	After a few seconds, the Dashboard will be loaded.	
Click on login without facebook	Click on login without facebook	After a few seconds, the Dashboard will be loaded.	
Test Help button	Click on the HELP button	A window should launch with information about getting help	
Test profile screen functionality	Click on the PROFILE button.	It will redirect you to a profile editor. Change your information if needed and click on save changes, or hit cancel to return to previous screen.	
Test training connectivity from dashboard	Click on the TRAINING button	It will redirect you to the training software page. Check if your nickname appears in the top right corner	
Finish a level on the training software	Finish a level on the training software. For example the first from basic.	When the level finishes you should get back to overview. Then load the Dashboard again.	
Check Training summary	See that a circle in the Training summary is now colored and the percentage should not be 0%.		
Check details	See the information on the details panel. Check if there are any errors, or NaN values somewhere.	The score should have nominal values from the third day of using the dashboard.	
Check that task popup works	Click on a task button (e.g.: E-mail)	A popup should appear, with a list of webpage(s)	
Check graph	Click on the GRAPHS tab button. And then switch between basic categories and all	The graph should have nominal values from the second day of using the dashboard.	

	categories. Check for errors or NaN values.		
GENERAL – language	Was the dashboard translated to your language based on your initial option in the registration/profile?		
General Comments/Remarks:			

5 Troubleshooting and FAQ

Problem	Solution
Eye-tracker cannot find eyes.	Avoid light sources which might reflect on your eyes and distract the eye-tracker, e.g. lamps or windows. If the eye-tracker infra-red lights are off, try to restart the system.
Focused buttons do not react, but nearby ones do.	The eye-tracker calibration might be off. Try to recalibrate the eye-tracker in GazeTheWeb.
Web page does not load.	Check your internet connection.
Text input button is not correctly placed on Web page.	Try to reload the page.
Web view is black.	Add a tab in Tab overview.
Web page displays to deactivate the Ad blocker.	Go to settings and deactivate Ad blocking.
Eye-tracker stays on after closing GazeTheWeb.	Wait for some seconds. If eye-tracker still stays on, go to Task Manager and terminate the myGaze Server process.
Auth/invalid e-mail stated when launching GTW	Make sure that you possess an account and have inserted the correct credentials during installation. The account can be changed by re-installing the platform.
Enobio connection problems	Most connection problems (e.g. running out of battery during recording) can be resolved by turning off all applications including the headset and trying again.
Shimmer connection problems	Delete Shimmer from Bluetooth devices and pair again while also turning the device off and on.

6 References

- [1] Sanderson, Conrad, and Ryan Curtin. "Armadillo: a template-based C++ library for linear algebra." *Journal of Open Source Software* (2016).
- [2] <http://sigpack.sourceforge.net/>

A Appendix

A.1. System Testing Results

A.1.1 GazeTheWeb

GazeTheWeb Test Plan			
Tester Name:	Raphael Menges		
Organization:	UKOB		
Computer Specifications:	Unknown		
Date:	2/2/2018		
Step	Description	Expected Result	Test Result
Start Up	GazeTheWeb is added to the Windows autostart when installed through the MAMEM installer.	Calibration Screen is shown.	PASS
Calibrate (Calibration Screen)	Check whether your eyes are shown in lower preview on the left. If you can see your eyes, select Calibrate on the right side.	MyGaze calibration process is executed. Fixate the dot to calibrate the eye-tracker.	PASS
Close (Calibration screen)	After calibration, check the quality in the upper left panel of the calibration screen. If it looks ok, select Close.	GazeTheWeb front interface is shown and user can start with browsing.	PASS
Pause	On the upper left is a global pause button, which pauses all input.	No interface interaction when pause is selected.	PASS
Tab Overview	Select Tab Overview button in the left panel.	Tab Overview opens.	PASS
Edit URL (Tab Overview)	Select Edit URL.	URL editing screen opens.	PASS
Mark Bookmark (Tab Overview)	Select Mark Bookmark.	The current page is marked as bookmark and the star symbol on the button is coloured in yellow.	PASS
Remove Tab (Tab Overview)	Select Remove Tab.	Removes the current tab.	PASS
Reload Tab (Tab Overview)	Select Reload Tab.	Reloads the current tab.	PASS

Overview)			
Bookmarks (URL input)	Select Bookmarks.	Bookmarks screen opens.	PASS
Select Tab (Tab Overview)	Select Tab.	It is switched to another open tab.	PASS
Add Tab (Tab Overview)	Select Add Tab.	Another tab is opened.	PASS
History (Tab Overview)	Select History.	History screen is opened.	PASS
Back	Select Back.	Previous page is loaded, if available.	PASS
Forward	Select Forward.	Next page is loaded, if user went back before.	PASS
Award	Select Award.	Opens dashboard page.	PASS
To Top	Select To Top.	Page is scrolled to the top.	PASS
Click Emulation	Select Click Emulation.	Click emulation is performed on the Web page.	PASS
Zoom	Select Zoom.	Zoom on Web page is increased.	PASS
Auto Scrolling	Select Auto Scrolling.	Scrolling sensors are hidden and the fixated page region is moved towards the center of the Web view.	PASS
Text Selection	Select Text Selection.	Procedure for text selection is initiated and selected text is copied to internal clipboard.	PASS
Settings	Select Settings.	Settings screen is opened.	PASS
Data Transfer	Select Data Transfer.	Deactivates all logging through GazeTheWeb, both offline and online. If deactivated, the left panel is coloured in purple. Does not affect social logging.	PASS
Scroll up	Focus Scroll up.	Scrolls the page up.	PASS
Scroll down	Focus Scroll down.	Scrolls the page down.	PASS
Closing Eyes for 30 seconds	User closes the eyes for 30 seconds or moves away from device.	A certain sound is played and the Calibration Screen from the start-up is shown again. Recalibration can be performed.	PASS
T-Button on Web page	Select T-Button upon text input field on Web page.	Keyboard screen opens, and text input field can be filled.	PASS
SelectField-Button on Web page	Select SelectField-Button upon select field on Web page.	Options screen opens, and it can be selected among the	PASS

		available options.	
Play-Button on Web page	Select Play-Button upon video on Web page.	Video mode is entered.	PASS
Globe (Keyboard)	Select Globe.	Language can be chosen.	PASS
Paste (Keyboard)	Select Paste.	Text from internal clipboard can be inserted.	PASS
Ok (Keyboard)	Select Ok.	Puts text into text input field.	PASS
Submit (Keyboard)	Select Submit.	Puts text into text input field and submits it.	PASS
Extra Keys (Keyboard)	Select Extra Keys.	Shows secondary keys with additionally letters.	PASS
Play (Video Mode)	Select Play.	Plays video.	PASS
Pause (Video Mode)	Select Pause.	Pauses video and shows forward / back controls on top of video.	PASS
Volume Up (Video Mode)	Select Volume Up.	Increases the sound volume.	PASS
Volume Down (Video Mode)	Select Volume Down.	Decreases the sound volume.	PASS
Mute (Video Mode)	Select Mute.	Mutes the sound of the video.	PASS
Exit (Video Mode)	Select Exit.	Closes Video Mode.	PASS
10s back (Paused Video Mode)	Select 10s back.	Rewinds video 10 seconds.	PASS
30s forward (Paused Video Mode)	Select 30s forward.	Forwards video 30 seconds.	PASS
General Comments/Remarks:			

A.1.2 SensorLib

SensorLib Test Plan			
Tester Name:	Georgios Liaros		
Organization:	CERTH		
Computer Specifications:	Dell, i7-6700HQ 2.6 GHz, 16GB RAM, W10		
Date:	9/2/2018		
Step	Description	Expected Result	Test Result
Eye-tracker data connection and recording	Start GazeTheWeb. Start SensorLib client. Wait 30 seconds and then terminate client	MyGaze stream should appear on the console as connected. A file with suffix myGazeLSL should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	PASS
GazeTheWeb events connection and recording	Start GazeTheWeb. Start SensorLib client. Open the keyboard by selecting the search input field on the homepage. Type a few characters. Terminate all applications.	GazeTheWebOutput stream should appear on the console as connected. A file with suffix GazeTheWebOutput should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	PASS
Enobio connection and recording	Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then start the protocol. Start SensorLib client. Wait 30 seconds and then terminate client	Enobio stream should appear on the console as connected. A file with suffix Enobio should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	PASS
Shimmer connection and	Pair Shimmer with	Shimmer stream should	PASS

recording	bluetooth. Start SensorLib client. Wait 30 seconds and then terminate client.	appear on the console as connected. A file with suffix Shimmer should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	
All sensors connection and recording	Start GazeTheWeb. Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then start the protocol. Pair Shimmer with bluetooth. Wait 30 seconds and then terminate client	All sensors should be listed as connected to the console. A file for each stream should be generated under C:\sensordata (4 files total). Check if all the files can be opened with Sigviewer or Matlab	PASS
Eye-tracker delayed connection	Start SensorLib client. Start GazeTheWeb after 10 seconds. Wait 30 seconds and then terminate client	MyGaze stream should appear on the console as connected. A file with suffix myGazeLSL should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	PASS
GazeTheWeb events delayed connection	Start SensorLib client. Start GazeTheWeb after 10 seconds. Open the keyboard by selecting the search input field on the homepage. Type a few characters. Terminate all applications.	GazeTheWebOutput stream should appear on the console as connected. A file with suffix GazeTheWebOutput should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	PASS
Enobio delayed connection	Start SensorLib client. Wait 10 seconds. Turn on Enobio headset. Start NIC applicatoin. PPress use Bluetooth	Enobio stream should appear on the console as connected. A file with suffix Enobio should be recorded under C:\sensordata. Check if the file can be opened with	PASS

	device and then start the protocol. Wait 30 seconds and then terminate client	Sigviewer or Matlab	
Shimmer delayed connection	Start SensorLib client. Wait 10 seconds. Pair Shimmer with bluetooth. Wait 30 seconds and then terminate client	Shimmer stream should appear on the console as connected. A file with suffix Shimmer should be recorded under C:\sensordata. Check if the file can be opened with Sigviewer or Matlab	PASS
All sensors delayed connection	Start SensorLib client. Wait 10 seconds. Start GazeTheWeb. Open the keyboard by selecting the search input field on the homepage. Type a few characters. Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then start the protocol. Pair Shimmer with bluetooth. Wait 30 seconds and then terminate client.	All sensors should be listed as connected to the console. A file for each stream should be generated under C:\sensordata (4 files total). Check if all the files can be opened with Sigviewer or Matlab	PASS
Eye-tracker unexpected disconnect-reconnect 1/2	Start SensorLib client. Start GazeTheWeb. Wait 30 seconds and remove the eye-tracker from the USB port. Wait 30 seconds and reconnect eye-tracker to the USB port. Wait 30 seconds and terminate all applications	A file should be generated under C:\sensordata with suffix myGazeLSL. Check if they can be opened with Sigviewer or Matlab. A gap in time_stamps signal should appear for the period the eye-tracker was disconnected	PASS

<p>Eye-tracker unexpected disconnect-reconnect 2/2</p>	<p>Start SensorLib client. Start GazeTheWeb. Wait 30 seconds and terminate GazeTheWeb. Wait 30 seconds and re-open GazeTheWeb. Wait 30 seconds and terminate all applications.</p>	<p>2 files should be generated under C:\sensordata with suffix myGazeLSL. Check if they can be opened with Sigviewer or Matlab. Check if the duration of both files are larger than 20 seconds.</p>	<p>PASS</p>
<p>GazeTheWeb events unexpected disconnect-reconnect</p>	<p>Start SensorLib client. Start GazeTheWeb. Open the keyboard by selecting the search input field on the homepage. Type a few characters. Exit GazeTheWeb. Wait 30 seconds and re-open GazeTheWeb. Open the keyboard by selecting the search input field on the homepage. Type a few characters. Terminate all applications.</p>	<p>2 files should be generated under C:\sensordata with suffix GazeTheWebOutput. Check if they can be opened with Sigviewer or Matlab. Check if the key events are properly logged.</p>	<p>PASS</p>
<p>Enobio unexpected disconnect-reconnect 1/2</p>	<p>Start SensorLib client. Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then start the protocol. Wait 30 seconds and then exit NIC application. Wait 30 seconds and then re-open NIC</p>	<p>2 files should be generated under C:\sensordata with suffix Enobio. Check if they can be opened with Sigviewer or Matlab. Check if the duration of both files is larger than 20 seconds.</p>	<p>FAIL -> Can't reconnect after exiting NIC. Enobio should be turned off and on before a new connection.</p>

	<p>application. Press use Bluetooth device and then start the protocol. Terminate all applications after 30 seconds</p>		
<p>Enobio unexpected disconnect-reconnect 2/2</p>	<p>Start SensorLib client. Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then start the protocol. Wait 30 seconds and then turn off the EEG headset. Wait 30 seconds and then turn on the EEG headset. Wait 30 seconds and terminate all applications</p>	<p>2 files should be generated under C:\sensordata with suffix Enobio. Check if they can be opened with Sigviewer or Matlab. Check if the duration of both files is larger than 20 seconds.</p>	<p>FAIL -> Only 1 file is generated, after reconnecting the signal is lost. Had to restart all applications</p>
<p>Shimmer unexpected disconnect-reconnect</p>	<p>Start SensorLib client. Wait 10 seconds. Pair Shimmer with bluetooth. Wait 30 seconds and then turn off Shimmer. Wait 30 seconds and then turn on Shimmer. Repair Shimmer with bluetooth. Wait 30 seconds and terminate all applications</p>	<p>2 files should be generated under C:\sensordata with suffix Shimmer. Check if they can be opened with Sigviewer or Matlab.</p>	<p>FAIL -> Data file before disconnection are OK. Data after reconnection are lost.</p>
<p>Eye-tracker start-pause-restart</p>	<p>Start SensorLib client. Start GazeTheWeb. Wait 30 seconds. Pause recording. Wait 30 seconds. Start recording. Wait 30 seconds.</p>	<p>2 files should be generated under C:\sensordata with suffix myGazeLSL. Check if they can be opened with Sigviewer or Matlab</p>	<p>PASS</p>

	Terminate all applications		
GazeTheWeb events start-pause-restart	Start SensorLib client. Start GazeTheWeb and type a few characters on the homepage input text field. Wait 30 seconds. Pause recording. Wait 30 seconds. Start recording and type a few characters on the homepage input text field. Wait 30 seconds. Terminate all applications	2 files should be generated under C:\sensordata with suffix GazeTheWebOutput. Check if they can be opened with Sigviewer or Matlab	PASS
Enobio start-pause-restart	Start SensorLib client. Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then start the protocol. Wait 30 seconds and then pause recording. Wait 30 seconds and then restart recording. Wait 30 seconds and terminate all applications	2 files should be generated under C:\sensordata with suffix Enobio. Check if they can be opened with Sigviewer or Matlab	PASS
Shimmer start-pause-restart	Start SensorLib client. Pair shimmer with bluetooth. Wait 30 seconds and pause recording. Wait 30 seconds and then restart recording. Wait 30 seconds and then terminate all applications.	2 files should be generated under C:\sensordata with suffix Shimmer. Check if they can be opened with Sigviewer or Matlab	PASS

<p>All sensors start-pause-restart</p>	<p>Start SensorLib client. Start GazeTheWeb. Turn on Enobio headset. Start NIC application. Press use Bluetooth device and then start the protocol. PAir shimmer with bluetooth. Type a few characters in the homepage input field. Wait 30 seconds and then pause recording. Wait 30 seconds and then restart recording. Type a few characters in the homepage input field. Wait 30 seconds and terminate all applications</p>	<p>2 files for each stream should be generated under C:\sensordata. Check if they can be opened with Slgviewer or Matlab</p>	<p>PASS</p>
<p>General Comments/Remarks:</p>			

A.1.3 Persuasive Design dashboard

Persuasive Design Dashboard Test Plan			
Tester Name:	Tasos Papazoglou		
Organization:	CERTH		
Computer Specifications:	i5-3570k @ 3.4 GHz, 16GB RAM, W10		
Date:	7/2/2018		
Step	Description	Expected Result	Test Result
Register	Go to http://augreal.mklab.itigr/mamem/gtw-home/register.html and fill in the information to register. Keep your E-mail and Password somewhere.	You will be redirected to a screen that features your registered E-mail and password	PASS
Install GTW	Run the MAMEM platform installer and add the E-mail and Password when asked.	Installation successful	PASS
Become a Facebook app Tester	Send an e-mail to tpapazoglou@iti.gr and ask him for facebook app permission. After you have been granted go to: https://developers.facebook.com/apps/340229343095066/dashboard/ Click on Roles, and add yourself as a tester clicking on Add Tester button		PASS
Open GTW in Dashboard page	Double click on GTW	GTW opens the Dashboard page	PASS
Click on login with facebook	Click on login with facebook	After a few seconds, the Dashboard will be loaded.	
Click on login without facebook	Click on login without facebook	After a few seconds, the Dashboard will be loaded.	PASS

Test Help button	Click on the HELP button	A window should launch with information about getting help	
Test profile screen functionality	Click on the PROFILE button.	It will redirect you to a profile editor. Change your information if needed and click on save changes, or hit cancel to return to previous screen.	PASS
Test training connectivity from dashboard	Click on the TRAINING button	It will redirect you to the training software page. Check if your nickname appears in the top right corner	PASS
Finish a level on the training software	Finish a level on the training software. For example, the first from basic.	When the level finishes you should get back to overview. Then load the Dashboard again.	PASS
Check Training summary	See that a circle in the Training summary is now colored and the percentage should not be 0%.		PASS
Check details	See the information on the details panel. Check if there are any errors, or NaN values somewhere.	The score should have nominal values from the third day of using the dashboard.	PASS
Check that task popup works	Click on a task button (e.g.: E-mail)	A popup should appear, with a list of webpage(s)	PASS
Check graph	Click on the GRAPHS tab button. And then switch between basic categories and all categories. Check for errors or NaN values.	The graph should have nominal values from the second day of using the dashboard.	PASS
GENERAL – language	Was the dashboard translated to your language based on your initial option in the registration/profile?		PASS
General Comments/Remarks:	- Login with facebook and HELP button not implemented yet.		

A.1.4 Integrated system

Integrated System Test Plan			
Tester Name:	Raphael Menges		
Organization:	UKOB		
Computer Specifications :	Lenovo, i5 2.3 GHz, 8GB RAM, W10		
Date:	14/02/2018		
Step	Description	Expected Result	Test Result
Register	Go to http://augreal.mklab.it/iti.gr/mamem/gtw-home/register.html and fill in the information to register. Keep your E-mail and Password somewhere.	You will be redirected to a screen that features your registered E-mail and password	PASS
Installation	Run the MAMEM platform installer and add the E-mail and Password when asked. Use the default settings for the rest.	MAMEM platform should be installed under Users/[User]/AppData/Roaming/MAMEM platform/	PASS
Run/update GTW	Run the MAMEM platform (shortcut lies inside start menu).	On first run GazeTheWeb should update from 0.7 version to 0.8. Ensure that version is indeed 0.8 as shown on the bottom right of the screen.	PASS
Test autostart	Terminate all applications and restart the computer	GazeTheWeb should run automatically on system startup	PASS

Calibration	Check whether your eyes are shown in lower preview on the left. If you can see your eyes, select Calibrate on the right side.	MyGaze calibration process is executed. Fixate the dot to calibrate the eye-tracker.	PASS
Close (Calibration screen)	After calibration, check the quality in the upper left panel of the calibration screen. If it looks ok, select Close.	GazeTheWeb front interface is shown and user can start with browsing.	PASS
Pause	On the upper left is a global pause button, which pauses all input.	No interface interaction when pause is selected.	PASS
Add a new tab	Select Tab Overview button in the left panel.	Tab Overview opens.	PASS
Add Tab (Tab Overview)	Select Add Tab.	Another tab is opened.	PASS
Edit URL (Tab Overview)	Select Edit URL.	URL editing screen opens.	PASS
Keyboard	Type www.google.com using the on-screen keyboard	Google webpage should load	PASS
Data transfer	Select the pause data transfer button.	Data transfer paused message should appear.	PASS
Data check	Check whether a sensordata folder is generated under C:\. Then check if data files are generated.	At least 2 files should be generated for the eye-tracker and events (if no other device is connected to the system). Try to open them using Sigviewer or Matlab	PASS
Data transfer 2	Go back to GTW and pause resume data transfer multiple times	Generation of files for each resume is not guaranteed, but make sure that GTW does not crash	PASS
Data transfer 3	Go back to GTW and pause resume data transfer multiple times but wait 10 seconds	A number of files equal to the number of resumes should be generated (at least for the eye-tracker and events stream)	PASS

	between each pause & resume		
Data transfer 4	Close GTW while data transfer is on	Check if the files are not corrupted and GTW does not crash.	PASS
Data transfer 5	Close GTW while data transfer is off	Check if the files are not corrupted and GTW does not crash.	PASS
Data transfer 6	Remove the eye-tracker while transfer is on. Then close GTW	Check if the eye-tracker data file is not corrupt. Check if GTW crashes in the process	PASS
Data transfer 7	Remove the eye-tracker while transfer is on. Re-connect the eye-tracker after 1 minute	There should be either 1 eye-tracker data file of the whole duration filled with zeros or 2 separate files. No crashes should occur	PASS
Become a Facebook app Tester	Send an e-mail to tpapazoglou@iti.gr and ask him for facebook app permission. After you have been granted go to: https://developers.facebook.com/apps/340229343095066/dashboard/ Click on Roles, and add yourself as a tester clicking on Add Tester button		
Open GTW in Dashboard page	Double click on GTW	GTW opens the Dashboard page	PASS
Click on login with facebook	Click on login with facebook	After a few seconds, the Dashboard will be loaded.	
Click on login without facebook	Click on login without facebook	After a few seconds, the Dashboard will be loaded.	PASS

Test Help button	Click on the HELP button	A window should launch with information about getting help	PASS
Test profile screen functionality	Click on the PROFILE button.	It will redirect you to a profile editor. Change your information if needed and click on save changes, or hit cancel to return to previous screen.	PASS
Test training connectivity from dashboard	Click on the TRAINING button	It will redirect you to the training software page. Check if your nickname appears in the top right corner	PASS
Finish a level on the training software	Finish a level on the training software. For example the first from basic.	When the level finishes you should get back to overview. Then load the Dashboard again.	PASS
Check Training summary	See that a circle in the Training summary is now colored and the percentage should not be 0%.		PASS
Check details	See the information on the details panel. Check if there are any errors, or NaN values somewhere.	The score should have nominal values from the third day of using the dashboard.	PASS
Check that task popup works	Click on a task button (e.g.: E-mail)	A popup should appear, with a list of webpage(s)	PASS
Check graph	Click on the GRAPHS tab button. And then switch between basic categories and all categories. Check for errors or NaN values.	The graph should have nominal values from the second day of using the dashboard.	PASS
GENERAL – language	Was the dashboard translated to your language based on your initial option in the registration/profile?		PASS
General Comments/R emarks:			

Integrated System Test Plan			
Tester Name:	Tasos Papazoglou		
Organization:	CERTH		
Computer Specifications :	i5-3570k @ 3.4 GHz, 16GB RAM, W10		
Date:	14/02/2018		
Step	Description	Expected Result	Test Result
Register	Go to http://augreal.mklab.it/gr/mamem/gtw-home/register.html and fill in the information to register. Keep your E-mail and Password somewhere.	You will be redirected to a screen that features your registered E-mail and password	PASS
Installation	Run the MAMEM platform installer and add the E-mail and Password when asked. Use the default settings for the rest.	MAMEM platform should be installed under Users/[User]/AppData/Roaming/MAMEM platform/	PASS
Run/update GTW	Run the MAMEM platform (shortcut lies inside start menu).	On first run GazeTheWeb should update from 0.7 version to 0.8. Ensure that version is indeed 0.8 as shown on the bottom right of the screen.	PASS
Test autostart	Terminate all applications and restart the computer	GazeTheWeb should run automatically on system startup	PASS
Calibration	Check whether your eyes are shown in lower preview on the left. If you can see your eyes, select Calibrate on the right side.	MyGaze calibration process is executed. Fixate the dot to calibrate the eye-tracker.	PASS

Close (Calibration screen)	After calibration, check the quality in the upper left panel of the calibration screen. If it looks ok, select Close.	GazeTheWeb front interface is shown and user can start with browsing.	PASS
Pause	On the upper left is a global pause button, which pauses all input.	No interface interaction when pause is selected.	PASS
Add a new tab	Select Tab Overview button in the left panel.	Tab Overview opens.	PASS
Add Tab (Tab Overview)	Select Add Tab.	Another tab is opened.	PASS
Edit URL (Tab Overview)	Select Edit URL.	URL editing screen opens.	PASS
Keyboard	Type www.google.com using the on-screen keyboard	Google webpage should load	PASS
Data transfer	Select the pause data transfer button.	Data transfer paused message should appear.	PASS
Data check	Check whether a sensordata folder is generated under C:\. Then check if data files are generated.	At least 2 files should be generated for the eye-tracker and events (if no other device is connected to the system). Try to open them using Sigviewer or Matlab	PASS
Data transfer 2	Go back to GTW and pause resume data transfer multiple times	Generation of files for each resume is not guaranteed, but make sure that GTW does not crash	PASS
Data transfer 3	Go back to GTW and pause resume data transfer multiple times but wait 10 seconds between each pause & resume	A number of files equal to the number of resumes should be generated (at least for the eye-tracker and events stream)	PASS

Data transfer 4	Close GTW while data transfer is on	Check if the files are not corrupted and GTW does not crash.	PASS
Data transfer 5	Close GTW while data transfer is off	Check if the files are not corrupted and GTW does not crash.	PASS
Data transfer 6	Remove the eye-tracker while transfer is on. Then close GTW	Check if the eye-tracker data file is not corrupt. Check if GTW crashes in the process	PASS
Data transfer 7	Remove the eye-tracker while transfer is on. Re-connect the eye-tracker after 1 minute	There should be either 1 eye-tracker data file of the whole duration filled with zeros or 2 separate files. No crashes should occur	PASS
Become a Facebook app Tester	Send an e-mail to tpapazoglou@iti.gr and ask him for facebook app permission. After you have been granted go to: https://developers.facebook.com/apps/340229343095066/dashboard/ Click on Roles, and add yourself as a tester clicking on Add Tester button		PASS
Open GTW in Dashboard page	Double click on GTW	GTW opens the Dashboard page	PASS
Click on login with facebook	Click on login with facebook	After a few seconds, the Dashboard will be loaded.	FAIL
Click on login without facebook	Click on login without facebook	After a few seconds, the Dashboard will be loaded.	PASS
Test Help button	Click on the HELP button	A window should launch with information about getting help	PASS
Test profile screen functionality	Click on the PROFILE button.	It will redirect you to a profile editor. Change your information if needed and click on save changes, or hit	PASS

		cancel to return to previous screen.	
Test training connectivity from dashboard	Click on the TRAINING button	It will redirect you to the training software page. Check if your nickname appears in the top right corner	PASS
Finish a level on the training software	Finish a level on the training software. For example the first from basic.	When the level finishes you should get back to overview. Then load the Dashboard again.	PASS
Check Training summary	See that a circle in the Training summary is now colored and the percentage should not be 0%.		PASS
Check details	See the information on the details panel. Check if there are any errors, or NaN values somewhere.	The score should have nominal values from the third day of using the dashboard.	PASS
Check that task popup works	Click on a task button (e.g.: E-mail)	A popup should appear, with a list of webpage(s)	PASS
Check graph	Click on the GRAPHS tab button. And then switch between basic categories and all categories. Check for errors or NaN values.	The graph should have nominal values from the second day of using the dashboard.	PASS
GENERAL – language	Was the dashboard translated to your language based on your initial option in the registration/profile?		PASS
General Comments/R emarks:	- Create a desktop shortcut on the installer should be checked by default		

Integrated System Test Plan			
Tester Name:	Georgios Liaros		
Organization:	CERTH		
Computer Specifications :	Dell, i7-6700HQ 2.6 GHz, 16GB RAM, W10		
Date:	13/02/2018		
Step	Description	Expected Result	Test Result
Register	Go to http://augreal.mklab.it/gr/mamem/gtw-home/register.html and fill in the information to register. Keep your E-mail and Password somewhere.	You will be redirected to a screen that features your registered E-mail and password	PASS
Installation	Run the MAMEM platform installer and add the E-mail and Password when asked. Use the default settings for the rest.	MAMEM platform should be installed under Users/[User]/AppData/Roaming/MAMEM platform/	PASS
Run/update GTW	Run the MAMEM platform (shortcut lies inside start menu).	On first run GazeTheWeb should update from 0.7 version to 0.8. Ensure that version is indeed 0.8 as shown on the bottom right of the screen.	PASS
Test autostart	Terminate all applications and restart the computer	GazeTheWeb should run automatically on system startup	PASS
Calibration	Check whether your eyes are shown in lower preview on the left. If you can see your eyes, select Calibrate on the right side.	MyGaze calibration process is executed. Fixate the dot to calibrate the eye-tracker.	PASS

Close (Calibration screen)	After calibration, check the quality in the upper left panel of the calibration screen. If it looks ok, select Close.	GazeTheWeb front interface is shown and user can start with browsing.	PASS
Pause	On the upper left is a global pause button, which pauses all input.	No interface interaction when pause is selected.	PASS
Add a new tab	Select Tab Overview button in the left panel.	Tab Overview opens.	PASS
Add Tab (Tab Overview)	Select Add Tab.	Another tab is opened.	PASS
Edit URL (Tab Overview)	Select Edit URL.	URL editing screen opens.	PASS
Keyboard	Type www.google.com using the on-screen keyboard	Google webpage should load	PASS
Data transfer	Select the pause data transfer button.	Data transfer paused message should appear.	PASS
Data check	Check whether a sensordata folder is generated under C:\. Then check if data files are generated.	At least 2 files should be generated for the eye-tracker and events (if no other device is connected to the system). Try to open them using Sigviewer or Matlab	PASS
Data transfer 2	Go back to GTW and pause resume data transfer multiple times	Generation of files for each resume is not guaranteed, but make sure that GTW does not crash	PASS
Data transfer 3	Go back to GTW and pause resume data transfer multiple times but wait 10 seconds between each pause & resume	A number of files equal to the number of resumes should be generated (at least for the eye-tracker and events stream)	PASS

Data transfer 4	Close GTW while data transfer is on	Check if the files are not corrupted and GTW does not crash.	PASS
Data transfer 5	Close GTW while data transfer is off	Check if the files are not corrupted and GTW does not crash.	PASS
Data transfer 6	Remove the eye-tracker while transfer is on. Then close GTW	Check if the eye-tracker data file is not corrupt. Check if GTW crashes in the process	PASS
Data transfer 7	Remove the eye-tracker while transfer is on. Re-connect the eye-tracker after 1 minute	There should be either 1 eye-tracker data file of the whole duration filled with zeros or 2 separate files. No crashes should occur	PASS
Become a Facebook app Tester	Send an e-mail to tpapazoglou@iti.gr and ask him for facebook app permission. After you have been granted go to: https://developers.facebook.com/apps/340229343095066/dashboard/ Click on Roles, and add yourself as a tester clicking on Add Tester button		PASS
Open GTW in Dashboard page	Double click on GTW	GTW opens the Dashboard page	PASS
Click on login with facebook	Click on login with facebook	After a few seconds, the Dashboard will be loaded.	FAIL
Click on login without facebook	Click on login without facebook	After a few seconds, the Dashboard will be loaded.	PASS
Test Help button	Click on the HELP button	A window should launch with information about getting help	FAIL

Test profile screen functionality	Click on the PROFILE button.	It will redirect you to a profile editor. Change your information if needed and click on save changes, or hit cancel to return to previous screen.	PASS
Test training connectivity from dashboard	Click on the TRAINING button	It will redirect you to the training software page. Check if your nickname appears in the top right corner	PASS
Finish a level on the training software	Finish a level on the training software. For example the first from basic.	When the level finishes you should get back to overview. Then load the Dashboard again.	PASS
Check Training summary	See that a circle in the Training summary is now colored and the percentage should not be 0%.		PASS
Check details	See the information on the details panel. Check if there are any errors, or NaN values somewhere.	The score should have nominal values from the third day of using the dashboard.	PASS
Check that task popup works	Click on a task button (e.g.: E-mail)	A popup should appear, with a list of webpage(s)	PASS
Check graph	Click on the GRAPHS tab button. And then switch between basic categories and all categories. Check for errors or NaN values.	The graph should have nominal values from the second day of using the dashboard.	PASS
GENERAL – language	Was the dashboard translated to your language based on your initial option in the registration/profile?		PASS
General Comments/R emarks:	<ul style="list-style-type: none"> - Eye-tracker is way inaccurate on first start, probably has to do with the installer default eye-tracker settings. - Login with facebook: the username and pass fields are too close to each other and cannot be easily clicked. After login a blank page is shown - Help button on dashboard: “Failed to load URL mailto:[anemailaddress] with error ERR_UNKNOWN_URL_SCHEME (-302). - When dashboard button is clicked it always asks to login with/without facebook. Can it remember my last choice? 		