

USER'S MANUAL

VISUALIZE INTERACTIVE

Visualize
Interactive

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Visualize Interactive Software User's Guide

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The Visualize Interactive is a desktop software developed to visualize physiological signals during the activities called mesh alignment, knotting, and go-around which are done by the participants of the research team who participated in the synchronization and analysis of the biomarkers under noise and stress. The software takes the files which consist of signals in the *.ASC format and visualizes the EKG, acceleration x,y,z, and the activity of the muscle groups both in right and left hand. Also, The Visualize

Interactive provides the user with scene video and eye video of the participants during the experiments. Therefore, the user can keep track of the video and signals simultaneously in the interactive stream. There is also a voice assistant in three languages English, Finnish and Swedish for beginners. However, Visualize Interactive is still requiring some improvements and updates. You can visit the GitHub repository of the related project to get to know more about the source code and the files.

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1 Introduction

1.1 Overview

This document describes the features and functionality of the software called Visualize Interactive. The visualize interactive is a software that is developed by using Python programming language. The software has a graphical user interface designed in the Qt Designer which can be integrated with the Python backend. General-purpose of the visualize interactive is to visualize physiological signals of the participants who are experiencing a certain kind of experiment interactively. Visualize interactive requires users to upload signals and task files. Signals file consists of the biomarkers generated during the activity of the participants in the *.ASC format and the tasks file consist of the starting frame and ending frames of each task. Task file also consists of the GMT matched frames that take users to the exact starting point of the signals and videos. Users can also provide the videos of the scene and eye during the experiment and then view simultaneously with the signals.

2 Software Components

2.1 Development Tools

Anaconda 3 is used to simulate required tools like spyder and qt designer. To provide the functionality to the multimedia widget tools PyQt5 is used. For the visualizations, the Matplotlib Pyplot library is

used and to make them work interactively a timer with a certain interval is set. Other operations, to handle maths and file importation, basic libraries like Numpy and Pandas are used. Also, the gtts and playsound libraries are used to create voice assistance during the program. The base programming language is Python and the software is created using python assisted libraries.

2.2 GUI Overview



Figure 1.0 Main Page

When the user executes the program, the user will face the page which is shown in Figure 1.0. There is a piece of general information and announcement at the beginning of the program which directs users to the correct operations. The Visualize Interactive is not functioning during the general announcements as a principle because the software is operating with the large files and tries to reduce possible errors. After the announcements user can take action and implement the next instruction. The control panel is located at the right-hand side and painted black there will also be instructions in which the user can overview the system messages. The graphs which will be displaying the interactive visualizations are placed at the

bottom. The task and eye video will appear in the middle and can be tracked by the timeline under them.



Figure 1.1 Top Left Menu

The top left menu is responsible for taking the files from the user, both signals and video files.

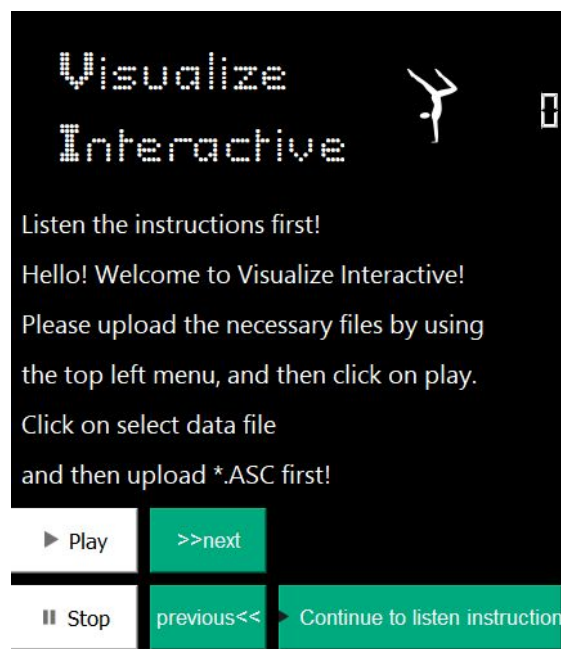


Figure 1.2. The control panel

The control panel consists of the main buttons which are used to play and stop the interactive visualizations. The user can also jump to the nearest event which is the starting or ending scene of the current task by using the next button.

3 Easy Start of The Visualize Interactive

3.1 How to start with Visualize Interactive?

Step 1.

Click on the select data file in the top left menu and choose to Open the ASC file option to upload signals file.

Step 2.

Click on the select data file in the top left menu again and choose to open tasks file to upload annotation results.

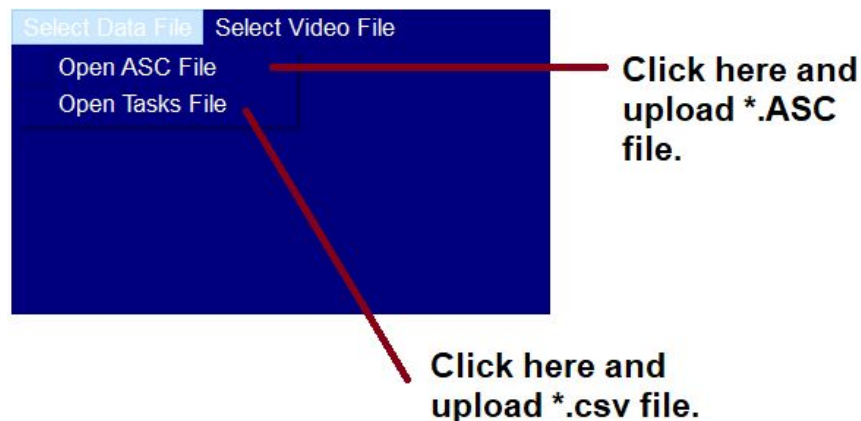


Figure 1.3 Step1 and Step2

Step 3.

Click on the select video file on the top left menu and then choose to open task video to upload a scene video.

Step 4.

Click on the select video file on the top left menu again and then choose to open eye video to upload an eye video.

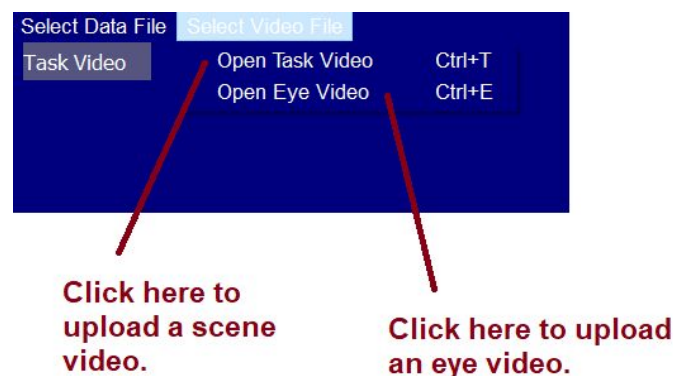


Figure 1.4 Step3 and step4

Step 5.

Click on the play and view the interactive visualizations. Then you will see the following screen which is shown in figure 1.5.

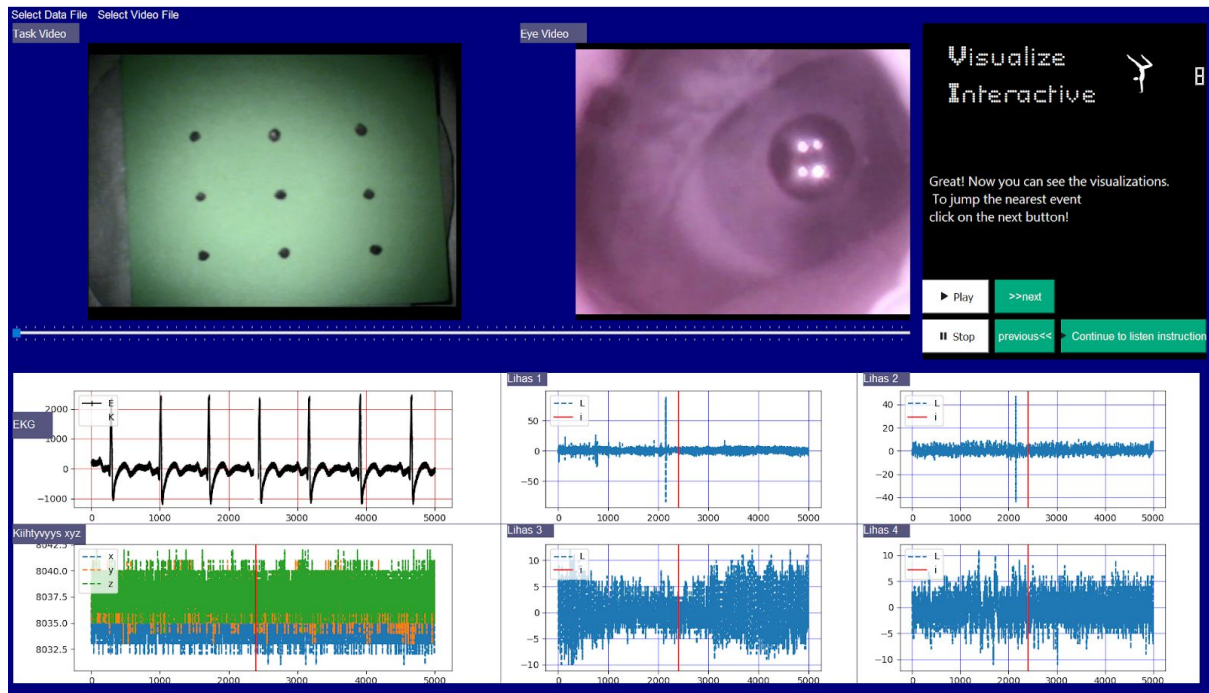


Figure 1.5 Step5

Step 6.

Now you can click on the Next button and jump to the nearest event which is, for example, a starting or an ending scene of a task.

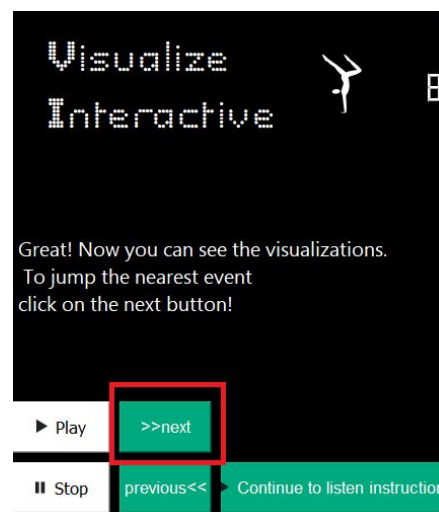


Figure 1.6 Step6, The Next Button

The following Figure 1.7 shows a picture from the software after clicking the first time to the Next button.

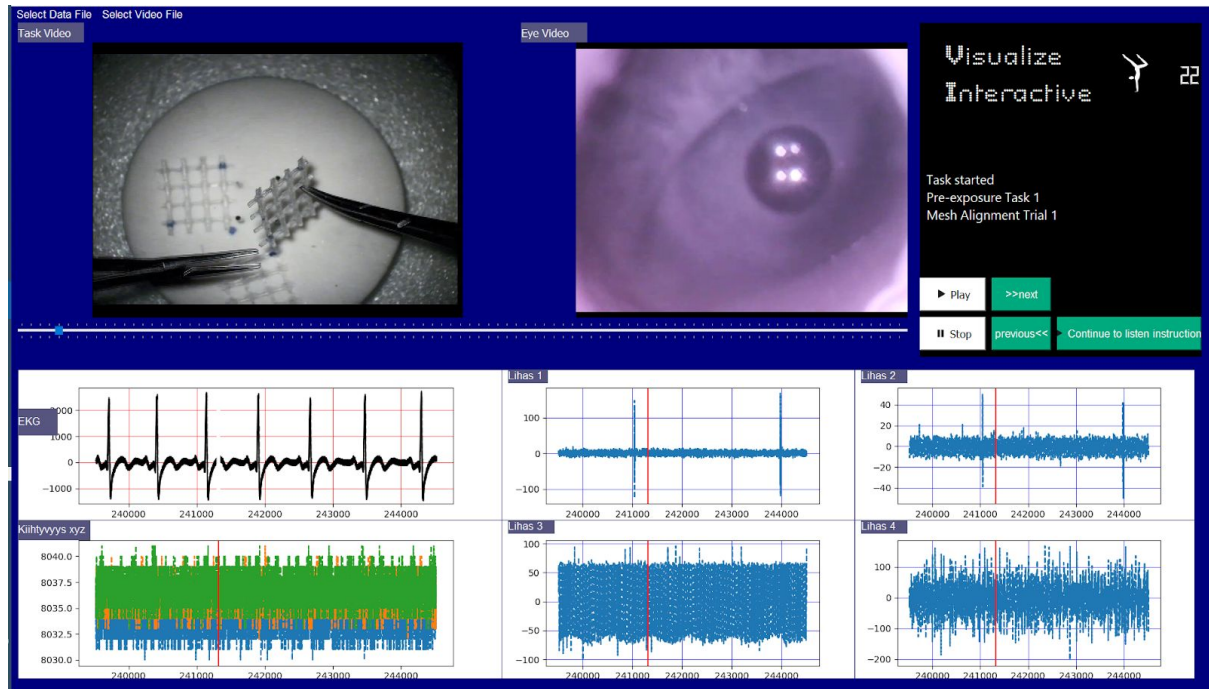


Figure 1.7. Scene after clicking the Next button

You can also observe the information on the event that the program jumps on the control panel as shown in figure 1.8.

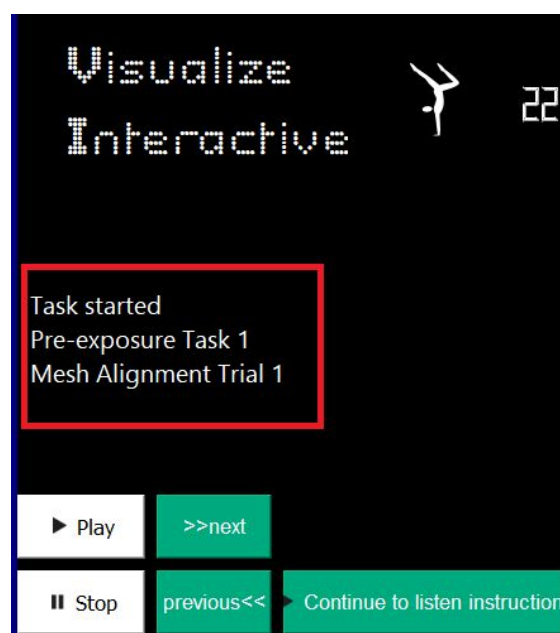


Figure 1.8. System and Event Information