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NEO TANDEM TECHNOLOGIES

User Manual
V0.1

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Document Revisions

Version: Version 0.0: Initial creation of document
Version: Version 0.1: Added basic content relating to Introduction, Processes and Appendix.

1 Introduction

1.1 Scope and Purpose

The purpose of this eye-tracking software is to provide the user with a eye-tracking software which will allow for the tracking of the eye on 2D and 3D models and videos.The system is centred around making eye-tracking possible for all media types.

1.2 Process Overview

There are a few core process that have been implemented and that will allow for more effective eye-tracking across mediums.The process are as follows:

- Eye tracking on 2D and 3D models and videos.
- Creation of heat maps from eye-tracking.
- Saving heat map on specific media.

The following process listed are the core of this program as they carry out the basic and most important functionality of this software.

2 Configuration

2.1 System Configuration

2.1.1 Minimum Hardware requirements

- 1.6 GHz or faster processor
- 4GB of RAM
- 1GB of available hard disk space
- 5400 RPM hard drive
- DirectX 9-capable video card
- Internet connection required

2.1.2 Recommended Hardware requirements

- 2.6 GHz or faster processor
- 8GB of RAM
- 2GB Graphics Card

- 1GB of available hard disk space
- 5400 RPM hard drive
- DirectX 9-capable video card running at 1024 x 768 or higher display resolution
- Internet connection required

2.1.3 Recommended Software requirements

- The Eye Tribe software. That comes with the Eye Tribe camera.
- Windows Media Player Version 12.

2.1.4 Recommended External Devices

- The Eye Tribe eye-tracking camera.The camera can be purchased at The Eye Tribes website (https://theeyetribe.com/).

2.2 Installation

Please ensure that you meet the minimum requirements. It is recommended that you meet the recommended requirements as this will ensure that the best performance is achieved.

Installation instructions to be appended at later stage.

3 Getting Started

The program is made to run with as little configuration as possible.There are no authentication processes that are associated with the program.The user will be able to just run the application and use it if the minimum requirements have been met.

3.1 Basic use

Once the application is run the user will be presented with a screen which will allow them to select the option to start a new recording session or use a previously created session. A new form will pop up with options to navigate to different sections of the application. The calibration button will navigate to the calibration page will allow the set-up of The Eye Tribe eye camera. This form will allow you to calibrate the camera to ensure that the data recorded is correct. The calibration process will be discussed further in a later section. The recording button on the main page will open the recording set up. This page will allow the user to select the type of recording which will then take them to the appropriate pages to do the recording. The recording the page will allow for recording on the selected media. You would select the appropriate media and then start the recording. The data will then be saved and then used to make the heat maps

and all the associated files.

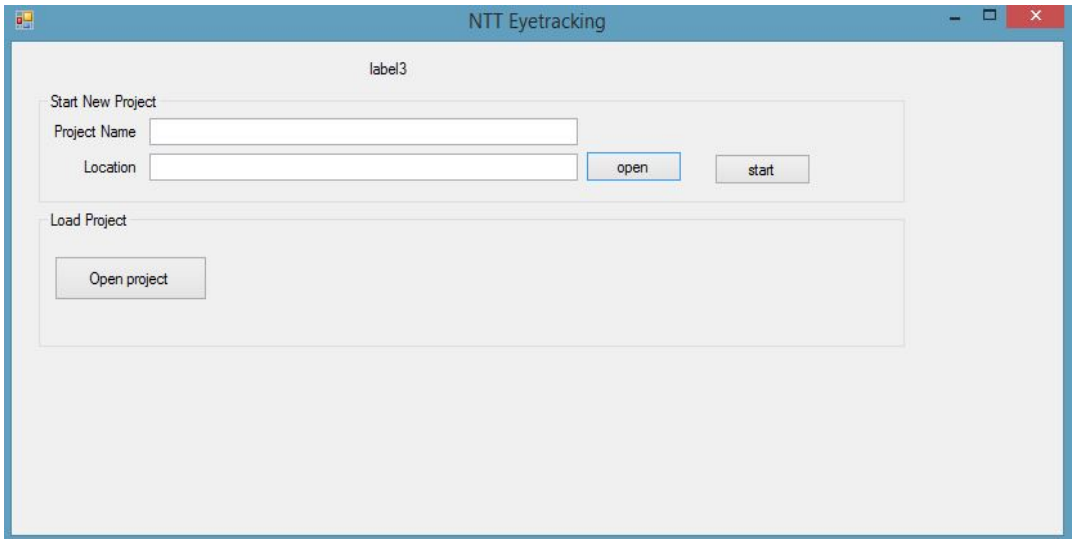
The application can be exited easily by just pressing the exit button(red cross) on the top right of the application. This will end the application and end all its accompanied processes.This will ensure that the application does not cause harm to the computer.

4 Using the System

The following section will go in to in depth detail about the system and how to use it. This section of the user manual will show you how to perform actions throughout the application.There will also be sections on what to expect from each action. Certain troubleshooting sections will be referenced in this text and if you encounter any of these errors please refer to the troubleshooting section to try and solve the error.

4.1 Starting the program

The program will allow you to perform eye-tracking on different kinds of media. Different media can be recorded and so the program will allow for multiple recordings of the same or different media. The program allows you to create what is known as a eye-tracking recording project. This project is used to keep all the information of your recordings for a specific session. You can always return to the session and continue recording in that project which allows you to move between recording projects.



When the user runs the Eye tracking software a form will appear. The form is split into two sections, start a new recording or to open a existing project.Below are the execution of both methods.

4.1.1 Start a new project

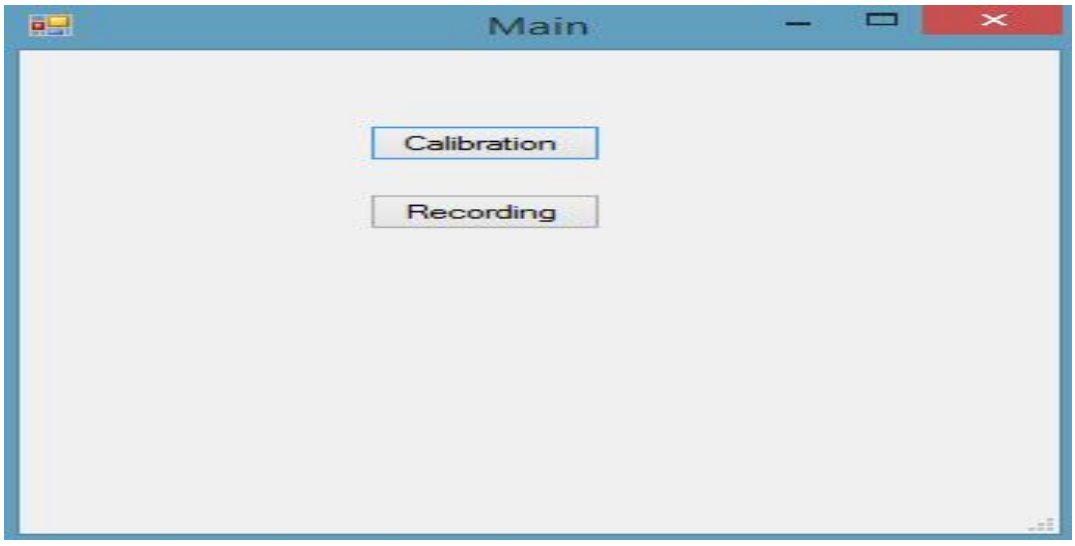
To start a new project you will need to specify a name for the project and location to store all the files. A default name will be given to the project called "project". This will create 3 files and a series of folders in the location selected. The 3 files created are the .eye file which contains all the information about the recording project. This information is all that is needed to continue recordings. The two other files that are created are the settings files for general user settings and then settings for 3D recording.The folders that are created are just the folders for the recording data and the results. Once this all the folders are created then the program will proceed to the main menu.

4.1.2 Open existing project

This will allow you to select an existing project and continue recording. Press the open button to select a file. The only file that will be accepted are ".eye" files. Once you select the file the settings are loaded up from the files and then the program moves to the main menu for you to continue recording.

4.2 Menu Screen

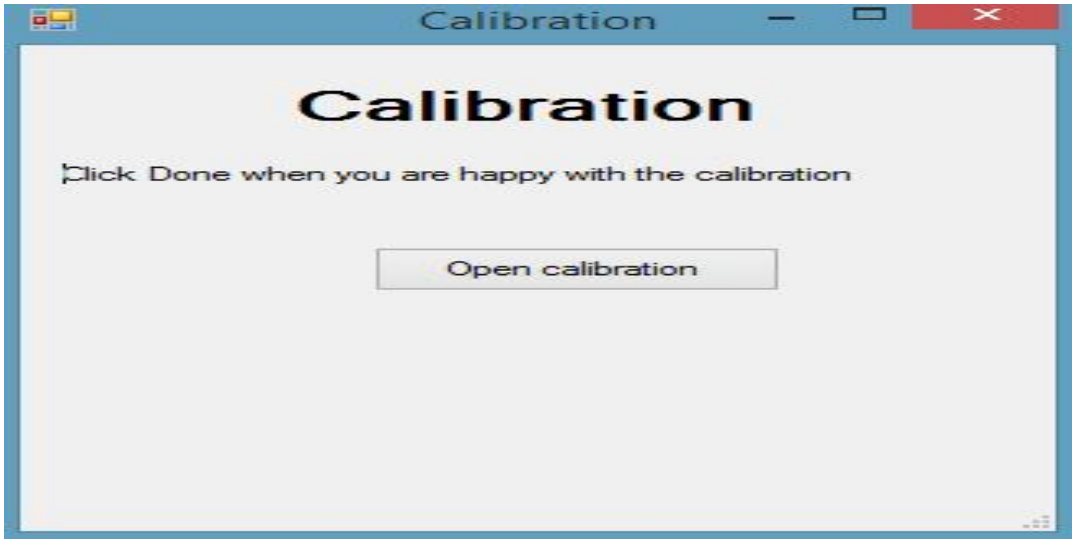
The menu screen is where the program will allow the user to navigate through the entire application and perform all the tasks. The menu is divided into two sections. The calibration and the recording sections. The calibration button will navigate the user to the configurations page and will allow the user to calibrate The Eye Tribe camera. This will need to be done to ensure that the camera is recording the data accurately. There is more detail on the calibration below.



The recording option will navigate to the recording set-up form which will be used to set up a recording. This will be discussed later on in the manual. While the menu screen offers navigation for the application it also provides a exit point for the application.This is where the the program is exited. This is achieved by pressing the red X in the top right corner of the form. This will safely end the program and ensure that nothing harms the computer.

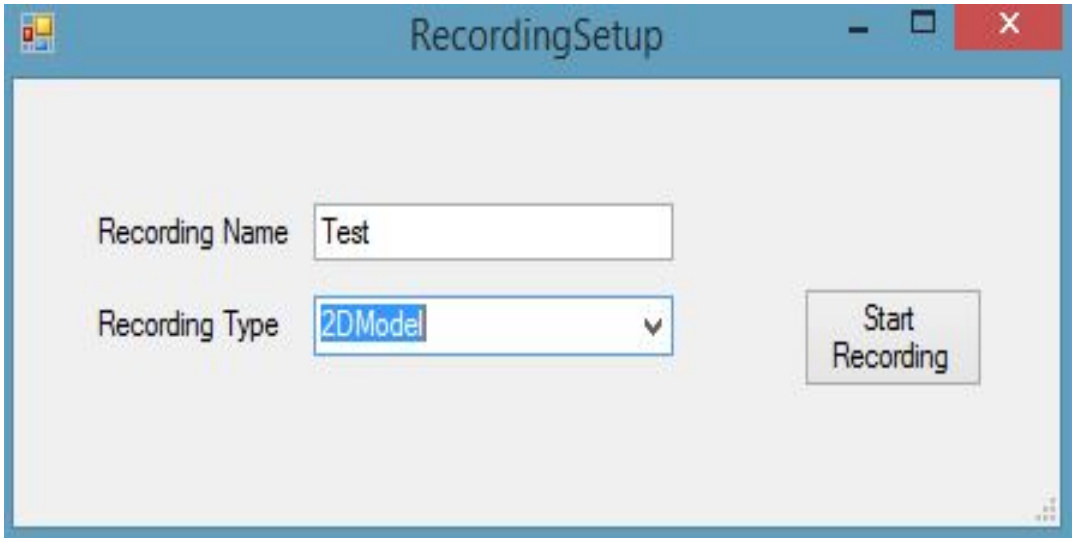
4.3 Calibration Screen

Pressing the calibration button on the menu screen will navigate to the calibration screen.The calibration of The Eye Tribe camera is vital as this will ensure that the program will accurately create the heat maps for the media that has the eye tracking performed on it. This will also allow the user to configure the settings of the recording to their needs.The pressing of the calibration button will open the EyeTribeUIWin program which initiates the server and opens up the calibration. Use the calibration to calibrate the camera.Leave the server window open as this is what will transfer the data from the camera to the program. The server is connected to the internet so also ensure that there is a stable internet connection available. Once you have calibrated you may then proceed back to the menu screen and then start recording.



4.4 Recording Set-up Screen

Pressing the Recording button on the menu screen will navigate to the Recording Set-up screen. This screen is used to set-up the recordings. This screen will allow you to do multiple recordings.These recordings are executed sequentially and can not be performed at the same time. The application will be navigated to either of three screens: 2D recording screen, 3D recording screen or the Video recording screen. This navigation will be dependant on the options taken in the recording set-up. You will also be allowed to name the recordings,this will create new folder in the recordings directory. The folder will be placed in the appropriate recording type sub-folder of the recordings folder. The folder will house all the information about the recordings such as eye-tracking data and also the resulting heat maps.



The screen has a text box for the user to enter the name of the recording. The name should contain only alpha numeric characters so that when the folder is created it will not fail. If it does not follow these rules then it will not be allowed to continue to the next section of the application. There is also a drop down list to select what type of recording is needed to be performed. Once ready then press the start recording to proceed to the recording page.

4.5 Recording 2D model

The 2D model recording form is navigated after the 2D model is selected in the recording set up. The page has a list of buttons that will perform all the tasks that need to be performed. The open model button when pressed,will allow the selection of a 2D model to be chosen. The 2D models are often just images and any image is allowed to be chosen. The quality of the image will improve the results from the eye tracking recording.The higher the image the more accurate the results will be. When an image is selected then the record button can be pressed. When the record button is pressed, the screen is filled with the image. The image is expanded to fit on the entire width and height of the image. The high image quality will provide a crisper and more clear image. The recording also starts ones the image is made full screen. During this process it is recommended that you move as little as possible as the data that is recorded could be tampered with. Once you are done with the recording press the Esc key. You are then able to find the results of the recording in the project location in the recordings folder and then in the folder with the models name as a folder. The folder will contain a copy of the image, a text file which contains all the recorded data and two images that have heat maps on them. The one heat map image is just the heat map while the other image is a heat map which then has the image that the recording was performed on. When you are done recording the data you can then exit the application or restart the recording. Restarting the recording will overwrite the data that was there. The exiting of the application is done through the pressing the red X in the top right corner of the form.

4.6 Recording 3D model

The 3D model recording form is navigated after the 3D model is selected in the recording set-up. The page has a list of buttons that will perform all the tasks that need to be performed. The open model button when pressed,will allow the selection of a 3D model to be chosen. The 3D model will need to be in the format of a object file. These files have the extension ".obj". When an 3D model is selected then the record button can be pressed. When the record button is pressed. The 3D model then has snapshots taken and then a slide-show is created of the model and then is shown. The slide-show is expanded to fit on the entire width and height of the screen. The recording also starts once the slide-show starts the is made full-screen. During this process it is recommended that you move as little as possible as the data that is recorded could be tampered with. The recording process will end when all the slide-show images have been shown. You are then able to find the results of the recording in the project location in the recordings folder and then in the folder with the models name as a folder. The folder will contain all the snapshots, a text file which contains all the recorded data and images that have heat maps for each snapshot on them. The one set of heat map images are just the heat maps for each snapshot. while the other image is a heat map which then has the models snapshot that the recording was performed on. When you are done recording the data you can then exit the application or restart the recording. Restarting the recording will overwrite the existing data that was there. The exiting of the application is done through the pressing the red X in the top right corner of the form.

4.7 Recording Video

The video recording form is navigated after the video is selected in the recording set-up. The page has a list of buttons that will perform all the tasks that need to be performed. The open video button when pressed, will allow the selection of a video to be chosen. The video that is chosen needs to be a ".wmv" file as it uses and extension of the Windows Media player. The length of the length of the video can be any length but the longer the video is the longer it will take to be processed. When an video is selected then the record button can be pressed. When the record button is pressed, the screen is filled with the video and the video will then start playing. The video is expanded to fit on the entire width and height of the screen. The video is recommended to be a medium quality one as the video might show signs of pixelation during the playing. The recording also starts once the video is made full screen and begins to play. During this process it is recommended that you move as little as possible as the data that is recorded could be tampered with. The recording will end when the video has stopped playing. Once you are done with the recording process you are then able to find the results of the recording in the project location in the recordings folder and then in the folder with the models name as a folder. The folder will contain a copy of the image, a text file which contains all the recorded data and two videos that have heat maps on them. The one heat map video is just the heat map while the other image is a heat map which then has the video that the recording was performed on. The heat map will be populated as time goes by showing the most looked at on the model. When you are done recording the data you can then exit the application or restart the recording. Restarting the recording will overwrite the data that was there. The exiting of the application is

done through the pressing the red X in the top right corner of the form.

5 Troubleshooting

This section of the user manual is dedicated to showing the errors that can occur on the system.This will also provide possible solutions to problems that you may encounter. Please note that the currently the program is not finished and the accompanying user manual is also not yet complete. This will be updated as the system is developed.

The system is split into many subsections. This section will also be split to ensure you are able to file what you need.

5.1 Start screen

5.1.1 String is not a path

This error occurs when starting a new recording project and the path in the path text-box does not follow path structure. The program will not continue if this error occurs. This can be fixed by ensuring that the text inside is a actual path such as: C:/User/MyPath.

5.1.2 The path does not exist

The following error occurs when the path that is selected no longer exists on the computer. This can be fixed by doing on of two things:

1. Ensuring that the path specified is correct.
2. Creating the file path to match the selection.

Any one of these solutions can help fix the problem and allow the program to continue.

5.2 Calibration screen

5.2.1 Could not find EyetribeWinUI.exe

The program requires that the Eye-tribe software be installed on the system.This error occurs when the software is not found on the system.
The solution is simply to install the software which can be found on The Eye-Tribe website when you have purchased the camera.

5.3 Recording set-up screen

5.3.1 Name has invalid characters

This error occurs when the name for the recording contains invalid characters.These characters need to be alphanumeric and can not contain any symbols.// The solution is to simply use only alphanumeric numbers and not symbols.

5.4 General recording errors

5.4.1 Could not find [insert path and name].txt

When a recording has been completed and this error is shown it means that the file that stores the data was never created so it can not create heat maps for the specific media type.This error can occur due to multiple factors.

- The eye tracking camera was not connected or was not calibrated correctly.
- The eye tracking camera was connected to a USB 2 port.

The solution would simply be to check that The Eye-tribe is connected to the computer properly and also that it is connected to a USB 3 port.

6 Appendices

6.1 EyeTribe

The Eye Tribe is a low cost development kit which can be used by various languages such as C# projects to track the movement of the eye. The Eye Tribe eye tracker includes a SDK (Software Development Kit) that allows the integration of eye tracking on multiple applications on multiple platforms. More information on the Eye Tribe and its various components can be found at http://www.theeyetribe.com.

7 Index

This is where the index will be located. Here the user will be able to look for specific words and see where they are located