

EPIImport Tutorial

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Introduction

EPIImport is a program that translates the eye movement data generated by E-Prime Extension for Tobii into VizFix data files, which then provide eye movement visualizations for an eye tracking experiment. This tutorial explains the procedures and the data files needed for EPIImport to generate appropriate visualizations for both eye movements and experiment stimuli. When you have completed this tutorial, you will have VizFix data files like “TETVaryingPositionAOITracking-4-1.vizfixsql”, and you will be able to visualize the eye movement data using VizFix in a form as shown below. You can read VizFix manual or visit the project website to know more about this eye movement visualization software.

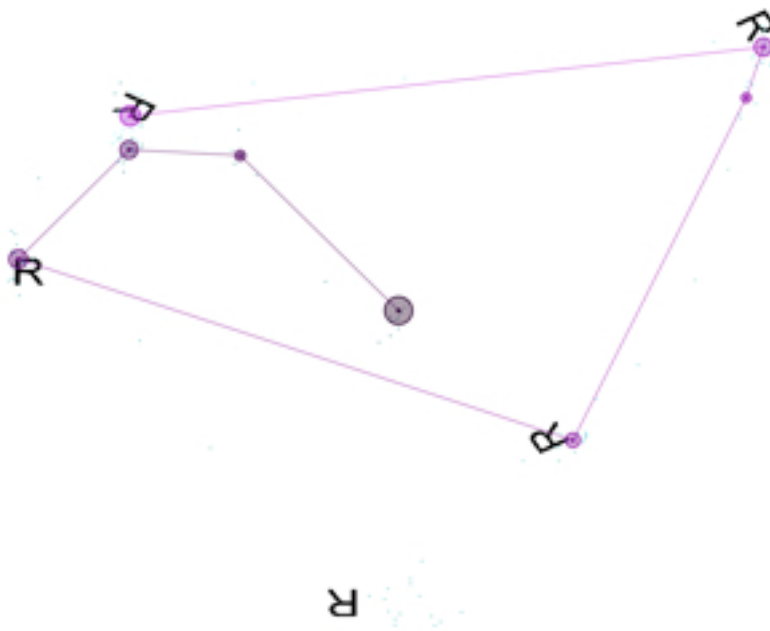


Figure 1. Eye movement data visualization for a trial of the TETVaryingPositionAOITracking experiment. The purple circles are fixations.

The fixation scan path starts at the center of the screen. As the time progresses, the fixation circle's color becomes brighter.

EPIImport System Requirements

1. Mac OS X 10.5 or above.
2. VizFix 1.0.
3. The input eye movement data should be generated by E-Prime Extension for Tobii.

Overview of Tasks:

1. Verify that EPIImport can handle your E-Prime experiment structure.
2. Take screenshots of the experimental visual stimuli.
3. Verify that the requirements are met.
4. Create settings.txt file.
5. Create *.screenshots files.
6. Execute EPIImport.

This tutorial uses the modified TETVaryingPositionAOITracking experiment as an example. TETVaryingPositionAOITracking is an experiment that comes with the **E-Prime Extension for Tobii** and is illustrated in the *E-Prime Extensions for Tobii User Manual*.

In the TETVaryingPositionAOITracking experiment you will be shown a target and asked to identify the target later. The target consists of a letter with a specific orientation. For example, you are shown the target, i.e. an upside down A. You are then shown a fixation followed by a randomly generated screen of the same letter in different orientations. The goal is to identify the original target and to locate that exact letter and orientation.

Task 1: Verify that EPIImport can handle your E-Prime experiment structure.

Currently, EPIImport is still under early development and it has many limitations regarding what experiment structure it can handle. It reads information about experiment structure from the E-Prime session log file (the .txt file generated after running a session, e.g. TETVaryingPositionAOITracking-4-1.txt in the “sample data” folder). Specifically, the program has the following restrictions:

1. EPIImport cannot handle nested procedures. In other words, the experiment cannot have blocks.
2. In E-Prime studio, the name of the slide which has the visual stimuli (hence the eye movement data during the slide's presence are recorded) should be “Stimulus”.

3. EPIImport relies on the screenshots of the experiment to recreate the visualizations. Therefore the visual stimuli need to be static and it should be easy to take screenshots for all trials.
4. If the visual stimuli are randomly chosen, there should be a way to input the random seed (see below).

The first two restrictions may go away in the future version of EPIImport, but using the screenshots (the third limitation) instead of recomposing the stimuli in VizFix (e.g. re-draw the images at their locations) seems to be the only way to make the tool general and easy to use.

Taking screenshots should be done separately from the formal experiment sessions so that it would not interrupt the experiment. However, for experiments that choose visual stimuli randomly, it might be hard to replicate the exactly same layout of the stimuli. For such an experiment, the experimenter should control the random seed applied to each session, and uses the same random seed to later recreate the same layout and take screenshots. To control the random seed, you can do the following:

1. Open the Experiment object properties and go to the Startup Info tab.
2. Add a Startup Info Parameter called "RandomSeed", making sure that it is Numeric.
3. Now when you start the run E-Prime will prompt you for the RandomSeed and use the entered value for the random seed.

The sample experiment, TETVaryingPositionAOITracking, presents visual stimuli at random locations and with random orientations. Therefore, we made the above changes to the experiment to allow inputting the random seed. You can try out the sample experiment included in the tutorial. The data and screenshots used in this tutorial were generated with random seed 1.

Task 2: Take screenshots of the experimental visual stimuli.

The preparation for taking screenshots has been discussed in Task 1. Here, you can use any program to take the screenshots of the experiment. I recommend to use [MWSnap](#), which can do auto-saving and support keyboard shortcuts.

The screenshots of the sample experiment are included in the folder "data from sample experiment/img".

Task 3: Verify that the requirements are met.

Here are the requirements for using the E-Prime importing tool:

- EPIImport runs on Intel Mac OS X 10.5 or above.
- VizFix is installed on the Mac.

- You have the experimental data from the E-Prime experiment, including:
 - The experiment session log files, “<experiment_name>-<subject>-<session>.txt”, which use UTF-16 Little Endian encoding and Windows line endings.
 - The eye movement data files, “<experiment_name>-<subject>-<session>.gazedata”, which use ASCII encoding and Window line endings.

For the sample experiment, TETVaryingPositionAOITracking, you should see the session log file “TETVaryingPositionAOITracking-4-1.txt” and the gaze data file “TETVaryingPositionAOITracking-4-1.gazedata” in the folder “data from sample experiment”.

Task 4: Create settings.txt file.

The “settings.txt” file provides the experimental apparatus settings. Currently, the following information is required: screen resolution, screen dimension (in mm), gaze sample rate, and eye-to-screen distance (in mm). You may use the following content to create a “settings.txt” file for the sample experiment and put the file in the “sample data” folder:

```
ScreenResolution: 1280, 1024
ScreenDimension: 324, 277
GazeSampleRate: 60
EyeToScreenDistance: 610
```

The settings.txt for your experiment must use the same entry names and format as shown above. Since the settings.txt file is assumed to be created on the Mac, its encoding is required to be UTF-8 and with Unix line endings.

Task 5: Create *.screenshots files.

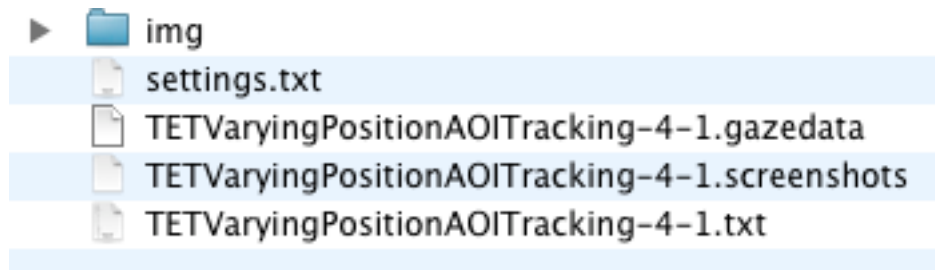
For each session, you need to create a file “<experiment_name>-<subject>-<session>.screenshots” that records the corresponding screenshots file path for each trial of the session.

For the sample experiment, you need to create a file “TETVaryingPositionAOITracking-4-1.screenshots” with the following content:

```
1: img/1.png
3: img/2.png
2: img/3.png
```

As an example, the second line says that for trial with TrialList number 3 (TrialList number can be found in the session log file), the corresponding screenshot is img/2.png. The .screenshots file should also be put in the “sample data” folder, and use the UTF-8 encoding with Unix line endings.

Now with all the above steps, your “sample data” folder should look like this:



Task 6: Execute EPIImport.

Just open the terminal, CD to the folder that has EPIImport, and type the following command:

```
./EPIImport <the path to the folder that contains your experiment data>
```

The program should import all the data files and generate .vizfixsql files which you can open using VizFix.