

Movement Time Evaluator (MTE): Installation & Operating Instructions

Martin J. Schedlbauer
Department of Computer Science
University of Massachusetts Lowell
Lowell, MA 01854
martins@cathris.com

To install MTE, follow these steps:

1. Make sure that you have a Java runtime version 1.4.1 or later installed on your system. MTE has been tested with J2SE 1.4.1, 1.4.2, and 1.5.1.
2. Unzip the file MTE.zip into the root directory on drive c: (or any other directory on Linux) into a folder called “data”. Once unzipped, the directory structure should look like this:

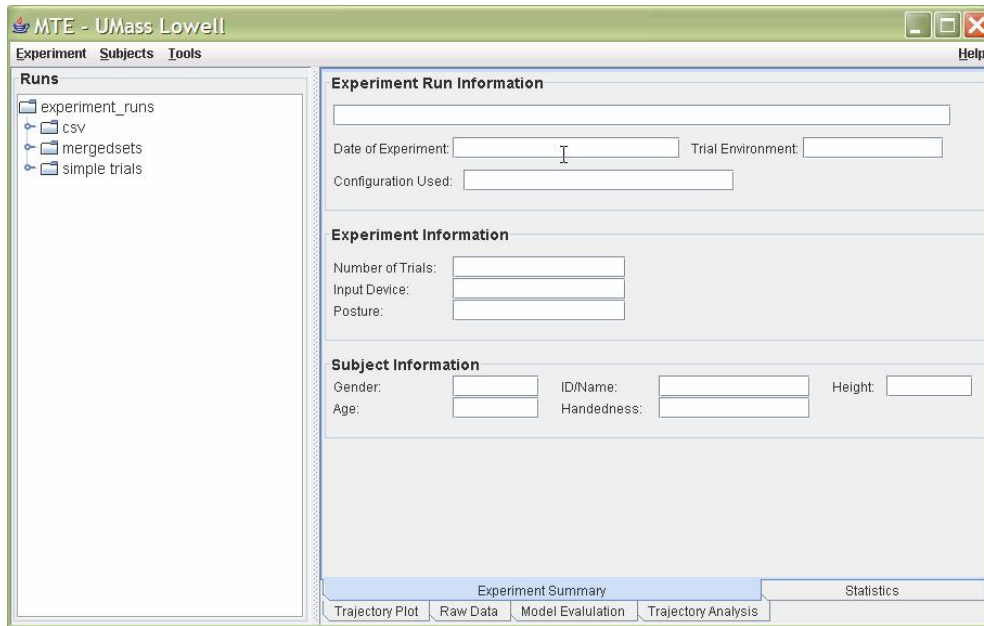
C:\data

C:\data\experiment_templates

C:\data\experiment_runs

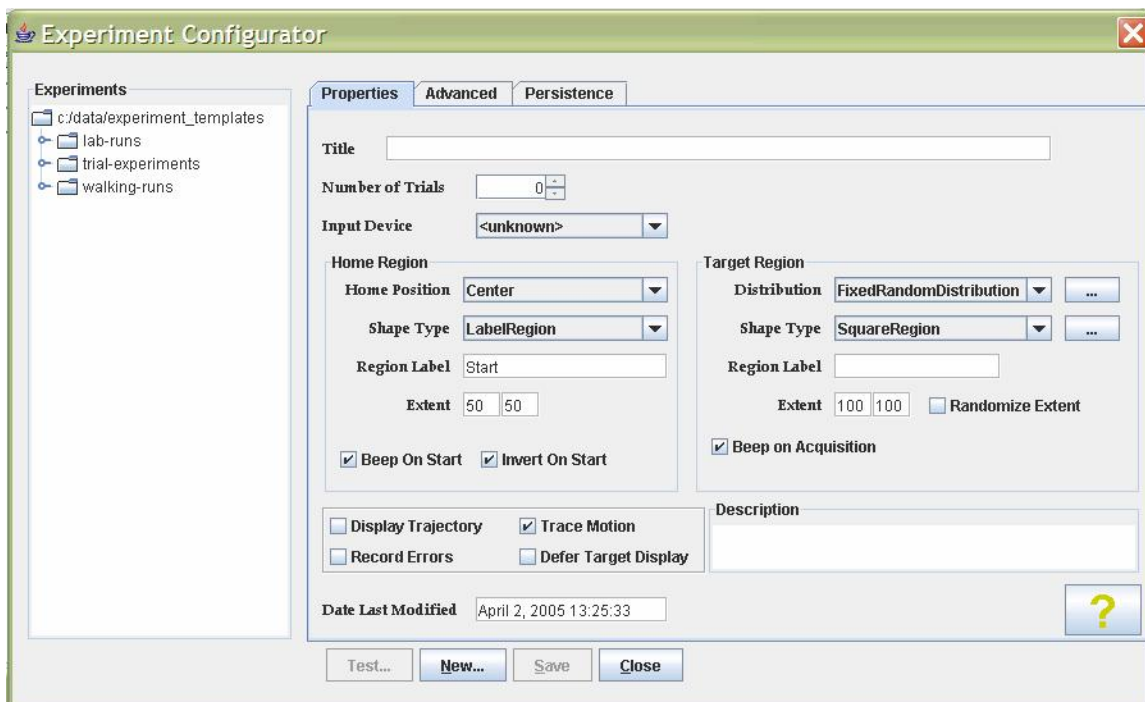
...

3. To run the software, execute the file c:\data\mte.bat (double-click on the icon or type it into the command line from the directory c:\data.) The initial screen will look like as follows, although your actual look-and-feel will depend on the settings in the c:\data\mte\fit-ui resource file as well as your version of Java.



This is the main experiment exploration panel that eventually displays experiment run data. Since you have no saved experiments at this time, there's not much to choose from.

Once you have MTE running, you are now ready to configure an experiment. Select "Experiment/Configure..." from the menu bar and you will see the following dialog:



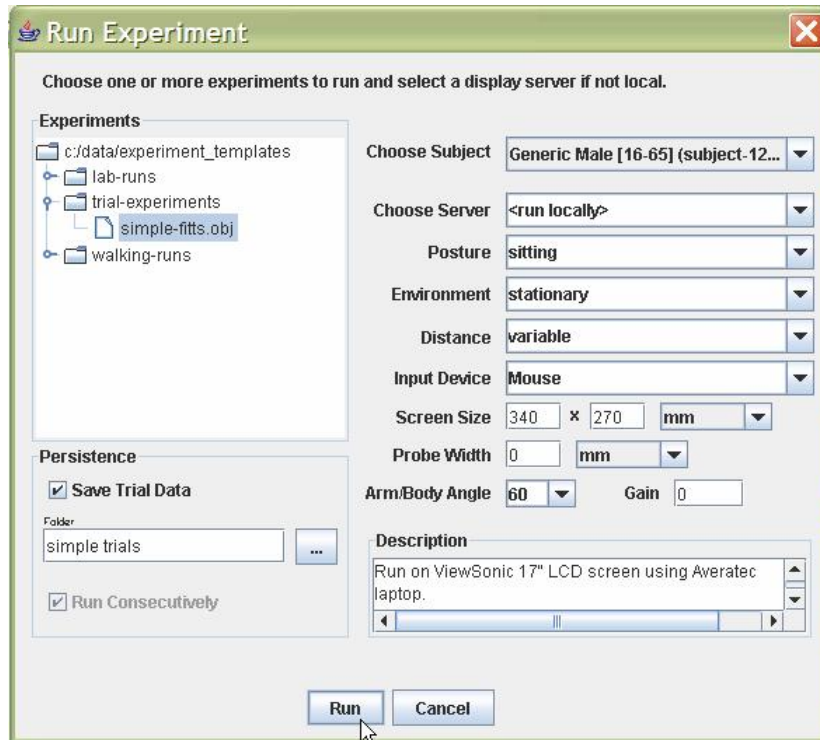
The next step is to select an existing experiment configuration to modify or to create a new one. To create a new experiment, first select one of the folders from the tree view on the left into which to store the experiment configuration (such as 'trial-experiments'), then select "New...". Enter a file name for the experiment, such as 'trial-1'. Now you are ready to configure the experiment parameters.

Here are the items you need to set:

1. Enter the number of trials/repetitions of the experiment into the field "Number of Trials".
2. Only pick an input device if all sessions of this experiment use that device; for now leave it empty.
3. Select a home position. This is a region that the user must press before they can hit on the target. For now leave 'Center'. The other choices are 'None' (no home region appears and the trial starts right away) and 'Origin' (home region appears in upper left corner.)
4. Select "Display Trajectory", "Trace Motion", and "Record Errors", but leave "Defer Target Display" unchecked. If "Defer Target Display" is checked, then the target does not appear until the user clicks on the home region, which means that the movement time measured will include a factor for reaction time.
5. Leave the Target parameters at their default values.
6. Click on "Save".
7. If you like, you can try out your configuration by pressing "Test...".
8. Once you are satisfied with your experiment configuration, click on "Close".

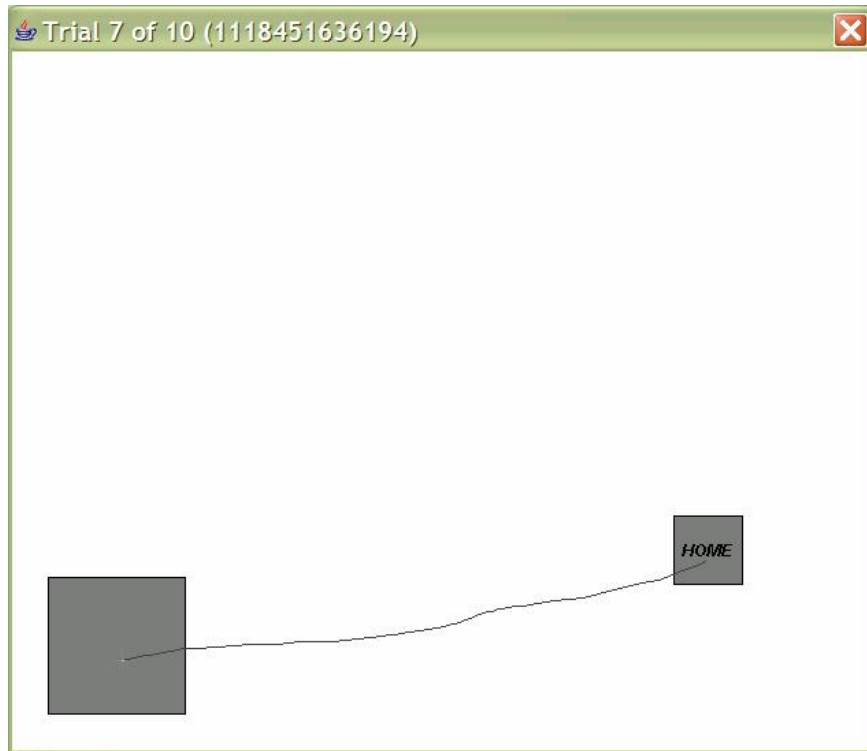
To execute an experiment that you have previously configured, select "Experiment/Run..." from the menu bar, then choose an experiment configuration from the file tree and enter session specific information. If you wish to analyze the results later, you need to check "Save Trial Data" and then click on the "..." button to select a folder into which to save the file. Each session will be stored in a file name that is fully numeric and unique. The underlying storage mechanism in Java serialization, but experiments can be exported into CSV files by selecting "Tools/Export Data...".

Here is a configured experiment session. Once done, press "Run". Be sure to leave "<run locally>" as the remote server name. We will discuss later how to run an experiment over the network.

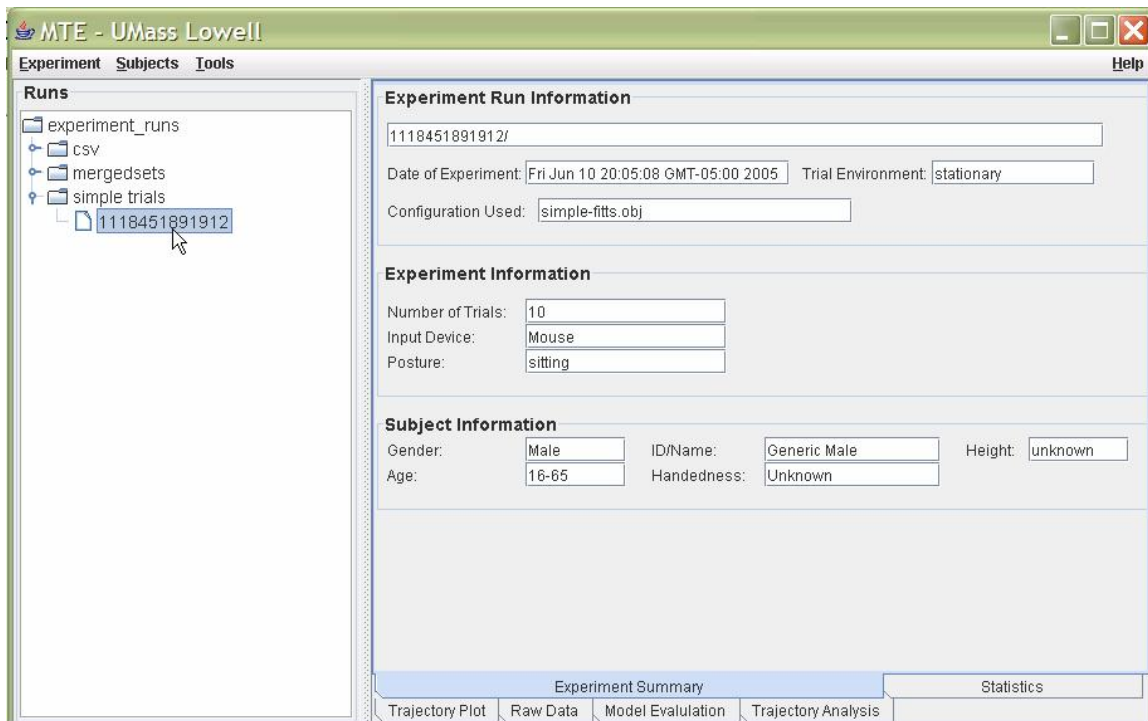


The experiment will start after pressing “OK” on the instruction screen. If you have selected a home region, you must first click on the home region, release the mouse button, then move to the target and click within the target boundary. If you’ve selected tracing you will see the actual path that the cursor takes. Once you have gone through all of the trials, you will see a final message with the file name into which the data was saved. Press “OK” and then close the experiment panel by pressing the “X” on the upper right corner of the window.

Here’s what a typical experiment trial looks like:



To explore and analyze the data of an experiment run, return to the main panel, then be sure to select “Tools/Refresh Experiment List” from the menu bar to update the files on the file tree. Next, expand the folder into which you saved your experiment data, then click on it once. It’s summary data will appear in the various panels.

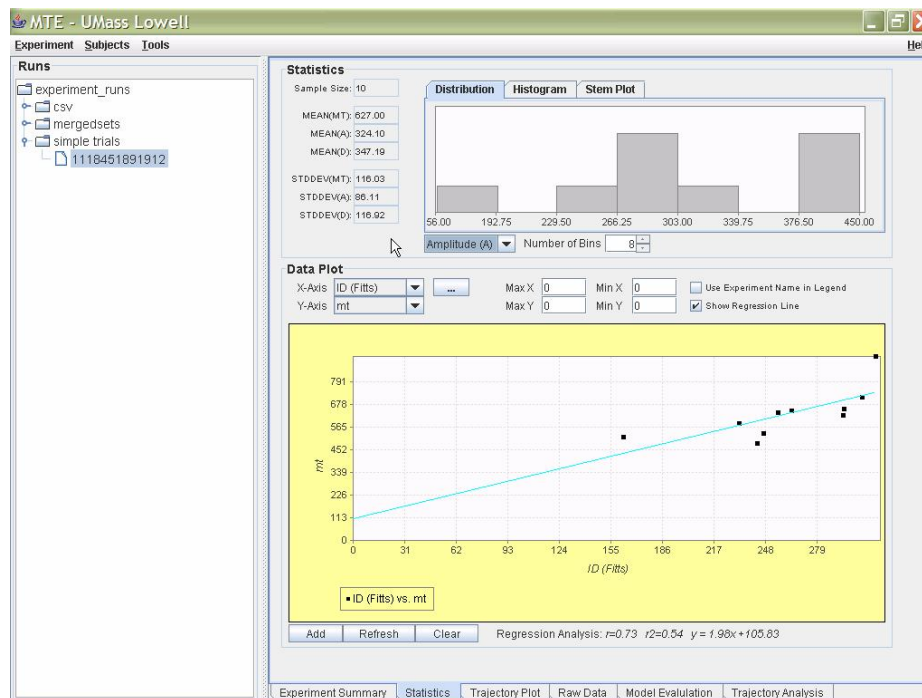


The “Experiment Summary” panel lists basic information about the run. The Statistic panel shows statistical analysis of the data set.

To create a scatter plot of ID versus MT, follow these steps:

1. Select the “Statistics” panel
2. From the drop-down box for the X axis, select “ID (Fitts)” or another movement time model.
3. From the drop-down box for the Y axis, select “MT”.
4. Check the box “Show Regression Line”
5. Click on the “Add” button below the plot window

You can overlay additional data sets into the plot by selecting them, then pressing “Add”. To clear all plots, select “Clear.” Here’s a sample screen:



Here’s what the other panels show:

1. Trajectory Plot: shows the actual cursor trajectory for each run in the experiment session. Useful for studying movement characteristics for various input devices.
2. Raw Data: displays some of the most pertinent elements of the actual data collected.
3. Model Evaluation: calculates correlation of ID and MT and throughput (ID/MT) for various movement time models.

4. Trajectory Analysis: shows the speed to the mouse cursor as it traveled from the home position to the final target position.

Other important features:

1. Exporting data to Excel: Use “Tools/Export Data...” to select one or more data sets for exporting into a CSV file.
2. Merging Data Sets: To combine several experiment runs stored in different files into a single data set for exploration, go to “Tools/Merge Data Sets...”.
3. Subject Information: Use “Subjects/Add New...” from the menu bar to add new subject data.